Participating in a Food-Assisted Maternal and Child Nutrition and Health Program in Rural Guatemala Alters Household Dietary Choices¹–³

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Abstract

Background: Food assistance programs may alter food choices, but factors determining households’ decisions regarding food acquisition, preparation, and consumption in the context of food aid are not well understood.

Objective: This study aimed to understand how the Programa Comunitario Materno Infantil de Diversificaci´on Alimentaria (Mother–Child Community Food Diversification Program; PROCOMIDA), a food-assisted maternal and child health and nutrition program in rural Alta Verapaz, Guatemala, altered household food choices.

Methods: We conducted semistructured interviews and focus groups with 63 households in 3 participating (n = 32 households) and 3 control (n = 31) villages. A last-day food recall (without estimating quantities) and food-frequency questionnaire that used food cards assessed dietary choices. Qualitative analysis used thematic a priori and emergent coding; food group consumption frequencies were analyzed by using 2-level, logistic, mixed modeling, and chi-square testing while accounting for community clustering.

Results: Compared with control households, PROCOMIDA changed household food choices through a combination of providing food resources (with monthly food rations) and new knowledge and skills related to health and food (in the program’s behavior change communication component) while reinforcing existing knowledge and beliefs. PROCOMIDA families consumed rice, red beans, and oil more frequently than did control families (differences of 2.20 (P < 0.001), 2.68 (P < 0.001), and 1.64 (P = 0.038) times/wk, respectively); these foods were in the rations. PROCOMIDA families also ate chicken, local plants, and some vegetables more frequently. The importance of these foods was emphasized in the behavioral change communication component; these foods may have been more accessible because provision of food rations freed resources.

Conclusion: Our findings suggest that if a program provides food free of cost to rural indigenous families in the context of a maternal and child nutrition and health program, it may be important to include a well-designed behavioral change communication component to improve household food choices.

Keywords: food choices, Guatemala, food assistance, dietary choices, behavior change communication, indigenous population

Introduction

Despite the world’s commitment to reducing poverty, which is stated in UN Sustainable Development Goal no. 1 (1), the prevalence of extreme poverty was estimated at 900 million people in 2012 (~12.8% of the world population) and projected to 700 million people in 2015 (2). Conditional cash transfer programs have been used as a strategy for poverty alleviation and to improve access to food in ≥20 developing countries (3). The implicit assumption underlying such programs is that households that receive cash or in-kind transfers will make healthy choices, which in turn will result in better nutritional status for all family members.

Multiple factors influence food choices of food providers in low-income households, including interconnected biological, psychological, economic, social, cultural, and political factors (4). Families deal with scarce time and resources with the use of strategies that can lead to either better or worse diet quality (5, 6), which is understood as related to their health (7). A number of studies have assessed changes in household food consumption as a result of different cash transfer or food assistance programs in developing countries, including Mexico.

Footnotes:
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The planned sample size included 12 interviews with women and 1 focus group with men in each of the 6 selected communities. Study subjects were selected as follows. Women eligible to participate in the study were PROCOMIDA beneficiaries with a child <2 y of age in the PROCOMIDA group and women with a child <2 y of age in the control group (i.e., those who would have been eligible had the program been available). For the PROCOMIDA group, a list of women was provided by the local nongovernmental organization staff in alphabetical order. Depending on the number of women eligible to participate in the study in relation to the desired sample size, every nth woman was selected (i.e., if 48 were eligible and we required a sample size of 12, we selected the 4th, 8th, 12th, etc., from the list) to participate. In the control group, a similar approach was used; the sampling frame was a list of women with children <2 y of age, and we invited twice as many women as were needed because we anticipated less willingness to participate in this group. The interviewer and interpreter were not previously known to the families; in the PROCOMIDA groups they were introduced to community leaders by Mercy Corps staff, which could have increased the willingness of families in this group to participate in PROCOMIDA compared with those in the control group. For a subsample of the interviewed women, male partners were invited to participate in focus group discussions. These were selected in the order in which women participated in the interviews, until a total of 6–8 had agreed to participate in the focus group.

**Data collection.** The study used qualitative interviews and dietary assessment methods to better understand food choices in participating and control households. Data from women were collected with the use of a semistructured interview guide (which included a last-day food recall with no estimation of the amounts consumed; an FFQ that used 52 food cards; and additional questions on health perceptions, reasons for food consumption or nonconsumption, money use, perceived changes in food choices and spending because of PROCOMIDA, CSB use, and others). The semistructured interview guide was developed in English and then translated into Spanish in written format. During the interviewer training session, the instrument was translated to Q’eqchi’ orally. Later, the instrument was back-translated orally (Q’eqchi’ to Spanish). The instrument was piloted with 8 women.

For the last-day food recall, women first ascertained that the day before had been a typical day in the household’s food consumption pattern. (All participants confirmed that the previous day had been typical. If not typical, they would have been asked about the day before that day.) Then, they were asked to remember the foods and beverages that were eaten at home on that day with the use of a modified multiple-pass, last-day recall method that did not include assessment of quantities eaten (16). The interviewer listed all items mentioned and then prompted for beverages and snacks the respondent might have omitted. This process yielded a list of all foods consumed by the household on the previous day. The FFQ developed and used in our study was context-specific; we first developed a set of food cards based on the typical diet of Q’eqchi’ families with input from the Mercy Corps staff nutritionist and local residents. This set of food cards was pilot-tested with 8 local women who were not part of the study sample, and slight modifications were made based on their feedback. We determined the frequency of household consumption of the resulting 52 foods and beverages by asking how frequently those foods were eaten in a day, week, month, or year. The set of food cards was shown to the participants and placed by the interviewer in one of the following categories depending on the participant’s response: 1) every day, 2) 5–6 times/wk, 3) 3–4 times/wk, 4) 1–2 times/wk, 5) 2–3 times/mo, 6) 1 time/mo, 7) <1 time/mo, or 8) never. The subsequent questions in the interview built on participants’ answers regarding the frequency of food consumption (e.g., asking why some foods were eaten more frequently than others). A discussion guide adapted from the semistructured interview guide was developed for the focus groups with men. The focus groups were used to gain additional insight on perceived changes in food choices, including spending, because of PROCOMIDA, as well as men’s views regarding health and food choices. Focus groups were conducted with men because their time was limited because of paid work obligations. Whereas the interviews with women were done throughout the day, the men’s focus groups were done in the morning.

**Methods**

The PROCOMIDA program and its evaluation. PROCOMIDA was a food-assisted maternal and child health and nutrition program funded by the US Agency for International Development’s Office of Food for Peace and implemented by Mercy Corps in Alta Verapaz, 1 of the 22 departments of Guatemala, located in the north-central region of the country. Approximately 90% of the population belongs to a Mayan indigenous linguistic community (15). The 2 major ethnic groups in the department are the Mayan Q’eqchi’ and the Ladino.

The PROCOMIDA program aimed to improve the health and nutritional status of pregnant and lactating women and children <2 y of age and to improve the quality and delivery of health care services by strengthening the local health service providers. PROCOMIDA’s 3 interrelated activities focused on the distribution of family and individual food rations, including corn–soy blend (CSB), beans, rice, and vegetable oil; a requirement for participation of beneficiaries in a behavior change communication strategy focused on improving health and nutrition–related behaviors; and a requirement for the use of preventive health services for pregnant and lactating women and children <2 y of age. Food distributions, behavioral change communication sessions, and preventive health care services typically were provided at primary health care facilities that are known locally as convergence centers.

This study capitalized on the cluster-randomized controlled design of the PROCOMIDA impact evaluation study being conducted by the International Food Policy Research Institute (IFPRI). The findings presented here are not the results of the formal impact evaluation of PROCOMIDA. This study aimed to provide an in-depth understanding of how participation in the PROCOMIDA program changed household food choices.

**Study sample.** The unit of randomization for the formal impact evaluation study was the convergence center. For the study presented here, one PROCOMIDA center was selected from each region of Alta Verapaz (north, central, and west), with 3 centers out of a total of 20 being selected. The centers were selected according to the day on which food distribution would occur during the data collection weeks. The first author accompanied the food distribution staff so that she could be introduced to the community members and to guarantee her personal safety. For each of the 3 PROCOMIDA centers, a control center (for a total of 3 out of 20 centers) situated in the same region and with a similar traveling time to Cobán (the capital of Alta Verapaz) was selected.

7 Abbreviations used: CSB, corn–soy blend; IFPRI, International Food Policy Research Institute; PROCOMIDA, Programa Comunitario Materno Infantil de Diversificaci´on Alimentaria (Mother–Child Community Food Diversification Program).
Interviews and focus groups were conducted in Q’eq’chi’, with a native speaker serving as simultaneous interpreter for the first author. Neither the interviewer nor the interpreter was known to the families before conducting the study, to help avoid bias from social desirability. Interviews with women took 40–60 min to complete, whereas focus groups were longer (60–90 min). For all interviews and focus groups, both the Q’eq’chi’ and Spanish translation were recorded. Both interviewer and first author took notes when necessary. All interviews and focus groups then were transcribed in Spanish. All recordings were reviewed by a quality-control person fluent in Q’eq’chi’ and Spanish who compared the recording with the transcribed data and added notes if necessary. The first author listened to the Spanish translation from a subset of interviews and compared them with the Spanish transcription to verify verbatim transcription.

Ethical approval for the study was obtained from Guatemala’s Ministry of Health and the Institutional Review Board of the University of South Carolina. Oral informed consent was obtained from all study participants. Data collection took place from May to July 2011. A total of 63 interviews (32 PROCOMIDA and 31 control) and 6 focus groups (1 in each community) were completed. Although a sample of 72 interviews had been planned, in some communities the goal was not reached because study subjects did not show up or declined to participate. Women were given soap (valued at ~10 quetzales; US$1 = 7.6 quetzales) as appreciation for participation. For participation in focus groups, men received 30 quetzales to compensate for potential lost work time.

Data analysis. All in-depth interview and focus group transcripts were imported into NVivo 9 software for analysis (17, 18). Initial line-by-line open coding was performed on a subset of the interviews to determine a set of preliminary themes and subthemes emerging from the data. Questions were analyzed separately, because each addressed a specific topic: health in relation to food, projected money use, decisions in the household, changes because of PROCOMIDA, CSR use, and health perceptions. Within each topic, themes and subthemes were coded and a constant comparative method was used (19). Matrices were developed to compare and contrast codes emerging between PROCOMIDA and control groups when appropriate. For example, when decisions in the household were analyzed, a matrix was created, with the columns being control compared with PROCOMIDA communities and the rows being different ways in which participants made decisions.

Foods from the last-day food recall were classified into 7 predetermined food groups (grains, roots, and tubers; legumes and nuts; dairy products; flesh foods; eggs; vitamin A–rich fruits and vegetables; and other fruits and vegetables). A 2-level logistic mixed model (20) was used to test the hypothesis that the proportion of households that consumed each food group in the PROCOMIDA was higher than in the control groups, accounting for community clustering, with the use of Stata version 11. We did not control for the number of children in the household because this variable was not related to any of the food groups.

The frequency of consumption of 15 of the 37 foods represented on the food cards could not be determined accurately—many of them were seasonal fruits and vegetables or foods consumed only for special occasions—and these were not included in the food-frequency analyses. These foods included cassava, sweet potatoes, malanga (Xanthosoma sagittifolium, a root vegetable), plantains, watermelons, mangoes, papayas, pineapples, oranges, bananas, avocados, squash, pear squash, cacao, and frescos (beverage prepared with fruit and sugar). The data available for these foods suggested a trend similar to those that were included in the analysis (i.e., most were consumed more frequently in the PROCOMIDA group); therefore, not including them likely did not affect our overall results.

For 22 of the remaining 37 foods, we created a composite food-frequency score for each household to assess whether the total frequency of consumption of the 22 foods was different in the intervention group from in the control group on the basis of a priori hypotheses. The composite score was created by adding the frequencies (number of days in a typical week) of consumption of 18 foods hypothesized to be increased by the intervention and subtracting the frequencies of consumption of 4 foods hypothesized to be decreased by the intervention. We used our qualitative data to develop the following a priori hypotheses:

1. For foods provided by the program, frequency of consumption would be greater in those who received the benefit (PROCOMIDA families) than in those who did not.
2. Foods considered healthy by PROCOMIDA families would be eaten more frequently in this group than in the control group, whereas foods labeled as unhealthy would be eaten less frequently.
3. Foods commonly cited by women in the control group as foods they would purchase if they had more resources would likely be eaten more frequently in the PROCOMIDA group.
4. Additional perceptions of PROCOMIDA women and men on how the program has changed household food consumption (according to the qualitative data) would be reflected in the frequency of consumption of the foods involved.

The other 15 of the 37 foods were not subject to an a priori hypothesis and therefore were not included in the calculation of the composite food-frequency score. Two-level logistic and linear mixed regression models accounting for community clustering were used to analyze the frequency for each of these 22 foods and the composite variable. The models controlled for the number of children in the household because it differed by PROCOMIDA and control and was associated with several frequency variables. Statistical tests were evaluated at an α of 0.05.

Results

Results are presented in the following 4 sections: 1) sample description, 2) knowledge and perceptions related to health and food, 3) factors that influence household food choices, and 4) how PROCOMIDA changed household food choices. We integrated the findings from the different methods, mainly in the fourth section, in which qualitative data provided additional understanding regarding food choices assessed with the last-day food recall and the FFQ. Values are means ± SDs.

Sample description. The mean age of women was 25.5 ± 6.9 y, and 87% were married or living with their partner. The mean number of children per woman was 2.6 ± 2.1. Approximately one-third of the women had never attended primary school; an additional 46% had attended primary school, but did not complete it. Women had a mean of 3.6 ± 3.1 y of schooling, and 17.4% reported engaging in some type of economic activity (in addition to their housework). The only meaningful difference between the women in the PROCOMIDA and control groups was the mean number of children (3.4 ± 2.5 and 1.8 ± 1.3, respectively; P = 0.004).

Men were older than women (29.4 ± 7.3 y), and by design were married or living with their partner. Approximately 42% had not attended primary school; an additional 33% had attended but did not complete it. The mean schooling was 3.4 ± 3.6 y. All reported working in agricultural-related activities. Men in the PROCOMIDA group were older than in the control group (32.7 ± 6.5 compared with 27.0 ± 7.1 y; P = 0.021); no other differences between groups were found.

Knowledge and perceptions related to health and food. Descriptions provided by participants were stated in many cases as a dichotomous set of adjectives and actions with opposite meanings to describe a healthy person (strong, blushed face, willing to work) and an unhealthy person (weak, pale, not willing to work). In Q’eq’chi’, the word “kawiil” is used to express the words health, well-being, and strength. The terms “strength” and “health” seem to be linked inherently in the
Q’eqchi’ culture, and when women referred to their perceptions of health, the Spanish word “fuerte” (i.e., strong) was present in nearly all interviews.

Women and men described a healthy person as strong and said that their face looks blushed. They commonly said that “you can tell” when someone is not healthy, because they look sick and pale. Some mentioned that unhealthy people look thin, whereas healthier people are usually heavier. This quote, in which the woman was referring to her opinion of a type of birth control, exemplified this perception of thin compared with fat: “Some people here are getting sick because they get the family planning injection every 3 mo (…) when the body doesn’t receive it well, they get thin and when the body does receive it well then they get fatter; they get healthier” (22-y-old mother with 2 children; intervention group).

Aspects related to work and to mobility were important. Their perception was that healthy people enjoy working, they work well, they sweat, and they do not get tired of doing so. They can lift heavy loads and clean their land; they work well at home. In contrast, characteristics ascribed to not being healthy included unwillingness to work or do any activity at all, lack of strength to work, and being bored with doing housework.

Eating well or being well fed was the most important factor considered to be conducive to health. Nearly all women said that this was why some people were healthier than others, and the factor also was common in all 6 men’s focus groups. Approximately one-third of the women said that eating local plants was important for health; the term “local plants” referred to leafy green plants, some of which grow underneath the corn plants. Less commonly mentioned was the importance of eating foods produced locally in the community and eating a variety of foods.

“… they don’t bathe, they don’t sweep, they don’t clean themselves” (23-y-old mother with 1 child; intervention group).

The importance of hygiene at home was emphasized by several women and men in relation to health. This included practices such as bathing and changing their children, combing girls’ hair, regular haircuts for boys, hand washing before meals, keeping the house clean, and washing clothes.

“… they don’t know how to have hygiene at home [when probed to explain what she meant] they don’t bathe, they don’t sweep, they don’t clean themselves” (23-y-old mother with 1 child; intervention group).

Taking vitamins, medicines, and remedies—and going to the health clinic regularly—also were mentioned by some as means of maintaining good health. Nearly one-third of women mentioned the importance of economic resources in relation to health. They said money was necessary to buy food, medicines, and vitamins, and they attributed the lack of health in some people to lack of money.

“… maybe they made money for breakfast, but not for lunch (…) or maybe they made money for food for today, but not for tomorrow because they don’t have enough to buy (…) that’s why there are people that are healthy and people that are not” (22-y-old mother with 2 children; intervention group).

Factors that influence household food choices. Eight factors influencing food choices were identified. Four of these broadly related to culture (i.e., personal preference, special celebrations, health beliefs, and upbringing) and 4 related to the physical world (i.e., seasonality, geographic access, monetary cost, and perishability).

Personal preference included taste, smell, weather conditions (e.g., whether it is hot or cold outside), and children’s preferences in relation to food. Some foods were linked to special celebrations, e.g., eating pork only during Christmas holidays in traditional tamales or drinking cacao only during planting season. Foods such as local plants, carrots, bananas, and other fruits and vegetables were eaten because of the believed health benefits. Upbringing had an important role in food purchasing behaviors, especially in a culture in which many of the traditions and simple food preparations pass from generation to generation. When talking about her eating habits, one woman said, “What other things would I eat? This is what my parents taught me to eat since I was little” (21-y-old mother with 1 child; intervention group).

Women commonly mentioned that consumption of fruits such as oranges, papayas, avocados, and mangoes depended on whether these were in season. Similarly, some women mentioned local plants that are most abundantly available in the field when they have just planted corn.

Geographic access to foods was limited because of long distances between communities and local food markets and restricted access to transportation. Consequently, families had access to only a small number of foods on a daily basis, limiting their consumption of pork, beef, cheese, and bread, for example. Some women from a particular community said that they would only buy beef when a cow was slaughtered in the community (which took place 1 time/wk). In contrast, corn, tomatoes, hot peppers, and coffee were some of the foods that women mentioned as being easy to access. Households raising chickens mentioned ready access to chicken, meat, and eggs.

The monetary cost of foods played an important role when food purchasing decisions were made. Foods perceived as expensive by some women included pork, beef, chicken, milk, cheese, bread, and margarine; foods such as hot peppers and local plants typically were considered to be inexpensive. Some foods that some referred to as inexpensive were referred to as expensive by others. For example, families that had their own corn field did not perceive corn as a big expense, because they produced it and had it readily available throughout at least part of the year. For families with limited or no land to grow corn, buying this grain on a daily basis was a necessary expense. PROCOMIDA altered women’s perceptions of food cost: rice, beans, and oil were no longer associated with high monetary cost in beneficiary families.

Lack of adequate means to preserve perishable foods was related to geographic access, because foods sold further away from the community, such as milk, cheese, and meats, are often the most perishable. Approximately one-quarter of households had electricity. A few women mentioned this explicitly as part of the interview process, and it was confirmed by observations in the communities and conversations with field staff.
**How PROCOMIDA changed household food choices.** One common theme was an increase in the amount or frequency of consumption of the foods provided by the program. This included consuming more rice, making different preparations with rice, consuming more oil, and using oil instead of lard (Supplemental Table 1). A second common theme was a decrease in the financial burden associated with having to buy foods provided by the program or foods in general. Another theme was changes in foods not provided by the program. Consumption of vegetables and tubers increased through the addition of vegetables to program foods, having money available to purchase vegetables, and use of local plants. Consumption of coffee decreased. Other themes included increased food preparation skills and increased knowledge about the health benefits of specific foods.

In several interviews, both the decrease in the financial burden associated with food purchases and new knowledge and skills were present. For example, one woman said, “Before the program, I didn’t use cilantro, onion, or tomato as often, because I didn’t know how to use them. But now they [program staff] have taught me how to cook” (32-y-old mother with 8 children; intervention group). Later in the interview, she added, “We used to spend more. Now we don’t spend as much because we don’t buy beans, rice, or oil.”

Similarly, another program participant said, “(…) when we’ve been in the classes they’ve told us those [cookies, sweets, bread] are not as important as fruits and vegetables and meat are,” later adding “(…) I used to spend a lot of money. But now I have great help from PROCOMIDA. My husband gives me the same amount of money, so I have a little bit more left over to buy meat” (33-y-old mother with 7 children; intervention group).

The last-day food recall provided a quantitative perspective on changes reflected during interviews. Grains, roots, and tubers were consumed by all women the day before the interview (Table 1). The most common foods in this group were tortillas and other corn preparations, rice, and wheat bread.

The control group reported consumption of foods from the legumes and nuts food group less frequently than did PROCOMIDA families ($P = 0.049$). Because PROCOMIDA families received beans as part of their food assistance ration, this finding was anticipated. The main foods reported for this food group across the sample were red and black beans.

There was little difference in the consumption of foods from the Vitamin A–Rich Fruits and Vegetables group and the Other Fruits and Vegetables group between the PROCOMIDA and control groups, according to the last-day food recall data. Although it might be encouraging that >70% of families in both groups reported the consumption of foods from both of these food groups, data on the amount consumed was not collected. Therefore, a family in which every person ate mango, for example, was counted in the same way as a family in which 1 tomato was used to prepare a meal for 7 people.

Dairy products were barely present in the control group, and were consumed only by 8 households (25%) participating in PROCOMIDA ($P = 0.035$). Flesh foods (i.e., beef, poultry, and fish) reported by both groups were mainly chicken and beef. Flesh foods were reported in 7 PROCOMIDA families and in 4 control group families ($P = 0.18$). The low consumption of dairy products and flesh foods in the 2 groups might be explained by perishability, monetary cost of these foods, and low availability of these products in local stores. In 7 of the 8 families from the PROCOMIDA group that reported having milk the previous day, milk was consumed in the common beverage made of milk and rice. PROCOMIDA families had greater access to rice, and therefore might be more likely to prepare this beverage.

Eggs seemed to be a more accessible and affordable animal protein source than flesh foods or dairy products, which was evidenced by the fact that more than one-half of PROCOMIDA families reported their consumption during the previous day. Nearly one-half of the families in the control group also reported egg consumption during the last-day food recall, a proportion not different from that of the PROCOMIDA group ($P = 0.19$).

The PROCOMIDA and control groups differed in the food-frequency composite score, which was consistent with the results from the last-day food recall data; the frequency was significantly higher in the PROCOMIDA group than in the control group (difference 25.2 d/wk, $P = 0.0045$). Tested separately, the sign of the difference in food frequency between the 2 study groups followed the a priori hypothesis for 21 of the 22 foods (Table 2). Ten foods were significantly more frequently consumed in the PROCOMIDA group than in the control group, including carrots, chicken, green beans, green onions, local plants, mint leaves, oil, potatoes, red beans, and rice ($P < 0.05$), with a similar trend for cilantro, eggs, and onions ($P < 0.10$). Lard was significantly less frequently consumed in the PROCOMIDA group than in the control group ($P = 0.011$).

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**Table 1** Food groups consumed by the households in the PROCOMIDA and control groups according to last-day food recall conducted with women

<table>
<thead>
<tr>
<th>Food group</th>
<th>PROCOMIDA</th>
<th>Control</th>
<th>One-sided $P^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grains, roots, and tubers</td>
<td>32</td>
<td>31</td>
<td>—</td>
</tr>
<tr>
<td>Legumes and nuts</td>
<td>27</td>
<td>15</td>
<td>0.049</td>
</tr>
<tr>
<td>Other fruits and vegetables</td>
<td>25</td>
<td>23</td>
<td>0.41</td>
</tr>
<tr>
<td>Vitamin A–rich fruits and vegetables</td>
<td>23</td>
<td>25</td>
<td>0.21</td>
</tr>
<tr>
<td>Dairy products</td>
<td>8</td>
<td>2</td>
<td>0.035</td>
</tr>
<tr>
<td>Flesh foods</td>
<td>7</td>
<td>4</td>
<td>0.18</td>
</tr>
<tr>
<td>Eggs</td>
<td>19</td>
<td>15</td>
<td>0.19</td>
</tr>
<tr>
<td>Animal-source foods (dairy, flesh foods, and/or eggs)</td>
<td>24</td>
<td>19</td>
<td>0.12</td>
</tr>
</tbody>
</table>

$^1$ PROCOMIDA, $n = 32$; control, $n = 31$. PROCOMIDA, Programa Comunitario Materno Infantil de Diversificaci´on Alimentaria (Mother–Child Community Food Diversification Program).

$^2$ Calculated while accounting for community clustering (but not accounting for the number of children in the household, because this variable was not related to any of the food groups).
Eating well or being well fed was the most important factor considered as conducive to health. Food was viewed as a means to remain healthy by study participants. Having good hygiene practices; taking vitamins, medicines, or remedies; and going to the health clinic were also mentioned by some. Some women referred to the importance of having money to afford food and necessary treatments when sick. It was difficult to distinguish whether the concept of health was viewed differently from not being sick. Characteristics that were used to describe the term “unhealthy” could be ascribed to someone ill. Furthermore, responses reflected the physical dimension of health, whereas aspects related to mental and social well-being were absent during the interviews.

Food choice in Q’eqchi’ households was influenced by personal preferences, special celebrations, health beliefs, up-bringing, seasonality, geographic access, monetary cost, and perishability. These influences are consistent with models of food choice (26, 27). Food purchase decisions are determined not only by an individual’s preference for different foods, but also by factors such as prices, income, and product characteristics (28).

PROCOMIDA families consumed chicken, local plants, and some vegetables (carrots, green beans, green onions, mint leaves, and potatoes) more frequently than did the families from the control group. Our findings suggest that this difference can be
explained partly by their freed-up resources. A decrease in the financial burden associated with food purchasing was a prevalent theme across the interviews, and other studies have shown that when additional economic resources enter a household, the freed-up resources might be used to purchase goods that were not purchased previously (9–11). Therefore, although we have limited direct evidence to support the idea that the consumption of foods previously eaten infrequently increased as a result of resources having been freed up, it is possible that participation in PROCOMIDA allowed the purchase of such foods (in small quantities). A second likely pathway of impact suggested by our findings was the behavioral change communication of the program (29), which provided knowledge and skills related to health and food.

Our results thus suggest that the PROCOMIDA program may have altered household food choices by providing additional resources (through the monthly food ration) and through both new and reinforced knowledge and skills related to health and food (through the behavioral change communication). Synergy between these 2 forces in altering household food choices is crucial for understanding the impact the program might or might not have. Although this study was not designed specifically to estimate or test this synergy quantitatively (this would require a 2 × 2 factorial design), information about this synergy emerged from what participants reported in the interviews.

Providing food alone may not result in desirable dietary behaviors. For example, a desirable behavior such as participants’ diversifying the household diet by using freed-up monetary resources might be less likely to occur if the importance of diet diversity has not been transmitted to participants in any way. On the other hand, if PROCOMIDA only provided the behavioral change communication without the food ration, beneficiaries might be less likely to participate in these sessions. If they did attend the sessions, they might not be able to put the health and food knowledge to practice without the necessary resources to do so, which can lead to discouragement with the program and possible discontinuance. Finally, to be effective, the educational sessions must reinforce the participants’ existing knowledge and beliefs related to food and health, when appropriate. If key messages in nutrition and health education are culturally sensitive, and adapted to the physical, social, and economic environment of program participants, it is more likely that this reinforcement will occur (30).

The synergy between providing food and knowledge influences household food choices related to geographic access, monetary cost, and health beliefs, according to our data. For participants in PROCOMIDA, the geographic access to and the monetary cost of rice, beans, oil, and CSB were no longer factors inhibiting consumption of these foods by households. We found that the PROCOMIDA families consumed rice, red beans, and oil more frequently than did the control group. First, by providing these foods free of charge at the nearby convergence center, PROCOMIDA shifted rice, red beans, and oil from being perceived as expensive and hard to access to being perceived as handy and always there, making consumption of these foods convenient. Second, families reported substituting some of the foods they typically ate with foods provided by the program. This was the case for oil (instead of margarine and lard), red beans (instead of black beans), and, to a lesser extent, rice (instead of noodles/pasta) and CSB (instead of coffee). Third, the foods provided by the program were desired by the population, and therefore their provision likely resulted in an increase in their consumption. When women in the control group were asked what they would buy if they had more money, rice, beans, and oil were among the most commonly mentioned food items.

The health beliefs influencing food choice also were affected by the provision of food and new knowledge. The behavioral change communication sessions of PROCOMIDA provided knowledge and skills related to health and food, and therefore affected the health beliefs that influence food choice. Throughout the interviews, women referred to the sessions when asked about the foods they considered healthy. Two messages in relation to food and health were prevalent: foods that come from the earth are healthy (they give strength, have vitamins, and nourish us) and foods that are packaged (or sold in the store; referring mainly to candies, soft drinks, chips, cookies, and crackers during the interviews) should be avoided. The health benefit of consuming local plants was mentioned with more frequency during the interviews with the PROCOMIDA group than the control group. The educational sessions promoted the consumption of local plants, and that message was influencing the knowledge and beliefs of some women.

The data collection instruments, in particular the use of the food cards, were suitable for a population that is mostly monolingual and illiterate. The process of gaining trust from the community leaders and willingness from the women and men to participate in the study was not difficult. This might have been because the first author was accompanied by a native Q’eqchi’ speaker during the data collection process who was culturally similar to the population being studied. The positive relationship between the staff of the organization implementing PROCOMIDA in Guatemala (Mercy Corps) and the staff of the institute evaluating it (IFPRI) was an asset for this research.

The study design did not allow for the collection of preintervention (PROCOMIDA) data. Although we included a control group, the design did not allow for comparison of the food choices for the same families before and after participating in the program. This study relied on the cluster-randomized study design of the PROCOMIDA evaluation by IFPRI, for which baseline results indicated that intervention and control families were similar. Because the current study included 6 of the 40 convergence centers, we cannot be sure that the control and intervention centers were comparable with respect to baseline characteristics. In addition, our qualitative findings cannot be generalized to the whole beneficiary population in Alta Verapaz. The qualitative findings related to how PROCOMIDA changed household food choices, however, might be transferable to other households participating in this program.

In conclusion, this study provides insight on the changes in household food choices after participation in PROCOMIDA and shows how those changes occurred in the context of local health perceptions and the factors influencing their food choices. In conjunction with the provision of food, the behavioral change communication, which was carefully designed in this project, appears to have changed food choices to include more healthy foods, adding value to the food transfer program. The results thus suggest that if a program provides food free of cost to rural indigenous families in the context of a maternal and child nutrition and health program, a well-designed behavioral change communication strategy might be important to improve household food choices.

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