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Factors associated with food security among small-holder farming households in Lesotho

Nthabeleng Nkoko^{1,2*} , Natasha Cronje¹ and Jan Willem Swanepoel¹

Abstract

Background Food insecurity and malnutrition are persistent challenges worldwide and Lesotho is not an exception. Hunger and poverty have worsened with the dawn of COVID-19 pandemic and on-going Russia–Ukraine war. The study seeks to assess food security and associated socio-economic factors among farming households in Lesotho. Household food security has been assessed using Household Food Access Scale (HFIAS) and Household Dietary Diversity Score (HDDS). Questionnaires were employed to collect data from 236 farming households.

Results The HFIAS results show that 40% of the farming households were food secure, 18% were mildly food insecure, 32% were moderately food insecure and 10% were severely food insecure and severe food insecurity mostly experienced in the highlands. HDDS results indicated that the farming households had consumed 8 to 12 food groups 7 days prior to data collection, the mean HDDS is 9.68. Households that are involved in commercial farming had more (9.98) diverse diets than those in subsistence farming (8.67). Households in the highlands have the lowest diet diversity (9.0) among the four agro-ecological zones. A logistic regression analysis indicated that the socio-economic factors associated with food security were household income, household size, marital status and education status of the respondent.

Conclusions The findings depict that over half (60%) of the farming households experience varied degrees of food insecurity. Contrary to this, the farming households had consumed highly varied diets in the past 7 days. The socio-economic factors that influence the attainment of food security household food security were household size, household income, education and marital status. The findings suggest that agricultural development interventions must be more sensitive to household food security and nutrition, which includes training farmers on nutrition and food security issues. Furthermore, socio-economic factors must be considered in the development of interventions, since they influence the food security of the farming households.

Keywords Household food insecurity access scale, Household dietary diversity, Farming households, Household food security

Introduction

Food insecurity is a condition where shortage of nutritious food is experienced as a result of lack of resources [1, 2]. Malnutrition on the other hand refers to deficiencies, excesses or imbalances in a person's intake of energy and/or nutrients together with impaired utilisation of nutrients by the body [3]. Food insecurity and malnutrition are interlinked, and these related matters

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are currently challenging the global community. Food insecurity and malnutrition in all its forms are a threat to human health [4]. The Sustainable Development Goals 1, 2 and 3 are related to food insecurity and malnutrition problems as they aim to end poverty and hunger and enhance good health and wellbeing by 2030 [1]. However, progress towards the achieving these goals is very slow in developing countries [5, 6].

Several factors can be attributed to hindering progress towards achieving these SDGs, but the recent COVID-19 pandemic and Russia–Ukraine war have exacerbated the delay [5, 6]. Under the shadow of the COVID-19 pandemic, global hunger rose in 2020. In 2019 to 2022, hunger increased in most of Africa, Asia and Latin America and the Caribbean, and hunger continued to rise in most sub-regions in 2021, but at a slower pace. Compared with 2019, the largest increase was observed in Africa, both in terms of percentage and number of people [5].

Hunger and malnutrition in Africa have been on the increase since the 1960s. During the 1970s, it is estimated that 30 million people were directly affected by famine and malnutrition. Despite the many interventions, malnutrition remains a growing challenge to the African continent. At nearly 20%, Africa has the highest prevalence of undernourishment [7]. In 2020, more than one-third of the people affected by hunger worldwide were from Africa. [2].

Food insecurity in Southern part of Africa remains a major development challenge despite several interventions to enhance food security [8]. According to the Southern African Development Community (SADC) report of 2022, progress towards enhancing food security is hindered by complex challenges that include gender inequalities, communicable diseases, malnutrition and marginalisation. Child malnutrition is another great concern. Food insecurity in the African continent is also exacerbated by the rapidly growing population and the growth is not parallel with food production. Instead, food production had been decreasing [9, 10]. Malnutrition has stalled development and growth in most developing countries [1]. Thus the search for solutions to food insecurity and malnutrition continue to be explored.

Lesotho is not an exception, the prevalence of food security and malnutrition is high. Undernutrition has been the most dominant form of malnutrition, but overnutrition is also becoming a serious concern [11]. Malnutrition has stalled the country's social and economic development as it claims an estimated LSL1,97 billion (\$200 million) annually in GDP [12]. Factors that hinder progress in fighting malnutrition include poverty, natural and man-made disasters, low consumer demand for nutritious food, low agricultural productivity, little or no government prioritisation of nutrition issues, and limited

commitment and capacity of local government units to deliver nutrition interventions [11, 13].

Chronic malnutrition claims 7.13% of Lesotho's the GDP. Among others, dietary diversity is low, owing to limited access to various food groups. While improvements have been made in the health sector, malnutrition remains a serious concern [11, 12].

Farming households are expected to be food secure as a result of crop production and income generated from surplus produce [14, 15]. However, agricultural productivity is compromised by weather shocks in the form of heavy rains, early and/late frost and drought [16]. Thus food availability is affected, rendering the farming households vulnerable to poverty and hunger [16]. On the other hand, urban households are vulnerable to price increases as they depend on purchasing foods. They are forced to purchase more carbohydrates for satiety, and the other food groups are minimally consumed. Their diets are also evolving from traditional to refined foods, which are low in nutritional quality [17], a transition which is experienced globally [18, 19]. This change in diets is resulting in an increased prevalence of overnutrition in most Southern African countries [20].

Limited information is available to understand the specific food and nutrition-related vulnerabilities within the farming households in Lesotho [11]. This information is important in informing development plans and programming solutions. With the increasing attention on understanding food and nutrition security and its drivers in agricultural households, there is an overarching need to gather empirical evidence to inform interventions that are specific to the observed challenges. The study sought to assess household food security and associated socio-economic factors among farming households in Lesotho.

Methodology

Study area, population and sampling

The study focused on small-holder farming households in Lesotho. A multi-stage sampling technique was employed. In the first stage, four of the ten districts of Lesotho were selected. Figure 1 shows the four agro-ecological zones in Lesotho and Mafeteng, Berea, Thabatseska and Quthing districts are representative of the zones: Lowlands, Foothills, Mountains and Senqu River Valley, respectively [21]. Within the districts constituencies were determined through the guidance of extension officers which were informed by the concentration of active farmers. In the last stage, villages and farming households were randomly selected to participate in the study and a sample of 236 farming households participated in the study.

A sample was randomly selected from a list of registered farming households that were accessed through

AGRO- ECOLOGICAL ZONES

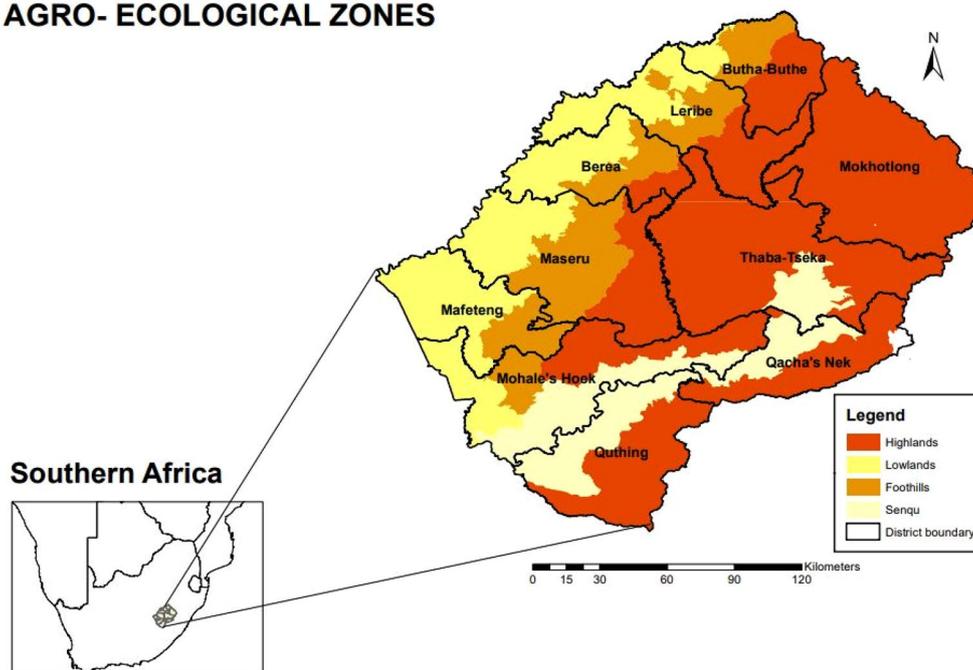


Fig. 1 Agro-ecological zones in Lesotho

the extension workers in the four districts (Berea, Thaba Tseka, Quthing and Mafeteng). The sample size was calculated using the following formula:

$$\begin{aligned}
 n &= NC^2 \div C^2 + (N - 1) e^2 \\
 &= 7000 * 0.3^2 / 0.3^2 + (7000 - 1) 0.02^2 \quad (1) \\
 &= 218
 \end{aligned}$$

where n = sample size; N = population size; C = coefficient of variation which is $\leq 30\%$; e = margin of error which is fixed between 2 and 5%). The study sample was calculated at a 30% coefficient of variation and a 2% margin of error for low variability and minimising error [22].

This number was increased by 10% to derive 240 households to compensate for non-responses and to reduce the margin of error. However, 4 of the responses were excluded during data cleaning due to incomplete responses, and a total of 236 questionnaires were used.

Data collection and instrumentation

Prior to data collection, a pilot study was conducted to assess feasibility. The pilot was carried out in Maseru district which did not form part of the selected areas for this study. Amendments informed by this phase were incorporated into the questionnaire. The enumerator's misinterpretations that were observed at this stage were corrected, as this would affect the quality of the data.

Data were collected in March to June 2022 using electronic questionnaires (using Evasys®). The researcher and trained enumerators administered the questionnaire face-to-face to ensure a thorough understanding of the questions and minimise a low response rate. The questionnaire consisted of the following sections: socio-economic characteristics, food consumption data and household food insecurity access scale. Ethical clearance was acquired for the University of the Free State Ethics Committee (UFS-HSD2021/1888/21).

Measurement of household food security

There are several challenges in measuring household food security. Primarily, the absence of standards makes the comparison of findings across different regions and cultures difficult [23–25]. Choosing an appropriate method to measuring food security is highly dependent on the conceptualisation of the construct to be measured and the intended use of the data to be collected [25]. The following validated and widely used tools have been selected for purposes of this study:

Household food insecurity access scale

A set of questions that entails predictable reactions to the experience of food insecurity that can be summarised and quantified on a scale were developed by the Food and Nutritional Technical Assistance (FANTA) [26]. Respondents give subjective responses on their

experience of food insecurity [26, 27]. The HFIAS has nine questions that covers three broad themes: (i) anxiety and uncertainty about food access; (ii) insufficient quality (variety, preferences, and social acceptability); and (iii) insufficient food intake and the physical consequences [26, 28].

Respondents were asked to respond to the nine HFIAS questions that are grouped by domains as follows:

- (i) Anxiety and uncertainty about the household food supply:
 - Did you worry that your household would not have enough food?
- (ii) Insufficient quality (includes variety and preferences of the type of food):
 - Were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?
 - Did you or any household member have to eat a limited variety of foods due to a lack of resources?
 - Did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?
- (iii) Insufficient food intake and its physical consequences:
 - Did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?
 - Did you or any household member have to eat fewer meals in a day because there was not enough food?
 - Was there ever no food to eat of any kind in your household because of a lack of resources to get food?
 - Did you or any household member go to sleep at night hungry because there was not enough food?
 - Did you or any household member go a whole day and night without eating anything because there was not enough food in?

To determine the food insecurity status, the household food insecurity access scale (HFIAS) can be categorised into four levels: severely food insecure, moderately food insecure, mildly food insecure and food insecure [26].

Household dietary diversity score

Data were collected by asking the respondent a series of yes or no questions related to food groups consumed by the household 7 days prior to the data collection. The respondents were people who are responsible for food preparation or were involved in planning of meals. The included food groups were those that were consumed by household members in the home, or prepared in the home for consumption by household members outside the home.

Data analysis

Data analysis was done using SPSS version 28. Frequencies and means were used to describe the food security status of the farming households. Independent t-tests and one-way ANOVA were used to compare means between types of farming and districts, respectively. Logistic regression analysis was employed to assess the socio-economic factors associated with household food security of the farming households. Possible factors were identified from literature and these were independent variables. The dependent variables were household food insecurity access scale (HFIAS) and household dietary diversity score (HDDS). Variables that were significant at 5% were included in the final model.

Results and discussion

Household food insecurity access scale (HFIAS)

The HFIAS score was calculated for each household by summing the codes of responses to the occurrence question [26, 27]. The scores have been categorised into food secure, mildly food insecure, moderately food insecure and severely food insecure. This score measures the degree of food insecurity (access) in the household 4 weeks (30 days) prior to data collection. The score ranges from 0 to 27, where 0 means the household responded "no" to all occurrence questions, while 27 indicates the households responded "often" to all nine frequency-of-occurrence questions. The higher the score, the more food insecurity (access) the household experienced. The lower the score, the less food insecurity (access) a household experienced [26].

As seen in Fig. 2, over half (60%) of the surveyed farming households are experiencing varied levels of food insecurity. Of the households that are food insecure, 32% are moderately food insecure, 18% are mildly food insecure and 10% are severely food insecure. In Oyo State

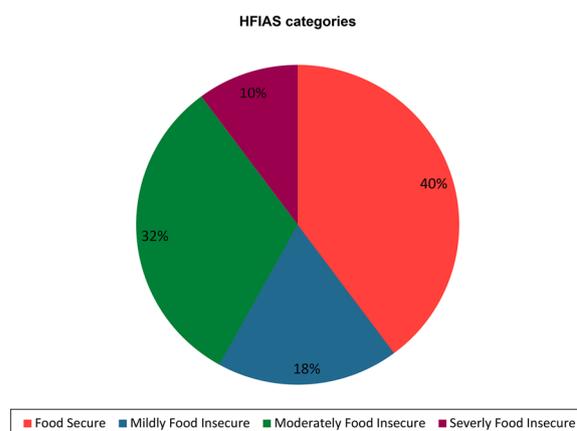


Fig. 2 Categories of household food insecurity access scale

Nigeria, food insecurity among farming households was more prevalent as only 12.8% of the households were food secure and 54% were severely food insecure [29]. Farming households in Ethiopia (Tehuledere Woreda district) did not experience severe food insecurity, 17.9% were food secure, 54.4% were mildly food insecure and 27.4% were moderately food insecure [30]. Food secure farming households in Iran (Dowreh Chegeni county in Lorestan province) were almost equivalent (40.8%) to Lesotho (40%), with 13.4% experiencing mild food insecurity, 14.4% moderate food insecurity and 31.4% severe food insecurity [31]. Although the study was not focused on farming households, in Northern Iran, 43.2% of the households were food secure, 52.% were mildly food insecure, 32.8% were moderately food insecure and 14.7% were experiencing severe food insecurity [32].

The findings in Table 1 indicate that Thaba Tseka has (49% households that are food secure, followed by Berea (42.6%), Quthing (36.8%) and Mafeteng (32.4%) had the least. The findings are contradictory to previous study findings as areas in the highlands (including Thaba Tseka) of Lesotho were more susceptible to food insecurity owing to their remoteness and limited access to facilities [11]. Interestingly, severe food insecurity is also experienced mostly in Thaba Tseka (20.7%) and is least experienced in Berea (1.4%). The findings further show that commercial farming households (42.5%) were more food secure than the subsistence farming households (30.9%). More (27.2%) subsistence farming households experienced severe food insecurity than the commercial farming households (4.9%).

The majority of farming households in Kwazulu Natal (South Africa) and Nigeria were also experiencing food insecurity [29, 33]. Involvement in farming is often associated with improved household food security [28, 33], but the findings of the surveyed households in Lesotho, Nigeria and those in Kwazulu Natal were inconsistent

with this phenomena. This suggests that farming households are vulnerable to food insecurity and involvement in farming alone may not be sufficient to afford the households food security, thus other factors must be considered.

The findings in Table 2 further show that households in Thaba Tseka (highlands) have the highest (5.62) average food insecurity score, implying that they are the most food insecure among the districts. Households in Berea are the least food insecure (3.92). Even though the difference between the districts is statistically insignificant, a report stated that the inability to afford nutritious diets is particularly high in the mountainous regions (above 70%) of Lesotho, where high cost of food and inability to afford nutritious food overlap. The lowlands have the lowest non-affordability for a nutritious diet in the country, although the number of households unable to afford nutritious foods remains high (50%). The findings are consistent since Thaba Tseka is in the mountainous regions while Berea is towards the country's lowlands [11]. The COVID-19 pandemic has contributed

Table 2 Mean household food insecurity access scores for different districts and types of farming in Lesotho

District	N	Mean	Std. deviation
Berea	68	3.92	4.68
Mafeteng	77	4.46	5.06
Quthing	38	5.23	5.58
Thaba Tseka	53	5.62	6.56
F statistic			1.145
Type of farming			
Subsistence farming	55	7.47	7.41
Commercial farming	181	3.85	4.34
T statistic			4.510**
Total	236		

Level of significance: 0.01**

Table 1 Household food insecurity access scale categories

Area	Frequency (%)				
	N	Food secure	Mildly food insecure	Moderately food insecure	Severely food insecure
Berea	68	42.6	19.1	36.7	1.4
Mafeteng	77	32.4	28.5	31.1	7.7
Quthing	38	36.8	15.7	31.5	15.7
Thaba Tseka	53	49.0	3.7	26.4	20.7
Type of farming (%)					
Subsistence farming	55	30.9	12.7	29.0	27.2
Commercial farming	181	42.5	19.8	32.5	4.9

significantly to the accessibility and affordability of nutritious diets, as food prices have been on the rise, and is likely to have exacerbated food insecurity among the farming households [29, 34]. The Russia Ukraine war on the other hand has made it difficult for some farmers to continue producing for their consumption and/or the market as the prices of agricultural inputs have increased. The war has had an enormous effect on global food systems due to the major contributions Ukraine and the Russian Federation have significant on fuel production, fertilizers and food commodities like wheat, maize and sunflower oil [35, 36].

On the other hand, subsistence farmers experience less food access as they have a higher food insecurity score than commercial farmers, and the difference is statistically significant. The findings suggest that farming for commercial purposes increases the household's ability to procure healthy diets and thus reducing food insecurity [29, 37]. In Ghana, farmers who were engaged in commercial farming were more food secure than their counterparts who produced for own consumption [38]. A study on farmers in Zimbabwe showed the existence of a very weak but positive relationship between the household's involvement in commercial agriculture and the HFIAS score [39]. On the contrary, Ntakyo [40] found that more commercialised households had a likelihood to be food insecure. Thus, commercialisation as a development approach must be accompanied by capacitation on the allocation of agricultural produce and income generated for the benefit of the household's food security.

Household dietary diversity score (HDDS)

HDDS is an indicator of the number of food groups consumed by a household over a particular period of time. The score was computed from food consumption data 7 days prior to the survey. It is based on 12 food groups that include; cereals, vitamin A-rich vegetables, roots and tubers, green leafy vegetables, other vegetables, vitamin A-rich fruits, other fruits, organ meat, flesh meats, eggs, fish and seafood, legumes, all dairy products, sugar and sweets, oils and fats. It is an indicator that reflects the diversity of food groups that have been consumed. A higher score indicates higher diversity of food groups consumed and, thus, better economic access to food. The HDDS score can be categorised into low dietary diversity (1–3), medium dietary diversity (4–5) and high dietary diversity (6–12) [41–43].

Table 3 shows the dietary diversity categories of the farming households 7 days prior to data collection. The majority (97%) of the households had consumed a highly varied diet (6–12 food groups) in the previous

Table 3 Household dietary diversity categories

Categories	Range	Frequency	(%)	Mean	(SD)
Low	1–3	0	0	0	0
Medium	4–5	7	3	4.57	0.53
High	6–12	229	97	9.83	1.59
Total	1–12	236	100	9.68	1.81

Table 4 Mean household dietary diversity scores for districts and types of agriculture

Districts	N	Mean	Std. deviation
Berea	68	10.22	1.44
Mafeteng	77	9.71	1.89
Quthing	38	9.55	1.58
Thaba Tseka	53	9.03	2.0
F Statistic			4.51***
Type of farming			
Subsistence farming	55	8.67	2.15
Commercial farming	181	9.98	1.57
T Statistic			-4.956**
Total	236		

Levels of significance: 0.01**, 0.001***

week with a mean of 9.83. The dietary diversity of farming households in Cape Town Metropole was slightly higher (10.38) [24]. Other findings on dietary diversity of farming household were computed from a 24-h recall and were not comparable to the results of the 7-day recall [42, 43, 47]. While this does not equate to adequate daily dietary diversity, it is an important positive that the households could procure diverse diets and this could be attributed to agricultural production.

Table 4 shows that Berea had the highest (10.22) score, followed by Mafeteng (9.71) and Thaba Tseka had the lowest score (9.03). This implies that households in the foothills (Berea) have more access to a varied diet than the other areas, while Thaba Tseka has the least. The differences in HDDS between districts are statistically significant ($p=0.004$). HDDS for commercial farmers is higher than that of subsistence farmers, and the difference is significant ($p=0.001$). Thus, households who reside in the foothills and are engaged in commercial farming have better access to food. Income generated from commercial farming increases their purchasing power, which translates into higher likelihood to access a variety of food [34, 44]. If the households keeps part of the produce for household consumption, this improves food availability [45].

Table 5 Logistic regression analysis for the factors affecting household food insecurity access scale (HFIAS)

Model	B	Std. Error	Coefficients	t	P-value
(Constant)	5.572	1.198		4.651	0.000
Household size	0.614	0.183	0.220	3.351	0.001***
Household income (monthly)	0.000	0.000	-0.244	-3.441	0.001***
Married	-2.187	0.938	-0.198	-2.332	0.021*
Divorced	-0.396	1.714	-0.017	-0.231	0.818
Single	-1.211	1.405	-0.067	-0.862	0.390
Secondary	-1.287	0.872	-0.111	-1.476	0.141
High	-0.648	1.001	-0.048	-0.647	0.518
Tertiary	-2.028	1.185	-0.138	-1.711	0.089
Never	2.589	2.089	0.082	1.240	0.217
Pensioner	-1.582	1.254	-0.088	-1.261	0.209
Business	-1.748	2.078	-0.055	-0.841	0.401
Unemployed	0.157	0.836	0.013	0.188	0.851

Levels of significance: 0.05*, 0.001***

Studies on market participation and commercialisation of agricultural produce attest that households that produce for the market have a significantly higher HDDS [46–48]. Other study findings showed that commercial farmers had high dietary diversity, but it was not related to commercialisation. These households could be getting their diversified food through other livelihood means [49, 50].

Factors affecting household food security

Tables 5 and 6 show the factors that affect the household food security proxies, HDDS and HFIAS. Socio-economic variables that retained their significance were household size, monthly income, education level and marital status of the respondents. Although a study by Muroyiwa and Linakane [51] focused on rural farming households in Leribe, Lesotho, household size, marital status and education level were found to be significantly associated with the food security of the farming households. Household size had a significant effect on HFIAS as large household sizes increase household food insecurity. Fewer members of a household would need to procure less food and are less likely to experience food insecurity [52]. The findings are consistent with previous study findings in South Africa (Free State Province) [53]. While other findings suggest that large farming households translate into improved productivity [54, 55] it has been found that food insecure households in sub-Saharan Africa were characterised by large household sizes where members compete for limited food.

Household income is significantly associated to HFIAS and HDDS. An increase in the monthly income decreases household food security. The more the household earns the less the household food insecurity. The findings are consistent with previous study findings among households in Sri Lanka, Maphumulo Local Municipality (South Africa) and Pakistan [56–58]. Higher income affords households good quality and sufficient food, together with other necessities for

Table 6 Logistic regression analysis for the factors affecting household dietary diversity score (HDDS)

Model	b	Standard error	Coefficients	t	P-value
(Constant)	9.204	0.398		23.133	0.000
Household size	-0.087	0.061	-0.091	-1.424	0.156
Household monthly income	4.840E-05	0.000	0.137	1.994	0.048*
Marital status					
Married	0.253	0.311	0.067	0.811	0.418
Divorced	-0.376	0.569	-0.046	-0.661	0.509
Single	-1.006	0.467	-0.163	-2.156	0.032*
Education status					
Never been to school	-1.514	0.694	-0.140	-2.183	0.030*
Secondary	0.928	0.289	0.234	3.205	0.002**
High	1.188	0.332	0.256	3.575	0.000***
Tertiary	1.468	0.394	0.292	3.729	0.000***
Employment status					
Pensioner	0.576	0.417	0.094	1.383	0.168
Business	-0.262	0.690	-0.024	-0.380	0.704
Unemployed	-0.490	0.277	-0.114	-1.765	0.079

Levels of significance: 0.05*, 0.01**, 0.001***

good quality of life [58]. However Beer et al. [59] argues that income may be a main determinant, but it must be complemented by other relevant interventions as there are high-income households who still experience food insecurity and malnutrition. It is of great importance to educate the farming households on healthy and nutritious diets to influence their food choices [29, 59].

The marital status of the respondent had an effect on both HFIAS and HDDS. The households whose respondent was married, experienced lower food insecurity. Similar studies found that married respondents had a higher likelihood to be food secure than the other categories (single, unmarried and divorced) in Southern Ethiopia [60] and South West Nigeria [61]. This may be attributed to higher income earned in the households of the married if both partners are income earners, and the income is likely to be lower in the other categories.

A higher education status is associated with an increased HDDS. Together with improving the household's income and access to food, education also affords increased employment opportunities [62]. Education increases the productivity of the human resource, and heightens adoption of technologies and innovations thus enhancing household food security [61].

Limitations of the study

The food consumption recall does not capture seasonal variation, as diets can change with agricultural seasons. Data were collected during harvest of grains for most households, but vegetables cropping was ending as winter was dawning, thus the findings must be interpreted with caution considering the context provided. However, the findings provide evidence for the food security situation within farming households, which is very limited in the area. The information will be a useful baseline for future research and can be used in evidence-based development decisions.

Conclusions

The findings reflect that 60% of the farming households experience varied levels of food insecurity. These findings were consistent with previous study findings in developing countries in Africa and Asia predominantly. The HFIAS results show that households that reside in the highlands (Thaba Tseka) and are involved in subsistence farming are the most vulnerable to food insecurity. Households that reside in the highlands and did not farm to sell their produce consumed less varied diets as they had the lowest dietary diversity scores. However, the farming households had generally consumed varied diets in the past 7 days (mean = 9.68), which does not translate into adequate daily dietary diversity. This can be attributed to agricultural production and sale of

produce depending on the purpose for production. The findings are consistent with previous studies that show a positive association between household food security and commercial farming. The socio-economic factors associated with household food security are household size, household income, marital status and education status. The findings suggest that agriculture alone is not sufficient in enhancing household food security, socio-economic factors play a significant role. Recommendations emanating from the findings include the consideration of socio-economic in developing interventions for enhancing household food security. The stimulation of the economy to create income generating activities for the farming households is an important aspect. Economic access is important to attain to sufficient quantities and quality of food for the household. Improved access to education is another important pathway to enhance household food security among the farming households. Since there are other important factors that influence food security, further research on the association of food security with production and environmental factors is recommended.

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Author contributions

NN was involved in the study design, data collection, analysis, discussion of the results and writing of the manuscript. JWS and NC were involved in the study design, analysis, discussion of the results and reviewing of the manuscript. All authors approved to the publication of the findings.

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Availability of data and materials

Data will be made available upon reasonable request.

Declarations

Ethics approval and consent to participate

Ethical clearance was acquired from the University of the Free State Ethics Committee (UFS-HSD2021/1888/21). Participants were informed about the objectives of the study. They were also informed that their participation in the study is voluntary, and their freedom to withdraw at any point was expressed. Participants signed consent forms prior to participation in the study to show consent for participation.

Consent for publication

Not applicable.

Competing interests

The authors declare that there are no competing interests.

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