Original Research Article

Examining Patterns and Trends of Household Food Consumption of in the city of Ati (Chad)

ABSTRACT

Households in Ati face high food consumption costs which determine different states of food and nutritional security. This study was carried out with the aim of analyzing household food consumption in order to contribute to better knowledge of the food and nutritional situation and to inform stakeholders working in the field of food security so that they can better guide their intervention strategies. A prospective, cross-sectional descriptive research survey was adopted for the study and was conducted from 15 April to 14 June 2022 in the city of Ati. The study involved 135 households selected in the neighborhoods of the city of Ati. Data were collected using a questionnaire survey form and then processed using Excel 2016. The food consumption score was used to reflect dietary diversity, frequency of consumption as well as household nutritional intake relative to products and food groups consumed individually. Results showed that more than a third of households (38.52%) consumed at least 3 meals per day and more than half of the households surveyed (54.07%) had 2 meals per day. The group of cereals and tubers is the most consumed by the majority of households. The results show that 30.60% of households surveyed had a poor ACS, 63.60% had a borderline ACS and 5.80% had an acceptable ACS. It emerges that 76.6% of households have low AMDS, 17.9% have average diversity and only 5.50% have good dietary diversity.

Keywords: households, food consumption, food safety, Ati, Chad.

1. INTRODUCTION

Food is a priority human right (Charter of Human Rights) and remains the subject of multidisciplinary study today. Every human being has the right to adequate food and the fundamental right to be free from hunger [1]. Knowledge of food or at least food resources at household or individual level has been the subject of several studies [2]. Many studies have also highlighted the interest in considering food as a whole by identifying food typologies, the purpose of which is the evaluation of food consumption profiles [3, 4]. Better understanding the dietary behavior of the population makes it possible to adjust and guide nutritional information and education actions, which have become of indisputable utility. The development of these prevention actions requires in-depth knowledge of food consumption habits but also of their determinants in the populations concerned [5].At numerous world food summits, experts have discussed issues relating to the availability, accessibility and utilization of food worldwide as well as at the continental, regional and local levels. A number of authors have addressed the issue of availability, use and access to food by the population. However, between the availability and use of food lies the major problem of access to food by households, linked either to the question of financial means or hostile

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geographical conditions, or to the willingness of households or individuals to indulge in a particular type of food.

Chad, like other Sahelian countries, faces the constant challenge of ensuring sustainable food and nutritional security for its population. The food situation has deteriorated significantly in recent years with declines in cereal production. Nearly 5.3 million people suffer from food insecurity, including 1.8 million with severe food insecurity, according to the projected situation in the harmonized framework of November 2021 [6].According to the results of the 2022 SMART survey, at the national level, the prevalence of global acute malnutrition was estimated at 8.6%, that of stunting is estimated at 28.0% and the prevalence of underweight is estimated at 18.9% [7].The persistence of food and nutritional insecurity remains a real problem, particularly in the town of Ati, where households face both high food consumption costs and shortages that affect various aspects of food and nutritional security.Our study looked at the foods consumed by households in the city of Ati.The general objective of this study is to analyze the food consumption of households in the city of Ati in order to contribute to a better understanding of the food and nutritional situation and to inform stakeholders working in the field of food security to better guide their intervention strategies.

2. MATERIAL AND METHODS

2.1 Study area

The study was conducted in the city of Ati, capital of the Batha Province in central Chad. The climate is hot desert type. The driest season lasts 9.7 months. The temperature generally varies from 15°C to 42°C during the year. The population is estimated at 35,311 inhabitants [8]. The geographical location of the study area is shown in Fig. 1.

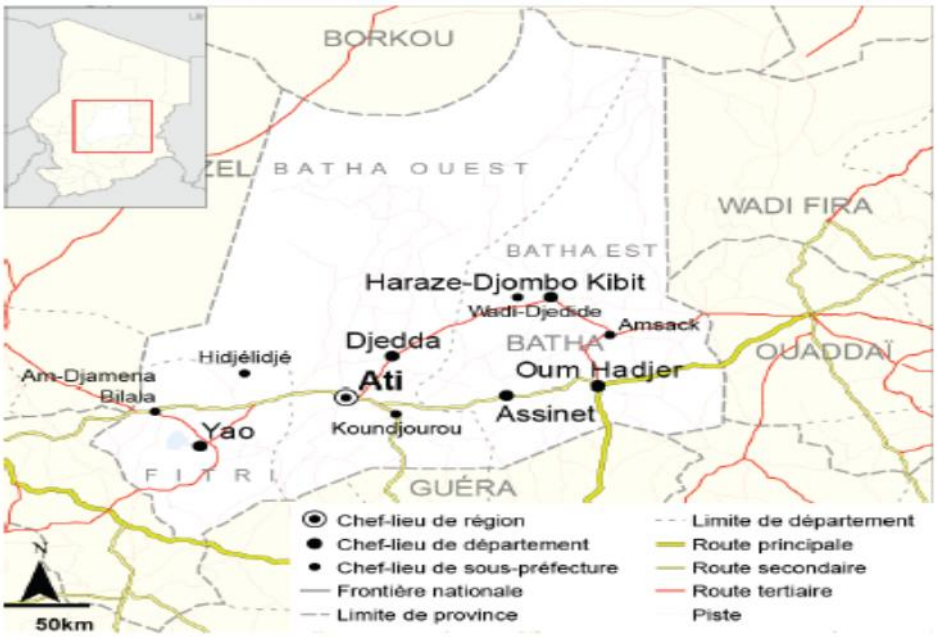

Fig.1.Geographical location of the city of Abeche (source [9])

2.2Type, period and study population

The study is of a prospective, cross-sectional type with a descriptive aim, on household food consumption in the study area. The study was carried out during the mitigation phase, in the dry season, for a period of two months, from April 15 to June 14, 2022. The study population consists of households and heads of households residing in the city of Ati.

2.3Sampling Method

The sampling methodology applied is two-stage probabilistic survey. The first stage focused on the selection of neighborhoods through a systematic random selection based on probability proportional to the size of the population. At the 2nd level, households were selected in a systematic random manner with a sampling interval.

2.4Sample size

The sampling frame used was that of the 2009 General Population and Housing Census (RGPH 2) [10]updated at the local level. As the city is made up of 1,232 households, 10% of households were surveyed randomly, i.e. 135 households.

2.5Data collection

Data focused on household characteristics and on consumption and dietary diversity were collected using a household questionnaire survey form and secondary data.

2.6Data processing and analysis

Data analysis was carried out using the Excel 2016 spreadsheet. The food consumption score (standardized by WFP) was used to reflect dietary diversity, frequency of consumption as well as the nutritional intake of households relating to products and food groups consumed individually. This score (FCS) is the sum of the frequency of consumption of each food group (capped at 7 days) multiplied by the weighting coefficient of the food group [50]. Foods are grouped into standard food groups (eight groups) to which weights have been assigned according to their nutritional value according to the method of Ndiaye (2014) [11].

FCS = ^{a}cereal *cereal + ^{a}legume *legume+ ^{a}vegetable *vegetable + ^{a}fruit *fruit + ^{an}animal *animal + ^{a}sugar *sugar + ^{a}milk *milk + ^{an}oil *oil

With:
ai = Weight assigned to the food group.
xi = Number of days of consumption relative to each food group (≤7 days)

Standard thresholds were used to determine the three household food consumption classes. Thus, all households were classified into one of three groups according to their FCS into poor, borderline and acceptable.
1-the poor consumption class made up of households whose consumption score was less than or equal to 21;
2-the borderline or poor food consumption class which brings together households whose food consumption score was greater than 21.5 and less than or equal to 35;
3-the acceptable food consumption class composed of households whose food consumption score was greater than 35.
The FCS is a proxy indicator of household access to food and the household food security level. Table 1 shown the food groups and their corresponding weights.

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Table 1. Food groups included in the FCS calculation and their corresponding weight

Food Types	Food Groups Weight	Weight
Sorghum, millet, corn, wheat, rice, pasta, fonio, bread, potato, yam, cassava…	Cereals and tubers	2
Cowpea, Peanuts, lentils, peas, nuts	Legumes	3
Vegetables (+ leaves)	Vegetables and leaves	1
Fruits (mangoes, oranges, bananas, etc.)	Fruits	1
Meat, fish, seafood, offal, eggs	Meat and fish	4
Milk, cheese, yogurt or other dairy products	Milk and dairy products	4
Sugar and sweet products	Sugar	0.5
Oil and grease	Oil	0.5

The household dietary diversity score (HDDS) is calculated by counting the number of food groups consumed in the household or by the respondent during a 24-hour period. It is a composite score used as a proxy indicator of food consumption and therefore access to food. It was developed from the food groups proposed by FANTA [12]. Thus, HDDS is said to be low, when the HDDS is less than 4.5, average when the HDDS is between 4.5 and 6 and good diversity, when it is higher at 6.

2.7 Ethical consideration

A community consultation was carried out to better explain to administrative authorities and community leaders the goal, the objective of the study and the data collection procedures. Participation in this study was voluntary, respondents had the possibility to withdraw from the study at any time without prejudice. The information collected was also processed in such a way as to preserve the confidentiality of the data collected.

3. RESULTS AND DISCUSSION

3.1 Household characteristics

Analysis of the profile of the heads of households surveyed shows a predominance of males (85.93%) compared to (14.07%) females, i.e. a male/female sex ratio of 6.10. The role of the head of household in household food choices, although not apparent, is very important because of the power dynamics within the family, his role as guardian of traditions and customs which can restrict food choices, their income which can also constitute a constraint for the composition of the respondent'sbasket. 62.22% of households surveyed were headed by married couples. On the other hand, heads of single, widowed and divorced households represent 17.04%, 12.59% and 8.15% respectively. These household heads are predominantly young: 45.93% aged 18 to 39, 35.56% aged 40 to 59 and 18.52% were aged over 60. Although education is a factor likely to influence household living conditions and above all, the improvement of food and nutritional practices, 5.93% of household heads had not attended school and only 6.67 % had a higher level of education. Concerning their main activities, traders were the most represented with more than a quarter of the heads of households surveyed (25.93%). Farmers, breeders and fishermen represent a fifth of the heads of households surveyed (20%). However, the proportion of people without any occupation is low, at 4.44%. The sources of income are diversified, three quarters of households (75.56%) have more than one source of income. The ethnic composition of households reveals the existence of a multitude of ethnic groups divided into five main groups: Arab (25.9%), Boulala (20%), Sara (31.1%), Moundang (15.56%) and

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Ouaddaï(9.6%). The Arabs and Boulala are the indigenous people of the city while the others are considered non-natives. This ethnic diversity constitutes a key variable for this study, especially since the question concerns the eating habits of the populations. The main socio-demographic and socio-economic characteristics of the households investigated are shown in Table 2.

Table 2. Main characteristics of the households surveyed (N= 135)

Household characteristics	Workforce (Percentage)
Gender of household heads	
Male	116 (85.93)
Female	19 (14.07)
Marital status of heads of households	
Married	84 (62.22)
Divorced	11 (8.15)
Single	23 (17.04)
Widower	17 (12.59)
Age group of heads of households	
18 -39 years old	62 (45.93)
40 - 59 years old	48 (35.56)
60 - 79 years old	25 (18.52)
Educational level of household heads	
Never frequented	8 (5.93)
Coranic	38 (28.15)
Primary	41 (30.37)
Secondary	39 (28.89)
Superior	9 (6.67)
Main activity of heads of households	
Official	18 (13.33)
Agriculture/Livestock/Fishing	27 (20.00)
Craftsman (mason, mechanic, etc.)	24 (17.78)
Trade	35 (25.93)
Students	8 (5.93)
Daily work	17 (12.59)
Unoccupied	6 (4.44)
Number of sources of household income	
1	33 (24.44)
2	77 (57.04)
Greater than 2	25 (18.52)
Origin of head of household	
Arab	33 (24.44)
Boulala	28 (20.74)
Sarah	40 (29.63)
Moundang	21 (15.56)
Ouaddaï	13 (9.63)
Household size	
1 to 6 people	60 (44.44)
7 to 12 people	55 (40.74)
More than 12 people	20 (14.81)

3.2Meal frequency

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The result obtained shows that more than 92.59% of households living in the city of Ati eat at least two (2) meals per day.

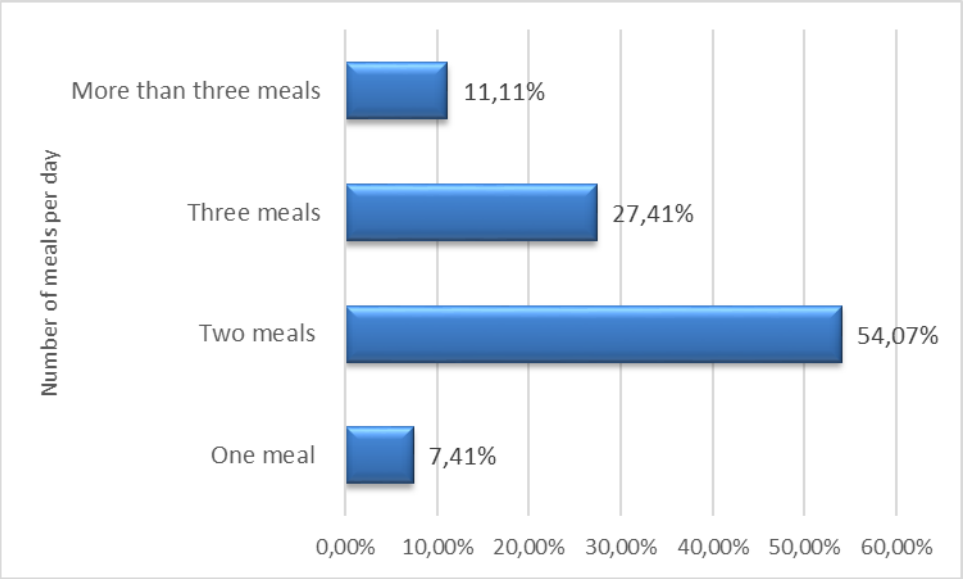

Fig.2.Percentage of households according to the number of meals per day

It appears from figure 2 that more than a third of households consume at least 3 meals per day (27.41% consume three meals per day and 11.11% consume more than three meals per day)and more than half of the households surveyed (54.07%) had 2 meals per day. This high proportion of households eating three meals a day can be explained by the diversification of sources of income and also that in urban areas, food is available and accessible for households. 7.41% of households ate only one meal per day. It is certain that with just one meal per day, these households would not be able to cover the required energy needsestimated at more than 2,000 kcal for adults. Considering that the average number of meals per day in Chad is 3, we can deduce that the situation is worrying for these households.

3.3Meal frequency

The consumption frequencies of the food groups are distributed in Fig. 3.

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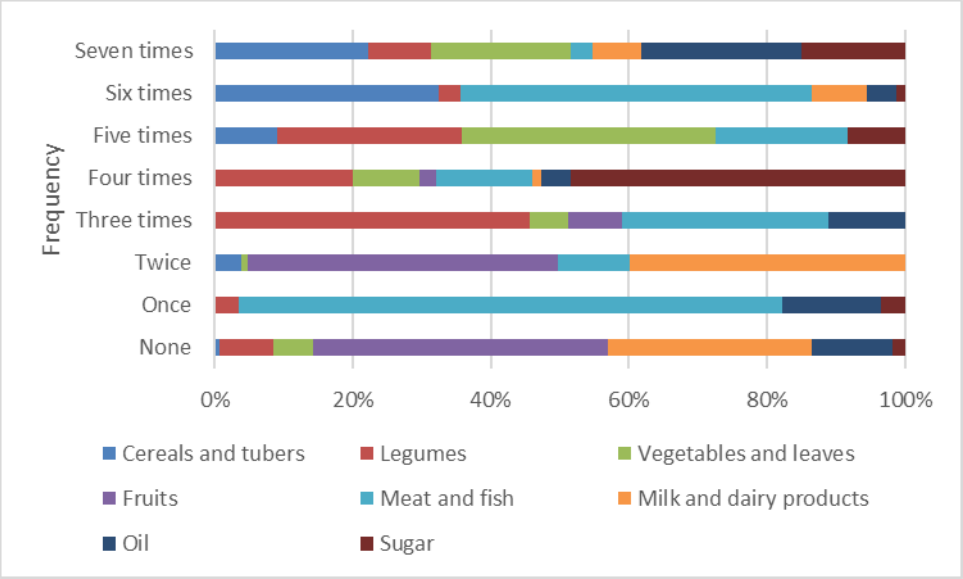

Fig.3.Frequency of consumption of the 8 food groups

It appears from the analysis of the results that the group of cereals and tubers is the most consumed by the majority of households. It is consumed 7 days a week by 96 households or 71.11% of the households surveyed and 6 days a week by 21 households (15.56%). Indeed, cereals are often consumed in different combinations with dried vegetables, fresh vegetables, red meats, milk and oils in the form of seasoning. Similar results were obtained by reference [13] in Burkina Faso and [14] in Mali, [15] in Abeche (Chad) which revealed the high frequency of cereal consumption by households. The food groups consumed at all, by a large part of the households, during the 7 days preceding the survey are fresh vegetables (77 households or 57.04%) and fruits (56 households or 41.48%).

3.4Sources of supplyof foods consumed

The production-consumption link is essentially carried out on the markets, although self-supply should not be neglected. This was noted through the household survey in Ati. The results of the respondents showed that it is possible to realize that the purchasing system remains the primary source of food supply for households. Of the 135 households in total, 19.96% of households source the food they consume at home simultaneously from their own products and from the market.The food consumed by households mainly comes from the market. Own production represents the second source of food consumed by households. Hunting and fishing represent a tiny part of the food consumed, as do donations.

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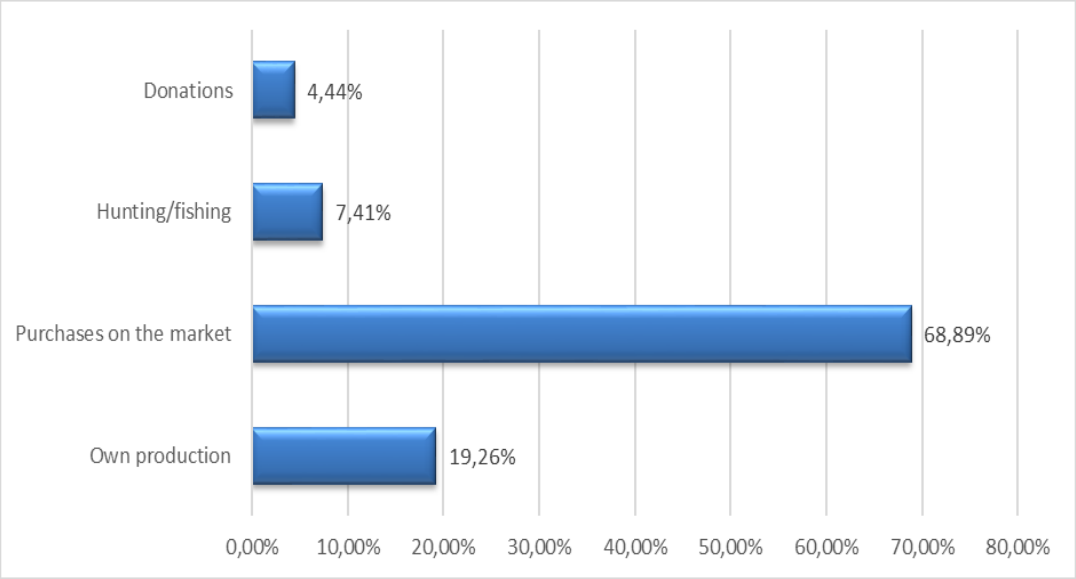

Fig.4.Sources of supply of foods consumed

Among the foods consumed in different households, we distinguish between rain-fed agricultural products, market gardening products, livestock, fishing or harvested products and manufactured products. This distinction shows that preparing a meal requires the combination of a range of food products. Market garden products here constitute complementary foods known as spices and condiments and sometimes main ingredients. The statistics on the use of this type of product give a percentage of 98.29% or 115 meals corresponding to 115 households out of 135 using this food product.

3.5Household food consumption score

The Food Consumption Score (FCS) was obtained using the different foods consumed by households during the last 7 days preceding the survey, their frequency of consumption and taking into account their weighting in terms of energy intake.

Food is said to be inadequate in quality and quantity, when the FCS is ≤ 28. It is inadequate quantitatively when the FCS is between 28.5 and 42 and adequate or acceptable when the FCS > 42. Fig. 5 shows the results obtained.

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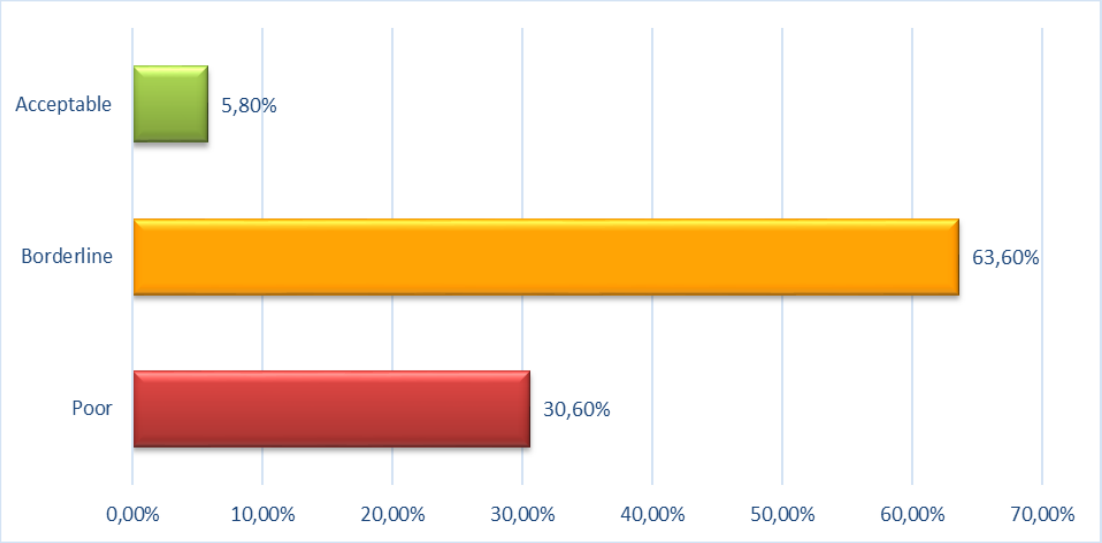

Fig.5.Distribution of households according to their FCS

The results show that 30.60% of the households surveyed have poor FCS, 63.60% have borderline FCS and 5.80% have acceptable FCS. The poor food consumption of households in Ati could be explained by the fact that our study was conducted during the end of the mitigation phase and also by the fact that in the study area, fresh vegetables and fruits are less available and less accessible by households due to their high costs.

3.6Household Dietary Diversity Score

Fig. 6 shows the distribution of households according to the Household Dietary Diversity Score (HDDS) measured on the basis of 7 food groups during a 24-hour recall period.

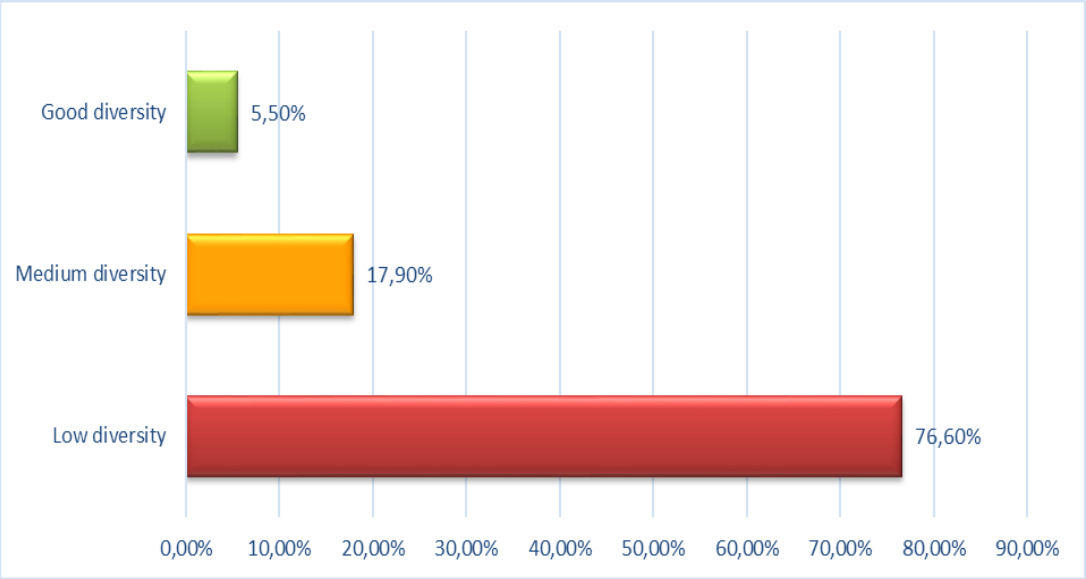

Fig.6.Distribution of households according to their HDDS

It appears that 76.6% of households have low HDDS, 17.9% have average diversity and only 5.50% have good dietary diversity. This diversity is very low compared to the results obtained by reference [16] in Niger which found 67.3% of households having a high HDDS. Dietary diversity being a qualitative measure of food consumption which reflects nutritional quality through access to more nutrients, the low dietary diversity of the households surveyed could be due to the economic and/or physical inaccessibility of certain foods in our study area.The household dietary diversity score provides a snapshot of a household's economic capacity to access a variety of foods [17]. Studies have shown that increased dietary diversity goes hand in hand with better socioeconomic status and level of household food security (household energy availability) [18 - 19].

4. CONCLUSION

These results lead us to conclude that household characteristics significantly influence the consumption and dietary diversity of households in the town of Ati. This study therefore constitutes a decision-making support tool. in order to effectively combat food and nutritional insecurity.

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