Food Security in Rural and Urban Areas of Ayacucho, Peru

A senior honors thesis

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Abstract

The objective of this study was to gather information on food security and household food diversity in the department of Ayacucho, Peru. Information was gathered in the markets of Ayacucho, the central city of the department, as well as gathered in Macachaba, a rural area outside of the city of Ayacucho. I proposed to examine the food security in each location and determine how food security correlates with household food diversity in both of the individual areas. The group interviewed in the city of Ayacucho (n = 7) is in one of the lower economic classes within the city, but they are from a higher economic class than those interviewed in Macachaba (n = 11). However, Macachaba went through a CARE program to improve the amount and diversity of food available to them. By comparing the two groups I planned to measure the success of the CARE program in order to estimate the possible success of a similar program if conducted in the areas surrounding Macachaba.

The survey participants in Ayacucho had diverse results. People within the urban area ranged from food secure (food security score = 1) to severely food insecure (food security score = 15). The participants in Machachaba had a much smaller range and were all classified as severely food insecure (food security scores = 13-15). The food inventory results were not what were expected in the research. In the two populations surveyed I found that the lowest food insecure participant (HFSSM score = 1) had less diversity of food than the highest (HFSSM score =15) participant in all food categories except dairy. This is most obvious in the comparison of the food inventory in the urban area compared to the rural area. However, even in the urban area alone, the participant with the highest food insecurity (food security score = 15) had higher numbers of food stuffs per category than most of the other urban participants.

It is possible that in Ayacucho people with higher food insecurity grow diverse gardens, but have such small financial capitals that when the homegrown food runs out they have no way of getting more. It is likely that another study done in Ayacucho with a larger sample size will yield results closer to what
has been found in other countries in South America. Some studies have suggested that the HFSSM tool is not valid with all racial and ethnic subgroups; a larger study will have to be done to determine if that may be the case in Ayacucho (Melgar-Quinonez, et al, 2008).

I. Introduction

Food security was defined by heads of state at the World Food Summit as: “when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (World Food Summit, 1998). Household food insecurity is often linked with malnutrition. Malnutrition presents in two forms: macronutrient malnutrition, a lack of adequate carbohydrates, lipids, proteins, or overall calories; or micronutrient malnutrition, a lack of essential vitamins and minerals (World Health Organization, 2009).

Dignitaries at the World Food Summit pledged to cut in half the global number of hungry people from 1996 to 2015 (World Food Summit, 1998), however, still today 1 in 7 people, 936 million, do not have enough food. In the past two full calendar years, 2007 and 2008, the number of people without adequate food has increased by 75 million and 40 million, respectively (Food and Agriculture Organization, 2008), with 58.4 million of those without enough food are in Latin America and the Caribbean (United Nations World Food Programme, 2009).

Peru has a Human Development Index (HDI) rating of 79 out of 179 countries. HDI is a composite measure of a country’s life expectancy, education, and standard of living. Peru’s HDI places it above most of the Latin American and Caribbean countries (United Nations Development Programme, 2008), however, in South America, Peru has the third lowest Gross Domestic Product (GDP) per capita (U.S. Agency for International Development, 2008). Over half of the population of Peru lives below the poverty line, and twenty-five percent live on less than a dollar a day. The poorest of the population typically live in the rural and mountain range areas (World Food Programme, 2009).
Ayacucho is set up in the Andes Mountains, nine hours east of Lima, with a largely indigenous population. Poverty is a hallmark of indigenous populations in South America (Pan American Health Organization, 2008). Malnutrition is not uncommon in Ayacucho. Unclean water results in a high number of parasitic infections, especially among children, which leads to malabsorption of a number of nutrients (Dr. José Carlos, personal communication, July 1, 2008). A lack of adequate food also results in high Vitamin A deficiency among children, and high numbers of iron deficiency among women of childbearing age (Carlos Isaías Poma Vivas, personal communication July 21, 2008).

The purpose of this research was to examine food security in Ayacucho, Peru using a modified version of the United States Household Food Security Survey Module (US-HFSSM). The US-HFSSM has been validated in a number of Latin American and Caribbean countries.

The US-HFSSM began being administered annually in the United States in 1995 as part of the Current Population Survey. Eight years later researchers started working to verify a Spanish translated version of the US-HFSSM for country-wide use (Harrison, et al, 2003). The US-HFSSM is a multi-question survey that focuses on the psychological and physiological effects of food insecurity (i.e. worrying about having enough food, meals lacking nutritive qualities, going to bed hungry). Each question on a household’s situation has a follow-up question to determine the frequency of occurrence within the last three months (i.e. always, frequently, one or two days). The questions are ordered so that a continued positive response to the questions indicates an increased level of food insecurity.

Due to differences in language, local customs, and food practices, the translated and modified HFSSM needs to be tested and validated for use in a variety of countries before it can be accepted as a tool to measure food insecurity worldwide. The effects of gender of the interviewee were tested recently in a study completed in Brazil (Hackett, et al, 2008). Males and females often experience food insecurity differently because of different social status. In most societies, women are in charge of cooking the meals, and generally take on the burden of stretching small amounts of food. Many times
children are protected from the effects of food insecurity by the adults, meaning adults will usually go without a meal before the children will. Due to the social status of women in developing countries, women will often go without food before men when buffering the children. Some researchers questioned whether the difference in gender roles in dealing with food security would alter male and females responses to the HFSSM. However, the study found that when reporting the household food insecurity the respondent’s gender does not affect the answer (Food and Agriculture Organization, Unknown).

In 2006 researchers studied food security and its association with total daily household consumption per capita in three countries: Bolivia, Burkina Faso, and the Philippines. The researchers used a modified version of the HFSSM in all three countries. They had roughly 330 subjects in each country, 1/3 from urban areas and 2/3 from rural areas (Melgar-Quinonez, et al, 2006).

The researchers found that food expenditure and food security are directly related, with food security increasing when food expenditure increases. The strongest correlation was found between food security and expenditure on meat products. The researchers also found evidence that suggested that even households with moderate food insecurity may have poor dietary quality (Melgar-Quinonez, et al, 2006).

The results of the study provide evidence that the HFSSM tool is a valid tool in these three countries. The study also provides evidence that the tool is able to discriminate between levels of food insecurity. Although the study verified the tool for all three countries, a Rasch analysis of the data suggested that the modified HFSSM worked better in Bolivia and the Philippines than in Burkina Faso (Melgar-Quinonez, et al, 2006).

Researchers examined food security in Ecuador in order to assess the validity of the HFSSM in the rural area of the country. The study also looked at household food shelf-inventory and demographic characteristics. The food shelf-inventory was compared with the food security score from HFSSM with
the expectation that as food insecurity increased shelf-inventory would decrease. A statistically significant inverse relationship was found between the two criteria (Hackett, et al, 2007).

The tool was tested on a relatively small sample size of 52 households spread out over 4 rural areas in Ecuador, all participating households were part of a grassroots program, Community Planning for Sustainable Livestock-based Forested Ecosystems (PLAN). The study concluded that the adapted HFSSM model was valid in Ecuador, especially in testing the effectiveness of local programs aimed at improving food security in rural areas (Hackett, et al, 2007).

In 2007 researchers in Columbia assessed a locally adapted version of the HFSSM, the Columbia Household Food Security Scale (CHFSS), using low-income families with pre-school age children that were on a government food assistance program, MANA (Hackett, et al, 2008). The CHFSS tool is designed similar to the HFSSM tool; as the questions increase a positive response indicates an increased level of food insecurity. In the study in Columbia the CHFSS tool was found to be valid among MANA participants, although it still needs to be tested on non-MANA participants (Hackett, et al, 2008).

On a global scale, the modified HFSSM is gaining popularity as being a widely accepted tool to measure food security in a variety of locations, though some studies suggest that the tool is not valid among all racial or ethnic groups, such as the U.S. Samoans. Controversy surrounds the global use of HFSSM. Some researchers believe that the best type of food security survey would be one modeled from the bottom-up in the country where it was intended to be used (Melgar-Quinonez, et al, 2008).

A study was done in Brazil using a locally modified survey and comparing the validity of it to the U.S. HFSSM. The Brazil survey was found to be valid and is now widely used by the country’s government. However, the modification of the survey was based on a previously adapted US-HFSSM survey that was used in a research study in Brazil (Melgar-Quinonez, et al, 2008). Although bottom-up adapted surveys may result in more detailed measurements of local food insecurity, not having a global tool for
measurement will decrease researchers’ ability to compare food security between locations, a crucial aspect when dealing with international food assistance (Melgar-Quinonez, et al, 2008).

Prior to this study a modified version of HFSSM had not been tested in Peru. I tested the HFSSM in two low income areas within the department of Ayacucho. Surveys were completed in the markets of the capital city, Ayacucho, and in the fields of Machachaba, a rural area thirty minutes outside of the city of Ayacucho with a population around 3,000. (Marisol Chancos Mendoza, personal communication, July 2008)

Machachaba went through a grassroots program headed by CARE and with help from local organizations in an effort to improve living conditions. The program focused on hygiene and nutrition and brought the leaders of the community together to work as a unit. People in the community were taught how to plant a variety of fruits and vegetables, and how to raise and care for livestock. The program was community based and the people of Machachaba were brought together to use public land to grow food communally, in addition to the small personal gardens at some homes. The program ended in 2005 and is viewed as a success because all changes have been sustained; however, there is still widespread poverty in Machachaba. (Marisol Chancos Mendoza, personal communication, July 2008)

The people who work in the markets of Ayacucho are considered to be part of the lower income group. They often produce the goods or foods they sell. They generally sell most of the food they grow. (Marisol Chancos Mendoza, personal communication, July 2008)

One goal of my research was to get a sense of the food insecurity in both regions. I also hoped to gather information on household food diversity. In previous studies food diversity and food security have direct relationship, where low food security correlated with low food diversity.
After working with the people of Ayacucho I hypothesized that food insecurity would be high in both Machachaba and Ayacucho, however I believed that it would be higher in Machachaba, as previous research has found that food insecurity is higher in rural areas.

Through my research I also wanted to examine the effectiveness of the CARE program through comparing the low income rural area population of Machachaba to the low income urban group of Ayacucho.

II. Methods

All participants were given an explanation of the purpose of the study and a release form to sign. Due to recent political unrest and fear of the government, many participants would not give their signature or full names, but did give verbal consent to participate in the study. This study was not granted approval from The Ohio State University Institutional Review Board because of factors that could not be accounted for during the time of application, specifically who the members of the team of interviewers would be.

A modified HFSSM and a translated food inventory survey were given in both locations with the help of international volunteers and a local aid worker. There was a household sample size of 7 (n=7) from the markets within the city of Ayacucho, and a sample size of 11 (n=11) from the rural area of Machachaba.

The total sample size for the study was 18, with a little over 1/3 (38%) from the urban area of Ayacucho and a little less than 2/3 (61%) from the rural area. The subjects from Machachaba are considered to be at a lower poverty level than those from the urban area. However, compared to surrounding rural areas the Machachaba area is considered to have more resources and better living conditions due to the participation in the grassroots program.
In Machachaba the surveys were conducted in the fields while community members were harvesting crops. In Ayacucho the surveys were conducted in two separate markets while subjects were working.

The US-HFSSM that was used was a version that was previously translated into Spanish for use in Brazil. The survey was a 15-question questionnaire with follow-up frequency questions with increasing severity, a sample of the questions can be seen in Table 1, and the complete survey is available in the appendix. The first 8 questions of the survey related to the adults’ and general household situation of food security while the next 7 questions related to the children’s situation. Due to high illiteracy levels in both locations the surveys were administered verbally by an interviewer and participants’ answers were recorded.

The food inventory survey was a modified version of a survey previously used in Brazil. The questionnaire contained 7 questions regarding the household’s food purchasing and growing practices, as well as a list of foods along with the question of which foods had been in the household pantry within the last three months.

Statistical analysis was performed on all data comparing the two locations using STRATA software. Food security scores were compared between the two locations, as well as household availability of all categories of food. Food security scores were compared to household inventory numbers and broken down by location for comparison as well.

A food security score is determined by totaling the number of positive responses to the 15 question survey. Scores can range from 0 to 15. A score of 0 classifies the household as highly food secure. A score between 1 and 2 classifies a household as moderately food secure. This score indicates some anxiety over food supply, but no diet alterations. A food security score from 3 to 6 indicates a household has low food security. A household with low food security will have reduced food quality and variety, but no decrease in intake. A household is classified as having very low food security when the food
security score is 7 or higher. A very low food secure household has altered food patterns and decreased food intake due to an inability to get adequate food (United States Department of Agriculture, 2008).

III. Results

The mean food security score of the two locations combined was 11.7, with a standard deviation of almost 5 points, and a range from 1 to 15. The majority of the large range in scores was found in the urban area.

The mean food security score in Ayacucho was 6.7, which would classify the urban area as having low or very low food security. Household food security scores in the urban area ranged from 1 to 15.

The rural area has very low food security; the mean food security score in Machachaba was 14.2. The household food security scores in the rural area ranged from 13 to 15. Figure 1 compares the percent of the total survey population in each location that responded positively to each question.

Children are typically protected from household food insecurity by the adults for as long as the household’s situation will allow. The HFSSM is divided into two sections. The first section, questions 1-8 has questions pertaining to the household’s adults’ food security. The second half of the survey correlates to the children’s food security. An Adult Food Security Survey Module (AFSSM) score between 1 and 3 classifies the adults of the household to be moderately food secure. A score greater than 4 classifies the adults as having low food security. The Children’s Food Security Survey Module uses the same scoring as the AFSSM. When the results are separated to calculate child and adult food security scores for each area the mean AFSSM score in Ayacucho was 4.3, and 7.8 in Machachaba. The Child Food Security Survey Module (CFSSM) score in Ayacucho was 2.4, and 6.5 in Machachaba. Figures 2-5 compare adult food security and child food security between the two locations.

The first seven questions of the food inventory survey relate to household food practices: how often food is bought, if food is grown at home, and how much of the grown food is sold for profit. All participants in Machachaba grew vegetables, fruit, corn, beans, and raised livestock, half of the yield
was used by the household while the other half was sold. The urban households that were classified as low to very low food secure followed the same pattern as the participants of Machachaba.

The rest of the survey lists foods in eight different categories: dairy products, grains, sweets, vegetables, fruits, drinks, meats and high protein foods, and condiments. The participant is asked to respond to which foods have been stocked in the household over the past three months.

For both locations combined the mean amount of dairy products in the household was 2.3, with a range from 1 to 4 products out of seven listed items. There was an eighth choice to give any unlisted dairy items; no participants in either location had additions. The mean amount of grain in the household was 8.7 with a range from 3 to 11 out of 16 listed items and a space to give additional items. No participants gave additional grains. The mean amount of sweets in a household was 2.3 with a range from 0 to 4 out of 5 choices. The mean amount of vegetables was 18.4 with a range from 9 to 22 items. There were 27 vegetables listed on the survey and no additional food provided. The mean amount of fruit was 11.9 with a range from 2 to 16 out of 24 fruits listed and no additional ones in either location. The mean amount of drinks was 5.8. The number of beverages in the household ranged from 2 to 8. The survey provided a list of 9 drinks and no additional ones were given. The mean number of protein rich foods (i.e. meats with the addition of nuts and eggs) was 6.9. The range of proteins in the household was from 2 to 9 out of 11 choices and the addition of pigeon and guinea pig. The mean amount of condiments was 6.4. The amount of condiments in the household ranged from 4 to 8 out of the 11 choices listed and no additional options added.

Figure 6 compares the average number of food stuffs by category between households in the rural area to those in the urban area. The mean amount of different food items a household had in the last three months for dairy products, grains, sweets, vegetables, fruit, drinks, protein, and condiments, respectively in Ayacucho was: 2.1, 6.6, 0.7, 16.3, 10.8, 4.3, 4.6, and 6.1. Where as in Machachaba means were: 2.4, 10.0, 3.4, 19.8, 12.6, 6.6, 8.4, and 6.6. Grains and sweets were the only statistically significant
numbers. The significance of those two categories is not unexpected, high amounts of grains and sweets in low and very low food secure households is common, as these foods often provide high amounts of calories for little money. For side by side comparison of these results see Table 2.

When the HFSSM tool is used with the food inventory survey, food security is typically positively correlated with the average household diversity. Between the two locations surveyed in Ayacucho the lowest food insecure participant (HFSSM score = 1) had less diversity of food than the highest (HFSSM score =15) participant in all food categories except dairy. This same anomaly was also found when looking at only the results from the urban area. This is best illustrated in Figure 6 which compares the average amounts of food in a household in Machachaba to one in Ayacucho.
Table 1: This is a selection of questions from the HFSSM which illustrates how the questions increase in severity.

<table>
<thead>
<tr>
<th>Question</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. During the last three months were you worried your household would run out of food because of lack of money or other resources to obtain food?</td>
<td></td>
</tr>
<tr>
<td>2. During the last three months did your household run out of food because of lack of money or other resources to obtain food?</td>
<td></td>
</tr>
<tr>
<td>7. During the last three months, did you or any adult in your household feel hungry but couldn’t eat because there was no food, nor any way to obtain it?</td>
<td></td>
</tr>
<tr>
<td>8. During the last three months, did you or any adult in your household go without eating for a whole day because there was not food, nor any way to obtain it?</td>
<td></td>
</tr>
<tr>
<td>14. During the last three months, did any child in your household go to bed hungry because of lack of money or other resources to obtain food?</td>
<td></td>
</tr>
<tr>
<td>15. During the last three months, did any child in your household go without eating for a whole day because there was no food, nor any way to obtain it?</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: This graph compares the percent of participants who responded positively to each question of the modified HFSSM. The responses are separated by location to illustrate the difference in household food security between the urban and rural area.
**Figures 2 & 3:** These graphs show the percent of the population in each location who responded positively to the first 8 questions of the modified HFSSM, which measures adult food security in the household.

**Figures 4 & 5:** These graphs show the percent of the population that responded positively to the last 7 questions (9-15) of the modified HFSSM. These questions measure the food security of children in the household.
Table 2: This table provides a side by side comparison of the average amounts of food stuffs by category in households in Ayacucho compared to households in Machachaba. The average food security score is also provided for each location. Grains and sweets averages were the only statistically significant data.

<table>
<thead>
<tr>
<th>Location</th>
<th>FS score</th>
<th>Dairy</th>
<th>Grains</th>
<th>Sweets</th>
<th>Vegetables</th>
<th>Fruit</th>
<th>Drinks</th>
<th>Protein</th>
<th>Condiments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ayacucho</td>
<td>6.7</td>
<td>2.1</td>
<td>6.6</td>
<td>1</td>
<td>16.3</td>
<td>10.8</td>
<td>4.3</td>
<td>4.6</td>
<td>6.1</td>
</tr>
<tr>
<td>Machachaba</td>
<td>14.2</td>
<td>2.4</td>
<td>10</td>
<td>3.4</td>
<td>19.8</td>
<td>12.6</td>
<td>6.6</td>
<td>8.4</td>
<td>6.6</td>
</tr>
</tbody>
</table>

Figure 6: This graph illustrates the difference between the average household food diversity that is listed in Table 2.
IV. Discussion

Previous studies using the HFSSM model have supported the theory that food security is lower in rural areas compared to urban areas (Hackett, et al, 2008). This result was found in Ayacucho as well. In total food security as well as adult and child food security the rural area as a whole was consistently less food secure than the urban area.

The survey participants in Ayacucho had diverse results. People within the urban area ranged from moderately food secure (food security score = 1) to very low food security (food security score = 15). The participants in Machachaba had a much smaller range and were all classified as being very low food secure (food security scores = 13-15). Distribution of a more food insecure population in rural areas as opposed to urban is typical of developing countries.

The grassroots program that Machachaba participated in worked to improve sanitation and food availability in the area. CARE workers and local aid workers taught the people in the area how to sustainably farm the land and raise livestock. As evidenced by the food inventory reports, the people of Machachaba grow a wide variety of fruits, vegetables, and grains. The responses to the first seven questions of the food inventory revealed that most households in Machachaba split their yields in order to sell half. They also raise a wide variety of animals including: cattle, goats, chickens, and guinea pig. The wide variety of food they have available to them likely explains the decrease in response at question number three of the HFSSM. The third question asks if the household has had a decreased variation of diet over the last three months because of a lack of resources. Results suggest that the people of Machachaba may have many different types of food available to them, but not have enough of any one kind of food to provide an adequate amount.
In the urban area there was a spike in responses at question number three. The majority of participants in the urban area do not grow food for their household. In households with low food security where the food that is consumed is bought, cheap food is often purchased in large amounts, decreasing the variety of the household’s diet.

The difference between the first two questions of the CFSSM in the urban area (Figure 5) may be the result of participants misunderstanding the question. The ninth question of the HFSSM (the first question of the CFSSM section) asks if children have gone without a “nutritious and varied diet” over the past three months, while question 10 asks if the children of the household “consumed just a few types of food” because of lack of money or resources. The term “nutritious” may have confused interviewees as they may believe that their children’s diet is nutritious even when it lacks variety.

The food inventory results were not what were expected in the research. Generally, it is assumed that households with more food insecurity will have less diversity of food they consume. In the two populations surveyed I found that the lowest food insecure participant (HFSSM score = 1) had less diversity of food than the highest (HFSSM score =15) participant in all food categories except dairy. This is most obvious in the comparison of the food inventory in the urban area compared to the rural area (Figure 6). However, even in the urban area alone, the participant with the highest food insecurity (food security score = 15) had higher numbers of food stuffs per category than most of the other urban participants.

The high amount of fruits and vegetables in the household is unusual as well. In many low and very low food security situations minimal amounts of fruits and vegetables are consumed because the cost of these items is often higher than that of more energy dense foods. However, in Ayacucho fruits and vegetables are very common. They can often be purchased from street vendors for the same price as a piece of candy.
There are a number of possible explanations for the unexpected inverse relationship between the food security and household food diversity found in Ayacucho. The people of Machachaba grow a wide number of foods as a result of the grassroots program in which they participated. Therefore, they respond positively to having had a large number of the foods on the food inventory in their household over the past three months. Yet, the households in the area have such small financial capitals that when the homegrown food runs out they have no way of getting more. If this is the case I would suggest that the grassroots program Machachaba participated in achieved the goal of improving food availability. However, the area is still severely food insecure and although the people have a number of foods available to them they do not have enough of any food. Another grassroots program may be needed to further improve the food situation, or to assist the community in finding ways to make money so that when homegrown food runs out households can purchase enough to sustain them until the next harvest.

Another study done in Ayacucho with a larger sample size may yield results closer to what has been found in other countries in South America. However, some studies have suggested that the HFSSM tool is not valid with all racial and ethnic subgroups, so it is possible that the HFSSM tool is not valid among the indigenous population of Peru’s Andes Mountain area. (Melgar-Quinonez, et al, 2008).

A larger study should be done in the two areas with the HFSSM tool and food inventory tool in order to better understand the results this study yielded. The second study may better show if these tools can be validated for widespread use in Ayacucho.

I hypothesized that food insecurity would be high in both the rural and urban area from which I interviewed participants, but that it would be higher in the rural area. The results from the HFSSM support this hypothesis. The results of the food inventory suggest that households with less severe food insecurity have a lower diversity in their diet than households with more severe food insecurity, especially in comparison between the rural and urban areas. This may suggest that the CARE program
Machachaba participated in helped to improve the diversity of food available in the area. However, because of the unexpected inverse correlation between level of food insecurity and household food diversity another study will have to be done in Ayacucho to validate both tools.

V. Sources


Appendix

Latin American and Caribbean Food Security Scale

Escala Latinoamericana y Caribeña de Seguridad Alimentaria (ELCSA)

English version - Free translation by Hugo Melgar-Quinonez and Mark Nord

Instructions for the interviewer:

Please read the following questions to the person being interviewed, insure that these events happened in the last three months, and that they happened as a result of a lack of money or another type or resource necessary to acquire food. In the case of an affirmative answer to the question (1, 2, 3, etc), inquire as to the frequency of the event (1a, 2a, 3a, etc). The first eight questions refer to the general situation in the home and to the situation of the adults in the household. The following questions (9 to 15) refer to the situation to the children in the household.

Please assure the interviewee that the information gathered is completely confidential, and that at no point will personal information be used in a written or oral report. Also, please assure the interviewee that participation in this survey will neither negatively or positively affect her/his participation in food or social assistance programs.

1. ¿During the last three months, were you worried that your household would run out of food because of lack of money or other resources to obtain food?

   a. Yes

   b. No (go to question 2)

1a. ¿How often did this happen?

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1 Rafael Pérez-Escamilla, PhD (1), Hugo Melgar-Quiñonez, MD, PhD (2), Mark Nord, PhD (3), Martha Cecilia Álvarez Uribe, Mr (4), Ana Maria Segall-Correa, MD, PhD

(1) University of Connecticut, (2) The Ohio State University, (3) US Department of Agriculture, Economic Research Service, (4) Universidad de Antioquia, Medellin, Colombia, (5) Universidad de Campinas, Sao Paulo, Brasil
a. Frequently (almost every day)
b. Sometimes (some days but not every day)
c. Rarely (on only 1 or 2 days)

2. ¿During the last three months, did your household run out of food because of lack of money or other resources to obtain food?
   a. Yes
   b. No (go to question 3)

2a. ¿How often did this happen?
   a. Frequently (almost every day)
   b. Sometimes (some days but not every day)
   c. Rarely (on only 1 or 2 days)

3. ¿During the last three months, did your household lack of enough money or other resources to obtain a nutritious and varied diet?
   a. Yes
   b. No (go to question 4)

3a. ¿How often did this happen?
   a. Frequently (almost every day)
   b. Sometimes (some days but not every day)
   c. Rarely (on only 1 or 2 days)
4. ¿During the last three months, did you or any adult in your household have to consume just one or two kinds of food because of lack of money or other resources to obtain food?
   a. Yes
   b. No (go to question 5)

4a. ¿How often did this happen?
   a. Frequently (almost every day)
   b. Sometimes (some days but not every day)
   c. Rarely (on only 1 or 2 days)

5. ¿During the last three months, did you or any adult in your household not eat breakfast, lunch or dinner because of lack of money or other resources to obtain food?
   a. Yes
   b. No (go to question 6)

5a. ¿How often did this happen?
   a. Frequently (almost every day)
   b. Sometimes (some days but not every day)
   c. Rarely (on only 1 or 2 days)

6. ¿During the last three months, did you or any adult in your household eat less than you thought you should because of lack of money or other resources to obtain food?
   a. Yes
   b. No (go to question 7)

6a. ¿How often did this happen?
a. Frequently (almost every day)
b. Sometimes (some days but not every day)
c. Rarely (on only 1 or 2 days)

7. ¿During the last three months, did you or any adult in your household feel hungry but couldn’t eat because there was no food nor any way to obtain it?
   a. Yes
   b. No (go to question 8)

7a. ¿How often did this happen?
   a. Frequently (almost every day)
   b. Sometimes (some days but not every day)
   c. Rarely (on only 1 or 2 days)

8. ¿During the last three months, did you or any adult in your household go without eating for a whole day there was no food nor any way to obtain it?
   a. Yes
   b. No (go to question 9)

8a. ¿How often did this happen?
   a. Frequently (almost every day)
   b. Sometimes (some days but not every day)
c. Rarely (on only 1 or 2 days)

Instructions for the interviewer:

The following questions are about children up to age 18 living in the household. Please only ask these questions to those with members of the household under the age of 18. These questions are general and do not specify gender. Please assure the interviewee that the information gathered from these questions is confidential and will not be used against her/him.

9. ¿During the last three months, did any child in your household not receive a nutritious and varied diet because of lack of money or other resources to obtain food?

a. Yes

b. No (go to question 10)

9a. ¿How often did this happen?

a. Frequently (almost every day)

b. Sometimes (some days but not every day)

c. Rarely (on only 1 or 2 days)

10. ¿During the last three months, did any child in your household have to consume just a few types of food because of lack of money or other resources to obtain food?

a. Yes

b. No (go to question 11)

10a. ¿How often did this happen?

a. Frequently (almost every day)

b. Sometimes (some days but not every day)

c. Rarely (on only 1 or 2 days)
11. ¿Durante los últimos tres meses, cualquier niño en tu hogar comió menos de lo que pensabas que debía por falta de dinero o otros recursos para obtener comida?
   a. Sí
   b. No (vaya a la pregunta 12)

11a. ¿Cuánto a menudo esto ocurrió?
   a. Frecuentemente (casi todos los días)
   b. A veces (algunos días, pero no todos los días)
   c. Raramente (sólo 1 o 2 días)

12. ¿Durante los últimos tres meses, tuviste que servir menos comida a cualquier niño en tu hogar por falta de dinero o otros recursos para obtener comida?
   a. Sí
   b. No (vaya a la pregunta 13)

12a. ¿Cuánto a menudo esto ocurrió?
   a. Frecuentemente (casi todos los días)
   b. A veces (algunos días, pero no todos los días)
   c. Raramente (sólo 1 o 2 días)

13. ¿Durante los últimos tres meses, cualquier niño en tu hogar se sintió hambriento pero no pudiste obtener más comida porque de falta de dinero o otros recursos para obtener comida?
   a. Sí
   b. No (vaya a la pregunta 14)
13a. ¿How often did this happen?

a. Frequently (almost every day)

b. Sometimes (some days but not every day)

c. Rarely (on only 1 or 2 days)

14. ¿During the last three months, any child in your household go to bed hungry because of lack of money or other resources to obtain food?

a. Yes

b. No (go to question 15)

14a. ¿How often did this happen?

a. Frequently (almost every day)

b. Sometimes (some days but not every day)

c. Rarely (on only 1 or 2 days)

15. ¿During the last three months, any child in your household go without eating for a whole day there was no food nor you had the possibility of obtain it?

a. Yes

b. No

15a. ¿How often did this happen?

a. Frequently (almost every day)

b. Sometimes (some days but not every day)

c. Rarely (on only 1 or 2 days)