Perceived effect of feed-health intervention for improved small ruminant production on gender and household nutrition in northern Ghana

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The Africa Research In Sustainable Intensification for the Next Generation (Africa RISING) program comprises three research-in-development projects supported by the United States Agency for International Development (USAID) as part of the U.S. Government's Feed the Future initiative.

Through action research and development partnerships, Africa RISING is creating opportunities for smallholder farm households to move out of hunger and poverty through sustainably intensified farming systems that improve food, nutrition, and income security, particularly for women and children, and conserve or enhance the natural resource base.

The three regional projects are led by the International Institute of Tropical Agriculture (in West Africa and East and Southern Africa) and the International Livestock Research Institute (in the Ethiopian Highlands). The International Food Policy Research Institute leads the program's monitoring, evaluation, and impact assessment.

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Contents

Introduction

Under the feed and health intervention study for improved, small-ruminant production in nine intervention communities in three regions of Northern Ghana, data has been collected on animal performance (average daily gain, flock dynamics), manure production (both quantity and quality), and cost and benefit, which covers the productivity, environmental, and economic domains of the sustainable intensification assessment framework. Necessary data has not been collected for the human and social domains regarding this feed-health intervention. The objective of this study was to collect data on the human and social domains to ensure that missing gaps that address these issues for smallholder farmers are highlighted to allow for subsequent interventions in the future to improve small-ruminant production or follow-on studies. This study entailed developing short survey instruments to collect data on how the feed-health intervention impacts on household food security and nutrition, and gender in terms of household labor distribution for the management of small ruminants, and benefit sharing from improved small ruminant production. The same households in the nine communities, ninety in total, involved in the feed-health intervention study conducted between 2015 and 2017 were involved in the study.

The objective of this study was to collect additional data on social and human domains to assess the feed-health intervention based on the five domains of the sustainable intensification assessment framework.

Methodology

This survey on the perceived effect of feed and health interventions on gender and household nutrition was conducted in the same nine intervention communities where the feed and health intervention study was carried out. The communities where the survey was conducted in December 2018 and January 2019 were Tibali, Duko, and Bontigle in Northern Region; Gia, Samboligo, and Nyangua in Upper East Region; and Guo, Zanko, and Passe in Upper West Region. Ten farmers who were involved in the feed and health intervention study in each community were interviewed on the perception of the effect of the intervention on gender and household nutrition. The survey (see appendix) addressed household labor distribution for sheep and goat management by gender groups (men, women, girls, and boys) and the perceived impact of the intervention on household labor (none, marginal increase, moderate increase, significant increase, marginal decrease, moderate decrease, and significant decrease). Questions were also asked on the contribution of small-ruminant husbandry to household food security and dietary diversity. The preliminary results of the survey data are presented in the section on Results and Discussion.

Results and discussion

Distribution of household labour by gender

The results showed that most small-ruminant, management-related activities are distributed by gender group (see Figs. 1a–1g; n = 89 respondents). Boys tended to be responsible for taking out the animals for grazing (Fig. 1a) though male adults were also involved to some extent. Sale of animals was mainly by men (Fig. 1d) though women were also involved to a limited extent. Men were 40% more involved in animal sales than women. The results confirm the common practice in West Africa where male household heads generally make the decision on the sale of household animals. All gender groups were involved in searching for feed and giving feed to the animals, though the girls were the least involved (Fig. 1b and c). Male adults and boys were generally responsible for animal health care and manure collection (Fig. 1e and f). Cleaning of the animal house was by all gender groups (Fig. 1g). Except for search for feed and giving feed to the animals, where more respondents were reported to be engaged in the feed and health intervention compared to the control and health only treatments, there was no treatment effect observed for other activities.

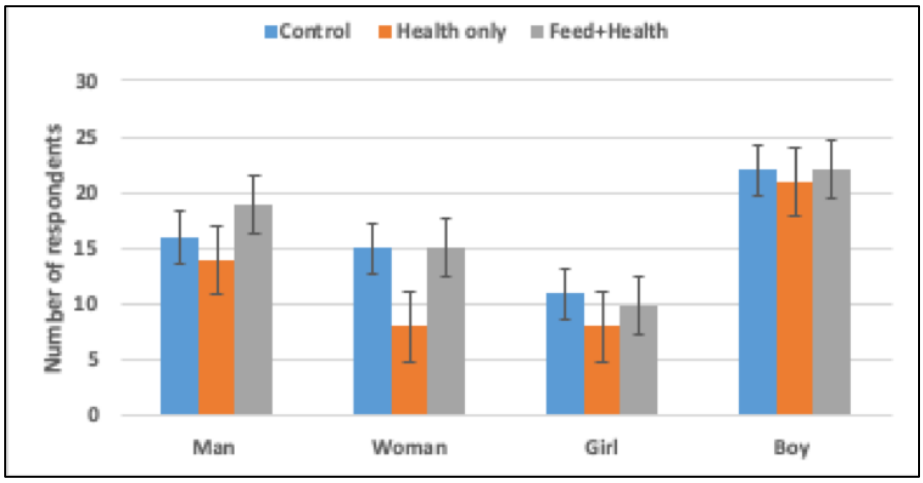

Figure 1a: Who takes the animals out for grazing.

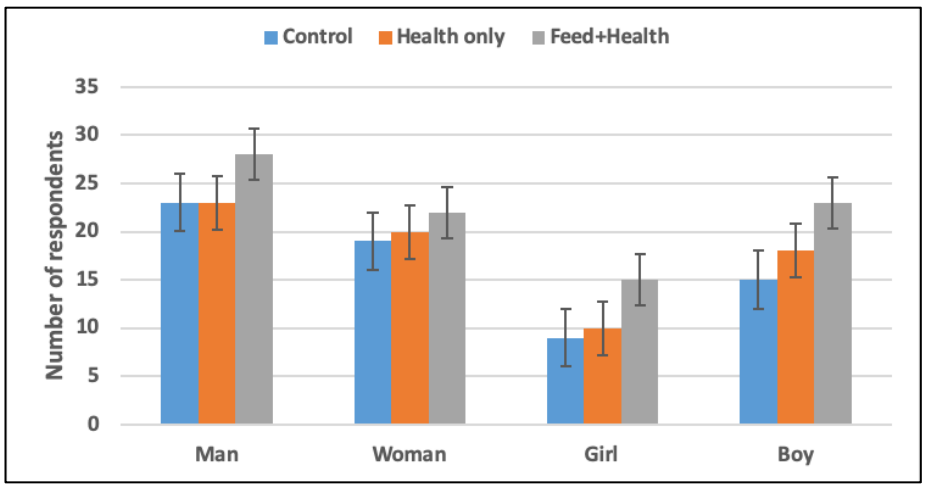

Figure 1b: Who is engaged in searching for feed.

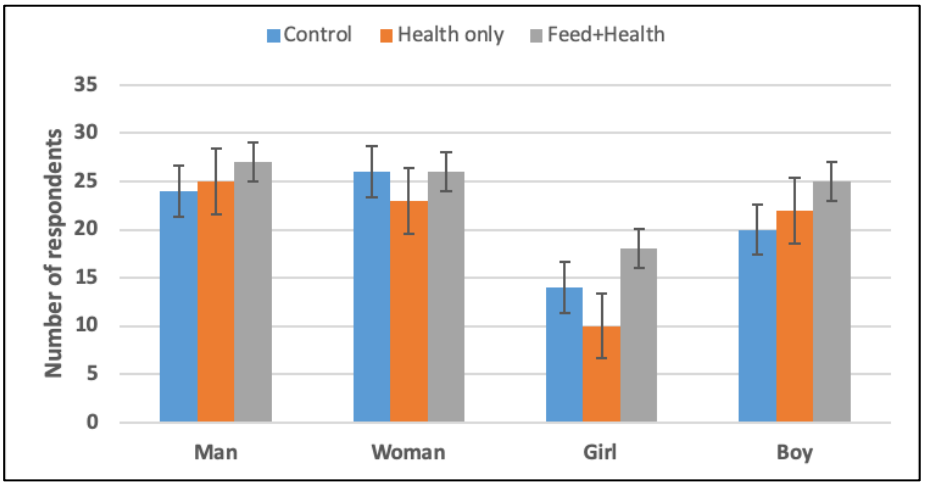

Figure 1c: Who gives feed to the animals.

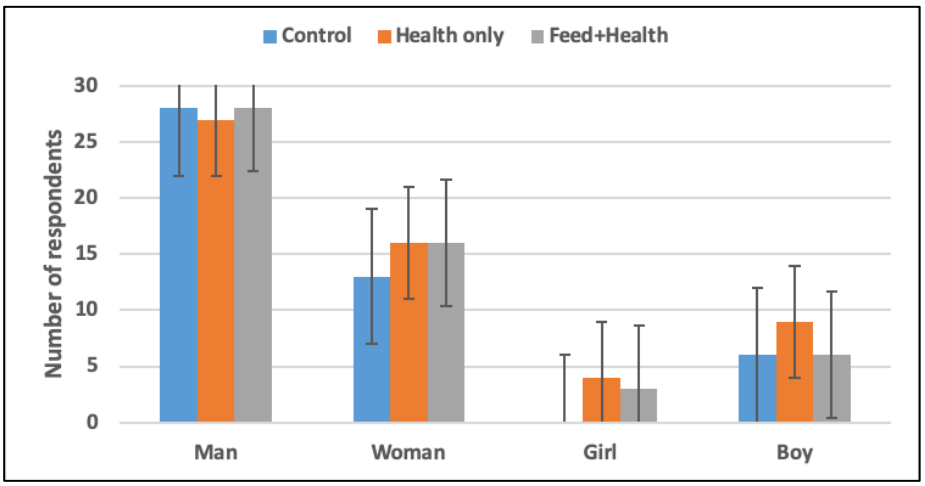

Figure 1d: Who is involved in the sale of animals.

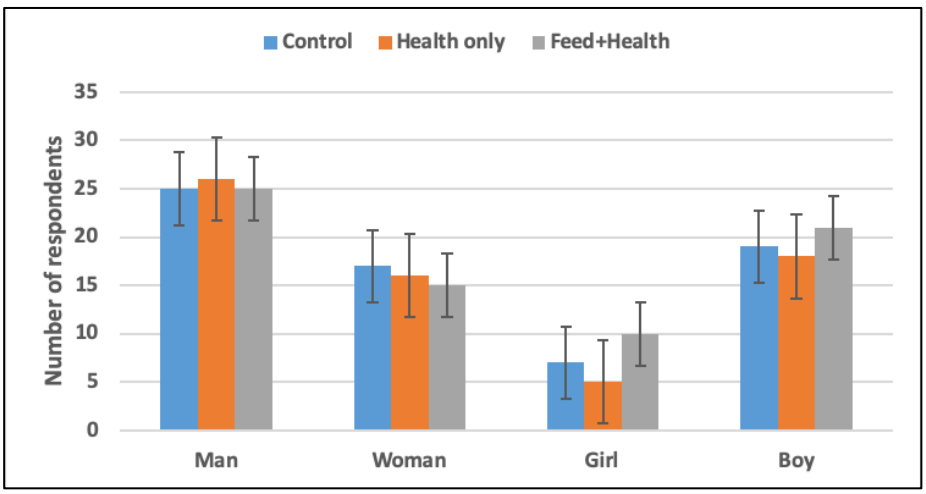

Figure 1e: Who is involved in animal health care.

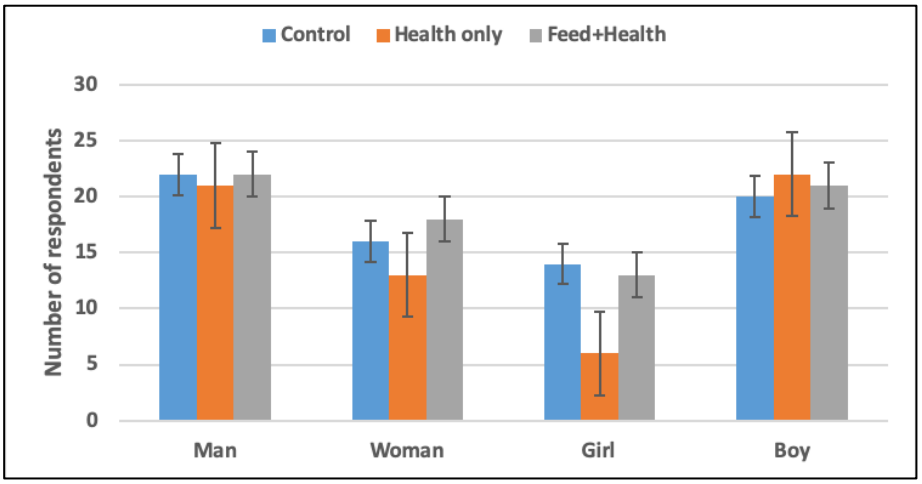

Figure 1f: Who collects manure.

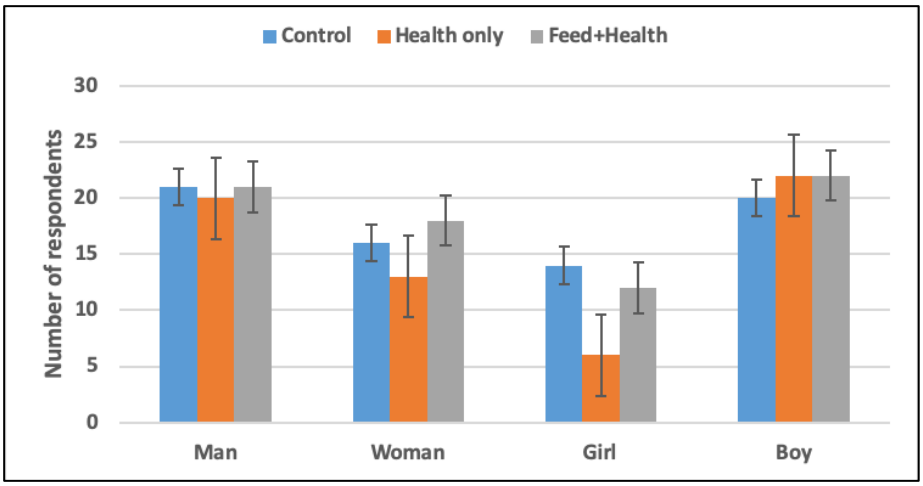

Figure 1g: Who cleans the animal houses.

Perceived effect of the intervention on small ruminant management-related activities

The results show that most of the respondents—irrespective of the gender group—expressed that the feed and health intervention does not have any effect on small-ruminant-related management activities such as taking out animals for grazing, search for feed, giving feed to the animals, and animal health care (Figs. 2a,b,c & d). However, the boys reported a marginal to moderate increase in labor to take out the animals for grazing. This is understandable given that the boys were largely responsible for taking out the animals for grazing. Only very few respondents mentioned a marginal to moderate decrease in labor for animal-management activities as a result of the feed and health interventions. These results suggest that the feed and health intervention generally does not increase household labor for small-ruminant management.

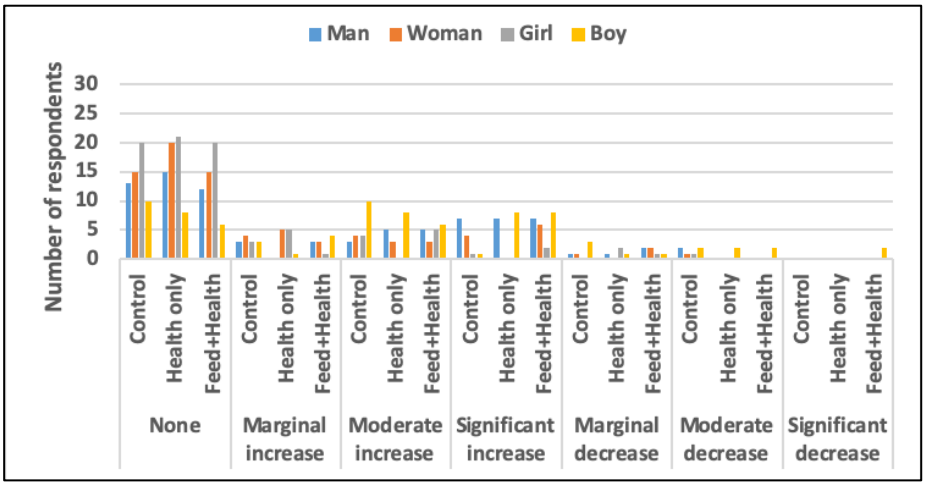

Figure 2a: Taking out animals for grazing.

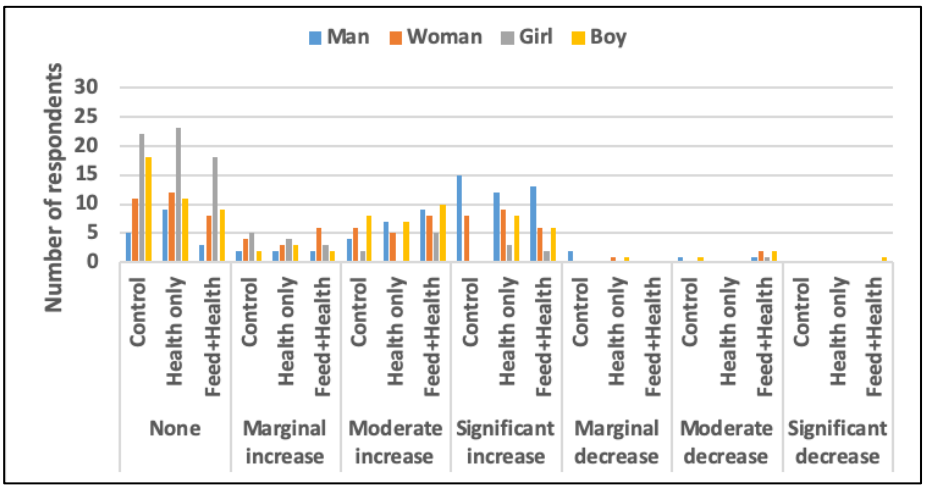

Figure 2b: Search for feed.

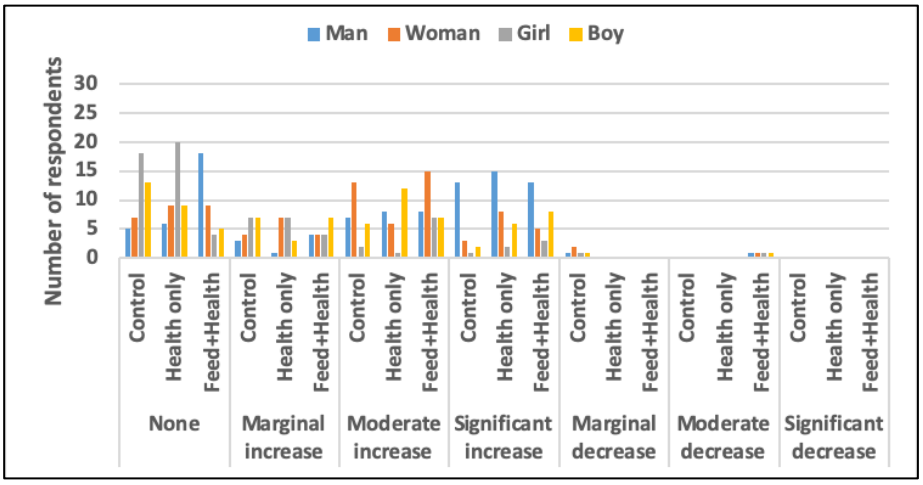

Figure 2c: Giving feed to the animals.

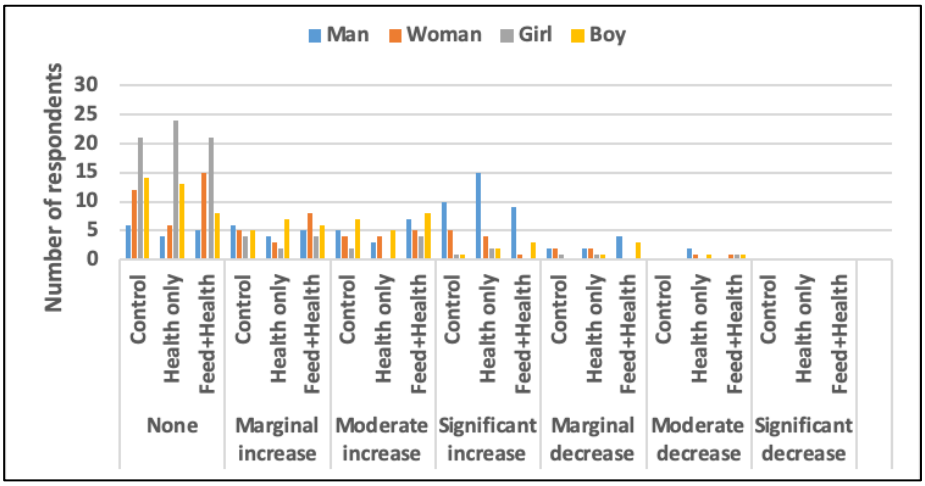

Figure 2d: Animal health care.

Household food security status

According to the respondents, the average (± standard error of the mean) number of months per year of food security were 9.10 ± 1.01 for the control, 9.35 ± 0.97 for health, and 9.68 ± 0.89 for feed-health treatments. The results showed that feed and health intervention slightly improved the number of months of food security. According to the results of the food security status of the respondents across the three major seasons (wet, early dry, and late dry seasons), there is a food security challenge in the wet and late dry seasons while the early dry season was the best period in terms of food security (Fig. 3). The early dry season corresponds with the harvest period. Generally, households with feed and health intervention tended to have a better food security status, particularly in the early dry season. The common contribution of small-ruminant husbandry to household food security is through the sale of animals with the proceeds used to buy food for household consumption.

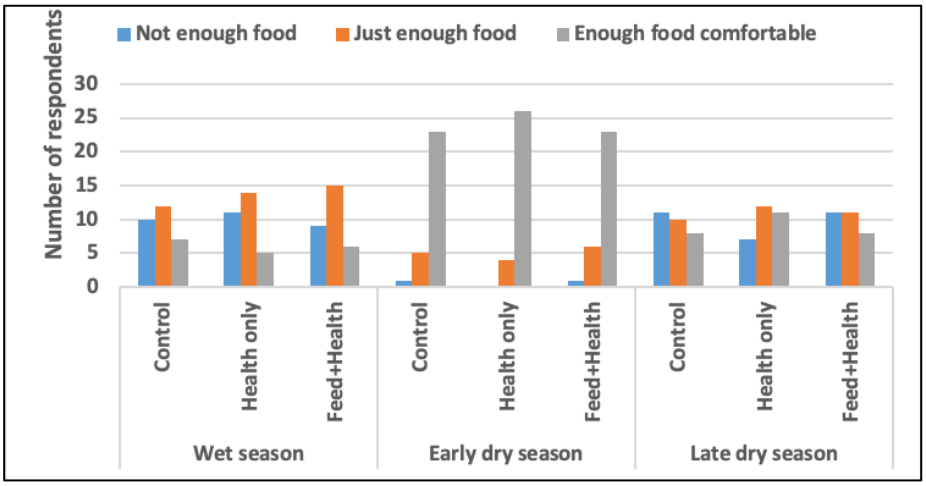

Figure 3: Perceived household food security status (n = 89).

Contribution of small-ruminant husbandry to household food security

According to the respondents, small-ruminant husbandry contributed to household food security through the sale of the animals to buy grain for household consumption (Figs. 4a, b & c). Across all treatments, healthy sheep and goats were hardly slaughtered for household consumption whereas sick animals were reported to be slaughtered for consumption by the households. The results also showed that most households slaughtered small ruminants during religious festivals for household consumption. Households that received feed and health intervention tended to sell animals more frequently to buy grain and animal source food for household consumption than the households with control and health only treatments. These results suggest that the effect of improved small-ruminant husbandry through feed and health interventions is not direct through increased consumption of sheep and goats by the households but indirect through the sale of the animals to buy grain and animal source food. Therefore, increased flock size through feed and health intervention will enhance offtake and consequently increase proceeds from animal sales, which can be used to buy grain and animal source food.

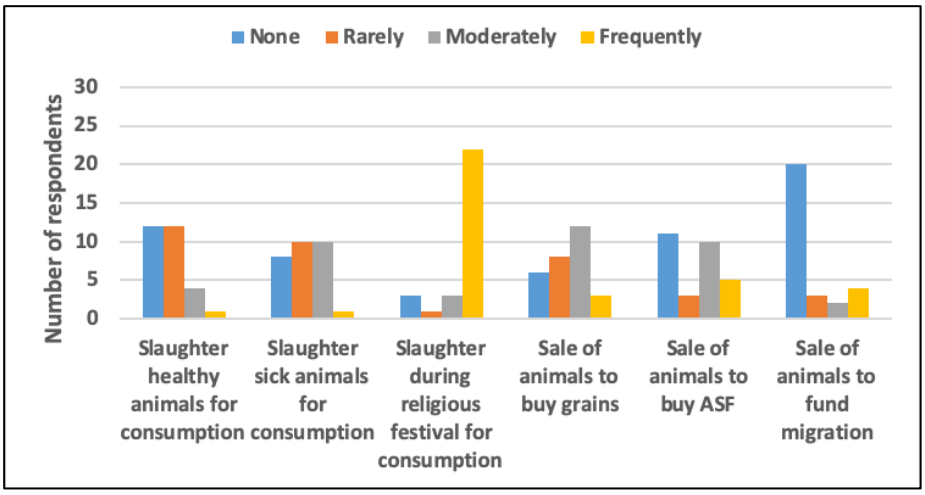

Figure 4a: Contribution of small ruminants to food security—control.

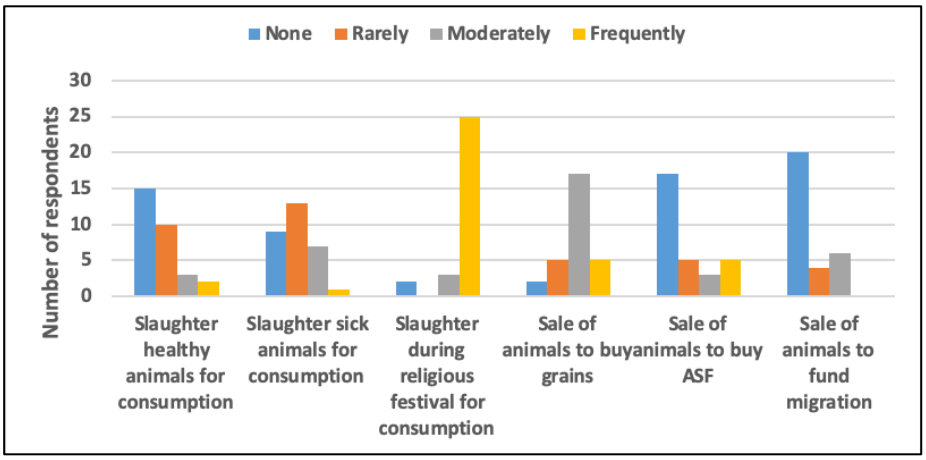

Figure 4b: Contribution of small ruminants to food security—health intervention only.

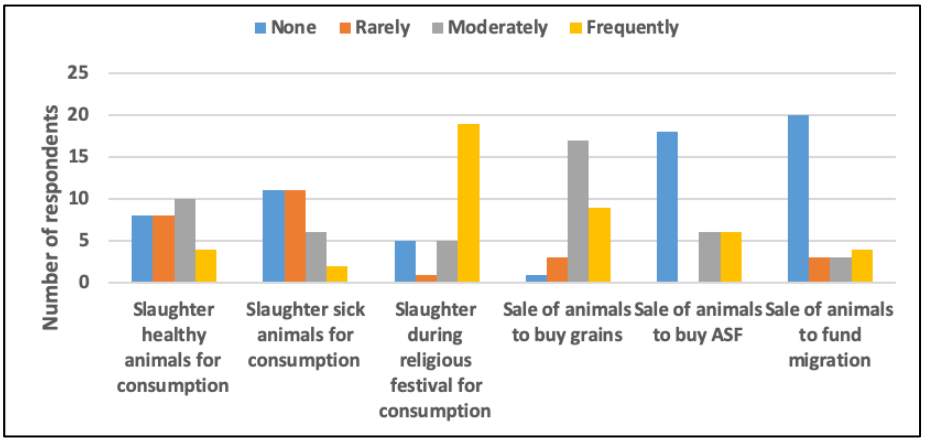

Figure 4c: Contribution of small ruminants to food security—feed and health intervention.

Household dietary diversity

Household Dietary Diversity Score (HDDS) is a measure of household access to different food types during different periods, for example, difficult and favorable periods. HDDS is based on the recommended 12 food groups by Swindale and Bilinsky 2006[1]. The respondents were asked their consumption of different food groups at different intervals (never, daily, weekly, monthly) during difficult and favorable food situations following the RhoMIS (Rural Household Multiple Indicator Survey) approach as explained by Hammond et al. 2017[2].

Results of the dietary diversity by the households in the nine intervention communities showed that grain formed the main diet of more than 90% of the households who consumed grain-based diets every day in both difficult and favorable food periods (Fig. 5). The results further showed a tendency of higher consumption of animal source food (meat, fish, egg, and dairy products) during the favorable food period than in the difficult period. The households that received the health only treatment, and feed and health interventions consumed more animal source food than those in the control (no intervention), which implies consumption of more diverse food. Though there was no slaughtering of sheep and goats for household consumption, the proceeds from the sale of the animals were used not only to buy grain but also animal source food for consumption as shown in Figure 4.

[1] Swindale A and Bilinsky P. 2006. Household Dietary Diversity Score (HDDS) for measurement of household food access: Indicator guide (v.2). Washington, DC: FHI 360/FANTA.

[2] Hammond J, Fraval S, Etten JV, Suchini JG, Mercado L, Pagella T, Frelat R, Lannerstad M, Douxchamps S, Teufel N, Valbuena D, vanWijk MT. 2017. The Rural Household Multi-Indicator Survey (RHoMIS) for rapid characterisation of households to inform climate smart agriculture interventions: Description and applications in East Africa and Central America. Agricultural Systems, 151: 225–233. DOI: http://dx.doi.org/10.1016/j.agsy.2016.05.003.

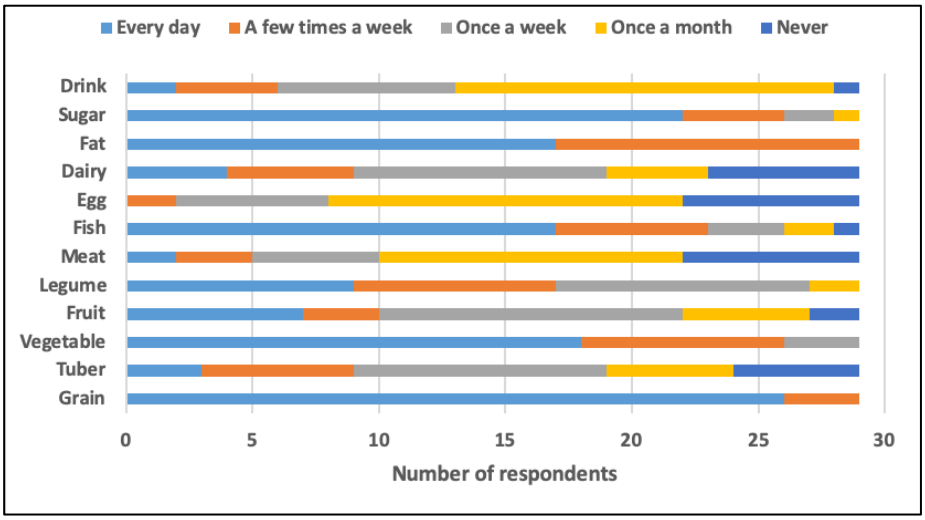

Figure 5a: Household dietary diversity during difficult period—control.

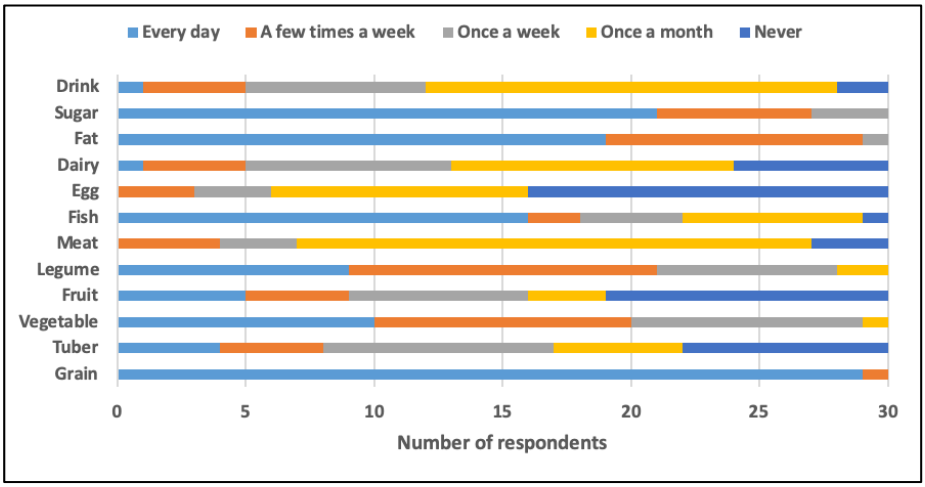

Figure 5b: Household dietary diversity during difficult period—health intervention only.

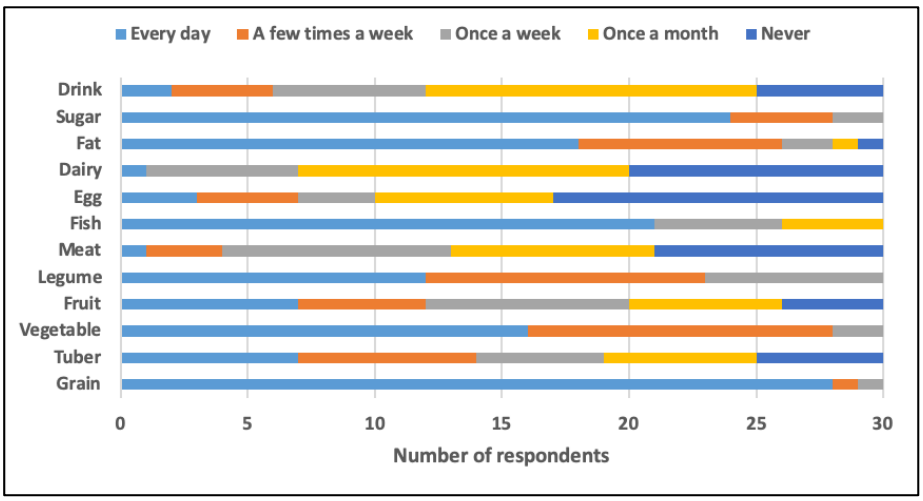

Figure 5c: Household dietary diversity during difficult period—feed and health intervention.

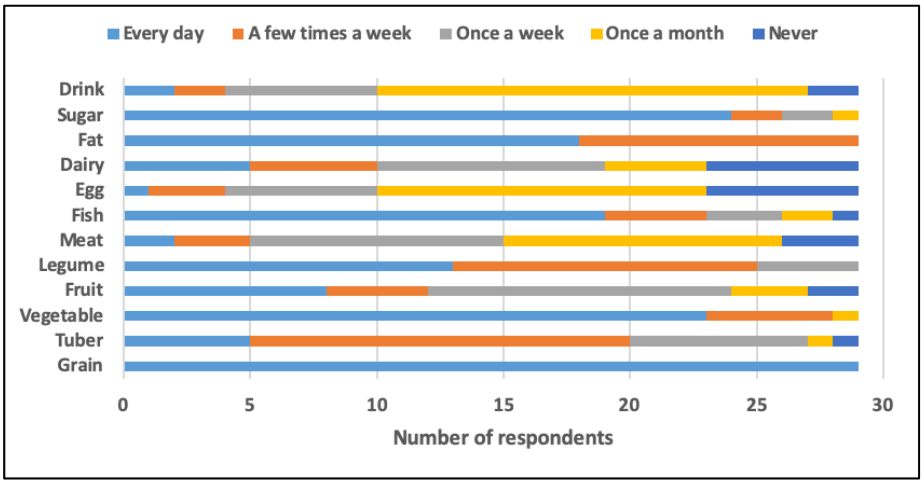

Figure 5d: Household dietary diversity during favorable period—control.

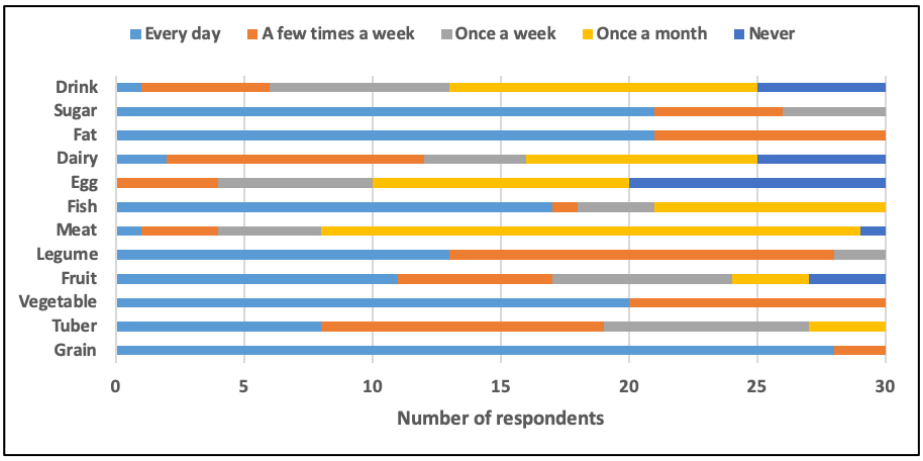

Figure 5e: Household dietary diversity during favorable period—health intervention only.

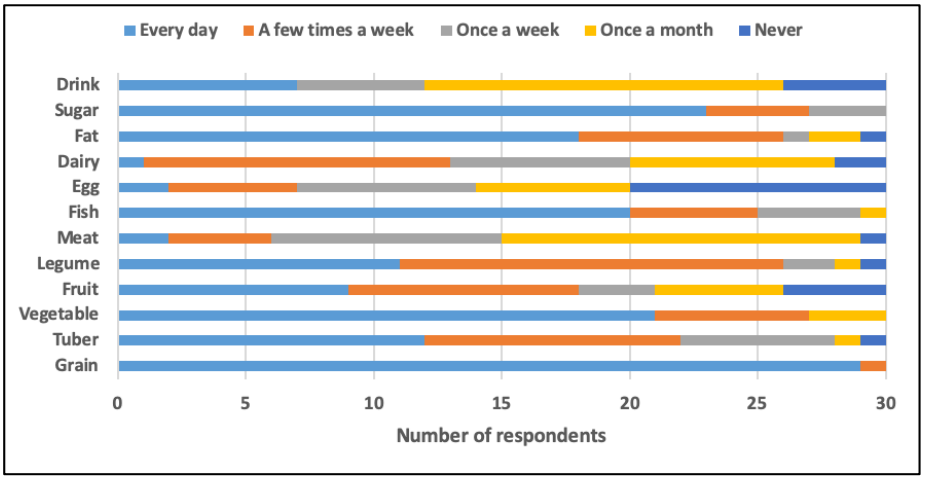

Figure 5f: Household dietary diversity during favorable period—feed and health intervention.

Table 1. Summary of consumption of animal source food (meat, fish, egg, and dairy products during the difficult and favorable food situations (the average of percentage respondent excluding response of never to have consumed the food type).

Animal source food	Control (n = 29)	Health only (n = 30)	Feed + Health (n = 30)
Difficult period			
Meat	18.96	22.50	17.50
Fish	24.14	24.17	25.00
Egg	18.97	13.33	14.17
Dairy	19.83	20.00	16.67
Favorable period			
Meat	22.41	24.17	24.17
Fish	24.14	25.00	25.00
Egg	19.83	16.67	16.67
Dairy	19.83	20.84	23.33

Conclusions

The main conclusions from this survey on the perceived effect of the feed and health intervention for improved, small-ruminant production on gender and household nutrition are:

- Most small-ruminant, management-related activities are distributed by gender groups. Boys tended to be responsible for taking out the animals for grazing though male adults were also involved to some extent while the sale of animals was mainly by men.
- The feed and health intervention did not increase household labor for some small-ruminant-related management activities such as taking animals out for grazing, search for feed, giving feed to the animals, and animal health care according to the respondents.
- Feed and health intervention slightly improved the number of months of food security of the households in the intervention communities (mean ± standard error of the mean: 9.10 ± 1.01, 9.35 ± 0.97, and 9.68 ± 0.89 months per year for control, health only, and feed-health treatments, respectively. The common contribution of small-ruminant husbandry to household food security is through the sale of animals with the proceeds used to buy food for household consumption based on the number of respondents that mentioned this compared to other modes of contribution.
- The households that received health only treatment, and feed and health intervention tended to consume more meat, fish, and dairy products than those in the control (no intervention) during the favorable period, which implies consumption of more diverse food, but the trend is not clear during the difficult period. The results suggest that feed and health interventions for improved, small-ruminant production may contribute to the consumption of more diverse food by the households, particularly during the favorable period.

Appendix

Appendix: Survey on the perceived effect of feed-health intervention for improved, small-ruminant production on gender and household nutrition

Information on the household

Date of Interview (JJ/MM/AAAA):	/ /2018						
Name of the enumerator:							
Did the household give its consent for the interview? (0= NO ; 1=YES)	[ ]						
If NO, Why? (See Code below)							
Time at beginning of the interview:	HH:		MM:				
Time at the end of the interview:	HH:		MM:				
Name of the Village:							
Name of household head:							
Household size:							
a) No consent							
1 = Respondent refuses to participate 2 = Respondent does not have the time 3 = Household head (or another knowledgeable household member) is not present at the house Other: (specify in cell)							

Information on the respondent

Name	
Age	
Sex (code)	
Religion (code)	
Ethnic group	
Marital status (code)	
Primary activity	
Level of education (code)	

Sex: 1 = Male; 2 = Female **Marital status** 1 = Married; 2 = Single; 3 = Divorced; 4 = Other (specify) **Religion** 1 = Christian; 2 = Muslim; 3 = Traditional; 4 = Other (specify)	**Primary occupation** 1 = Crop farming only 2 = Livestock husbandry only 3 = Crop and livestock farming 4 = Small commerce 5 = Salaried employment 6=Other (specify)	**Level of education** 0= Never attended school 1= Koranic education 2= Primary school 3= Secondary school 4= Post-secondary school 5 = Other: (specify)

Section 1: Role in small ruminant husbandry and the effect of feed-health intervention on gender.

1.1 Distribution of labor in management of small ruminants

What is the level of involvement of each gender group in the following tasks of managing household small ruminant flock?

	Task	Level of involvement (0=None; 1=Low; 2=Moderate; 3=High; 4=Very high)			
		Adult male	Adult female	Girl (<15years)	Boy (<15 years)
Small ruminants (sheep and goat)	Herding for grazing				
	Looking for feeds for the animals including feed purchase				
	Feeding the animals				
	Watering				
	Sale of animals				
	Taking the animals for vaccination				
	Treating sick animals				
	Collection of manure				
	Cleaning of animal shed/barn				
	Other: [ ]				

1.2: Perceived effect of the feed-health intervention on division of labour in managing household small ruminant flock by gender.

Ask the respondent of the effect of the feed-health intervention on division of labour in managing household small ruminant flock for different gender groups. The response can be: 0 = None; 1 = marginal increased; 2 = modest increased; 3 = significant increased; 4 = marginal decreased; 5 = modest decreased; significant decreased.

Activité	Practice (0=No ; 1 = Yes)	Adult male	Adult female	Girl (<15 years)	Boy (<15 years)
Herding for grazing					
Looking for feeds for the animals including feed purchase					
Feeding the animals					
Watering					

Sale of animals					
Taking the animals for vaccination					
Treating sick animals					
Collection of manure					
Cleaning of animal shed/barn					
Other (specify)					

1.3: Sharing of benefits from small ruminant production.

Benefit	Who decides how to share the benefit? (Code A)	Proportion of sharing benefit (1=0%; 2=1%–25%; 3=26%–50%; 4=51%–75%; 5=76%–100%				
		Household head	Woman (wife)	Children	All member of the family	Not Applicable
1. Proceed from sale of sheep and goats						
2. Consumption of meat from sheep and goats slaughtered						
3. Animal manure						
4. Proceed from sale of animal manure						
5. Means of dowry payment						
6. Other (specify)						

Code A: 1 = household head only; 2 = household head and his spouse(s); 3 = woman only; 4 = children; 5 = all members of the family; 6 = other (specify).

Section 2. The effect of feed-health intervention on household nutrition

2.1 Food security status of the household per season.

	Wet season (Jun–Oct)	Early dry season (Nov–Jan)	Late dry season (Feb–May)
Average Number of meals per day			
Food security status 1=not enough food for the whole family; 2= just enough food; 3=enough food, comfortable.			
Have you received food aid in the past one year? (1=Yes, 0 = No)			
Number of hungry months			

2.2 Contribution of small ruminant husbandry to household food security

	Statement	Yes or No	If Yes, to what extent (1-Rarely; 2=Moderately; 3=Frequently)
1.	We do slaughter healthy sheep and or goat for household consumption		
2.	We do slaughter sick sheep and or goat for household consumption		
3.	We only slaughter sheep and or goat for household consumption during religious festival		
4.	We do sell sheep and or goat to buy grains and other food items for household consumption		
5.	We do barter (or exchange) sheep and or goat for grains for household consumption		
6.	We use proceed from the sale of sheep and or goat to buy meat/fish from butcher or market for household consumption		
7.	We use sheep and or goat as collateral for rented land being cultivated for food production		
8.	We sell sheep and or goat to raise money for member(s) of the family going on migration and the remittance from the migrant(s) is used for household food		

2.3 Household dietary diversity

Dietary diversity	
Worst month	**Response (use code)**
1. During the worst month, how many times did you consume: grains or flour?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
2. During the worst month, how often do you eat: starchy roots?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
3. During the worst month, how often do you eat: vegetables?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
4. During the worst month, how often do you eat: fruits?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
5. During the worst month, how often do you eat: beans, legumes, nuts or seeds?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
6. During the worst month, how often do you eat: meat or organs from animals?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
7. During the worst month, how often do you eat: Fish?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
8. During the worst month, how often do you eat: Eggs?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
9. During the worst month, how often do you eat: Milk or things made out of milk?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
10. During the worst month, how often do you eat: Fats, like oil, butter, margarine, lard?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
11. During the worst month, how often do you eat: Sweet things made from sugar?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
12. During the worst month, how often do you eat: Other foods, like drinks or foods in packets?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
Code: *A. Every day (or almost every day)* *B. A few times a week (more than two times per week)* *C. Once a week* *D. Once a month* *E. Never*	
And now the same questions, but during the good season	
When there is more food, in a typical month, how often do you eat:	Response (use code)
Grain or flour?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
Starchy roots?	

Where does this food come from? 1: on farm; 2: off farm; 3: combination	
Vegetables?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
Fruits?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
Beans, legumes, nuts or seeds?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
Meat or organs from animals?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
Fish?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
Eggs?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
Milk or dairy food products?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
Fats, like oil, butter, margarine, lard?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
Sweet things made from sugar?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	
Other foods, like drinks or foods in packets?	
Where does this food come from? 1: on farm; 2: off farm; 3: combination	