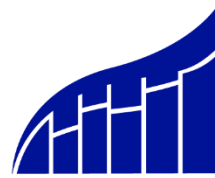




ATENEO DE MANILA UNIVERSITY

DEPARTMENT  
OF ECONOMICS



ATENEO CENTER  
FOR ECONOMIC  
RESEARCH AND  
DEVELOPMENT

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BY

Vanessa T. Siy Van, Carmina P. Siguin, Andrew C. Lacsina, Lean Franzl  
Yao, Zarah G. Sales, Normahitta P. Gordoncillo, Leslie Advincula-Lopez,  
Joselito T. Sescon, and Eden Delight Miro

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Rm. 409 4/F, Dr. Ricardo & Rosita Leong Hall,  
Ateneo de Manila University  
Loyola Heights, Quezon City 1108, Philippines  
Telephone: (632) 8426 6001 Local 5221 or 5222  
Telefax: (632) 8426 5661

# Evaluating a Community-Led Central-Kitchen Model for School Feeding Programs in the Philippines: Learnings for Multisectoral Action for Health

Vanessa T. Siy Van<sup>a\*</sup>, Carmina P. Siguin<sup>b</sup>, Andrew C. Lacsina<sup>b</sup>, Lean Franzl Yao<sup>c</sup>, Zarah G. Sales<sup>d</sup>, Normahitta P. Gordoncillo<sup>d</sup>, Leslie Advincula-Lopez<sup>e</sup>, Joselito T. Sescon<sup>f</sup>, and Eden Delight Miro<sup>c</sup>

<sup>a</sup>Health Sciences Program, Ateneo de Manila University;

<sup>b</sup>Community Welfare, Wellness, and Well-being Laboratory, Ateneo de Manila University;

<sup>c</sup>Department of Mathematics, Ateneo de Manila University;

<sup>d</sup>Institute of Human Nutrition and Food, University of the Philippines;

<sup>e</sup>Development Studies Program, Ateneo de Manila University; and

<sup>f</sup>Department of Economics, Ateneo de Manila University

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## Abstract

In devolved governments like the Philippines, local government units (LGUs) must be engaged to develop and coordinate responses to tackle the multisectoral problem of childhood undernutrition. However, current Philippine nutrition interventions, such as school feeding programs (SFPs) generally rely on the national government or private sector, to mixed results. The central-kitchen SFP-model was developed by 2 Philippine non-government organizations and facilitated large-scale feeding through community multisectoral action. This paper evaluated the model's impact in 1 urban-city and 1 rural-province using data from 24-hour dietary recalls with 308 rural and 310 urban public-school students and household surveys with their caregivers. Enabling factors were explored in focus-group discussions with 160 multisector participants and implementers, and a review of official documents. The program had greater impact on rural beneficiaries and improved dietary habits and school participation in both sites, though menu modifications could increase program impact. The locally-led-and-operated central kitchens were a multisectoral investment that served as a scaffold for other health, education, and social-welfare interventions. Program sustainability was attributed to affording communities agency to operate and modify the model according to local needs, embed volunteer pools in social networks, and organize demand for related services from their LGU. Public participation in local policymaking compelled LGUs to rally non-health sectors to address non-health determinants of undernutrition. Operations were sustained despite political leadership changes through formal and informal accountability mechanisms and transparent monitoring and evaluation across sectors. The model demonstrated empowering civil society can hold local governments accountable for multisectoral action in decentralized settings. Future interventions should also focus on educating local leaders, as their knowledge of the relevance of holistic health interventions was a necessary precondition that motivated their stewardship and coordination of different government sectors.

**Keywords:** community-led central kitchen model, school feeding program, childhood nutrition

**JEL Classifications:** H750, I180

# 1. Background

Childhood malnutrition is an immediate, lifetime, and intergenerational concern in the Philippines, where high poverty rates have led to slow improvements in childhood stunting and underweight prevalence over the last 30 years.<sup>1</sup> Currently, one-fifth of children-under-5 are underweight<sup>2</sup> and 30.3% are stunted, higher than the Asian average (21.8%).<sup>3</sup> Undernutrition increases risk to diseases,<sup>4</sup> hampers cognitive development,<sup>5</sup> and leads to significant economic losses.<sup>6</sup> The poor are especially vulnerable, as 10% of Filipino households in the lowest-third income-deciles experienced recent hunger.<sup>1</sup> Inadequate nutrition has also been linked to poor education outcomes,<sup>7</sup> a crucial element of poverty reduction,<sup>8</sup> especially in low-and-middle-income countries (LMICs) like the Philippines.

To address the problem of malnutrition, the Philippines ratified Republic Act 11037 or the National Feeding Law in 2017.<sup>9</sup> The law mandated the Department of Education (DepEd) to implement school-based feeding programs (SFP) in all public schools for severely wasted and wasted students from Kindergarten to Grade 6. The Department of Social Welfare and Development (DSWD) was tasked with implementing a supplemental feeding program for daycare children aged 3-to-5. However, SFPs have been implemented by DepEd, private organizations, and non-government organizations (NGOs) for decades with mixed results. Previous evaluations<sup>10-12</sup> have found that operational issues such as the quality of meals and measuring equipment, human resource shortages, and household characteristics contributed to students' regression and program unsustainability, recommending the need for alternative interventions and innovations to the traditional feeding model.

One innovation to SFPs is the central-kitchen SFP-model,<sup>13</sup> which facilitates large-scale feeding by procuring, preparing, and packing meals for multiple schools in one kitchen through community volunteers. Recent research<sup>14-16</sup> suggests that community-participatory interventions improve primary healthcare and nutrition outcomes. Local support is critical in the Philippines, which has a decentralized government<sup>17</sup> and national agenda for health and nutrition are operationalized by local government units (LGUs). Elected local-chief executives (LCEs) adapt policies and allocate human and financial resources based on their constituents' needs. Assessments of local health systems have found that after decentralization, LGU-investment in population-level healthcare services declined,<sup>18</sup> as LCEs may not prioritize public health.<sup>19,20</sup>

However, LGUs' roles in mediating policies from various national government agencies<sup>21</sup> highlight their potential<sup>22</sup> for multisectoral planning and coordination, to address the multidimensional determinants of malnutrition. Though literature<sup>23-25</sup> has explored challenges to multisectoral action for health in LMICs, successful models of local-led multisectoral models are scarcer. The study presents 2 such LGUs, 1 urban, 1 rural, where the adoption of a locally-developed central-kitchen SFP-model has withstood shocks and changes in political leadership, improving health and civic-engagement outcomes. As part of the first comprehensive independent evaluation of the model, this study examines the program's impact on beneficiaries, as well as identifying common challenges and key factors contributing its success and sustainability which may be applied to other community-based multisector interventions.

## 2. Program Description

In 2010, a basic-education NGO launched a template for a large-scale feeding program catering to public elementary school students. Shortly after, a community-development foundation partnered to expand use of the model across the country. The focal point of the program was a central kitchen where standardized food preparation and packing took place to maximize the use of resources and avoid waste. The centralized-kitchen model sought to alleviate the burden of traditional SFPs on teachers, who procured ingredients, cooked, fed, and cleaned-up after students, which detracted focus from teaching. Though DepEd models envisioned volunteers fulfilling these roles, volunteerism was often inconsistent or unsustainable.

The NGOs partnered with willing LGUs for one-year pilots. NGOs provided training and technology, as well as building back-end support infrastructure such as procurement, liquidation, and monitoring systems. NGOs also helped orient teachers and kitchen staff for operations. After the pilot, LGUs' were evaluated on their cohesion, leadership, and volunteerism. Though the model has over a hundred central kitchens around the country, many of these remain privately funded and operated. Pilots are deemed successful only in sites where LGUs demonstrated both interest and capability for implementation. Interviewees described capability as an ability to mobilize the community and secure the buy-in of local stakeholders in a process called "social preparation," as volunteers sustain kitchen and feeding operations. Following the first year, successful LGUs propose the program to DepEd, which funds the program for succeeding years through the national feeding law (Republic Act 11037). The program undergoes regular evaluation and iterative improvements are implemented based on feedback and recommendations. Though the template is strictly followed, decision-making space is deliberately left for local implementers to adapt the model to variations in local contexts.

Multisectoral coordination among schools, parents, the community, LGUs, and NGOs is crucial to meet the program's desired outcomes (**Table 1**). The second and third objectives may be summarized as providing access to quality foods, changing dietary habits, and improving health and education outcomes. The fourth objective highlights the need for community and political sustainability. The fifth objective emphasizes multisectoral investment, and the first objective is the goal of strengthening the program to scale-up nationally.

**Table 1.** Objectives of the Central-Kitchen SFP Model

Objective	Outcome
1	To develop a large-scale comprehensive feeding program, that can cater to all malnourished children in public elementary schools in the Philippines
2	To reduce rates of malnutrition, stunting, and wasting among participant-children
3	To lay a foundation for lifelong healthy eating based on favorable experiences, the acquisition of sufficient skills and confidence in one's capacity to practice a healthy lifestyle
4	To encourage maximum community support for the feeding program
5	To encourage a whole-school approach to improving the health and well-being of students and their families

### 3. Methods

The study used a mixed-methods approach to evaluate the impact of the program based on its objectives. One (1) city in Metro Manila and 1 province in Mindanao were chosen as the study setting. In 2012, the urban site of the study became the first city-wide implementation of the program while the rural site of the study was the first to implement province-wide in 2016.

*Data Collection.* To assess program impact on the individual-level, elementary-school students were randomly sampled from the 39 and 60 public schools of the urban and rural site, respectively (**Table 2**), using a list of SFP beneficiaries provided by DepEd. Schools matched sampled beneficiaries with a random non-beneficiary of the same grade level. However, the list of city beneficiaries provided was 2 years outdated, with most beneficiaries rehabilitated and taken off the SFP. Only students with the same SFP status at the time of the study were included, leading to a decreased number of urban participants.

**Table 2.** Characteristics of School-Children Participants

Study Site	Rural (n=308)				Urban (n=310)			
	SFP Beneficiary		SFP Non-Beneficiary		SFP Beneficiary		SFP Non-Beneficiary	
Age/Sex	Female	Male	Female	Male	Female	Male	Female	Male
3 to 5	21	14	13	15	0	0	1	0
6 to 9	30	33	31	42	8	11	61	54
10 to 12	20	26	22	26	16	10	63	56
13 to 18	4	8	1	2	3	8	3	16
<b>Total</b>	<b>75</b>	<b>81</b>	<b>67</b>	<b>85</b>	<b>27</b>	<b>29</b>	<b>128</b>	<b>126</b>

Data collection began in February 2018. Nutritionist-enumerators conducted 24-hour dietary recalls thrice (two weekdays, one weekend) for accurate estimation.<sup>26</sup> A structured interview recorded all food and beverages consumed by the child the previous day. Intakes were then converted into nutrient values. Household characteristics were captured in concurrent surveys with each child's caregiver, as the study ensured that no students came from the same household. Surveys determined households' sociodemographic characteristics, livelihoods, incomes, expenditures, education-levels, and included the Household Food Insecurity Access Scale,<sup>27</sup> developed by USAID to measure food insecurity.

Participants from different sectors were recruited for semi-structured interviews. Focus-group discussions (FGDs) with parents, educators, city and provincial local government officials, government employees from local offices of national agencies, and healthcare workers (**Table 3**) provided insight into the community-level impact and perception of the program, as well as factors contributing to its successes or challenges. Data were corroborated with a review of NGOs', schools', and government offices' official published materials and internal documents.

**Table 3.** Characteristics of Focus-Group Discussion Participants

Sector	Rural	Urban	Total
Parents	5	18	23
Education Sector	20	15	35
Health Sector	5	10	15

Local Government	14	21	35
Central Kitchens	29	21	50
NGOs	1	1	2
<b>Total</b>	<b>74</b>	<b>86</b>	<b>160</b>

Ethical approval was granted by an ethics review board, and written informed consent was provided by all participants.

*Data Analysis.* To determine the impact of the SFP, difference-in-difference estimation was used to compare nutritional adequacy of SFP beneficiaries and non-beneficiaries. The empirical model measured intrahousehold-flypaper effect (IFE), or the percentage of SFP calories additional to beneficiaries' intake, with the assumption that the remaining calories were reallocated to other household members (e.g., home meals fed other siblings). It was adapted from a previous Philippine study,<sup>28</sup> which ascertained whether transfers from an SFP were negated by reallocation of food within the household. The following model was used:

$$C_i^T = \alpha_B D_i^P + \alpha_A D_i^P D_i^A + \beta X_i + u_i$$

Where a child's total caloric intake ( $C_i^T$ ) is explained by whether on a school day ( $D_i^A$ ), a student-beneficiary ( $D_i^P$ ) consumed their feeding meal ( $D_i^P D_i^A$ ), as well as a vector of individual and household characteristics ( $X_i$ ). Control characteristics were based on a more extensive study linking household characteristics and public transfers with child nutrition.<sup>29</sup> A complete list of variables may be found in **Supplementary File S.1**. Though the original specification included school-fixed effects, the public schools in the sample did not show significant variation, and these were not included in the study model.

Sensitivity analysis<sup>30</sup> was conducted to determine optimal arrangements for the SFP. Five (5) modifications to the program menu were tested for the greatest impact based on nutrition literature by the Philippine Department of Science and Technology Food and Research Institute, the *Pinggang Pinoy*.<sup>31</sup> However, *Pinggang Pinoy* recommends different portions of rice, viands, fruits, and vegetables for children of different ages. Feedback from implementers emphasized difficulties packing meals with different portions. Test scenarios 4 and 5 accounted for these concerns by making uniform changes to the menu (**Table 4**). Nutritionists then computed and substituted the nutritional value of the SFP meal with the nutritional value of the modified meals in beneficiaries' diets. Difference-in-difference estimation was again used to analyze the program's impact for each modification.

**Table 4.** Modifications made to the Program Menu for Sensitivity Analysis

<b>Scenario</b>	<b>Modifications</b>
1	Adding one glass of milk to existing SFP portions
2	Adding ½ cup of rice and 1/6 cup of viand to existing SFP portions
3	<i>Pinggang Pinoy</i> recommended portions specific to each age group
4	<i>Pinggang Pinoy</i> portions for ages 6 to 9
5	<i>Pinggang Pinoy</i> portions for ages 10 to 12

Descriptive statistics complemented the multivariate analysis and provided more context for the results.

Qualitative thematic analysis<sup>32</sup> on the FGD transcripts aimed to identify trends, agreeing or conflicting ideas, and factors contributing to the successes or shortcomings of the program from multisectoral perspectives. In the Program Results section, we present translated quotes and redact portions of translations that may lead to identification of the participants. Document reviews and a review of secondary literature from similar programs and country contexts verified whether the derived themes contributed to program outcomes.

## 4. Program Results

*Access to quality foods, dietary habits, and school performance.* The most immediate outcomes of the program related to improvements in the diets of program beneficiaries. Difference-in-difference analysis found that the SFP had a greater impact on rural beneficiaries. About one-third (33%) of the calories from the feeding meal supplemented rural children's diets (**Table 5**), as without the program they were more likely to have inadequate energy (277, 85%) and protein intake (109, 35%) compared to their urban counterparts (193 [62%] and 72 [23%], respectively). On the other hand, the program showed no IFE on urban children, implying transfers were reallocated to the household. Despite the difference in impact, parents in both sites made use of the program to replace one meal of the day. However, the lower nutritional adequacy of rural children, coupled with the greater incidence of food insecurity experienced by their households<sup>33</sup> implies that the SFP meal was more nutritionally adequate than the meal being substituted in rural homes.

**Table 5.** Impact of SFP on Rural and Urban Children's Consumption at Baseline and Various Menu Modifications

	Energy (kcal)	Protein (g)	Calcium (mg)	Phosphorus (mg)	Iron (mg)	Vit. A (µg)	Vit. B <sub>1</sub> (mg)	Vit. B <sub>2</sub> (mg)	Vit. B <sub>3</sub> (mg)	Vit. C (mg)
<b>Rural (n=308)</b>										
Base	0.3295***	0.2501***	0.2365**	0.2722***	0.2585**	0.6928***	0.1433	0.1648	0.3019***	-0.0343
Mod. 1	0.5016***	0.4344***	0.5923***	0.2722***	0.4566***	0.6928***	0.1433	0.1648	0.3019***	-0.0343
Mod. 2	0.5470***	0.5470***	0.6495***	0.3505***	0.5054***	0.8833***	0.1891	0.2206*	0.4146***	0.1541
Mod. 3	0.6331***	0.6032***	0.8024***	0.4822***	0.6074***	1.4052***	0.3306*	0.3369***	0.5670***	0.6463***
Mod. 4	0.6494***	0.6016***	0.8405***	0.4862***	0.6248***	1.5205***	0.3513**	0.3399***	0.5634***	0.7594***
Mod. 5	0.6819***	0.6932***	0.8671***	0.5639***	0.6638***	1.5378***	0.3778**	0.4008***	0.6928***	0.7634***
<b>Urban (n=310)</b>										
Base	0.0356	0.0515	0.0246	0.0467	0.0640	0.4083	0.0083	0.1331	0.1173	0.2507
Mod. 1	0.1667	0.1990	0.3005	0.0467	0.2580*	0.4083	0.0083	0.1331	0.1173	0.2507
Mod. 2	0.1481	0.1481	0.2265	0.0300	0.2215	0.4297	-0.0390	0.0685	0.1019	0.2971
Mod. 3	0.0541	0.0333	0.1999	-0.0787	0.1733	0.4790*	-0.2535	-0.0553	0.0052	0.7047**
Mod. 4	0.0441	0.0312	0.1804	-0.0841	0.1605	0.5041*	-0.2496	-0.0674	-0.0328	0.6800**
Mod. 5	0.0869	0.0757	0.1979	-0.0421	0.1943	0.5140*	-0.2156	-0.0436	0.0209	0.7450**

Significance levels: \* significant at the 10 percent level; \*\* significant at the 5 percent level; \*\*\* significant at the 1 percent level;

The dependent variable is the logarithmic form of the daily dietary intake for each nutrient.

For full regression results, see supplementary file S.1.

Projections of different menu modifications found that IFE for energy, protein, calcium, and iron increased by about 20% by adding milk to meals. However, modifying the menu according to *Pinggang Pinoy* recommendations increased the impact of the SFP more than only increasing the rice and viand portions did for rural beneficiaries. Findings from Scenarios 3 to 5 indicated that *Pinggang Pinoy* portions increased the Vitamins A and C intake of urban beneficiaries, whose median adequacy for these vitamins, mostly found in fruits and leafy green vegetables, were below those of rural beneficiaries. Similarly, following *Pinggang Pinoy* recommendations showed the greatest increase in rural children's Vitamins B<sub>1</sub> and B<sub>2</sub> intake, as their diets were low in meats and eggs. These differences may be attributed to the inclusion of fruits in *Pinggang Pinoy*'s menu, which the SFP menu cycle does not yet have.

Beyond supplementing poor children's food intake, the program's ability to rehabilitate beneficiaries was highlighted by respondents in both sites. Parents, educators, healthcare workers, and local government officials noted decreases in the number of beneficiaries after each program cycle, advocating for the continual expansion of the program.

*In our area, before there were many beneficiaries there in [area-of-residence]. Now, there's only a few. This means the number of malnourished from last year went down (Urban-FGD1, Health Worker).*

The program also improved eating habits. Parents praised the SFP's positive impact on their children's consumption of vegetables at home. Though implementers noted aversion to the vegetable-heavy menu at the beginning of the feeding cycle, beneficiaries would adjust after a few weeks and even found it delicious. Feeding activities promoted contiguous habits, such as handwashing and cleaning up after oneself (*Urban-FGD16, Educator*). Moreover, parent-volunteers at the central kitchen or feeding areas desired to learn and recreate SFP recipes in the home to incentivize their children to consume healthful and inexpensive meals (*Urban-FGD27, Parent*). These direct outcomes were attributed to increased exposure, acclimatization, and flavorful recipes, as well as a peer support: beneficiaries ate together, and negative impressions of vegetable consumption were eclipsed by lighthearted conversations.

Based on the program's secondary goal to improve education outcomes, educators reported that program participation increased school attendance and participation (*Urban-FGD18, Local Government*), since students no longer needed to find food prior to classes or leave campus during lunch hours, especially for rural beneficiaries whose homes were far from school (*Rural-FGD3, Educator*). However, both parents and educators were unable to determine whether there was a clear impact on students' grades and participation in extra-curricular activities.

More pressing was the challenge of regression during the summer months when schools were not in operation. The succeeding sections discuss how the respective communities overcame this issue.

*Community involvement and program ownership.* Implementation of the SFP necessitated the creation of volunteer networks and grassroots support that served as the scaffolding for more community-based health interventions and protected program sustainability from threats of political interference. Community participation and roles varied in the 2 LGUs. Rural communities were less dense and geographically dispersed across the province. Consequently, several small kitchens were established in contrast to the central kitchen of the city. While staff were drawn from the community, they were considered government employees and paid a salary, relying less on informal community ties to ensure responsibilities were fulfilled. Nonetheless, community buy-in to the importance of nutrition, which began with SFP, facilitated adjacent initiatives: though the program was a province-level initiative, *barangays* volunteered to deliver meals to their respective schools. Volunteer local government employees also supported a provincial program, which provided aid to non-rehabilitated beneficiaries' families over the summer break, to mitigate household-level causes of malnutrition.

In the urban site, nearly all (279, 98 %) volunteers were uncompensated, and the majority (187, 66%) did not have children participating in the SFP. However, the central kitchen could reliably assign 50 volunteers from their pool of about 600 to arrive for the day's operations. The sustainability of the city's volunteer pool over 8 years was attributed to ingraining volunteer operations within community relationships. In the initial phases of implementation, SFP volunteers were drawn from local women's groups supporting the LCE.



As the program matured, recruitment from civil-society groups waned (82, 29%), with friendships and neighborhood relationships becoming the primary source of information for volunteering (145, 51%).

*Interviewer: Why do you volunteer? You don't have children in the feeding [program].*

*Urban-FGD27, Parent: Because in the beginning, the officers at [civil-society association] are my clique, but even if I wasn't an officer, [they said] "Oh, sis, come on!" So there. Helping out. Until they left already. When someone else was in charge and needed volunteers, you know, experienced ones. "Okay, yeah," was what I said...so I already got used to helping out.*

Communities' active participation in local policy encouraged demand for more integrated health services. LGUs responded by subsidizing medical check-ups and treatment for non-rehabilitated beneficiaries, as DepEd found that students whose nutritional status did not improve after the feeding cycle usually had underlying medical concerns (*Urban-FGD23 and Rural-FGD21, Health Workers*). LGUs also made structural investments in social services through programs sustained by community volunteerism. SFP kitchens were used in disaster-relief operations, as the country is vulnerable to tropical storms, and to feed frontline healthcare workers during the COVID-19 pandemic. The urban LGU continues feeding operations during summer classes, as SFP was integrated into an ambitious multi-faceted educational investment program including educational reform, parenting seminars, and building physical and technological infrastructure. The provincial LGU launched home and school gardening programs for household income generation and food production, and locally-sourced ingredients for feeding.

People's roles in the success of their own programs created a sense of ownership that withstood changes in political leadership. Since its pilot in 2011, the city SFP has persisted four terms and two mayors, while the provincial SFP has been in operation since 2016. This culminated in local ordinances that codified local priority and support for the SFP (*Urban-FGD11 and Rural-FGD2, Local Governments*), ensuring these programs' implementation regardless of who is elected to local office.

*Local government stewardship and coordination.* The program underwent an iterative process of planning, implementation, and evaluation with multisectoral input, which helped overcome challenges faced by traditional feeding models. Public school feeding was originally under the purview of DepEd's National SFP; however, schools faced difficulties coordinating with the centralized national-government agency. School staff identified beneficiaries, bought and cooked ingredients, and submitted progress reports and liquidation forms for reimbursement. In both urban and rural settings, this additional uncompensated work was assigned to teachers, who reported being unable to focus on teaching and paying out-of-pocket when ingredients were insufficient or unavailable in the market. DepEd's hierarchical bureaucratic processes delayed reimbursements and incentivized schools to decline feeding programs.

*Before the [DepEd SFP], I fed [students] through the help of the parents. So, every three times a week, we cooked. We got our funds from the [school] canteen...Later, the [DepEd SFP] came. We were given a budget of 15-pesos or 16-pesos per child. So, last year—two years ago—I think, I was asked if I would accept the SFP again. I really didn't want anymore because it was so tiring being the [SFP] coordinator. Because I was the one who went to the market and I was the one who liquidated, and then if the parents I assigned*

*didn't come in or come here, I was the one who had to cook. So, it was really tiring, really tiring. (Rural-FGD13, Educator)*

When the centralized-kitchen model was first proposed, schools in the city perceived the LGU did not trust them to implement the program on their own (*Urban-FGD11, Local Government*). The LCE held dialogues with all public-school administrators to onboard them. Following the successful pilot, the LGU then coordinated with DepEd to develop a unified work-and-financial plan, as each had unique liquidation and procurement protocols that necessitated a new system to interface between them. Through the LGUs' efforts, initial ambivalence towards the program was overcome.

LGUs deliberately engaged other sectors to minimize threats to implementation (*Rural-FGD2, Local Government*). Though successful pilots were funded by DepEd in succeeding years of operation, LGUs augmented funds through their internal revenue allotment and contributed to building and renovating kitchens and hiring full-time kitchen staff. By mobilizing their civil-society groups, LGUs created an initial pool of volunteers. They also responded to context-specific needs: To alleviate the burden of SFP implementation on teachers, the city LGU hired full-time feeding coordinators to conduct feeding and monitoring activities, while the provincial LGU provided transportation at the *barangay*-level so teachers did not need to pick up or return meal containers. LGUs also played an important role in expectation-setting and both formal and informal accountability. When some schools tasked feeding coordinators with teaching errands, they were reprimanded by the mayor and the practice was stopped. Volunteers, though unpaid, attend an annual seminar-retreat organized by the LGU to refresh their training and raise morale. As such, stakeholders felt recognized and seen, and were incentivized to perform better because they were being rewarded or sanctioned for their actions.

*You see your name has a blank everywhere. Then you feel ashamed moving forward [laughter]. I see my name is blank, I get ashamed to be absent. (Urban-FGD3, Central Kitchen)*

*It's unacceptable that you don't find a solution. You need to find a solution, because every day there are those [students] who need to eat. (Rural-FGD9, Central Kitchen)*

Because the LGU sat at the intersection of different government agencies, the central kitchens were maximized across sectors. Coordinating with the DSWD's city office, the central kitchen also provided universal feeding for the city's 70 daycare centers as an early childhood health intervention. Collaborating with the local healthcare sector, LGUs began to include micronutrient supplementation in SFP. When class suspensions occurred, LGUs transported packed meals to shelters, detention centers, and healthcare workers, to prevent food waste. However, the LGUs remained receptive to feedback from parents, teachers, and implementation partners. An often-cited anecdote was the modification of the feeding menu for each locale, accounting for local market availability and familiarity with the ingredients used (*Urban-FGD29 and Rural-FGD23, NGOs*). For instance, tomato-based sauces had small amounts of added sugar or used Filipino-style sweet sauce popular in the country. In the rural site, higher energy requirements necessitated increasing rice portions. Given the limited availability of vegetables, local vegetables were used, and potatoes were substituted with sweet potatoes. Instead of mushroom sauce, the province used coconut milk with turmeric.

Students and parents initially complained about every meal being soup-based with finely chopped viands. Though research-based and nutritious, when packed with rice, the meals

would resemble slop or porridge. Drier viands were quickly substituted, increasing the acceptability of the program.

*They [students] compare the food with what was there before. “At least the one before, our viands were delicious.” You could really see the viand, the beef and the contents...Because now, we chop [everything], ground beef. (Rural-FGD7, Educator)*

*Before it was like that, there were really those [meals] that the children didn't want to eat, especially the food that was sweet, the one like the food of the elderly. (Urban-FGD26, Parent)*

*Scale-up and sustainability.* Visible successes in multisectoral collaboration have fostered a culture of data-sharing and evidence-based decision-making among stakeholders. Respondents from all sectors proudly shared that their SFP protocols were based on research, making them trustworthy. Program data were not only collected from schools but also compared to program goals. Results and recommendations were presented to school principals, feeding coordinators, and kitchen managers semi-annually by the LGU and NGOs.

*It's not really an issue for us because of support. All the programs and projects of the LGU, we always support...Because we know that those are beneficial to us, to the children, to the community, to the parents. Just like another project they have that's also ongoing, the [parent-teacher seminars]. We support the LGU because we know the results of it will benefit us too...Why not support, right? (Urban-FGD15, Educator)*

*Actually, Mayor looked forward to the [evaluation] study. Because we wanted [to know] how can we improve the feeding more. Because the problem of malnutrition does not originate from just a simple problem, right? (Urban-FGD11, Local Government)*

Multisectoral involvement in the SFP had spurred investments in physical and social infrastructure that allowed the program to continue operations despite crises. Despite the shift to remote learning during the COVID-19 pandemic, central kitchen operations continued, with meals delivered to *barangays* and distributed to beneficiary households by *barangay* health workers and *barangay* nutrition scholars. The success of the central kitchen model eased scaling-up, implementing universal feeding in the disadvantaged areas within the LGU, such as a relocated community in the city, and geographically isolated and disadvantaged areas in the province. The success of the central-kitchen-SFP model has prompted other localities to inquire about the program template for implementation in their own LGUs.

*Our visitors—they also benchmark against us—love shortcuts. Because immediately they want the root. “Where's the root?” ...They're looking for the root of the problem. Why is it like that? Because in their [operations], there are volunteers, but it still failed (Urban-FGD7, Central Kitchen).*

Aside from volunteers, key contributors to success were input from multiple stakeholders, which led to improvements in existing feeding procedures as well as new innovations applicable to other local government programs. For instance, a major concern voiced by implementers was the need for a single database for feeding coordinators, principals, DepEd, and the NGOs, with each having different levels of access to the data, while maintaining children's data privacy. This prompted the development of a web-based integrated

nutrition database where schools input individuals' nutrition data, DepEd's local offices consolidate them, LGUs generate reports, and the NGOs provide recommendations for LGU interventions beyond SFP. User-training for the application was conducted in 2019, though the full pilot scheduled for 2020 was interrupted by the COVID-19 pandemic.

## 5. Discussion

A community-supported central-kitchen model for SFPs is a relatively novel form of technology transfer. Our study examined a multisectoral pilot intervention to improve the diets and nutritional status of low-income children at the local level through an analysis of the program's impact, as well as exploring factors that contributed to its successes and setbacks. Despite households in urban and rural households' using SFP as a meal-replacement, the program had a greater impact on rural children, who had lower baseline nutritional adequacy. The program also improved dietary habits and school participation, though incorporating recommendations from the *Pinggang Pinoy* portions would increase SFP meals' impact. The model's success was attributed to strong community support for the central kitchen, mobilized into a steady pool of volunteers, embedding the program in the city's and province's social networks. Public participation in local policymaking compelled local government investment in adjacent holistic health and nutrition interventions by rallying non-health sectors to create new systems for multisectoral collaboration. Operations were sustained despite changes in political leadership through both formal and informal accountability mechanisms facilitated by transparent monitoring and evaluation. The central-kitchen SFP model envisioned multisectoral, community-led action from its inception. While a wide body of research<sup>24,25,34,35</sup> indicates governance for multisectoral action in LMICs is notoriously difficult, this case presented three learnings to account for in the design and evaluation of multisectoral policies.

First, community-based interventions have been increasingly recognized as a vital component of health promotion. Civil participation brings nuanced knowledge, social trust, and formal and informal regulation to health programs.<sup>36,37</sup> Community input is particularly relevant in LMICs, where interventions are rarely locally conceived and led, and policies may be incompatible with local structural contexts.<sup>38</sup> Where community volunteers are able to organize and lead health initiatives, support and sustainability tend to be higher compared to programs led and implemented by external stakeholders.<sup>39</sup> A key contributing factor is the creation of an enabling environment through community engagement, education, and mobilization,<sup>40</sup> facilitating smoother implementation. Evidence from a volunteer community malnutrition intervention in Tajikistan<sup>41</sup> point to volunteers' ability to directly improve their own health outcomes while changing social behavior, indirectly improving health. By integrating volunteer networks into the social fabric of the city and province where the SFP is implemented, an adequate number of staff prevented possible challenges to continuity,<sup>42</sup> as volunteers felt their actions directly accountable to their respective communities.<sup>43</sup>

Second, civil clamor for health interventions such as the SFP is important especially in decentralized health systems like that of Philippines, where LCEs are elected officials who may not necessarily prioritize health.<sup>44</sup> Compared to other decentralized LMICs, Philippine LCEs were found to have wide decision-making space,<sup>45</sup> translating into discretionary power to prioritize agenda and allocate resources. The NGOs' clear delegation of accountability to the LGU for the success of the pilot served as a political incentive for elected leaders to galvanize parents, community networks, and schools, and negotiate multisectoral arrangements with the local offices of other government agencies in the education, health, and social-welfare sectors. These arrangements were instrumental in overcoming siloed performance and the inclination

towards sector-specific achievements,<sup>46</sup> borne from each sector's own understanding<sup>34</sup> of malnutrition and the feasible policy solutions it can unilaterally implement. These differing sectoral goals may be a potential source of conflict,<sup>25</sup> as was illustrated by actors in the education sector initially hesitant to cede control of what they deemed were their responsibilities. However, LGUs' use of well-defined operational plans that articulated sectors' mutual gain from the SFP secured their commitment to provide support infrastructure beyond the central kitchen, leading both sites to overcome the problem of regression over the summer.

Third, strong leadership demonstrated by local leaders was complemented with an openness to feedback and support for evidence-based innovations to the model. In contrast, traditional authoritarian leadership-styles were negatively associated with cohesion in cross-specialization teams.<sup>42</sup> Though the lack of formal horizontal accountability mechanisms poses a challenge in multisectoral interventions,<sup>47</sup> LGUs were able to overcome it with monitoring and information systems<sup>48</sup> that enforced each implementer's responsibility to the community and innovations for consolidated databases to swiftly<sup>49</sup> identify implementation gaps. Moreover, NGOs and LCEs' low tolerance for corruption and non-compliance reinforced necessary social sanctions<sup>25</sup> that led to the program's sustainability despite natural hazards, disasters, and other shocks.

The roles played by communities in program advocacy, operations, and accountability emphasize the need for community-based interventions to promote local ownership and allow room for nuanced variations to bring about a sense of agency and empowerment.

## **6. Limitations**

Given the study's focus on community-led health interventions only two implementation sites out of the many central kitchens established by the NGOs, were chosen. These were the biggest and first city- and province-wide operations, completely sustained by their local governments and communities. Though their experiences may not easily be generalizable to sites which did not manage to secure full community- or LGU-support, findings provided a picture of the confluence of factors necessary for success, as well as how challenges were overcome at the pilot, development, and mature phases of implementation. The inclusion of 1 urban and 1 rural site represented possible structural differences that may have affected implementation.

Survey data, particularly the dietary recalls, were sensitive to recall bias.<sup>50</sup> To improve accuracy and precision, respondents were asked about only the previous day's meals, and each household was visited thrice,<sup>26</sup> nonconsecutively, within the month of data collection. Because urban SFP beneficiaries were limited by the outdated DepEd-provided list, only those who remained beneficiaries over the 2 years of lag were included. However, their difficulty rehabilitating may have been due to unaccounted health issues confounding the impact-analysis results. To address this, other data collection techniques were utilized to triangulate results.

Though the researchers were unable to interview every implementer of the program, data collection from FGDs had reached a point of saturation<sup>51</sup> and common themes could be identified from participants' responses. Moreover, official document reviews and literature reviews were employed when necessary to provide more context for each sectors' tasks, policies, and capabilities.

## **7. Conclusion**

Locally-led-and-operated central kitchens are a multisectoral investment that can serve as a scaffold for health, education, and social welfare interventions. The experiences of 2 successful city- and province-wide implementation sites present a model for improving diet and health, empowering civil society, and holding local governments accountable for multisectoral action in decentralized governments. Program sustainability was attributed to affording communities agency to operate and modify the model according to local needs, embed volunteer pools in social networks, and organize demand for related services from their local politicians. Future interventions should focus on educating local leaders, as their knowledge of the relevance of holistic health interventions was a necessary precondition that motivated their stewardship and coordination of different government sectors.

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## Appendix

**Table S.1.** Impact of the School Feeding Program on Rural Children's Consumption at Baseline

Dependent Variable†	(1) Energy (kcal)	(2) Protein (g)	(3) Calcium (mg)	(4) Phosphorus (mg)	(5) Iron (mg)	(6) Vit. A (µg)	(7) Vit. B <sub>1</sub> (mg)	(8) Vit. B <sub>2</sub> (mg)	(9) Vit. B <sub>3</sub> (mg)	(10) Vit. C (mg)
<b>School feeding beneficiary=1</b>	-0.2234*** (0.052)	-0.1822*** (0.061)	-0.1249 (0.083)	-0.1665*** (0.060)	-0.1197 (0.088)	-0.2210* (0.113)	-0.1389 (0.131)	-0.1256 (0.093)	-0.1445** (0.072)	0.3775** (0.164)
<b>School day=1</b>	-0.0279 (0.052)	0.0199 (0.061)	0.0719 (0.083)	-0.0123 (0.060)	0.0534 (0.088)	0.0818 (0.113)	-0.0006 (0.131)	0.0682 (0.093)	-0.0577 (0.072)	0.0377 (0.159)
<b>Beneficiary attended school=1</b>	0.3295*** (0.072)	0.2501*** (0.085)	0.2365** (0.114)	0.2722*** (0.083)	0.2585** (0.121)	0.6928*** (0.156)	0.1433 (0.181)	0.1648 (0.128)	0.3019*** (0.100)	-0.0343 (0.222)
<b>Child's age</b>	0.1245** (0.049)	0.0052 (0.057)	-0.0320 (0.078)	0.0497 (0.057)	0.0165 (0.082)	-0.0951 (0.106)	0.0152 (0.123)	0.0183 (0.087)	0.0644 (0.068)	-0.0328 (0.149)
<b>Child's age squared</b>	-0.0056* (0.003)	0.0010 (0.003)	0.0033 (0.005)	-0.0015 (0.003)	-0.0003 (0.005)	0.0065 (0.006)	0.0034 (0.007)	-0.0002 (0.005)	-0.0023 (0.004)	0.0036 (0.009)
<b>Child's sex: female=1</b>	-0.0844** (0.038)	-0.0797* (0.045)	0.0608 (0.061)	-0.0524 (0.044)	-0.0248 (0.065)	0.0387 (0.083)	0.0586 (0.096)	0.0530 (0.068)	-0.0574 (0.053)	0.3145*** (0.118)
<b>Household size</b>	-0.0150 (0.011)	-0.0066 (0.013)	-0.0646*** (0.017)	-0.0169 (0.013)	-0.0451** (0.018)	-0.0302 (0.024)	-0.0267 (0.028)	-0.0223 (0.019)	0.0197 (0.015)	- (0.034)
<b>Boys aged 0-5 in household</b>	0.0549 (0.040)	-0.0049 (0.047)	0.2087*** (0.064)	0.0485 (0.046)	0.0655 (0.068)	0.1238 (0.087)	0.1435 (0.100)	0.1351* (0.071)	0.0004 (0.055)	0.4668*** (0.124)
<b>Girls aged 0-5 in household</b>	0.0515 (0.038)	0.0191 (0.045)	0.1366** (0.061)	0.0402 (0.044)	0.0599 (0.064)	0.0482 (0.083)	-0.0495 (0.096)	-0.0060 (0.068)	-0.0507 (0.053)	0.2766** (0.119)
<b>Sex of household head: female=1</b>	0.0461 (0.058)	0.0583 (0.068)	0.0274 (0.093)	0.0466 (0.067)	0.0466 (0.098)	-0.0521 (0.126)	0.2284 (0.146)	0.1314 (0.103)	0.2577*** (0.081)	0.0685 (0.185)
<b>Household head's years of education</b>	0.0006 (0.005)	0.0056 (0.006)	0.0079 (0.008)	0.0025 (0.006)	0.0132 (0.009)	0.0002 (0.011)	0.0284** (0.013)	0.0247*** (0.009)	0.0084 (0.007)	-0.0212 (0.016)
<b>4Ps beneficiary=1</b>	0.0805** (0.039)	0.0498 (0.046)	0.1747*** (0.063)	0.0465 (0.045)	0.1697** (0.066)	0.1272 (0.085)	0.0581 (0.099)	0.0512 (0.070)	-0.0299 (0.055)	0.1921 (0.120)
<b>Monthly household expenditure††</b>	0.1139*** (0.028)	0.0944*** (0.033)	0.0992** (0.045)	0.0941*** (0.033)	0.0715 (0.048)	-0.0032 (0.062)	0.0157 (0.072)	0.0638 (0.051)	0.0807** (0.040)	-0.0261 (0.087)
	-0.0297	-0.1499*	-0.0347	-0.1516*	-0.3600***	-0.0077	-0.0608	-0.1248	-0.1825*	-0.5010**

<b>Dependent Variable†</b>	<b>(1)</b> Energy (kcal)	<b>(2)</b> Protein (g)	<b>(3)</b> Calcium (mg)	<b>(4)</b> Phosphorus (mg)	<b>(5)</b> Iron (mg)	<b>(6)</b> Vit. A (µg)	<b>(7)</b> Vit. B <sub>1</sub> (mg)	<b>(8)</b> Vit. B <sub>2</sub> (mg)	<b>(9)</b> Vit. B <sub>3</sub> (mg)	<b>(10)</b> Vit. C (mg)
<b>Mild household food insecurity</b>	(0.077)	(0.091)	(0.122)	(0.089)	(0.130)	(0.167)	(0.194)	(0.137)	(0.107)	(0.237)
<b>Moderate household food insecurity</b>	-0.0564 (0.070)	-0.1073 (0.082)	-0.0822 (0.111)	-0.1370* (0.081)	-0.2214* (0.118)	-0.1210 (0.151)	0.0682 (0.176)	-0.1279 (0.124)	-0.2032** (0.097)	- (0.216)
<b>Severe household food insecurity</b>	-0.1656** (0.072)	-0.2868*** (0.085)	-0.2375** (0.115)	-0.2468*** (0.084)	-0.4267*** (0.122)	-0.1444 (0.156)	-0.1738 (0.182)	-0.2130* (0.129)	-0.2698*** (0.100)	- (0.224)
<b>Constant</b>	5.3984*** (0.348)	2.6435*** (0.409)	4.5953*** (0.553)	5.0359*** (0.402)	1.5165** (0.587)	5.8702*** (0.752)	-1.8141** (0.874)	-1.7699*** (0.618)	1.3290*** (0.483)	3.3891*** (1.061)
<b>Observations</b>	364	364	363	363	363	363	364	364	364	344
<b>R-squared</b>	0.240	0.174	0.143	0.149	0.129	0.153	0.085	0.093	0.140	0.118

Notes: Standard errors in parentheses; Significance levels: \* significant at the 10-percent level; \*\* significant at the 5-percent level; \*\*\* significant at the 1-percent level.

†The dependent variable is the logarithmic form of the daily dietary intake for each nutrient.

††Monthly household expenditure is the logarithmic form of each households' monthly expenditure.

**Table S.2.** Impact of the School Feeding Program on Rural Children's Consumption at Modification 1

Dependent Variable†	(1) Energy (kcal)	(2) Protein (g)	(3) Calcium (mg)	(4) Phosphorus (mg)	(5) Iron (mg)	(6) Vit. A (µg)	(7) Vit. B <sub>1</sub> (mg)	(8) Vit. B <sub>2</sub> (mg)	(9) Vit. B <sub>3</sub> (mg)	(10) Vit. C (mg)
<b>School feeding beneficiary=1</b>	-0.2233*** (0.051)	-0.1827*** (0.060)	-0.1250 (0.079)	-0.1665*** (0.060)	-0.1189 (0.086)	-0.2210* (0.113)	-0.1389 (0.131)	-0.1256 (0.093)	-0.1445** (0.072)	0.3775** (0.164)
<b>School day=1</b>	-0.0279 (0.051)	0.0199 (0.060)	0.0719 (0.079)	-0.0123 (0.060)	0.0534 (0.086)	0.0818 (0.113)	-0.0006 (0.131)	0.0682 (0.093)	-0.0577 (0.072)	0.0377 (0.159)
<b>Beneficiary attended school=1</b>	0.5016*** (0.070)	0.4344*** (0.082)	0.5923*** (0.108)	0.2722*** (0.083)	0.4566*** (0.118)	0.6928*** (0.156)	0.1433 (0.181)	0.1648 (0.128)	0.3019*** (0.100)	-0.0343 (0.222)
<b>Child's age</b>	0.1204** (0.048)	0.0041 (0.056)	-0.0357 (0.074)	0.0497 (0.057)	0.0172 (0.080)	-0.0951 (0.106)	0.0152 (0.123)	0.0183 (0.087)	0.0644 (0.068)	-0.0328 (0.149)
<b>Child's age squared</b>	-0.0054* (0.003)	0.0010 (0.003)	0.0035 (0.004)	-0.0015 (0.003)	-0.0004 (0.005)	0.0065 (0.006)	0.0034 (0.007)	-0.0002 (0.005)	-0.0023 (0.004)	0.0036 (0.009)
<b>Child's sex: female=1</b>	-0.0781** (0.037)	-0.0744* (0.044)	0.0638 (0.058)	-0.0524 (0.044)	-0.0187 (0.063)	0.0387 (0.083)	0.0586 (0.096)	0.0530 (0.068)	-0.0574 (0.053)	0.3145*** (0.118)
<b>Household size</b>	-0.0146 (0.011)	-0.0066 (0.013)	-0.0608*** (0.017)	-0.0169 (0.013)	-0.0441** (0.018)	-0.0302 (0.024)	-0.0267 (0.028)	-0.0223 (0.019)	0.0197 (0.015)	- (0.034)
<b>Boys aged 0-5 in household</b>	0.0507 (0.039)	-0.0050 (0.046)	0.1979*** (0.060)	0.0485 (0.046)	0.0595 (0.066)	0.1238 (0.087)	0.1435 (0.100)	0.1351* (0.071)	0.0004 (0.055)	0.4668*** (0.124)
<b>Girls aged 0-5 in household</b>	0.0459 (0.037)	0.0161 (0.044)	0.1207** (0.058)	0.0402 (0.044)	0.0511 (0.063)	0.0482 (0.083)	-0.0495 (0.096)	-0.0060 (0.068)	-0.0507 (0.053)	0.2766** (0.119)
<b>Sex of household head: female=1</b>	0.0467 (0.057)	0.0600 (0.067)	0.0349 (0.088)	0.0466 (0.067)	0.0571 (0.096)	-0.0521 (0.126)	0.2284 (0.146)	0.1314 (0.103)	0.2577*** (0.081)	0.0685 (0.185)
<b>Household head's years of education</b>	0.0008 (0.005)	0.0056 (0.006)	0.0073 (0.008)	0.0025 (0.006)	0.0133 (0.009)	0.0002 (0.011)	0.0284** (0.013)	0.0247*** (0.009)	0.0084 (0.007)	-0.0212 (0.016)
<b>4Ps beneficiary=1</b>	0.0772** (0.038)	0.0463 (0.045)	0.1708*** (0.059)	0.0465 (0.045)	0.1642** (0.065)	0.1272 (0.085)	0.0581 (0.099)	0.0512 (0.070)	-0.0299 (0.055)	0.1921 (0.120)
<b>Monthly household expenditure††</b>	0.1099*** (0.028)	0.0891*** (0.033)	0.0870** (0.043)	0.0941*** (0.033)	0.0670 (0.047)	-0.0032 (0.062)	0.0157 (0.072)	0.0638 (0.051)	0.0807** (0.040)	-0.0261 (0.087)
<b>Mild household food insecurity</b>	-0.0311 (0.075)	-0.1503* (0.088)	-0.0531 (0.116)	-0.1516* (0.089)	-0.3566*** (0.127)	-0.0077 (0.167)	-0.0608 (0.194)	-0.1248 (0.137)	-0.1825* (0.107)	-0.5010** (0.237)
<b>Moderate household food insecurity</b>	-0.0587 (0.068)	-0.1074 (0.080)	-0.0992 (0.105)	-0.1370* (0.081)	-0.2202* (0.115)	-0.1210 (0.151)	0.0682 (0.176)	-0.1279 (0.124)	-0.2032** (0.097)	- (0.216)

<b>Dependent Variable†</b>	<b>(1)</b> <b>Energy (kcal)</b>	<b>(2)</b> <b>Protein (g)</b>	<b>(3)</b> <b>Calcium (mg)</b>	<b>(4)</b> <b>Phosphorus (mg)</b>	<b>(5)</b> <b>Iron (mg)</b>	<b>(6)</b> <b>Vit. A (µg)</b>	<b>(7)</b> <b>Vit. B<sub>1</sub> (mg)</b>	<b>(8)</b> <b>Vit. B<sub>2</sub> (mg)</b>	<b>(9)</b> <b>Vit. B<sub>3</sub> (mg)</b>	<b>(10)</b> <b>Vit. C (mg)</b>
<b>Severe household food insecurity</b>	-0.1648** (0.071)	-0.2789*** (0.083)	-0.2450** (0.109)	-0.2468*** (0.084)	-0.4209*** (0.119)	-0.1444 (0.156)	-0.1738 (0.182)	-0.2130* (0.129)	-0.2698*** (0.100)	- (0.224)
<b>Constant</b>	5.4560*** (0.339)	2.6986*** (0.399)	4.7369*** (0.524)	5.0359*** (0.402)	1.5504*** (0.572)	5.8702*** (0.752)	-1.8141** (0.874)	-1.7699*** (0.618)	1.3290*** (0.483)	3.3891*** (1.061)
<b>Observations</b>	364	364	363	363	363	363	364	364	364	344
<b>R-squared</b>	0.318	0.240	0.270	0.149	0.182	0.153	0.085	0.093	0.140	0.118

Notes: Standard errors in parentheses; Significance levels: \* significant at the 10-percent level; \*\* significant at the 5-percent level; \*\*\* significant at the 1-percent level.

†The dependent variable is the logarithmic form of the daily dietary intake for each nutrient.

††Monthly household expenditure is the logarithmic form of each households' monthly expenditure.

**Table S.3.** Impact of the School Feeding Program on Rural Children’s Consumption at Modification 2

Dependent Variable†	(1) Energy (kcal)	(2) Protein (g)	(3) Calcium (mg)	(4) Phosphorus (mg)	(5) Iron (mg)	(6) Vit. A (µg)	(7) Vit. B <sub>1</sub> (mg)	(8) Vit. B <sub>2</sub> (mg)	(9) Vit. B <sub>3</sub> (mg)	(10) Vit. C (mg)
<b>School feeding beneficiary=1</b>	-0.2232*** (0.051)	-0.2232*** (0.051)	-0.1249 (0.078)	-0.1662*** (0.060)	-0.1186 (0.085)	-0.2192* (0.112)	-0.1380 (0.131)	-0.1249 (0.093)	-0.1449** (0.072)	0.3785** (0.161)
<b>School day=1</b>	-0.0279 (0.051)	-0.0279 (0.051)	0.0719 (0.078)	-0.0123 (0.060)	0.0534 (0.085)	0.0818 (0.112)	-0.0006 (0.131)	0.0682 (0.093)	-0.0577 (0.072)	0.0375 (0.155)
<b>Beneficiary attended school=1</b>	0.5470*** (0.070)	0.5470*** (0.070)	0.6495*** (0.108)	0.3505*** (0.083)	0.5054*** (0.118)	0.8833*** (0.154)	0.1891 (0.180)	0.2206* (0.127)	0.4146*** (0.100)	0.1541 (0.217)
<b>Child’s age</b>	0.1198** (0.047)	0.1198** (0.047)	-0.0353 (0.073)	0.0481 (0.056)	0.0177 (0.080)	-0.0943 (0.105)	0.0144 (0.122)	0.0195 (0.087)	0.0597 (0.068)	-0.0321 (0.146)
<b>Child’s age squared</b>	-0.0054* (0.003)	-0.0054* (0.003)	0.0034 (0.004)	-0.0015 (0.003)	-0.0004 (0.005)	0.0064 (0.006)	0.0034 (0.007)	-0.0003 (0.005)	-0.0021 (0.004)	0.0036 (0.009)
<b>Child’s sex: female=1</b>	-0.0762** (0.037)	-0.0762** (0.037)	0.0651 (0.058)	-0.0487 (0.044)	-0.0166 (0.063)	0.0427 (0.082)	0.0585 (0.096)	0.0554 (0.068)	-0.0512 (0.053)	0.3117*** (0.115)
<b>Household size</b>	-0.0143 (0.011)	-0.0143 (0.011)	-0.0605*** (0.016)	-0.0168 (0.013)	-0.0440** (0.018)	-0.0309 (0.024)	-0.0267 (0.027)	-0.0229 (0.019)	0.0198 (0.015)	- (0.033)
<b>Boys aged 0-5 in household</b>	0.0498 (0.039)	0.0498 (0.039)	0.1968*** (0.060)	0.0484 (0.046)	0.0580 (0.066)	0.1198 (0.087)	0.1409 (0.100)	0.1353* (0.071)	0.0021 (0.055)	0.4557*** (0.121)
<b>Girls aged 0-5 in household</b>	0.0443 (0.037)	0.0443 (0.037)	0.1192** (0.057)	0.0384 (0.044)	0.0494 (0.062)	0.0456 (0.082)	-0.0500 (0.096)	-0.0073 (0.068)	-0.0519 (0.053)	0.2729** (0.116)
<b>Sex of household head: female=1</b>	0.0471 (0.056)	0.0471 (0.056)	0.0365 (0.087)	0.0476 (0.067)	0.0593 (0.095)	-0.0503 (0.125)	0.2309 (0.146)	0.1317 (0.103)	0.2577*** (0.081)	0.0722 (0.181)
<b>Household head’s years of education</b>	0.0009 (0.005)	0.0009 (0.005)	0.0073 (0.008)	0.0025 (0.006)	0.0135 (0.009)	-0.0005 (0.011)	0.0285** (0.013)	0.0246*** (0.009)	0.0083 (0.007)	-0.0206 (0.016)
<b>4Ps beneficiary=1</b>	0.0754** (0.038)	0.0754** (0.038)	0.1692*** (0.059)	0.0441 (0.045)	0.1622** (0.064)	0.1228 (0.084)	0.0577 (0.099)	0.0482 (0.070)	-0.0337 (0.055)	0.1892 (0.118)
<b>Monthly household expenditure††</b>	0.1096*** (0.028)	0.1096*** (0.028)	0.0862** (0.043)	0.0930*** (0.033)	0.0674 (0.047)	-0.0073 (0.061)	0.0142 (0.071)	0.0651 (0.051)	0.0780** (0.039)	-0.0377 (0.085)
<b>Mild household food insecurity</b>	-0.0297 (0.075)	-0.0297 (0.075)	-0.0525 (0.115)	-0.1491* (0.088)	-0.3525*** (0.126)	-0.0145 (0.165)	-0.0594 (0.193)	-0.1218 (0.137)	-0.1777* (0.107)	-0.5039** (0.231)
<b>Moderate household food insecurity</b>	-0.0592 (0.068)	-0.0592 (0.068)	-0.0996 (0.105)	-0.1397* (0.080)	-0.2186* (0.114)	-0.1301 (0.150)	0.0640 (0.175)	-0.1289 (0.124)	-0.2047** (0.097)	- (0.212)



<b>Dependent Variable†</b>	<b>(1) Energy (kcal)</b>	<b>(2) Protein (g)</b>	<b>(3) Calcium (mg)</b>	<b>(4) Phosphorus (mg)</b>	<b>(5) Iron (mg)</b>	<b>(6) Vit. A (µg)</b>	<b>(7) Vit. B<sub>1</sub> (mg)</b>	<b>(8) Vit. B<sub>2</sub> (mg)</b>	<b>(9) Vit. B<sub>3</sub> (mg)</b>	<b>(10) Vit. C (mg)</b>
<b>Severe household food insecurity</b>	-0.1646** (0.070)	-0.1646** (0.070)	-0.2451** (0.108)	-0.2471*** (0.083)	-0.4179*** (0.118)	-0.1492 (0.155)	-0.1747 (0.181)	-0.2090 (0.128)	-0.2701*** (0.100)	- (0.220) 0.7190***
<b>Constant</b>	5.4621*** (0.337)	5.4621*** (0.337)	4.7428*** (0.521)	5.0545*** (0.399)	1.5420*** (0.569)	5.9266*** (0.745)	-1.7952** (0.871)	-1.7825*** (0.617)	1.3753*** (0.482)	3.5072*** (1.039)
<b>Observations</b>	364	364	363	363	363	363	364	364	364	344
<b>R-squared</b>	0.344	0.344	0.297	0.173	0.199	0.221	0.086	0.100	0.166	0.139

Notes: Standard errors in parentheses; Significance levels: \* significant at the 10-percent level; \*\* significant at the 5-percent level; \*\*\* significant at the 1-percent level.

†The dependent variable is the logarithmic form of the daily dietary intake for each nutrient.

††Monthly household expenditure is the logarithmic form of each households' monthly expenditure.

**Table S.4.** Impact of the School Feeding Program on Rural Children's Consumption at Modification 3

Dependent Variable†	(1) Energy (kcal)	(2) Protein (g)	(3) Calcium (mg)	(4) Phosphorus (mg)	(5) Iron (mg)	(6) Vit. A (µg)	(7) Vit. B <sub>1</sub> (mg)	(8) Vit. B <sub>2</sub> (mg)	(9) Vit. B <sub>3</sub> (mg)	(10) Vit. C (mg)
<b>School feeding beneficiary=1</b>	-0.2210*** (0.050)	-0.1800*** (0.060)	-0.1206 (0.078)	-0.1640*** (0.060)	-0.1152 (0.085)	-0.2095* (0.113)	-0.1349 (0.130)	-0.1222 (0.093)	-0.1437** (0.073)	0.3856** (0.158)
<b>School day=1</b>	-0.0279 (0.050)	0.0199 (0.060)	0.0719 (0.078)	-0.0123 (0.060)	0.0534 (0.085)	0.0818 (0.113)	-0.0006 (0.130)	0.0682 (0.093)	-0.0577 (0.073)	0.0372 (0.152)
<b>Beneficiary attended school=1</b>	0.6331*** (0.069)	0.6032*** (0.083)	0.8024*** (0.107)	0.4822*** (0.082)	0.6074*** (0.117)	1.4052*** (0.156)	0.3306* (0.178)	0.3369*** (0.128)	0.5670*** (0.100)	0.6463*** (0.213)
<b>Child's age</b>	0.1506*** (0.047)	0.0321 (0.056)	0.0190 (0.073)	0.0735 (0.056)	0.0531 (0.080)	0.0158 (0.106)	0.0343 (0.121)	0.0412 (0.087)	0.0870 (0.068)	0.0717 (0.143)
<b>Child's age squared</b>	-0.0073*** (0.003)	-0.0007 (0.003)	0.0001 (0.004)	-0.0029 (0.003)	-0.0025 (0.005)	-0.0001 (0.006)	0.0023 (0.007)	-0.0014 (0.005)	-0.0036 (0.004)	-0.0026 (0.008)
<b>Child's sex: female=1</b>	-0.0756** (0.037)	-0.0704 (0.044)	0.0611 (0.057)	-0.0482 (0.044)	-0.0183 (0.063)	0.0361 (0.083)	0.0540 (0.095)	0.0533 (0.068)	-0.0495 (0.053)	0.2766** (0.113)
<b>Household size</b>	-0.0128 (0.011)	-0.0053 (0.013)	-0.0584*** (0.016)	-0.0162 (0.013)	-0.0430** (0.018)	-0.0310 (0.024)	-0.0267 (0.027)	-0.0240 (0.019)	0.0209 (0.015)	- 0.0885*** (0.032)
<b>Boys aged 0-5 in household</b>	0.0453 (0.038)	-0.0068 (0.046)	0.1874*** (0.060)	0.0463 (0.046)	0.0522 (0.065)	0.1040 (0.087)	0.1336 (0.099)	0.1336* (0.071)	0.0025 (0.055)	0.4282*** (0.119)
<b>Girls aged 0-5 in household</b>	0.0403 (0.037)	0.0112 (0.044)	0.1159** (0.057)	0.0358 (0.044)	0.0468 (0.062)	0.0400 (0.083)	-0.0509 (0.095)	-0.0089 (0.068)	-0.0536 (0.053)	0.2689** (0.114)
<b>Sex of household head: female=1</b>	0.0616 (0.056)	0.0772 (0.067)	0.0627 (0.087)	0.0574 (0.067)	0.0779 (0.095)	-0.0110 (0.126)	0.2410* (0.145)	0.1381 (0.103)	0.2683*** (0.081)	0.1226 (0.177)
<b>Household head's years of education</b>	0.0007 (0.005)	0.0054 (0.006)	0.0066 (0.008)	0.0022 (0.006)	0.0132 (0.009)	-0.0032 (0.011)	0.0287** (0.013)	0.0239** (0.009)	0.0079 (0.007)	-0.0192 (0.016)
<b>4Ps beneficiary=1</b>	0.0729* (0.038)	0.0432 (0.045)	0.1668*** (0.059)	0.0408 (0.045)	0.1592** (0.064)	0.1161 (0.085)	0.0578 (0.098)	0.0410 (0.070)	-0.0365 (0.055)	0.1912* (0.116)
<b>Monthly household expenditure††</b>	0.1109*** (0.027)	0.0916*** (0.033)	0.0871** (0.042)	0.0951*** (0.033)	0.0706 (0.046)	-0.0060 (0.062)	0.0114 (0.071)	0.0695 (0.051)	0.0789** (0.040)	-0.0526 (0.084)
<b>Mild household food insecurity</b>	-0.0290 (0.074)	-0.1429 (0.089)	-0.0527 (0.115)	-0.1447 (0.088)	-0.3492*** (0.125)	-0.0232 (0.167)	-0.0564 (0.191)	-0.1208 (0.137)	-0.1696 (0.107)	-0.4958** (0.227)
<b>Moderate household food insecurity</b>	-0.0589 (0.067)	-0.1106 (0.081)	-0.0978 (0.104)	-0.1406* (0.080)	-0.2164* (0.114)	-0.1348 (0.151)	0.0557 (0.174)	-0.1296 (0.124)	-0.2048** (0.097)	- 0.7178*** (0.208)

<b>Dependent Variable†</b>	<b>(1) Energy (kcal)</b>	<b>(2) Protein (g)</b>	<b>(3) Calcium (mg)</b>	<b>(4) Phosphorus (mg)</b>	<b>(5) Iron (mg)</b>	<b>(6) Vit. A (µg)</b>	<b>(7) Vit. B<sub>1</sub> (mg)</b>	<b>(8) Vit. B<sub>2</sub> (mg)</b>	<b>(9) Vit. B<sub>3</sub> (mg)</b>	<b>(10) Vit. C (mg)</b>
<b>Severe household food insecurity</b>	-0.1649** (0.070)	-0.2739*** (0.083)	-0.2471** (0.108)	-0.2440*** (0.083)	-0.4164*** (0.118)	-0.1559 (0.156)	-0.1738 (0.180)	-0.2016 (0.128)	-0.2648*** (0.101)	- (0.215)
<b>Constant</b>	5.3199*** (0.335)	2.5510*** (0.401)	4.5135*** (0.518)	4.9244*** (0.398)	1.3631** (0.566)	5.5040*** (0.752)	-1.8521** (0.863)	-1.9053*** (0.617)	1.2423** (0.483)	3.2105*** (1.019)
<b>Observations</b>	364	364	363	363	363	363	364	364	364	344
<b>R-squared</b>	0.403	0.326	0.368	0.239	0.241	0.406	0.098	0.123	0.228	0.228

Notes: Standard errors in parentheses; Significance levels: \* significant at the 10-percent level; \*\* significant at the 5-percent level; \*\*\* significant at the 1-percent level.

†The dependent variable is the logarithmic form of the daily dietary intake for each nutrient.

††Monthly household expenditure is the logarithmic form of each households' monthly expenditure.

**Table S.5.** Impact of the School Feeding Program on Rural Children's Consumption at Modification 4

<b>Dependent Variable†</b>	<b>(1) Energy (kcal)</b>	<b>(2) Protein (g)</b>	<b>(3) Calcium (mg)</b>	<b>(4) Phosphorus (mg)</b>	<b>(5) Iron (mg)</b>	<b>(6) Vit. A (µg)</b>	<b>(7) Vit. B<sub>1</sub> (mg)</b>	<b>(8) Vit. B<sub>2</sub> (mg)</b>	<b>(9) Vit. B<sub>3</sub> (mg)</b>	<b>(10) Vit. C (mg)</b>
<b>School feeding beneficiary=1</b>	-0.2231*** (0.050)	-0.1825*** (0.060)	-0.1244 (0.077)	-0.1656*** (0.059)	-0.1178 (0.085)	-0.2144* (0.112)	-0.1350 (0.129)	-0.1236 (0.092)	-0.1460** (0.072)	0.3799** (0.155)
<b>School day=1</b>	-0.0279 (0.050)	0.0199 (0.060)	0.0719 (0.077)	-0.0123 (0.059)	0.0534 (0.085)	0.0818 (0.112)	-0.0006 (0.130)	0.0682 (0.092)	-0.0577 (0.072)	0.0372 (0.150)
<b>Beneficiary attended school=1</b>	0.6494*** (0.069)	0.6016*** (0.082)	0.8405*** (0.106)	0.4862*** (0.082)	0.6248*** (0.117)	1.5205*** (0.154)	0.3513** (0.178)	0.3399*** (0.127)	0.5634*** (0.099)	0.7594*** (0.210)
<b>Child's age</b>	0.1194** (0.047)	0.0029 (0.056)	-0.0328 (0.072)	0.0471 (0.056)	0.0197 (0.079)	-0.0883 (0.104)	0.0147 (0.121)	0.0242 (0.086)	0.0541 (0.067)	-0.0412 (0.141)
<b>Child's age squared</b>	-0.0054* (0.003)	0.0010 (0.003)	0.0032 (0.004)	-0.0014 (0.003)	-0.0005 (0.005)	0.0060 (0.006)	0.0033 (0.007)	-0.0005 (0.005)	-0.0018 (0.004)	0.0042 (0.008)
<b>Child's sex: female=1</b>	-0.0733** (0.037)	-0.0688 (0.044)	0.0668 (0.057)	-0.0451 (0.044)	-0.0130 (0.062)	0.0554 (0.082)	0.0568 (0.095)	0.0581 (0.068)	-0.0475 (0.053)	0.3011*** (0.111)
<b>Household size</b>	-0.0135 (0.011)	-0.0059 (0.013)	-0.0596*** (0.016)	-0.0166 (0.012)	-0.0437** (0.018)	-0.0332 (0.023)	-0.0271 (0.027)	-0.0237 (0.019)	0.0203 (0.015)	- (0.032)
<b>Boys aged 0-5 in household</b>	0.0460 (0.039)	-0.0050 (0.046)	0.1901*** (0.059)	0.0455 (0.046)	0.0532 (0.065)	0.1031 (0.086)	0.1311 (0.099)	0.1336* (0.070)	0.0029 (0.055)	0.4313*** (0.117)
<b>Girls aged 0-5 in household</b>	0.0398 (0.037)	0.0109 (0.044)	0.1144** (0.056)	0.0345 (0.043)	0.0458 (0.062)	0.0346 (0.082)	-0.0513 (0.095)	-0.0103 (0.068)	-0.0548 (0.053)	0.2653** (0.112)
<b>Sex of household head: female=1</b>	0.0482 (0.056)	0.0631 (0.067)	0.0414 (0.086)	0.0481 (0.066)	0.0637 (0.095)	-0.0435 (0.124)	0.2376 (0.144)	0.1321 (0.103)	0.2531*** (0.080)	0.0821 (0.175)
<b>Household head's years of education</b>	0.0010 (0.005)	0.0059 (0.006)	0.0070 (0.008)	0.0026 (0.006)	0.0137 (0.009)	-0.0021 (0.011)	0.0287** (0.013)	0.0244*** (0.009)	0.0085 (0.007)	-0.0185 (0.016)
<b>4Ps beneficiary=1</b>	0.0702* (0.038)	0.0401 (0.045)	0.1636*** (0.058)	0.0401 (0.045)	0.1558** (0.064)	0.1095 (0.084)	0.0579 (0.098)	0.0405 (0.070)	-0.0380 (0.054)	0.1807 (0.114)
<b>Monthly household expenditure††</b>	0.1093*** (0.027)	0.0883*** (0.033)	0.0827* (0.042)	0.0915*** (0.032)	0.0679 (0.046)	-0.0145 (0.061)	0.0084 (0.071)	0.0657 (0.050)	0.0750* (0.039)	-0.0613 (0.082)
<b>Mild household food insecurity</b>	-0.0280 (0.074)	-0.1429 (0.088)	-0.0536 (0.114)	-0.1457* (0.088)	-0.3457*** (0.125)	-0.0297 (0.165)	-0.0569 (0.191)	-0.1205 (0.136)	-0.1722 (0.106)	-0.4909** (0.224)
<b>Moderate household food insecurity</b>	-0.0587 (0.068)	-0.1095 (0.080)	-0.1007 (0.103)	-0.1421* (0.079)	-0.2153* (0.113)	-0.1423 (0.150)	0.0508 (0.174)	-0.1308 (0.124)	-0.2048** (0.096)	- (0.205)

<b>Dependent Variable†</b>	<b>(1)</b> Energy (kcal)	<b>(2)</b> Protein (g)	<b>(3)</b> Calcium (mg)	<b>(4)</b> Phosphorus (mg)	<b>(5)</b> Iron (mg)	<b>(6)</b> Vit. A (µg)	<b>(7)</b> Vit. B <sub>1</sub> (mg)	<b>(8)</b> Vit. B <sub>2</sub> (mg)	<b>(9)</b> Vit. B <sub>3</sub> (mg)	<b>(10)</b> Vit. C (mg)
<b>Severe household food insecurity</b>	-0.1630** (0.070)	-0.2732*** (0.083)	-0.2461** (0.107)	-0.2453*** (0.082)	-0.4121*** (0.117)	-0.1546 (0.155)	-0.1772 (0.180)	-0.2017 (0.128)	-0.2663*** (0.100)	- (0.212)
<b>Constant</b>	5.4665*** (0.336)	2.7067*** (0.398)	4.7706*** (0.514)	5.0764*** (0.395)	1.5250*** (0.564)	6.0221*** (0.743)	-1.7320** (0.863)	-1.7968*** (0.614)	1.4267*** (0.479)	3.7638*** (1.003)
<b>Observations</b>	364	364	363	363	363	363	364	364	364	344
<b>R-squared</b>	0.407	0.326	0.390	0.238	0.247	0.452	0.097	0.124	0.223	0.263

Notes: Standard errors in parentheses; Significance levels: \* significant at the 10-percent level; \*\* significant at the 5-percent level; \*\*\* significant at the 1-percent level.

†The dependent variable is the logarithmic form of the daily dietary intake for each nutrient.

††Monthly household expenditure is the logarithmic form of each households' monthly expenditure.

**Table S.6.** Impact of the School Feeding Program on Rural Children's Consumption at Modification 5

Dependent Variable†	(1) Energy (kcal)	(2) Protein (g)	(3) Calcium (mg)	(4) Phosphorus (mg)	(5) Iron (mg)	(6) Vit. A (µg)	(7) Vit. B <sub>1</sub> (mg)	(8) Vit. B <sub>2</sub> (mg)	(9) Vit. B <sub>3</sub> (mg)	(10) Vit. C (mg)
<b>School feeding beneficiary=1</b>	-0.2230*** (0.050)	-0.1823*** (0.060)	-0.1244 (0.077)	-0.1653*** (0.060)	-0.1176 (0.085)	-0.2144* (0.112)	-0.1346 (0.129)	-0.1229 (0.092)	-0.1462** (0.072)	0.3800** (0.155)
<b>School day=1</b>	-0.0279 (0.050)	0.0199 (0.060)	0.0719 (0.077)	-0.0123 (0.059)	0.0534 (0.084)	0.0818 (0.111)	-0.0006 (0.129)	0.0682 (0.093)	-0.0577 (0.073)	0.0372 (0.150)
<b>Beneficiary attended school=1</b>	0.6819*** (0.069)	0.6932*** (0.083)	0.8671*** (0.106)	0.5639*** (0.082)	0.6638*** (0.116)	1.5378*** (0.154)	0.3778** (0.178)	0.4008*** (0.127)	0.6928*** (0.100)	0.7634*** (0.209)
<b>Child's age</b>	0.1188** (0.047)	0.0018 (0.056)	-0.0328 (0.072)	0.0455 (0.056)	0.0199 (0.079)	-0.0888 (0.104)	0.0136 (0.121)	0.0248 (0.087)	0.0499 (0.068)	-0.0402 (0.141)
<b>Child's age squared</b>	-0.0054* (0.003)	0.0010 (0.003)	0.0032 (0.004)	-0.0014 (0.003)	-0.0006 (0.005)	0.0060 (0.006)	0.0034 (0.007)	-0.0006 (0.005)	-0.0016 (0.004)	0.0041 (0.008)
<b>Child's sex: female=1</b>	-0.0712* (0.037)	-0.0638 (0.044)	0.0683 (0.057)	-0.0407 (0.044)	-0.0109 (0.062)	0.0546 (0.082)	0.0582 (0.095)	0.0614 (0.068)	-0.0396 (0.053)	0.3012*** (0.111)
<b>Household size</b>	-0.0134 (0.011)	-0.0057 (0.013)	-0.0594*** (0.016)	-0.0165 (0.013)	-0.0437** (0.018)	-0.0331 (0.023)	-0.0273 (0.027)	-0.0244 (0.019)	0.0203 (0.015)	- (0.032)
<b>Boys aged 0-5 in household</b>	0.0462 (0.038)	-0.0038 (0.046)	0.1910*** (0.059)	0.0470 (0.046)	0.0529 (0.065)	0.1043 (0.086)	0.1308 (0.099)	0.1345* (0.071)	0.0053 (0.055)	0.4306*** (0.117)
<b>Girls aged 0-5 in household</b>	0.0390 (0.037)	0.0088 (0.044)	0.1137** (0.056)	0.0331 (0.044)	0.0445 (0.062)	0.0345 (0.082)	-0.0516 (0.095)	-0.0114 (0.068)	-0.0557 (0.053)	0.2650** (0.112)
<b>Sex of household head: female=1</b>	0.0485 (0.056)	0.0655 (0.067)	0.0420 (0.086)	0.0493 (0.066)	0.0655 (0.094)	-0.0436 (0.124)	0.2387* (0.144)	0.1323 (0.103)	0.2545*** (0.081)	0.0827 (0.175)
<b>Household head's years of education</b>	0.0011 (0.005)	0.0058 (0.006)	0.0071 (0.008)	0.0025 (0.006)	0.0139 (0.009)	-0.0021 (0.011)	0.0288** (0.013)	0.0245*** (0.009)	0.0082 (0.007)	-0.0185 (0.016)
<b>4Ps beneficiary=1</b>	0.0690* (0.038)	0.0374 (0.045)	0.1629*** (0.058)	0.0377 (0.045)	0.1548** (0.064)	0.1097 (0.084)	0.0567 (0.098)	0.0377 (0.070)	-0.0418 (0.055)	0.1809 (0.114)
<b>Monthly household expenditure††</b>	0.1093*** (0.027)	0.0874*** (0.033)	0.0829** (0.042)	0.0910*** (0.032)	0.0687 (0.046)	-0.0149 (0.061)	0.0085 (0.071)	0.0676 (0.050)	0.0722* (0.040)	-0.0616 (0.082)
<b>Mild household food insecurity</b>	-0.0257 (0.074)	-0.1383 (0.089)	-0.0520 (0.114)	-0.1425 (0.088)	-0.3412*** (0.125)	-0.0313 (0.165)	-0.0556 (0.191)	-0.1160 (0.137)	-0.1666 (0.107)	-0.4919** (0.224)
<b>Moderate household food insecurity</b>	-0.0596 (0.067)	-0.1118 (0.081)	-0.1009 (0.103)	-0.1450* (0.080)	-0.2137* (0.113)	-0.1447 (0.149)	0.0490 (0.173)	-0.1314 (0.124)	-0.2066** (0.097)	- (0.204)

<b>Dependent Variable†</b>	<b>(1)</b> Energy (kcal)	<b>(2)</b> Protein (g)	<b>(3)</b> Calcium (mg)	<b>(4)</b> Phosphorus (mg)	<b>(5)</b> Iron (mg)	<b>(6)</b> Vit. A (µg)	<b>(7)</b> Vit. B <sub>1</sub> (mg)	<b>(8)</b> Vit. B <sub>2</sub> (mg)	<b>(9)</b> Vit. B <sub>3</sub> (mg)	<b>(10)</b> Vit. C (mg)
<b>Severe household food insecurity</b>	-0.1633** (0.070)	-0.2730*** (0.083)	-0.2459** (0.107)	-0.2462*** (0.083)	-0.4090*** (0.117)	-0.1574 (0.154)	-0.1772 (0.179)	-0.1979 (0.128)	-0.2684*** (0.101)	- (0.212)
<b>Constant</b>	5.4697*** (0.335)	2.7199*** (0.400)	4.7667*** (0.514)	5.0889*** (0.397)	1.5128*** (0.563)	6.0300*** (0.742)	-1.7278** (0.862)	-1.8138*** (0.616)	1.4722*** (0.483)	3.7633*** (1.003)
<b>Observations</b>	364	364	363	363	363	363	364	364	364	344
<b>R-squared</b>	0.427	0.375	0.402	0.280	0.264	0.458	0.100	0.139	0.279	0.264

Notes: Standard errors in parentheses; Significance levels: \* significant at the 10-percent level; \*\* significant at the 5-percent level; \*\*\* significant at the 1-percent level.

†The dependent variable is the logarithmic form of the daily dietary intake for each nutrient.

††Monthly household expenditure is the logarithmic form of each households' monthly expenditure.

**Table S.7.** Impact of the School Feeding Program on Urban Children’s Consumption at Baseline

Dependent Variable†	(1) Energy (kcal)	(2) Protein (g)	(3) Calcium (mg)	(4) Phosphorus (mg)	(5) Iron (mg)	(6) Vit. A (µg)	(7) Vit. B <sub>1</sub> (mg)	(8) Vit. B <sub>2</sub> (mg)	(9) Vit. B <sub>3</sub> (mg)	(10) Vit. C (mg)
<b>School feeding beneficiary=1</b>	-0.2038** (0.086)	-0.1622* (0.097)	-0.0883 (0.134)	-0.1776* (0.097)	-0.2217** (0.100)	-0.2880 (0.199)	-0.1454 (0.143)	-0.1281 (0.126)	-0.1798* (0.103)	-0.2271 (0.248)
<b>School day=1</b>	0.0235 (0.050)	0.0272 (0.056)	0.1470* (0.078)	0.0656 (0.056)	0.1122* (0.058)	0.3877*** (0.115)	0.0947 (0.083)	0.1077 (0.073)	0.0145 (0.060)	0.1816 (0.143)
<b>Beneficiary attended school=1</b>	0.0356 (0.119)	0.0515 (0.134)	0.0246 (0.186)	0.0467 (0.134)	0.0640 (0.139)	0.4083 (0.275)	0.0083 (0.198)	0.1331 (0.174)	0.1173 (0.142)	0.2507 (0.331)
<b>Child’s age</b>	0.1178 (0.105)	0.0389 (0.118)	0.0038 (0.164)	0.0255 (0.118)	0.1318 (0.122)	0.0451 (0.243)	0.3041* (0.174)	0.1106 (0.153)	0.0830 (0.126)	0.6928** (0.304)
<b>Child’s age squared</b>	-0.0038 (0.005)	0.0002 (0.006)	0.0005 (0.008)	0.0003 (0.006)	-0.0042 (0.006)	-0.0017 (0.012)	-0.0122 (0.008)	-0.0047 (0.007)	-0.0021 (0.006)	-0.0302** (0.015)
<b>Child’s sex: female=1</b>	-0.0832* (0.047)	-0.1025* (0.053)	-0.1236* (0.073)	-0.1244** (0.053)	-0.0431 (0.054)	-0.0677 (0.108)	-0.0714 (0.077)	-0.0575 (0.068)	-0.0719 (0.056)	0.2044 (0.132)
<b>Household size</b>	-0.0193 (0.015)	-0.0166 (0.017)	-0.0782*** (0.023)	-0.0302* (0.017)	-0.0259 (0.017)	-0.0540 (0.034)	-0.0578** (0.025)	-0.0567*** (0.022)	-0.0228 (0.018)	- 0.1406*** (0.042)
<b>Boys aged 0-5 in household</b>	-0.0477 (0.050)	-0.0756 (0.056)	-0.0431 (0.078)	-0.0443 (0.056)	-0.0467 (0.058)	-0.1064 (0.115)	0.0049 (0.083)	-0.0622 (0.073)	-0.0833 (0.060)	-0.1345 (0.143)
<b>Girls aged 0-5 in household</b>	-0.0686 (0.048)	-0.0856 (0.054)	-0.0233 (0.075)	-0.0584 (0.054)	-0.0767 (0.056)	-0.1051 (0.111)	0.0780 (0.080)	-0.0270 (0.070)	-0.1159** (0.058)	-0.0471 (0.140)
<b>Sex of household head: female=1</b>	-0.0350 (0.063)	-0.0459 (0.071)	-0.0493 (0.099)	-0.0454 (0.071)	0.0222 (0.074)	0.1353 (0.146)	-0.0146 (0.105)	-0.0355 (0.092)	0.0092 (0.076)	0.4188** (0.181)
<b>Household head’s years of education</b>	0.0053 (0.009)	0.0060 (0.010)	0.0190 (0.014)	0.0069 (0.010)	-0.0012 (0.011)	0.0317 (0.021)	0.0105 (0.015)	0.0070 (0.013)	0.0061 (0.011)	0.0273 (0.026)
<b>4Ps beneficiary=1</b>	0.0731 (0.055)	0.0482 (0.062)	0.1333 (0.086)	0.0806 (0.062)	0.0413 (0.065)	0.1749 (0.128)	0.1306 (0.092)	0.1398* (0.081)	0.0722 (0.066)	0.0542 (0.157)
<b>Monthly household expenditure††</b>	0.0657 (0.041)	0.0725 (0.047)	0.2668*** (0.065)	0.1264*** (0.047)	0.1111** (0.048)	0.1686* (0.096)	0.1320* (0.069)	0.1689*** (0.060)	0.0507 (0.050)	0.0165 (0.119)
<b>Mild household food insecurity</b>	-0.0245 (0.075)	-0.0550 (0.084)	-0.0879 (0.116)	-0.0842 (0.084)	-0.0324 (0.087)	0.0064 (0.172)	0.1193 (0.124)	-0.0755 (0.109)	-0.0616 (0.089)	0.2073 (0.206)
<b>Moderate household food insecurity</b>	-0.0149 (0.064)	0.0065 (0.072)	0.0459 (0.100)	0.0362 (0.072)	-0.0053 (0.075)	-0.0241 (0.148)	0.0480 (0.107)	-0.0255 (0.094)	-0.1027 (0.077)	-0.1314 (0.183)



<b>Dependent Variable†</b>	<b>(1)</b> <b>Energy (kcal)</b>	<b>(2)</b> <b>Protein (g)</b>	<b>(3)</b> <b>Calcium (mg)</b>	<b>(4)</b> <b>Phosphorus (mg)</b>	<b>(5)</b> <b>Iron (mg)</b>	<b>(6)</b> <b>Vit. A (µg)</b>	<b>(7)</b> <b>Vit. B<sub>1</sub> (mg)</b>	<b>(8)</b> <b>Vit. B<sub>2</sub> (mg)</b>	<b>(9)</b> <b>Vit. B<sub>3</sub> (mg)</b>	<b>(10)</b> <b>Vit. C (mg)</b>
<b>Severe household food insecurity</b>	-0.0717 (0.058)	-0.0759 (0.066)	-0.0688 (0.091)	-0.0691 (0.066)	-0.0766 (0.068)	-0.0687 (0.135)	-0.0982 (0.097)	-0.1299 (0.085)	-0.1185* (0.070)	-0.2559 (0.165)
<b>Constant</b>	6.1761*** (0.671)	2.9379*** (0.756)	3.4241*** (1.048)	5.1797*** (0.757)	0.4936 (0.781)	3.5227** (1.551)	-3.2898*** (1.115)	-2.2612** (0.981)	2.0536** (0.804)	-0.9987 (1.943)
<b>Observations</b>	318	318	318	318	318	318	318	318	318	285
<b>R-squared</b>	0.110	0.095	0.138	0.114	0.106	0.108	0.076	0.096	0.091	0.121

Notes: Standard errors in parentheses; Significance levels: \* significant at the 10-percent level; \*\* significant at the 5-percent level; \*\*\* significant at the 1-percent level.

†The dependent variable is the logarithmic form of the daily dietary intake for each nutrient.

††Monthly household expenditure is the logarithmic form of each households' monthly expenditure.

**Table S.8.** Impact of the School Feeding Program on Urban Children’s Consumption at Modification 1

Dependent Variable†	(1) Energy (kcal)	(2) Protein (g)	(3) Calcium (mg)	(4) Phosphorus (mg)	(5) Iron (mg)	(6) Vit. A (µg)	(7) Vit. B <sub>1</sub> (mg)	(8) Vit. B <sub>2</sub> (mg)	(9) Vit. B <sub>3</sub> (mg)	(10) Vit. C (mg)
<b>School feeding beneficiary=1</b>	-0.2043** (0.086)	-0.1623* (0.097)	-0.0901 (0.133)	-0.1776* (0.097)	-0.2219** (0.099)	-0.2880 (0.199)	-0.1454 (0.143)	-0.1281 (0.126)	-0.1798* (0.103)	-0.2271 (0.248)
<b>School day=1</b>	0.0235 (0.050)	0.0272 (0.056)	0.1470* (0.077)	0.0656 (0.056)	0.1122* (0.057)	0.3877*** (0.115)	0.0947 (0.083)	0.1077 (0.073)	0.0145 (0.060)	0.1816 (0.143)
<b>Beneficiary attended school=1</b>	0.1667 (0.118)	0.1990 (0.133)	0.3005 (0.183)	0.0467 (0.134)	0.2580* (0.137)	0.4083 (0.275)	0.0083 (0.198)	0.1331 (0.174)	0.1173 (0.142)	0.2507 (0.331)
<b>Child’s age</b>	0.1216 (0.104)	0.0432 (0.118)	0.0166 (0.162)	0.0255 (0.118)	0.1389 (0.121)	0.0451 (0.243)	0.3041* (0.174)	0.1106 (0.153)	0.0830 (0.126)	0.6928** (0.304)
<b>Child’s age squared</b>	-0.0040 (0.005)	-0.0001 (0.006)	-0.0001 (0.008)	0.0003 (0.006)	-0.0045 (0.006)	-0.0017 (0.012)	-0.0122 (0.008)	-0.0047 (0.007)	-0.0021 (0.006)	-0.0302** (0.015)
<b>Child’s sex: female=1</b>	-0.0822* (0.046)	-0.1014* (0.052)	-0.1250* (0.072)	-0.1244** (0.053)	-0.0462 (0.054)	-0.0677 (0.108)	-0.0714 (0.077)	-0.0575 (0.068)	-0.0719 (0.056)	0.2044 (0.132)
<b>Household size</b>	-0.0194 (0.015)	-0.0168 (0.017)	-0.0782*** (0.023)	-0.0302* (0.017)	-0.0260 (0.017)	-0.0540 (0.034)	-0.0578** (0.025)	-0.0567*** (0.022)	-0.0228 (0.018)	- 0.1406*** (0.042)
<b>Boys aged 0-5 in household</b>	-0.0487 (0.050)	-0.0761 (0.056)	-0.0438 (0.077)	-0.0443 (0.056)	-0.0489 (0.057)	-0.1064 (0.115)	0.0049 (0.083)	-0.0622 (0.073)	-0.0833 (0.060)	-0.1345 (0.143)
<b>Girls aged 0-5 in household</b>	-0.0684 (0.048)	-0.0843 (0.054)	-0.0175 (0.074)	-0.0584 (0.054)	-0.0723 (0.055)	-0.1051 (0.111)	0.0780 (0.080)	-0.0270 (0.070)	-0.1159** (0.058)	-0.0471 (0.140)
<b>Sex of household head: female=1</b>	-0.0319 (0.063)	-0.0429 (0.071)	-0.0436 (0.098)	-0.0454 (0.071)	0.0252 (0.073)	0.1353 (0.146)	-0.0146 (0.105)	-0.0355 (0.092)	0.0092 (0.076)	0.4188** (0.181)
<b>Household head’s years of education</b>	0.0056 (0.009)	0.0063 (0.010)	0.0182 (0.014)	0.0069 (0.010)	-0.0006 (0.010)	0.0317 (0.021)	0.0105 (0.015)	0.0070 (0.013)	0.0061 (0.011)	0.0273 (0.026)
<b>4Ps beneficiary=1</b>	0.0753 (0.055)	0.0498 (0.062)	0.1402 (0.085)	0.0806 (0.062)	0.0454 (0.064)	0.1749 (0.128)	0.1306 (0.092)	0.1398* (0.081)	0.0722 (0.066)	0.0542 (0.157)
<b>Monthly household expenditure††</b>	0.0662 (0.041)	0.0734 (0.046)	0.2661*** (0.064)	0.1264*** (0.047)	0.1109** (0.047)	0.1686* (0.096)	0.1320* (0.069)	0.1689*** (0.060)	0.0507 (0.050)	0.0165 (0.119)
<b>Mild household food insecurity</b>	-0.0266 (0.074)	-0.0574 (0.084)	-0.0948 (0.115)	-0.0842 (0.084)	-0.0335 (0.086)	0.0064 (0.172)	0.1193 (0.124)	-0.0755 (0.109)	-0.0616 (0.089)	0.2073 (0.206)
<b>Moderate household food insecurity</b>	-0.0144 (0.064)	0.0074 (0.072)	0.0394 (0.099)	0.0362 (0.072)	-0.0047 (0.074)	-0.0241 (0.148)	0.0480 (0.107)	-0.0255 (0.094)	-0.1027 (0.077)	-0.1314 (0.183)

<b>Dependent Variable†</b>	<b>(1)</b> <b>Energy (kcal)</b>	<b>(2)</b> <b>Protein (g)</b>	<b>(3)</b> <b>Calcium (mg)</b>	<b>(4)</b> <b>Phosphorus (mg)</b>	<b>(5)</b> <b>Iron (mg)</b>	<b>(6)</b> <b>Vit. A (µg)</b>	<b>(7)</b> <b>Vit. B<sub>1</sub> (mg)</b>	<b>(8)</b> <b>Vit. B<sub>2</sub> (mg)</b>	<b>(9)</b> <b>Vit. B<sub>3</sub> (mg)</b>	<b>(10)</b> <b>Vit. C (mg)</b>
<b>Severe household food insecurity</b>	-0.0721 (0.058)	-0.0770 (0.065)	-0.0778 (0.090)	-0.0691 (0.066)	-0.0772 (0.067)	-0.0687 (0.135)	-0.0982 (0.097)	-0.1299 (0.085)	-0.1185* (0.070)	-0.2559 (0.165)
<b>Constant</b>	6.1505*** (0.668)	2.9053*** (0.753)	3.3714*** (1.035)	5.1797*** (0.757)	0.4549 (0.771)	3.5227** (1.551)	-3.2898*** (1.115)	-2.2612** (0.981)	2.0536** (0.804)	-0.9987 (1.943)
<b>Observations</b>	318	318	318	318	318	318	318	318	318	285
<b>R-squared</b>	0.109	0.099	0.158	0.114	0.117	0.108	0.076	0.096	0.091	0.121

Notes: Standard errors in parentheses; Significance levels: \* significant at the 10-percent level; \*\* significant at the 5-percent level; \*\*\* significant at the 1-percent level.

†The dependent variable is the logarithmic form of the daily dietary intake for each nutrient.

††Monthly household expenditure is the logarithmic form of each households' monthly expenditure.

**Table S.9.** Impact of the School Feeding Program on Urban Children’s Consumption at Modification 2

Dependent Variable†	(1) Energy (kcal)	(2) Protein (g)	(3) Calcium (mg)	(4) Phosphorus (mg)	(5) Iron (mg)	(6) Vit. A (µg)	(7) Vit. B <sub>1</sub> (mg)	(8) Vit. B <sub>2</sub> (mg)	(9) Vit. B <sub>3</sub> (mg)	(10) Vit. C (mg)
<b>School feeding beneficiary=1</b>	-0.2027** (0.087)	-0.2027** (0.087)	-0.0866 (0.134)	-0.1751* (0.098)	-0.2194** (0.100)	-0.2859 (0.200)	-0.1436 (0.143)	-0.1250 (0.127)	-0.1767* (0.104)	-0.2257 (0.247)
<b>School day=1</b>	0.0235 (0.050)	0.0235 (0.050)	0.1470* (0.078)	0.0656 (0.057)	0.1122* (0.058)	0.3877*** (0.116)	0.0947 (0.083)	0.1077 (0.073)	0.0145 (0.061)	0.1823 (0.143)
<b>Beneficiary attended school=1</b>	0.1481 (0.120)	0.1481 (0.120)	0.2265 (0.186)	0.0300 (0.136)	0.2215 (0.139)	0.4297 (0.276)	-0.0390 (0.198)	0.0685 (0.175)	0.1019 (0.144)	0.2971 (0.330)
<b>Child’s age</b>	0.1141 (0.106)	0.1141 (0.106)	0.0168 (0.164)	0.0250 (0.120)	0.1320 (0.122)	0.0537 (0.244)	0.2922* (0.175)	0.1068 (0.154)	0.0771 (0.127)	0.6903** (0.304)
<b>Child’s age squared</b>	-0.0038 (0.005)	-0.0038 (0.005)	-0.0004 (0.008)	0.0001 (0.006)	-0.0044 (0.006)	-0.0023 (0.012)	-0.0118 (0.008)	-0.0047 (0.007)	-0.0020 (0.006)	-0.0302** (0.015)
<b>Child’s sex: female=1</b>	-0.0794* (0.047)	-0.0794* (0.047)	-0.1210* (0.073)	-0.1247** (0.053)	-0.0473 (0.054)	-0.0691 (0.108)	-0.0686 (0.078)	-0.0548 (0.068)	-0.0714 (0.057)	0.1976 (0.132)
<b>Household size</b>	-0.0194 (0.015)	-0.0194 (0.015)	-0.0785*** (0.023)	-0.0304* (0.017)	-0.0258 (0.017)	-0.0547 (0.035)	-0.0581** (0.025)	-0.0569*** (0.022)	-0.0227 (0.018)	- 0.1405*** (0.042)
<b>Boys aged 0-5 in household</b>	-0.0468 (0.050)	-0.0468 (0.050)	-0.0421 (0.078)	-0.0406 (0.057)	-0.0469 (0.058)	-0.1061 (0.116)	0.0083 (0.083)	-0.0608 (0.073)	-0.0812 (0.061)	-0.1326 (0.142)
<b>Girls aged 0-5 in household</b>	-0.0749 (0.049)	-0.0749 (0.049)	-0.0224 (0.075)	-0.0593 (0.055)	-0.0758 (0.056)	-0.1035 (0.112)	0.0685 (0.080)	-0.0337 (0.071)	-0.1194** (0.058)	-0.0474 (0.140)
<b>Sex of household head: female=1</b>	-0.0404 (0.064)	-0.0404 (0.064)	-0.0503 (0.099)	-0.0562 (0.072)	0.0135 (0.074)	0.1372 (0.147)	-0.0230 (0.105)	-0.0424 (0.093)	-0.0020 (0.077)	0.4078** (0.181)
<b>Household head’s years of education</b>	0.0051 (0.009)	0.0051 (0.009)	0.0169 (0.014)	0.0056 (0.010)	-0.0015 (0.011)	0.0305 (0.021)	0.0104 (0.015)	0.0061 (0.013)	0.0055 (0.011)	0.0263 (0.026)
<b>4Ps beneficiary=1</b>	0.0751 (0.056)	0.0751 (0.056)	0.1329 (0.086)	0.0809 (0.063)	0.0447 (0.065)	0.1715 (0.129)	0.1279 (0.092)	0.1316 (0.081)	0.0700 (0.067)	0.0640 (0.156)
<b>Monthly household expenditure††</b>	0.0715* (0.042)	0.0715* (0.042)	0.2710*** (0.065)	0.1322*** (0.047)	0.1163** (0.048)	0.1712* (0.096)	0.1369** (0.069)	0.1729*** (0.061)	0.0563 (0.050)	0.0221 (0.118)
<b>Mild household food insecurity</b>	-0.0380 (0.075)	-0.0380 (0.075)	-0.1009 (0.116)	-0.0975 (0.085)	-0.0466 (0.087)	-0.0077 (0.173)	0.1094 (0.124)	-0.0827 (0.110)	-0.0712 (0.091)	0.1952 (0.206)
<b>Moderate household food insecurity</b>	0.0017 (0.065)	0.0017 (0.065)	0.0593 (0.100)	0.0517 (0.073)	0.0123 (0.075)	-0.0101 (0.149)	0.0700 (0.107)	-0.0036 (0.094)	-0.0846 (0.078)	-0.1129 (0.182)

<b>Dependent Variable†</b>	<b>(1)</b> <b>Energy (kcal)</b>	<b>(2)</b> <b>Protein (g)</b>	<b>(3)</b> <b>Calcium (mg)</b>	<b>(4)</b> <b>Phosphorus (mg)</b>	<b>(5)</b> <b>Iron (mg)</b>	<b>(6)</b> <b>Vit. A (µg)</b>	<b>(7)</b> <b>Vit. B<sub>1</sub> (mg)</b>	<b>(8)</b> <b>Vit. B<sub>2</sub> (mg)</b>	<b>(9)</b> <b>Vit. B<sub>3</sub> (mg)</b>	<b>(10)</b> <b>Vit. C (mg)</b>
<b>Severe household food insecurity</b>	-0.0584 (0.059)	-0.0584 (0.059)	-0.0595 (0.091)	-0.0571 (0.067)	-0.0635 (0.068)	-0.0589 (0.135)	-0.0781 (0.097)	-0.1113 (0.086)	-0.1032 (0.071)	-0.2400 (0.165)
<b>Constant</b>	6.1550*** (0.677)	6.1550*** (0.677)	3.3572*** (1.047)	5.1582*** (0.765)	0.4609 (0.781)	3.4858** (1.557)	-3.2616*** (1.119)	-2.2529** (0.987)	2.0522** (0.815)	-1.0185 (1.939)
<b>Observations</b>	318	318	318	318	318	318	318	318	318	285
<b>R-squared</b>	0.103	0.103	0.148	0.113	0.109	0.108	0.073	0.092	0.083	0.119

Notes: Standard errors in parentheses; Significance levels: \* significant at the 10-percent level; \*\* significant at the 5-percent level; \*\*\* significant at the 1-percent level.

†The dependent variable is the logarithmic form of the daily dietary intake for each nutrient.

††Monthly household expenditure is the logarithmic form of each households' monthly expenditure.

**Table S.10.** Impact of the School Feeding Program on Urban Children’s Consumption at Modification 3

<b>Dependent Variable†</b>	<b>(1) Energy (kcal)</b>	<b>(2) Protein (g)</b>	<b>(3) Calcium (mg)</b>	<b>(4) Phosphorus (mg)</b>	<b>(5) Iron (mg)</b>	<b>(6) Vit. A (µg)</b>	<b>(7) Vit. B<sub>1</sub> (mg)</b>	<b>(8) Vit. B<sub>2</sub> (mg)</b>	<b>(9) Vit. B<sub>3</sub> (mg)</b>	<b>(10) Vit. C (mg)</b>
<b>School feeding beneficiary=1</b>	-0.2098** (0.087)	-0.1670* (0.098)	-0.0926 (0.135)	-0.1820* (0.099)	-0.2273** (0.100)	-0.2914 (0.200)	-0.1596 (0.148)	-0.1336 (0.128)	-0.1861* (0.105)	-0.2408 (0.245)
<b>School day=1</b>	0.0235 (0.051)	0.0272 (0.057)	0.1470* (0.078)	0.0656 (0.057)	0.1122* (0.058)	0.3877*** (0.116)	0.0947 (0.086)	0.1077 (0.074)	0.0145 (0.061)	0.1816 (0.142)
<b>Beneficiary attended school=1</b>	0.0541 (0.123)	0.0333 (0.138)	0.1999 (0.190)	-0.0787 (0.139)	0.1733 (0.141)	0.4790* (0.281)	-0.2535 (0.208)	-0.0553 (0.180)	0.0052 (0.148)	0.7047** (0.333)
<b>Child’s age</b>	0.1443 (0.107)	0.0713 (0.121)	0.0338 (0.166)	0.0589 (0.121)	0.1629 (0.124)	0.0914 (0.246)	0.3279* (0.182)	0.1262 (0.157)	0.1036 (0.129)	0.7758** (0.305)
<b>Child’s age squared</b>	-0.0051 (0.005)	-0.0015 (0.006)	-0.0010 (0.008)	-0.0014 (0.006)	-0.0057 (0.006)	-0.0040 (0.012)	-0.0132 (0.009)	-0.0054 (0.008)	-0.0030 (0.006)	-0.0341** (0.015)
<b>Child’s sex: female=1</b>	-0.0752 (0.047)	-0.0913* (0.053)	-0.1240* (0.073)	-0.1193** (0.054)	-0.0452 (0.055)	-0.0585 (0.108)	-0.0525 (0.080)	-0.0490 (0.069)	-0.0689 (0.057)	0.1845 (0.131)
<b>Household size</b>	-0.0189 (0.015)	-0.0154 (0.017)	-0.0777*** (0.023)	-0.0294* (0.017)	-0.0250 (0.017)	-0.0528 (0.035)	-0.0557** (0.026)	-0.0540** (0.022)	-0.0204 (0.018)	- 0.1455*** (0.042)
<b>Boys aged 0-5 in household</b>	-0.0622 (0.051)	-0.0946* (0.057)	-0.0579 (0.078)	-0.0591 (0.057)	-0.0659 (0.058)	-0.1257 (0.116)	-0.0334 (0.086)	-0.0909 (0.074)	-0.1068* (0.061)	-0.1404 (0.141)
<b>Girls aged 0-5 in household</b>	-0.0852* (0.049)	-0.1035* (0.055)	-0.0298 (0.076)	-0.0704 (0.055)	-0.0867 (0.056)	-0.1149 (0.112)	0.0371 (0.083)	-0.0523 (0.072)	-0.1351** (0.059)	-0.0364 (0.139)
<b>Sex of household head: female=1</b>	-0.0240 (0.064)	-0.0360 (0.072)	-0.0405 (0.099)	-0.0402 (0.073)	0.0321 (0.074)	0.1433 (0.147)	0.0082 (0.109)	-0.0312 (0.094)	0.0160 (0.077)	0.4435** (0.180)
<b>Household head’s years of education</b>	0.0050 (0.009)	0.0057 (0.010)	0.0168 (0.014)	0.0057 (0.010)	-0.0015 (0.011)	0.0313 (0.021)	0.0104 (0.016)	0.0062 (0.014)	0.0054 (0.011)	0.0266 (0.026)
<b>4Ps beneficiary=1</b>	0.0819 (0.056)	0.0520 (0.063)	0.1372 (0.087)	0.0873 (0.064)	0.0518 (0.065)	0.1828 (0.129)	0.1466 (0.095)	0.1375* (0.083)	0.0761 (0.068)	0.1031 (0.156)
<b>Monthly household expenditure††</b>	0.0703* (0.042)	0.0769 (0.047)	0.2687*** (0.065)	0.1317*** (0.047)	0.1145** (0.048)	0.1780* (0.096)	0.1321* (0.071)	0.1693*** (0.061)	0.0523 (0.050)	0.0294 (0.117)
<b>Mild household food insecurity</b>	-0.0367 (0.076)	-0.0658 (0.085)	-0.1018 (0.117)	-0.0947 (0.086)	-0.0444 (0.087)	0.0051 (0.173)	0.1181 (0.128)	-0.0794 (0.111)	-0.0708 (0.091)	0.1982 (0.204)
<b>Moderate household food insecurity</b>	-0.0038 (0.065)	0.0202 (0.073)	0.0565 (0.101)	0.0454 (0.074)	0.0065 (0.075)	-0.0039 (0.149)	0.0682 (0.110)	-0.0051 (0.095)	-0.0960 (0.078)	-0.1111 (0.181)

<b>Dependent Variable†</b>	<b>(1)</b> <b>Energy (kcal)</b>	<b>(2)</b> <b>Protein (g)</b>	<b>(3)</b> <b>Calcium (mg)</b>	<b>(4)</b> <b>Phosphorus (mg)</b>	<b>(5)</b> <b>Iron (mg)</b>	<b>(6)</b> <b>Vit. A (µg)</b>	<b>(7)</b> <b>Vit. B<sub>1</sub> (mg)</b>	<b>(8)</b> <b>Vit. B<sub>2</sub> (mg)</b>	<b>(9)</b> <b>Vit. B<sub>3</sub> (mg)</b>	<b>(10)</b> <b>Vit. C (mg)</b>
<b>Severe household food insecurity</b>	-0.0702 (0.059)	-0.0770 (0.067)	-0.0673 (0.092)	-0.0711 (0.067)	-0.0752 (0.068)	-0.0626 (0.136)	-0.0919 (0.101)	-0.1237 (0.087)	-0.1211* (0.071)	-0.2351 (0.165)
<b>Constant</b>	6.0130*** (0.684)	2.7526*** (0.771)	3.2888*** (1.059)	4.9880*** (0.775)	0.3180 (0.789)	3.2109** (1.569)	-3.4039*** (1.160)	-2.3249** (1.003)	1.9461** (0.824)	-1.5262 (1.939)
<b>Observations</b>	316	316	316	316	316	316	316	316	316	283
<b>R-squared</b>	0.115	0.099	0.147	0.125	0.115	0.115	0.090	0.096	0.100	0.154

Notes: Standard errors in parentheses; Significance levels: \* significant at the 10-percent level; \*\* significant at the 5-percent level; \*\*\* significant at the 1-percent level.

†The dependent variable is the logarithmic form of the daily dietary intake for each nutrient.

††Monthly household expenditure is the logarithmic form of each households' monthly expenditure.

**Table S.11.** Impact of the School Feeding Program on Urban Children’s Consumption at Modification 4

Dependent Variable†	(1) Energy (kcal)	(2) Protein (g)	(3) Calcium (mg)	(4) Phosphorus (mg)	(5) Iron (mg)	(6) Vit. A (µg)	(7) Vit. B <sub>1</sub> (mg)	(8) Vit. B <sub>2</sub> (mg)	(9) Vit. B <sub>3</sub> (mg)	(10) Vit. C (mg)
<b>School feeding beneficiary=1</b>	-0.2109** (0.087)	-0.1690* (0.099)	-0.0938 (0.135)	-0.1838* (0.099)	-0.2286** (0.101)	-0.2935 (0.200)	-0.1603 (0.148)	-0.1353 (0.128)	-0.1877* (0.105)	-0.2415 (0.245)
<b>School day=1</b>	0.0235 (0.051)	0.0272 (0.057)	0.1470* (0.078)	0.0656 (0.057)	0.1122* (0.058)	0.3877*** (0.116)	0.0947 (0.086)	0.1077 (0.074)	0.0145 (0.061)	0.1815 (0.141)
<b>Beneficiary attended school=1</b>	0.0441 (0.121)	0.0312 (0.136)	0.1804 (0.186)	-0.0841 (0.137)	0.1605 (0.139)	0.5041* (0.276)	-0.2496 (0.204)	-0.0674 (0.177)	-0.0328 (0.146)	0.6800** (0.327)
<b>Child’s age</b>	0.1283 (0.106)	0.0480 (0.120)	0.0303 (0.164)	0.0375 (0.121)	0.1500 (0.123)	0.0673 (0.243)	0.3102* (0.180)	0.1157 (0.156)	0.0946 (0.128)	0.7479** (0.300)
<b>Child’s age squared</b>	-0.0042 (0.005)	-0.0003 (0.006)	-0.0008 (0.008)	-0.0003 (0.006)	-0.0050 (0.006)	-0.0027 (0.012)	-0.0123 (0.009)	-0.0049 (0.007)	-0.0026 (0.006)	-0.0326** (0.014)
<b>Child’s sex: female=1</b>	-0.0781* (0.047)	-0.0949* (0.053)	-0.1222* (0.073)	-0.1229** (0.054)	-0.0462 (0.054)	-0.0624 (0.108)	-0.0563 (0.080)	-0.0482 (0.069)	-0.0683 (0.057)	0.1796 (0.130)
<b>Household size</b>	-0.0188 (0.015)	-0.0153 (0.017)	-0.0788*** (0.023)	-0.0293* (0.017)	-0.0254 (0.017)	-0.0521 (0.035)	-0.0551** (0.026)	-0.0549** (0.022)	-0.0218 (0.018)	- 0.1440*** (0.042)
<b>Boys aged 0-5 in household</b>	-0.0628 (0.051)	-0.0954* (0.057)	-0.0553 (0.078)	-0.0598 (0.057)	-0.0651 (0.058)	-0.1285 (0.116)	-0.0351 (0.086)	-0.0889 (0.074)	-0.1035* (0.061)	-0.1432 (0.141)
<b>Girls aged 0-5 in household</b>	-0.0870* (0.049)	-0.1067* (0.055)	-0.0307 (0.075)	-0.0732 (0.055)	-0.0886 (0.056)	-0.1192 (0.112)	0.0352 (0.083)	-0.0543 (0.071)	-0.1362** (0.059)	-0.0394 (0.138)
<b>Sex of household head: female=1</b>	-0.0267 (0.064)	-0.0397 (0.072)	-0.0388 (0.099)	-0.0439 (0.073)	0.0306 (0.074)	0.1388 (0.147)	0.0038 (0.109)	-0.0305 (0.094)	0.0169 (0.077)	0.4367** (0.179)
<b>Household head’s years of education</b>	0.0049 (0.009)	0.0056 (0.010)	0.0168 (0.014)	0.0056 (0.010)	-0.0016 (0.011)	0.0312 (0.021)	0.0103 (0.016)	0.0062 (0.014)	0.0053 (0.011)	0.0262 (0.026)
<b>4Ps beneficiary=1</b>	0.0862 (0.056)	0.0595 (0.063)	0.1438* (0.087)	0.0939 (0.064)	0.0578 (0.065)	0.1876 (0.128)	0.1485 (0.095)	0.1456* (0.082)	0.0859 (0.068)	0.0983 (0.155)
<b>Monthly household expenditure††</b>	0.0696* (0.042)	0.0758 (0.047)	0.2699*** (0.065)	0.1307*** (0.048)	0.1145** (0.048)	0.1757* (0.096)	0.1307* (0.071)	0.1700*** (0.061)	0.0537 (0.051)	0.0256 (0.117)
<b>Mild household food insecurity</b>	-0.0358 (0.076)	-0.0651 (0.085)	-0.0986 (0.117)	-0.0946 (0.086)	-0.0430 (0.087)	0.0050 (0.173)	0.1178 (0.128)	-0.0754 (0.111)	-0.0682 (0.091)	0.1973 (0.204)
<b>Moderate household food insecurity</b>	-0.0006 (0.065)	0.0252 (0.074)	0.0619 (0.101)	0.0497 (0.074)	0.0110 (0.075)	-0.0009 (0.149)	0.0696 (0.110)	0.0010 (0.095)	-0.0885 (0.079)	-0.1126 (0.180)



<b>Dependent Variable†</b>	<b>(1)</b> <b>Energy (kcal)</b>	<b>(2)</b> <b>Protein (g)</b>	<b>(3)</b> <b>Calcium (mg)</b>	<b>(4)</b> <b>Phosphorus (mg)</b>	<b>(5)</b> <b>Iron (mg)</b>	<b>(6)</b> <b>Vit. A (µg)</b>	<b>(7)</b> <b>Vit. B<sub>1</sub> (mg)</b>	<b>(8)</b> <b>Vit. B<sub>2</sub> (mg)</b>	<b>(9)</b> <b>Vit. B<sub>3</sub> (mg)</b>	<b>(10)</b> <b>Vit. C (mg)</b>
<b>Severe household food insecurity</b>	-0.0632 (0.059)	-0.0665 (0.067)	-0.0597 (0.091)	-0.0619 (0.067)	-0.0671 (0.068)	-0.0547 (0.135)	-0.0870 (0.100)	-0.1134 (0.087)	-0.1101 (0.071)	-0.2338 (0.163)
<b>Constant</b>	6.0968*** (0.680)	2.8726*** (0.768)	3.2952*** (1.051)	5.1002*** (0.772)	0.3801 (0.784)	3.3430** (1.556)	-3.3062*** (1.151)	-2.2811** (0.996)	1.9799** (0.821)	-1.3620 (1.918)
<b>Observations</b>	318	318	318	318	318	318	318	318	318	285
<b>R-squared</b>	0.115	0.100	0.146	0.126	0.114	0.117	0.089	0.096	0.100	0.150

Notes: Standard errors in parentheses; Significance levels: \* significant at the 10-percent level; \*\* significant at the 5-percent level; \*\*\* significant at the 1-percent level.

†The dependent variable is the logarithmic form of the daily dietary intake for each nutrient.

††Monthly household expenditure is the logarithmic form of each households' monthly expenditure.

**Table S.12.** Impact of the School Feeding Program on Urban Children’s Consumption at Modification 5

<b>Dependent Variable†</b>	<b>(1) Energy (kcal)</b>	<b>(2) Protein (g)</b>	<b>(3) Calcium (mg)</b>	<b>(4) Phosphorus (mg)</b>	<b>(5) Iron (mg)</b>	<b>(6) Vit. A (µg)</b>	<b>(7) Vit. B<sub>1</sub> (mg)</b>	<b>(8) Vit. B<sub>2</sub> (mg)</b>	<b>(9) Vit. B<sub>3</sub> (mg)</b>	<b>(10) Vit. C (mg)</b>
<b>School feeding beneficiary=1</b>	-0.2110** (0.087)	-0.1687* (0.098)	-0.0939 (0.135)	-0.1837* (0.099)	-0.2286** (0.100)	-0.2936 (0.199)	-0.1599 (0.147)	-0.1353 (0.128)	-0.1872* (0.105)	-0.2423 (0.245)
<b>School day=1</b>	0.0235 (0.051)	0.0272 (0.057)	0.1470* (0.078)	0.0656 (0.057)	0.1122* (0.058)	0.3877*** (0.116)	0.0947 (0.085)	0.1077 (0.074)	0.0145 (0.061)	0.1815 (0.141)
<b>Beneficiary attended school=1</b>	0.0869 (0.120)	0.0757 (0.136)	0.1979 (0.186)	-0.0421 (0.137)	0.1943 (0.139)	0.5140* (0.276)	-0.2156 (0.203)	-0.0436 (0.176)	0.0209 (0.145)	0.7450** (0.327)
<b>Child’s age</b>	0.1298 (0.106)	0.0494 (0.120)	0.0308 (0.164)	0.0391 (0.120)	0.1510 (0.122)	0.0680 (0.243)	0.3112* (0.179)	0.1162 (0.156)	0.0952 (0.128)	0.7475** (0.300)
<b>Child’s age squared</b>	-0.0043 (0.005)	-0.0003 (0.006)	-0.0008 (0.008)	-0.0004 (0.006)	-0.0051 (0.006)	-0.0027 (0.012)	-0.0123 (0.009)	-0.0049 (0.007)	-0.0026 (0.006)	-0.0326** (0.014)
<b>Child’s sex: female=1</b>	-0.0779* (0.047)	-0.0945* (0.053)	-0.1222* (0.073)	-0.1223** (0.053)	-0.0465 (0.054)	-0.0628 (0.108)	-0.0570 (0.080)	-0.0488 (0.069)	-0.0679 (0.057)	0.1782 (0.130)
<b>Household size</b>	-0.0189 (0.015)	-0.0154 (0.017)	-0.0787*** (0.023)	-0.0292* (0.017)	-0.0254 (0.017)	-0.0521 (0.035)	-0.0553** (0.025)	-0.0548** (0.022)	-0.0214 (0.018)	- 0.1436*** (0.042)
<b>Boys aged 0-5 in household</b>	-0.0630 (0.051)	-0.0951* (0.057)	-0.0555 (0.078)	-0.0602 (0.057)	-0.0655 (0.058)	-0.1284 (0.116)	-0.0336 (0.085)	-0.0889 (0.074)	-0.1048* (0.061)	-0.1449 (0.141)
<b>Girls aged 0-5 in household</b>	-0.0869* (0.049)	-0.1062* (0.055)	-0.0307 (0.075)	-0.0732 (0.055)	-0.0881 (0.056)	-0.1185 (0.111)	0.0369 (0.082)	-0.0536 (0.071)	-0.1364** (0.059)	-0.0395 (0.138)
<b>Sex of household head: female=1</b>	-0.0256 (0.064)	-0.0387 (0.072)	-0.0385 (0.099)	-0.0431 (0.073)	0.0311 (0.074)	0.1385 (0.147)	0.0036 (0.108)	-0.0310 (0.094)	0.0170 (0.077)	0.4351** (0.179)
<b>Household head’s years of education</b>	0.0050 (0.009)	0.0057 (0.010)	0.0168 (0.014)	0.0057 (0.010)	-0.0015 (0.011)	0.0311 (0.021)	0.0104 (0.016)	0.0062 (0.013)	0.0057 (0.011)	0.0263 (0.026)
<b>4Ps beneficiary=1</b>	0.0866 (0.056)	0.0591 (0.063)	0.1440* (0.087)	0.0937 (0.064)	0.0581 (0.065)	0.1885 (0.128)	0.1489 (0.095)	0.1461* (0.082)	0.0850 (0.068)	0.1014 (0.155)
<b>Monthly household expenditure††</b>	0.0699* (0.042)	0.0762 (0.047)	0.2698*** (0.065)	0.1308*** (0.047)	0.1146** (0.048)	0.1759* (0.096)	0.1314* (0.071)	0.1700*** (0.061)	0.0541 (0.051)	0.0255 (0.117)
<b>Mild household food insecurity</b>	-0.0360 (0.075)	-0.0644 (0.085)	-0.0988 (0.117)	-0.0939 (0.086)	-0.0427 (0.087)	0.0043 (0.173)	0.1179 (0.127)	-0.0767 (0.110)	-0.0662 (0.091)	0.1946 (0.204)
<b>Moderate household food insecurity</b>	-0.0005 (0.065)	0.0255 (0.073)	0.0615 (0.101)	0.0493 (0.074)	0.0109 (0.075)	-0.0017 (0.149)	0.0693 (0.110)	0.0004 (0.095)	-0.0887 (0.078)	-0.1128 (0.180)

<b>Dependent Variable†</b>	<b>(1)</b> <b>Energy (kcal)</b>	<b>(2)</b> <b>Protein (g)</b>	<b>(3)</b> <b>Calcium (mg)</b>	<b>(4)</b> <b>Phosphorus (mg)</b>	<b>(5)</b> <b>Iron (mg)</b>	<b>(6)</b> <b>Vit. A (µg)</b>	<b>(7)</b> <b>Vit. B<sub>1</sub> (mg)</b>	<b>(8)</b> <b>Vit. B<sub>2</sub> (mg)</b>	<b>(9)</b> <b>Vit. B<sub>3</sub> (mg)</b>	<b>(10)</b> <b>Vit. C (mg)</b>
<b>Severe household food insecurity</b>	-0.0632 (0.059)	-0.0663 (0.067)	-0.0603 (0.091)	-0.0623 (0.067)	-0.0673 (0.068)	-0.0556 (0.135)	-0.0861 (0.100)	-0.1144 (0.086)	-0.1096 (0.071)	-0.2337 (0.163)
<b>Constant</b>	6.0853*** (0.680)	2.8604*** (0.767)	3.2931*** (1.050)	5.0888*** (0.770)	0.3730 (0.783)	3.3380** (1.555)	-3.3195*** (1.147)	-2.2839** (0.994)	1.9691** (0.820)	-1.3592 (1.917)
<b>Observations</b>	318	318	318	318	318	318	318	318	318	285
<b>R-squared</b>	0.114	0.099	0.147	0.122	0.116	0.117	0.087	0.095	0.097	0.155

Notes: Standard errors in parentheses; Significance levels: \* significant at the 10-percent level; \*\* significant at the 5-percent level; \*\*\* significant at the 1-percent level.

†The dependent variable is the logarithmic form of the daily dietary intake for each nutrient.

††Monthly household expenditure is the logarithmic form of each households' monthly expenditure.