

Diets and food security of host and non-host households of internally displaced persons in the Kora, Burkina Faso

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ABSTRACT

Introduction. Terrorism is escalating in the Sahel region of Africa, forcing massive population displacement and worsening food insecurity. **Aim.** The objective of the present study was to assess the level of food insecurity within households hosting internally displaced persons (IDP), known as host households, compared to households not hosting internally displaced persons, known as non-host households in the Kora area in Burkina Faso. **Methods.** A cross-sectional study was conducted in June 2020 at the Kora area and included 70 host households and 73 non-host households. **Results.** Most of the households had smallholding and were living from subsistence farming. Host households had better quality diets in terms of diet diversification compared to non-host households. In addition, the non-host household were the most vulnerable in terms of food insecurity. Factors associated with household food insecurity were household status (i.e. host or non-host household) and the occupation (i.e. function) of the head of the households. **Conclusion.** Food assistance received by IDPs improved the quality of food for their host families but did not protect them from food insecurity with all its consequences. **Recommendation.** The Burkinabe state, in collaboration with the concerned stakeholders should promote good dietary diversity practices, improve food availability and access and monitor host households and provide them with substantial food aid without forget the non-host households which are also exposed.

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INTRODUCTION

Food and nutrition insecurity is a major public health problem in developing countries. While the World Food Summit considers food security a basic right for people, the FAO 2021 report found that between 720 and 811 million people worldwide faced hunger, about 118 million more than in 2019 [1]. Indeed, globally an estimated 144 million (21.3%) children under 5 are still stunted, 47 million (6.9%) wasted and 38.3 million (5.6%) overweight [2]. For the World Bank, achieving food security requires that foodstuffs are available, accessible and used appropriately [3].

Every year many countries are victims of various disasters placing populations in precarious living situations. In 2018, more than 70 million people worldwide were in this situation according to a report by the United Nations High Commissioner for Refugees (UNHCR) [4]. Among these displaced persons, the UNHCR reports 41.3 million internally displaced persons, 25.9 million refugees and 3.5 million asylum seekers.

To solve the problem of food insecurity and malnutrition in sub-Saharan Africa, the emphasis is on the production and consumption of energy foods to the detriment of dietary diversity [5]. However, access to sufficient food being essential for the well-being of households, it is also important to take into account the diversification of diets as well as the accomplishment of other development activities. The 2008 national survey

on food insecurity and malnutrition (ENIAM) in Burkina Faso showed that perceived food insecurity globally affected one in three households (35.4% of households) [6].

In Burkina Faso, the security situation has deteriorated sharply in recent years with thousands of internally displaced persons. The United Nations Agency for the Coordination of Humanitarian Affairs (OCHA) estimates the number of people who had been forced to decamp due to insecurity was 848,000 at the end of April 2020 [7]. These thousands of people leave behind huge areas of cultivable land. At the same time, they occupy and reduce arable land in the host areas, thus leading to a drop in agricultural production. This negatively affects agricultural activities, which are reduced by around 70% in most municipalities in the province of Soum and by around 20 to 50% in municipalities in neighboring provinces [8]. These conditions place people in a situation of unprecedented food insecurity both in the IDP camps and in the households that offer hospitality to some of them. Thus, according to the Communication Sheet of the Harmonized Framework for the analysis and identification of risk areas and the estimation of food insecure populations in the Sahel and West Africa, more than one million six hundred thousand people over the period from March to May 2020, needed immediate food assistance [9]. In addition, around 587,000 children are estimated to be at risk of malnutrition [10]. The commune of Kongoussi, where the study takes place, is the capital of the province of Bam and is located in the North about 110 km from Ouagadougou, capital of Burkina Faso. This province is one of the three provinces in food crisis, in addition to [Soum and Sanmatenga](#) [7], which present a prevalence of global acute malnutrition (11.1%) above WHO alert threshold [11].

The objective of the present study was to assess the level of food insecurity within households hosting IDPs, known as host households, compared to households not hosting internally displaced persons, known as non-host households in the Kora area in Burkina Faso.

MATERIALS AND METHODS

This study was carried out in the village of Kora in the commune of Kongoussi, among the province most affected by insecurity (i.e., terrorism). This was a cross-sectional study with a descriptive and comparative aim which has been conducted between 14-30th of June 2020. The study concerned households which offered hospitality to internally displaced persons (IDPs), referred to as host households and ordinary control households, referred to as non-host households. These non-host households were households that had never received IDPs until the day of passage for data collection.

For a prevalence (P) of approximately 5.5% of households in severe food insecurity (SFI) according to the national survey on food insecurity and malnutrition (ENIAM) of 2008 at the national level, a level of confidence of 95% ($Z = 1.96$) and a precision (m) of 5%, the minimum sample size (n) was calculated with the formula of Schwartz [12].

$$n = \frac{z^2 * p * (1-p)}{m^2} \quad \text{with}$$

n: the sample size

z: value corresponding to a given level of confidence (1.96 for a level of confidence of 95%)

p: estimated prevalence of severe food insecurity

m: standard margin of error 5%

The calculation gives an estimated minimum sample size of 80 host households. However, only 70 host households were retrieved from the list of host households provided by the provincial direction of Social Action and in the end 70 host households were identified and surveyed. Non-host households (73 in total), as controls, were automatically neighboring surveyed host households.

The questionnaire that was used to collect the information had three parts:

- Sociodemographic characteristics of households and information on IDPs if the household has received any;
- Items on household food diversity where it was a question of listing in detail all the foods consumed by the household;
- Level of food insecurity felt in the household.

The Household Dietary Diversity Score (HDDS) provides a snapshot of the household's economic ability to access a variety of foods [13]. The 24-hours dietary recall recommended by the FAO and used in numerous dietary diversity studies [14, 15] was the method used for information collection in this study. The household dietary diversity score was calculated using the classification of foods into 12 food groups as proposed by the

FAO [16]. They are: **A.** Cereals; **B.** White roots and tubers; **C.** Vegetables of all types; **D.** Fruits of all types; **E.** Meat, offal, poultry; **F.** Eggs; **G.** Fish and seafood; **H.** Legumes, nuts and seeds; **I.** Milk and milk products; **J.** Oils and fats; **K.** Sweets and honey; **L.** Spices, condiments and beverages.

The HDDS is calculate based on the average of the score and is comprised between 0 and 12. The details of the calculations is provided in Table 1.

Table 1. Explanation of HDDS calculation (FAO, 2006)

HDDS per household (0 –12)	Total number of food groups consumed by the household. The values for A through L are either "0" or "1". Add (A + B + C + D + E + F + G + H + I + J + K + L)
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Information on household food insecurity was collected using the HFIAS (scale of access determining household food insecurity), a collection tool developed by FANTA and the FAO in the document "Indicator guide of Access Ladder for Household Food Insecurity, v.2". This indicator consists of nine questions [17].

For the analysis of data on food insecurity, a first approach (DomIAM) consisted of classifying households into the three domains referred to in the HFIAS [14]. These three domains are:

- Anxiety and uncertainty about household food supplies;
- Insufficient quality (includes varieties and food type preferences);
- Inadequate dietary intake and its physical consequences.

In a second approach, the household food insecurity score (HFIS) varied between 0 and 27 points and the analysis is based on the average score of the sample. The households were then classified from the terciles produced according to the distribution of scores in the sample.

The Household Food Insecurity Category Approach (CatIAM), is one in which households are categorized into increasing levels of food insecurity as they respond affirmatively to more severe conditions and/or experience more frequently such conditions [14]. The classification of the level of food insecurity is recorded in the table 2.

Table 2. Classification of the level of food insecurity

Items	Frequencies			
	Never	Rarely	Sometimes	Often
	0	1	2	3
Question no.1	Green	Green	Yellow	Yellow
Question no.2	Green	Yellow	Yellow	Yellow
Question no.3	Green	Yellow	Orange	Orange
Question no.4	Green	Yellow	Orange	Orange
Question no.5	Green	Orange	Orange	Red
Question no.6	Green	Orange	Orange	Red
Question no.7	Green	Red	Red	Red
Question no.8	Green	Red	Red	Red
Question no.9	Green	Red	Red	Red

Green Food Security (FS); Yellow Low Food Insecurity (LFI); Orange Average Food Insecurity (AFI); Red Severe Food Insecurity (SFI)

Ethical considerations

Authorization to collect data was obtained from the municipal authorities of Kongoussi. In this study, the populations were invited to participate in this evaluation based on their free and informed consent. Thus the respondents (heads of households and women) willingly participated in the survey. Also, respondents had the right to stop or continue their participation without constraints.

Data analysis and presentation

Data analyzed using IBM SPSS 23 statistical software and Excel 2016 spreadsheet. Frequency and mean analyzes were performed to describe household characteristics, food diversity and food insecurity scores, and the types of food groups consumed. The quantitative variables were analyzed in the form of average, standard deviation and the frequencies were calculated for the categorical variables. Associations between dependent and independent variables were analyzed using the chi-square test with a significance level set at $p < 0.05$.

Dietary diversity was assessed by assigning "1 point" to each food group consumed by the household and "0 point" when the group was not consumed. After calculating the dietary diversity score per household, an average score was calculated to constitute three classes of household dietary diversity: low HDDS (score lower than the calculated average), medium HDDS (score equal to the average) and high HDDS (score above average). A categorization of households based on the subdivision of scores into terciles was also carried out.

Food insecurity was first analyzed through the food insecurity score per household (between 0 and 27 points) by summing the points assigned to each item according to the degree of occurrence of the event. A tercile classification of scores was performed where households were categorized into low, medium or high scoring households. Then, an analysis was made through the domains related to household food insecurity. It provided summary information on the prevalence of households experiencing one or more behaviors in each of the three domains referred to in the HFIAS questionnaire, regardless of the frequency of occurrence of the event. These are the areas of anxiety and uncertainty about food supply, reduced food quality and insufficient food intake and its physical consequences. Finally, an analysis according to food insecurity categories consisted in classifying households into categories of four levels of food insecurity depending on the answers given: food security, mild food insecurity, moderate food insecurity (MFI) and severe food insecurity (SFI). Households are classified at increasing levels of food insecurity when they respond affirmatively to more severe conditions and/or experience such conditions more frequently. In addition, a grouping of households into two groups was carried out for analysis. It was a question of merging households in food security and those in low food insecurity to form households in food security and households in MFI and those in SFI to form households in food insecurity.

RESULTS

A total of 143 households were included in the study, including 49% host households and 51% non-host households.

Socio-demographic characteristics of households and internally displaced persons

About 98% of households were headed by men with, a predominance of the profession of farmers (79.7%), 7% market gardeners, and 7% traders. The majority of household heads (83.2%) declared that they had no schooling. Only 10.5% and 6.3% had primary and secondary education respectively. The households surveyed were mostly headed by young people between 31 and 59 years olds (61.5%) and senior over 60 years olds (32.5%). The households included in the study were relatively large with 35.5% having between 11 and 17 people and 29.4% having at least 18 people. The number of IDPs received per household varied between 1 to 20, with 7.8 ± 4.4 on average. Two out of three host households received a contribution, either food and/or cash, from the IDPs. More than half of IDP household heads were farmers, and about a third were housewives

Analysis of household dietary diversity

All households reported consuming cereals, vegetables and spices, condiments and beverages (Figure 1). Oils and fats, legumes, nuts and seeds, sugars and sweet products and fruits are consumed more by host households with respectively 38.6%, 95.7%, 7.1% and 7.1% of households. The number of food groups consumed per household varied between 3 to 8, with 5.08 ± 0.86 on average. Slightly more than half of the households consumed 5 food groups among the 12 groups. However, only 1.4% of households consumed 3 and 8 food groups. The tercile analysis shows that most households (72.7%) consumed between 5 and 6 food groups, therefore, had a medium household dietary diversity (HDD). Households that had high HDD (i.e., 7 and 8 food groups in their diets) represented only 5.6% of the surveyed households. The diet quality varied according to the type of household (Figure 2). Among host households, 20% had low diversity compared to 23.3% among non-host households. In addition, the proportion of households with an average HDD was 74.3% and 71.2% for host and non-host households, respectively.

Access ladder analysis determining household food insecurity

Food insecurity score

The average household food insecurity score (HFIS) is 7.16 ± 4.19 points with minimum and maximum scores ranging from 0 to 18 points. Half of the households in the sample have an average score and a third are in the lower tercile of the score, i.e. with a low HFIS.

Domains related to household food insecurity

The two types of households were all anxious about their food supply in different proportions with 6 points more for the host households (Figure 3). For the area of reduced food quality, a very large majority (98.60) of households that had received internally displaced persons had reduced the quality of their food compared to 79.5% of non-host households. More than 80 and 69.9% of host and non-host households had reduced their food intake to cope with the food insecurity.

Household food insecurity categories

A significant portion of the households surveyed were experiencing a difficult situation since only 7% of households felt food secure (FS) (Figure 4). Households with low food insecurity (LFI) represented only 14% of households surveyed. On the other hand, a little more than half of the households were in moderate food insecurity (MFI) and 25.2% felt in severe food insecurity (SFI). For better readability of the food insecurity felt by households, a grouping into two categories has been carried out. As a result, 21% of the households were food secure, and 79% were food insecure.

Household type and food security

The arrival of internally displaced persons had a negative impact on household food security since no host household was found food secure, while non-host households in food security represented 13.7%. In terms of severe food insecurity, host households were 1.5 times more exposed than non-host households. Grouping households into two categories reveals that host households are half as likely to be food secure as non-host households. In terms of food insecurity, 85.7% of host households are affected compared to 72.6% of non-host households.

Factors associated with food insecurity

In the analyses, it appeared that the status of the households (guest or not) and the occupation of the heads of households were significantly associated with food insecurity (Table 3). The other characteristics of the study have no significant link with household food security.

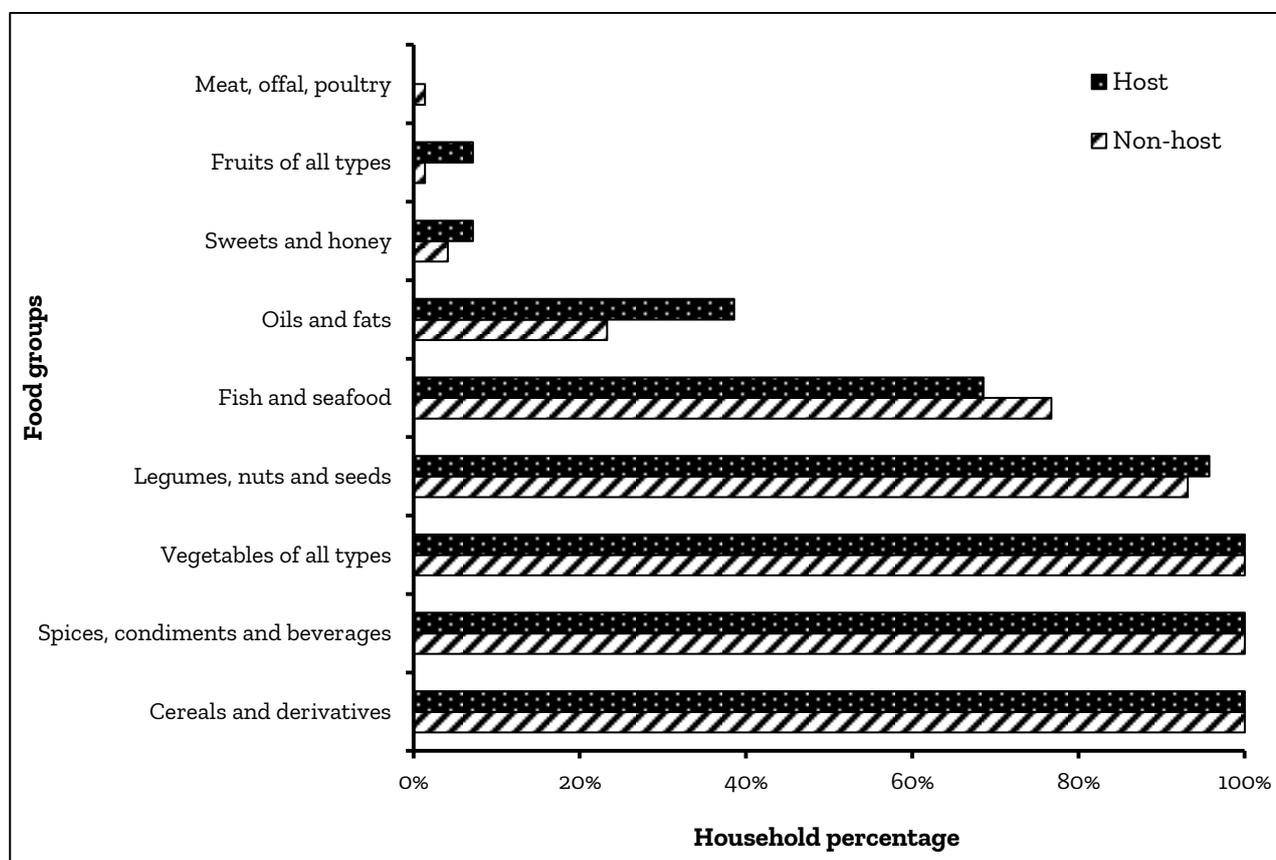


Figure 1. Consumption of food groups by host and non-host households

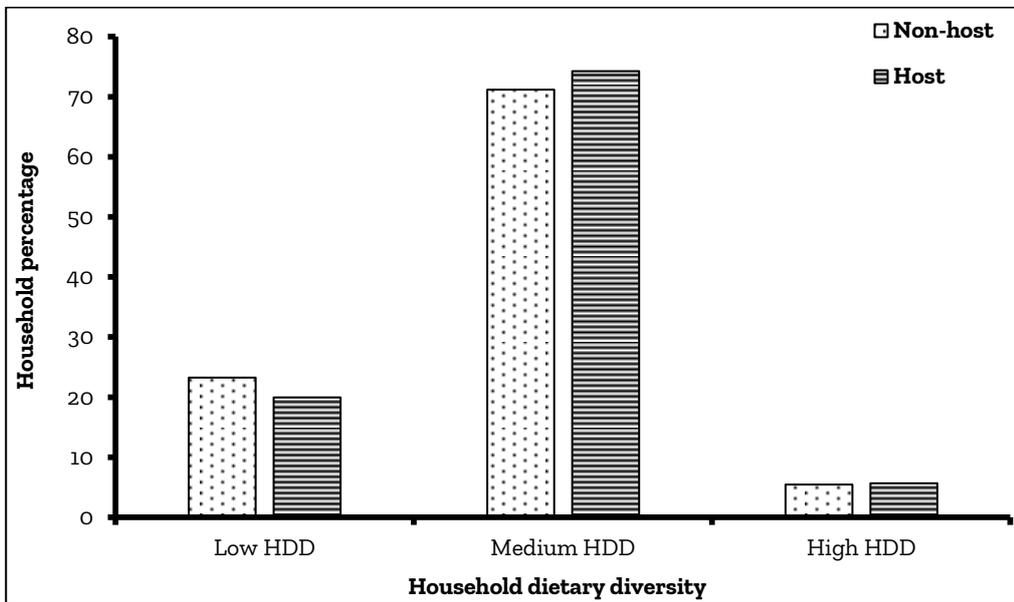


Figure 2. Dietary diversity by household type

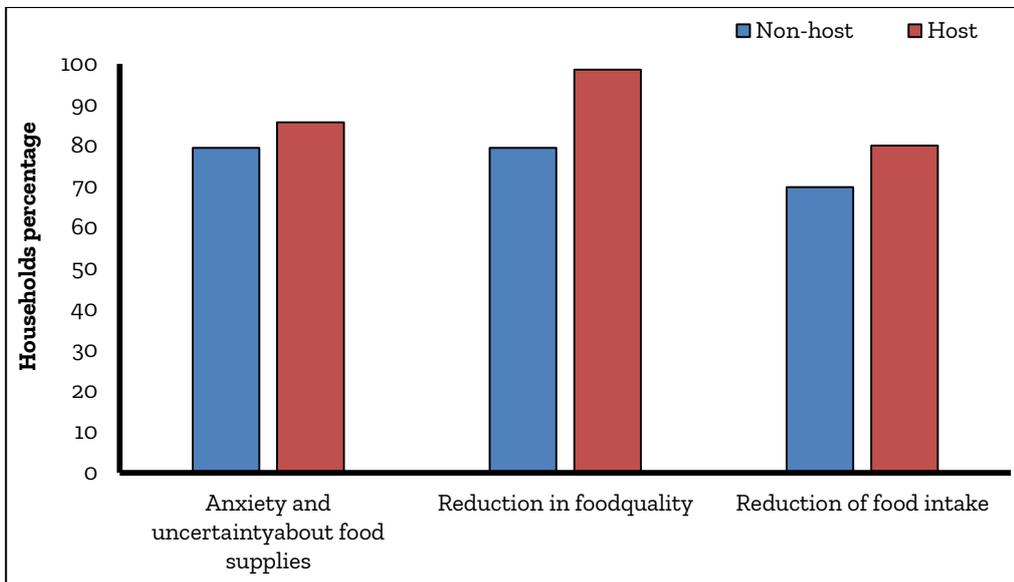


Figure 3. Household type and domain of food insecurity

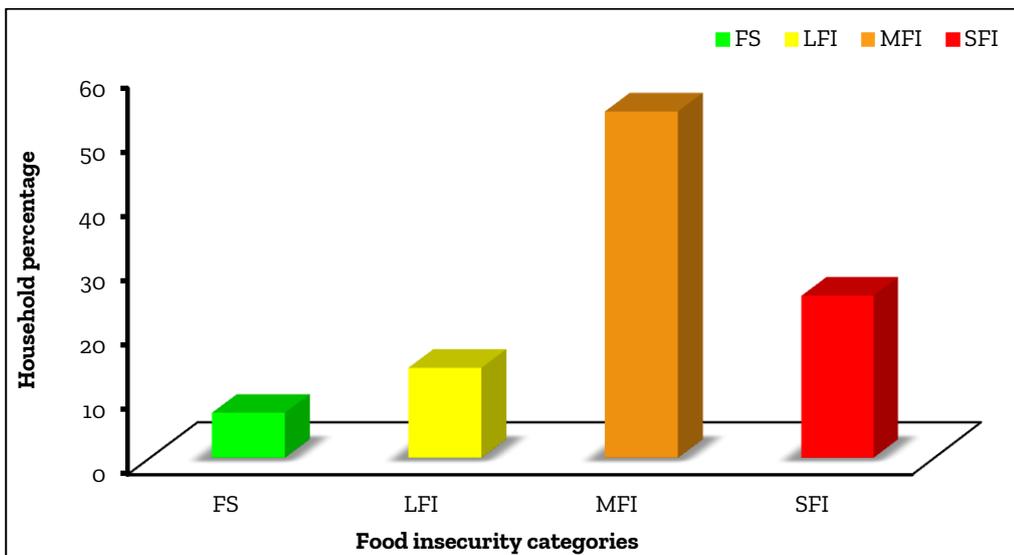


Figure 4. State of food security. Food Security (FS); Low Food Insecurity (LFI); Average Food Insecurity (AFI); Severe Food Insecurity (SFI).

Table 3. Association of sample characteristics with the food safety scale

Variables	Terms	N	Level of food insecurity n (%)				P
			Security	Low	Moderate	Severe	
Types of household	Host	70	0 (0.0)	10 (14.3)	39 (55.7)	21 (30.0)	0.012
	Non-host	73	10 (13.7)	10 (13.7)	38 (52.1)	15 (20.5)	
Gender of head of household	Male	141	10 (7.1)	20 (14.2)	77 (54.6)	34 (24.1)	0.393
	Female	2	0 (0.0)	0 (0.0)	0 (0.0)	2 (100)	
Occupation of head of household	Farmer	114	9 (7.9)	11 (9.6)	63 (55.3)	31 (27.2)	0.033
	Trader	5	0 (0.0)	3 (60.0)	1 (20.0)	1 (20.0)	
	Market gardener	10	1 (10.0)	3 (30.0)	5 (50.0)	1 (10.0)	
	Gold panner	4	0 (0.0)	2 (50.0)	2 (50.0)	0 (0.0)	
	Housewife	2	0 (0.0)	0 (0.0)	0 (0.0)	2 (100)	
	Others	8	0 (0.0)	1 (12.5)	6 (75.0)	1 (12.5)	
Level of education of the head of household	No	119	8 (6.7)	17 (14.3)	63 (52.9)	31 (26.1)	0.995
	Primary	15	1 (6.7)	2 (13.3)	9 (60.0)	3 (20.0)	
	Secondary	9	1 (11.1)	1 (11.1)	5 (55.5)	2 (22.2)	
Household size	≤10	50	7 (14.0)	8 (16.0)	19 (38.0)	16 (32.0)	0.068
	11 à 17	51	1 (2.0)	6 (11.8)	31 (60.8)	13 (25.5)	
	≥18	42	2 (4.8)	6 (14.3)	27 (64.3)	7 (16.7)	
Age group of household heads	≤30	10	0 (0.0)	1 (10.0)	4 (40.0)	5 (50.0)	0.308
	31 à 59	88	5 (5.7)	13 (14.8)	46 (52.3)	24 (27.3)	
	≥60	45	5 (11.1)	6 (13.3)	27 (60.0)	7 (15.6)	
Occupation of IDP household head	Farmer	48	0 (0.0)	8 (16.7)	27 (56.3)	13 (27.1)	0.693
	Housewife	20	0 (0.0)	2 (10.0)	11 (55.0)	7 (35.0)	
	Gold panner	1	0 (0.0)	0 (0.0)	1 (100)	0 (0.0)	
	Others	1	0 (0.0)	0 (0.0)	0 (0.0)	1 (100)	
Contribution of IDPs	Contribution (cereals, money)	46	0 (0.0)	8 (17.4)	26 (56.5)	12 (26.1)	0.448
	No contribution	24	0 (0.0)	2 (8.3)	13 (54.2)	9 (37.5)	
Number of IDPs received	≤ 5	26	0 (0.0)	6 (23.1)	13 (50.0)	7 (26.9)	0.488
	6 à 14	37	0 (0.0)	4 (10.8)	22 (59.5)	11 (29.7)	
	≥ 15	7	0 (0.0)	0 (0.0)	4 (57.1)	3 (42.9)	
Number of IDPs under 15	≤ 4	40	0 (0.0)	7 (17.5)	22 (55.0)	11 (27.5)	0.797
	5 à 9	25	0 (0.0)	2 (8.0)	14 (56.0)	9 (36.0)	
	≥ 10	5	0 (0.0)	1 (20.0)	3 (60.0)	1 (20.0)	
Number of IDPs over 15 years old	≤ 4	54	0 (0.0)	9 (16.7)	28 (51.9)	17 (31.5)	0.658
	5 à 9	14	0 (0.0)	1 (7.1)	10 (71.4)	3 (21.4)	
	≥ 10	2	0 (0.0)	0 (0.0)	1 (50.0)	1 (50.0)	

DISCUSSION

This is a cross-sectional study with possible biases in memory and reliability of responses, and no claim is made regarding the demonstration of causal relationships. Nevertheless, it is possible to estimate that these shortcomings do not seriously affect the validity of the present study.

In this study, the heads of households were predominantly male and farmers. The proportion of male household heads is corroborated by that found during the ENIAM in the Center-North of Burkina (96.5%) [6, 14]. Their average age is similar to that found in northern Burkina Faso (50.8 years) [17]. Households were hosting a high number of IDPs with more than half receiving between 6 and 14 IDPs and about two-thirds of host households IDPs were contributing.

The average SDAM observed in this study is similar to the average found by Sanou et al. [18] which was 5.7 points but relatively lower than that in a study in Brazil which was 9.15 ± 1.37 . On the other hand, this average was higher than the 4.7 ± 1.7 points that were found in Cambodia [20]. The Urban Food Vulnerability Survey (UFVS) report reported that 28.3% and 28.2% of households had medium and high dietary diversity, respectively [21]. The proportion of households with high dietary diversity is higher than that found in this study. This is

probably because that the security context combined with climatic hazards impact on household food production. In addition, in South Africa, researchers had also categorized the household's dietary diversity score into terciles and found that the proportion of households with high dietary diversity, i.e., having consumed at least 7 food groups, represented 34.8% of the sample [22].

The dietary diversity of households is characterized by an almost general consumption of cereals and condiments and spices [6]; which is the case in this study. Overall, host households had a much more diverse diet compared to non-host households. Their food consumption was marked by a more recurrent consumption of oils and fats and legumes, nuts and seeds; which can be explained by the food assistance the government and humanitarian aids provide to IDPs.

The average food insecurity score of this study is twice lower than that found during the national survey on food insecurity and malnutrition (ENIAM) in Burkina Faso in 2008. The sample size and areas covered could explain this difference since ENIAM had national coverage. However, this average was higher than the average found in a study in Cambodia, which was 5.3 ± 3.9 [20]. The proportion of distressed non-host households is higher than that found in a study in Ethiopia, which was 67.6% [23]. Almost all host households reported reduced food quality. The proportion of non-host households that reduced their food intake is almost identical to that found by Endale et al. [23] in Ethiopia. In addition, 80% of host households also declared that they had reduced the quantity of their food intake despite the consequences that this could have on health. These behaviors could be explained by the period of data collection and the fact that IDPs come to increase the number of people to feed in the host households.

The proportion of households in food security is twice lower than the proportion reported by the ENIAM in 2008. Households in severe food insecurity are represented at 25.2%, which is higher than the proportion found during the ENIAM in 2008 (5.5%). A study carried out in 2018 in the commune of Dangbo in south-eastern Benin revealed a higher rate than this study, i.e. 32.47% of households in severe food insecurity [24]. Also, another study in rural Tanzania reported that 41.8% of households in their sample were severely food insecure [25]. The pooled analysis shows that only one fifth of households felt food secure. However, the percentage of food insecure households is similar to that found in northwestern Benin which revealed that eight out of ten households were food insecure [26].

The comparative analysis shows that no host household felt food secure. The proportion of non-host households in food security is similar to those found during the ENIAM (15.3%) and in Haiti which was 15.1% [27]). In addition, host households are 1.5 times more likely to be food insecure than non-host households. The two-category analysis shows that host households are half as likely to be food secure as non-host households. Also, 85.7% of host households are food insecure. In Ethiopia, a study found in 2014 that approximately 70.7% of households were food insecure [23], and this result corroborates that found for non-host households in the present study. This is also the case of another study carried out in northwestern Benin which revealed that eight out of ten households suffered from food insecurity [26].

Household type and household head occupation were found to have a significant relationship with household food insecurity ($p < 0.05$). Larger sample size could highlight other factors associated with household food insecurity.

CONCLUSION

This study provided an overview of the diversity and food security of host and non-host households of IDPs. Host households have a more diversified diet compared to non-host households, thus proving the importance of food aid. However, this food assistance will have to be at the same time in quantity in order to relieve the host households most exposed to food insecurity. Households resist to food insecurity by reducing the quality and quantity of food intake despite the fact that this can have harmful and lasting consequences for women of childbearing age and children under five. Impactful and sustainable interventions must be implemented to prevent malnutrition of women and children in all its forms.

Recommendations

To get households out of this food insecurity, the Burkinabe state, in collaboration with the concerned stakeholders should:

- Promote good dietary diversity practices and improve food availability and access;

- Monitor host households and provide them with substantial food aid without forget the non-host households which are also exposed.
- Encourage the diversification of crops and the practice of animal husbandry and small-scale market gardening for self-consumption.
- Encourage the mobilization of internal resources to assist IDPs.

DECLARATIONS

Conflicts of interest

The authors do not declare any conflict of interest.

Authors' contributions

All authors contributed to the conduct of this work. All authors also declare that they have read and approved the final version of the manuscript.

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