

How Effective Are Food-for-Education Programs? A Critical Reassessment

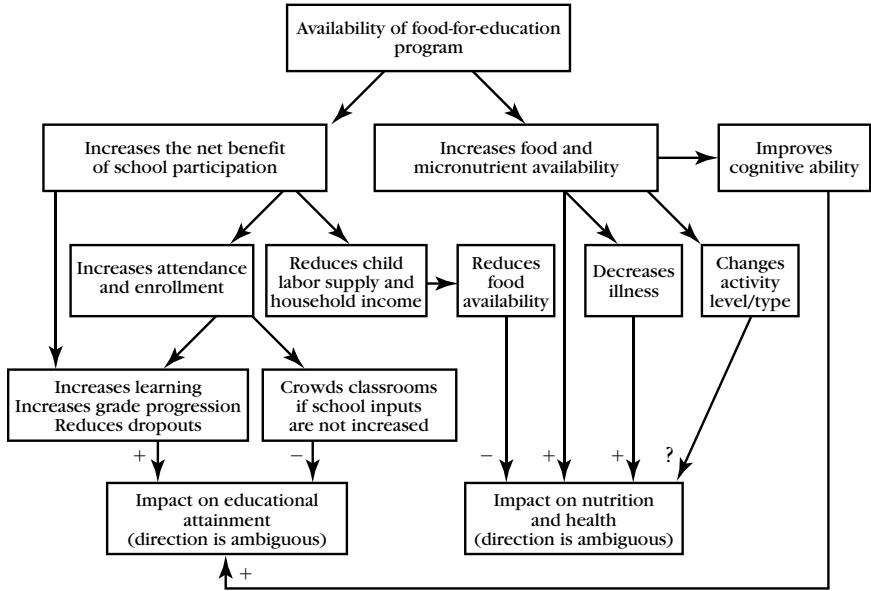
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Education and child health are important tools for poverty reduction and economic development. With the recent focus on universal primary education as a Millennium Development Goal, many developing countries have made dramatic improvements in primary school enrollment rates, but the rates of primary school attendance and secondary school participation remain low. One reason is that school-age children in poor households are often needed to work on the farm or to care for younger siblings so that parents can work. Another reason is that poor health and short-term hunger cause children to miss school. Children who are hungry during school also learn less effectively.

Food-for-education (FFE) programs, which include meals served to children in school as well as take-home rations conditioned on a child's school attendance, are a popular means of improving school participation while fostering learning and supplementing the inadequate diets of school-age children. When the meals provided are well timed, they can reduce short-term hunger and help children concentrate and learn. The food is often fortified, which helps address nutritional deficiencies and may improve health and cognitive functioning.

Figure 23.1 shows the pathways through which FFE programs may affect participants' education and nutrition outcomes. FFE programs raise the benefits of school participation, increasing enrollment and attendance. This may improve learning and educational achievement, which may be bolstered by improved nutrition and cognitive function. FFE programs may improve nutrition and health

Figure 23.1 Potential benefits of food-for-education programs



Source: Devised by the authors.

by directly increasing household food availability, but the net effect on nutrition could be negative if the family loses income because the child is spending more time in school and less time in productive activities. If an FFE program is not accompanied by increased school capacity, classrooms may be crowded, negatively affecting learning. Therefore, negative effects on both education and nutrition are possible. However, the evidence suggests that the effects on education are positive for most children. One possible exception is that children who were already attending school may suffer negative peer effects—the impact of lower-ability children joining school. The impact on nutrition also appears to be positive, depending on the quantity and quality of the food provided, but the gains may be small relative to nutrition interventions in the first two years of life.

Despite these potential benefits, FFE programs have recently come under attack by some donors and policymakers, who contend that these programs are an expensive method for producing the stated education and nutrition objectives and that there are other more cost-effective mechanisms that could be used. The empirical evidence on these claims is mixed and can be misleading. One reason is that most evaluations of FFE programs fail to account for both the education and nutrition impacts of the programs and for the potential joint benefits of feeding hungry children during school. As a result, aggregate impacts can appear modest.

Also, many impact evaluations fail to consider program costs. Indeed, there have been few comprehensive and rigorous studies of the cost-effectiveness of FFE programs. Another common critique is that FFE programs often fail in implementation because of unreliable food availability or disorganized meals that disrupt learning. There are examples to support these claims, but the solution is usually one of implementation rather than program design. The remainder of this chapter describes the scope and type of FFE programs in operation today, providing a critical assessment of the evidence on their impact and cost-effectiveness and concluding with policy implications and a call for more careful collection of evidence.

The Scope and Type of Today's FFE Programs

It is difficult to know the full scope of FFE programs in developing countries, but a summary of the programs currently operated by the World Food Programme (WFP) of the United Nations (UN), likely the world's largest multicountry provider of in-school meals and take-home rations, gives a good indication of the typology and popularity of FFE programs. WFP's FFE programs reached 21.6 million children in 72 countries in 2005. In addition to in-school meals and take-home rations, WFP sometimes provides fortified biscuits for distribution at school. Nearly half of the WFP programs combine these modalities of linking food to school participation. In 24 percent of participating schools, only fortified biscuits are provided, while 22 percent of program schools offer only on-site meals, and 6 percent provide take-home rations exclusively. On average, in-school meals provide 876 kilocalories (kcal) of food energy per child per day, while biscuits provide 313 kcal of energy.

The average cost to WFP of running its FFE programs in 2005 was US\$15.79 per child per year. The cost of on-site meals alone was slightly higher, while that of biscuits averaged US\$9.00 per child. For take-home rations, the annual average cost was much higher, US\$30.00 per child, due to transport costs and differences in food bundles. WFP also supports complementary activities to improve child health. For example, deworming is provided in 56 percent of WFP-assisted schools, micronutrient supplements in 40 percent of schools, and hand-washing facilities in half of schools. In some cases, WFP partners with nongovernmental organizations, national governments, or other UN agencies to provide complementary school facilities and services.

A Critical Review of the Evidence on Education and Nutrition Impacts

The empirical literature on the impacts of FFE programs on education and nutrition outcomes is substantial. The education outcomes considered include school participation, measured by enrollment and attendance; grades completed or dropout rates;

learning achievement; and cognitive development. Nutrition outcomes include food energy consumption, anthropometry, and micronutrient status. However, the number of studies with experimental or quasi-experimental evidence capable of providing causal impact estimates is relatively small. The nutrition literature offers many more experimental studies on nutrition outcomes than are available in the economics literature on education outcomes. However, many of the nutrition studies are controlled trials conducted in closely managed conditions, making it difficult to ascertain how these programs would fare in practice in a more typical setting. The number of experimental field studies for any outcome is small but growing. From the existing literature it is possible to draw conclusions about the likely impact of FFE programs on some outcomes, while for others the literature is inconclusive. The following summary presents the evidence for school participation, learning achievement, cognitive development, caloric intake, anthropometry, and micronutrient status, focusing on the studies with the strongest methodology for identifying causal impacts.

Both randomized trials and field experiments demonstrate a small causal impact of in-school meals on school attendance among children already enrolled in school. However, most studies do not test for the effect of in-school meals on net primary school attendance (attendance among children already enrolled and those not enrolled prior to the program) or enrollment rates for all school-age children living in the service area of a school. Thus, most impact estimates reported in the literature could greatly underestimate the full participation effects of these programs, particularly in areas where rates of pre-program enrollment were low. The best recent evidence on net attendance and enrollment comes from a nonexperimental study in Bangladesh. This study found a strong association between in-school feeding and net primary school attendance, but the estimated relationship was not causal. The only study found on the effect of take-home rations on net school attendance and enrollment, also in Bangladesh, provides some support for a moderate impact.

The evidence for learning achievement is less conclusive. While two studies detected an impact of school feeding on students' test scores, each found a significant impact in only one of three tests. One study, in Bangladesh, found a significant impact on mathematics scores but no impact on English scores, while the other, in the Philippines, found the reverse. Neither study identified whether the gains in learning attributed to in-school meals operated through improved learning efficiency or increased school participation.

FFE programs may also have an impact on cognitive development; however, empirical evidence on the effects of in-school meals is mixed and depends on the tests used, the content of the meals, and the initial nutritional status of the children. Nonetheless, a randomized trial in Kenyan primary schools found evidence that school meals improve arithmetic abilities and that meals rich in animal-source

foods improve arithmetic and perceptual function in Kenyan children. Another study demonstrated the effect of breakfast on the cognitive function of nutritionally at-risk Jamaican students. However, all of the evidence collected thus far comes from highly controlled experiments, so it is difficult to determine whether the same impacts would be found in a less controlled setting.

For nutrition outcomes, most of the evidence comes from randomized, controlled, in-school feeding trials, though some recent studies in the economics literature employed quasi-experimental field evaluations to assess changes in energy consumption. In-school feeding programs appear to show greater potential to improve children's total daily macronutrient consumption when children's baseline consumption is well below age- or weight-recommended consumption levels. FFE programs may also improve the quality of children's diets, if not the quantity. Part of the same Kenyan study detected significant increases in micronutrient intake even among children whose overall food energy (calorie) consumption did not increase.¹

FFE programs also show the potential to increase children's body size and muscle mass, though it is unclear whether the benefits are derived from increased energy intake or the provision of micronutrient-rich foods. Moreover, there is virtually no evidence on how in-school feeding affects children's activity levels, which could ultimately impact anthropometric outcomes. Given sufficient treatment duration, the evidence shows that small increases in weight or body mass index can result from school feeding. However, increases in height and body composition have been detected only when micronutrient-fortified or animal-source foods are provided. Deworming treatments can also improve the nutritional benefits of school feeding. A controlled trial in South Africa found that deworming interacts positively with iron-fortified school meals to significantly affect several measures of anthropometry depending on initial iron status. The combined treatment had larger effects than either deworming or fortified meals alone. No study was found that tested for a causal effect of take-home rations on student anthropometric status.

The evidence that FFE programs have an impact on children's micronutrient status is sparse, though the available evidence does show some potential for improvement of their status with regard to some micronutrients. Most evidence suggests that iron-fortified school meals improve children's iron status compared with unfortified meals; children with low baseline iron stores or higher iron demands may benefit more. However, improvements in iron status were not detected among Kenyan children receiving iron-rich, animal-source foods. The evidence is even less conclusive for other micronutrients. While beta-carotene and iodine fortification does improve vitamin A and iodine status in South African primary school students, the Kenyan study found no improvement in vitamin A status among students consuming foods rich in vitamin A. In fact, this study detected a positive impact only for vitamin B-12, although foods rich in vitamin A, vitamin B-12, riboflavin, and zinc were

provided and a high baseline prevalence of deficiencies in these micronutrients was reported. The presence of malaria or other infections may impede detection of these benefits, particularly with respect to iron status.

Policy Implications

There is a reasonable consensus among those experienced in managing and studying FFE programs that in-school meals increase primary school participation. Where calorie intakes are low, providing meals at school has a unique ability to attract children. However, careful estimates of the size of the causal impact of in-school meals on school enrollment and attendance rates for all children living in the service area of a school are still not available, making it difficult to assess the cost-effectiveness of these programs, even for this primary objective. The evidence on secondary program objectives is mixed, but there is potential for impacts on learning achievement, cognitive development, individual food consumption, anthropometry, and micronutrient status. An important finding that deserves further study is the complementary impact on anthropometry of in-school meals coupled with deworming.

Despite this evidence on the impacts of FFE programs, there is very little rigorously produced evidence on the central policy question of cost-effectiveness: Do FFE programs yield higher impacts per dollar spent than alternative programs? No study has provided a thorough analysis of FFE program impacts across all of the outcomes considered here to obtain a complete impact measure on which to base a comprehensive estimate of program cost-effectiveness. FFE programs typically appear expensive relative to other programs targeted at fewer outcomes. For example, providing daily meals at school is certainly a more expensive way of increasing learning achievement than providing textbooks to students, but such a narrow comparison is incomplete. The difficulty in evaluating the cost-effectiveness of FFE programs is in aggregating impacts across various education and nutrition outcomes in common terms, such as gains in future income. Though difficult, such an analysis is certainly feasible.

Cost-effectiveness studies of FFE programs are also complicated by the fact that the main source of food for many such programs is food aid, which is provided free or below market cost. In the short run, a cost-effectiveness analysis could treat the food aid as free to the program, but this approach to financing the food transfers also reduces the sustainability of these programs. More accurate cost-effectiveness measures would capture the complete cost of funding and operating the programs. Because of concerns about sustainability and effects on local markets, “home-grown” school feeding programs that obtain food from local sources are now being considered in many countries. However, this approach faces other significant chal-

lenges, such as maintaining a reliable food source and developing systems to fortify the food with micronutrients as needed.

Another approach to measuring the cost-effectiveness of FFE programs is to conduct side-by-side field experiments with alternative programs. Little research of this type has been undertaken. One exception was a randomized field experiment from the Philippines that compared the education impact of in-school meals to that of programs that provided teaching materials, fostered parent–teacher communication, or both. The program that combined teaching materials with improved parent–teacher communication was most cost-effective, though this study was hampered by a small sample and only limited measures of education outcomes. To make this comparison more accurate, only part of the cost of the FFE program should have been attributed to the education outcomes in the cost-effectiveness measures, because school-based education interventions do not typically affect nutrition. Still, this type of side-by-side field experiment provides some of the best evidence of relative cost-effectiveness. Given the current level of expenditure on FFE programs and the tenor of the debate on their effectiveness, more careful evaluation studies are needed.

Note

1. For this study, vitamin B-12 concentrations significantly increased in children fed a meat or milk meal; the prevalence of severe plus moderate deficiency fell from 80.7 percent at baseline to 64.1 percent in the meat group and from 71.6 percent to 45.1 percent in the milk group. See J. H. Siekmann, L. H. Allen, N. O. Bwibo, M. W. Demment, S. P. Murphy, and C. G. Neumann, Kenyan school children have multiple micronutrient deficiencies, but increased plasma vitamin B-12 is the only detectable micronutrient response to meat or milk supplementation, *Journal of Nutrition* 133, no. 11 (2003): 3972S–80S.

For Further Reading

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