

CHAPTER 3

Why Implement School Feeding?

There are three main reasons why countries may choose to implement school feeding programs: to address social needs and to provide a social safety net during crises; to improve learning and educational outcomes; and to enhance nutrition. The analyses below show that the evidence of benefit is particularly strong for safety nets and for education and that the responses in both of these sectors appear to contribute to gender equity.

School Feeding as a Safety Net

School feeding programs are often used for social protection purposes as much as or more than for education goals. The programs provide an explicit or implicit transfer to households of the value of the food distributed, with the value of the transfer varying significantly from in-school snacks at the lower end and large take-home rations at the upper end of the spectrum. Here we consider some of the key issues in assessing the benefits of school feeding programs versus other forms of social safety nets.

Adequacy

Safety net programs are most effective if they provide a meaningful level of transfer to the population they are trying to assist. In the conditional

cash transfer programs with the largest impacts, the transfer value is of the order of 20 percent of household base income, and social pensions programs often provide transfers of a similar order of magnitude. Less generous programs, including child allowances and programs of last resort, generally provide a transfer that is some 10 percent of household base income (Grosh et al. 2008).

The value of transfer of in-school meals appears to fall in the range of transfer common for other safety net programs. The value of school feeding to the household as a percentage of household base income is rarely reported, but a back-of-the-envelope calculation can give us an approximate range that may be plausible. A family wishes their children to eat three meals a day, or 1,095 meals a year. The school year may be 180 days, and the program will serve one meal per school day. Thus, a child may receive about 16 percent of his or her meals at school. The share in total income for the family will be less, because even poor families must spend on things other than food. Assuming that a generous two-thirds of their expenditure goes to food, and that the schoolchild eats an average amount per person for the family, the program might supply about 10 percent of household expenditure for each child who participates, a not inconsequential sum, especially as some families will have more than one child participating. Furthermore, a study in the Philippines indicates that child caloric intake shows virtually no impact on intrahousehold reallocation of calories, and that in that setting, the individual child benefited from the meal (Jacoby 2002). Take-home rations are not constrained by the amount of food a single child would customarily eat in a single sitting, and so can provide still larger transfers.

Reaching the Poor

To be effective, safety net programs must reach the poor. School feeding programs face challenges in reaching the poorest wherever enrollment is less than universal because enrollment rates are always lowest among the poorest. The importance of this issue is context specific. In urban Botswana, for example, enrollment is effectively universal and the potential errors of exclusion resulting from children not being in school are hardly a concern. But quite the opposite is true in rural Mali, where fewer than half the children attend school, so in-school feeding programs will potentially miss most of the poorest children and errors of exclusion are large. There are also important gender dimensions, because in many, though not all, settings girls are less likely to be enrolled than boys. These errors of exclusion are likely to increase with age and level of education,

because first grade enrollment is always higher than that of higher grades, and by the upper secondary grades, enrollment is often much less than half of first grade enrollment and highly skewed to the better-off children. School feeding programs themselves contribute to enhanced enrollment, so the potential for exclusion may change as the programs are implemented.

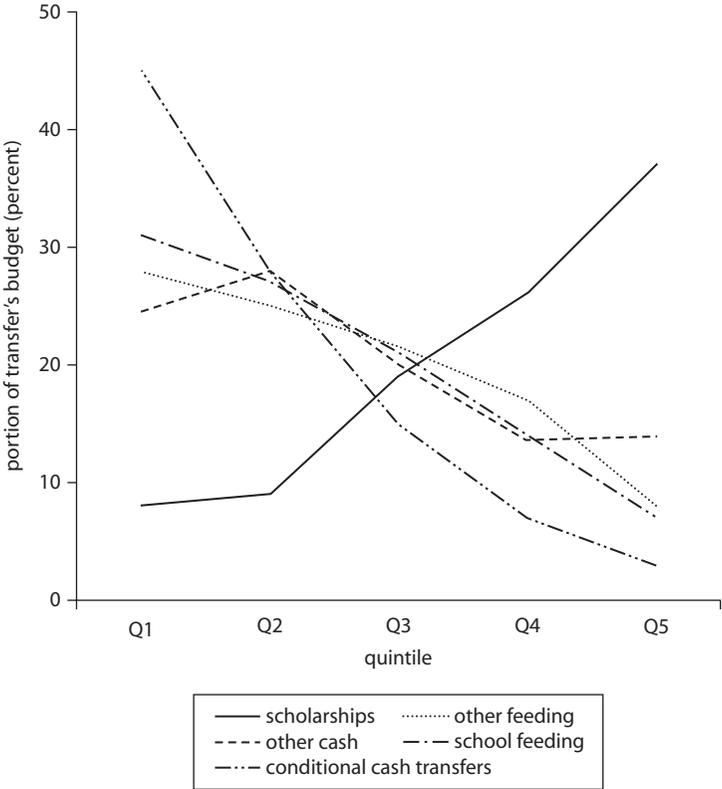
Safety net programs also often try to concentrate their benefits on the neediest to provide maximum resources to them within a constrained budget. This leads to the concept that it is an “error of inclusion” to provide benefits to those who are not poor.

Geographic targeting—including some districts or schools but not others—is ubiquitous in school feeding programs. In-school meals are usually served to all children in the school including non-needy children, to avoid issues of logistics, jealousies, or stigma that might arise if only some children are fed. Where such programs are relatively small, geographic targeting can be powerful and result in most of the benefits going to the poor. A program that serves 10 percent of schools and is placed only in the poorest districts would have few errors of inclusion. But as coverage increases and grows toward universal, school feeding programs will include higher portions of nonpoor children. Take-home rations are sometimes targeted to individual households within schools and have the potential to be more finely targeted and have less direct trade-offs between coverage and errors of inclusion. Like most other targeting, however, this may also result in issues of logistics, jealousies, or stigma.

Because of these factors, the distribution of benefits from school feeding programs often favor the poor over the nonpoor; that is, they differentially benefit the poor, but less than programs that use household targeting systems. Figure 3.1 compares in-school feeding, which is geographically targeted, and conditional cash transfer programs in Latin America, which use household targeting systems (often complemented by geographic targeting). The analysis shows that in-school feeding programs are progressive, in contrast to scholarships in this setting, and provide targeting outcomes that are similar to those of other cash and food interventions, but less effective than conditional cash transfer programs. This type of analysis should be used routinely to assess which of the range of possible safety net options is most appropriate in the local context.

There is less comparative evidence elsewhere, and a particular need for studies to explore the performance of social safety net instruments in low-income settings in Africa, where other safety net options, especially conditional cash transfer programs, tend to be small and rare, and where

Figure 3.1 Targeting Results from Latin America and the Caribbean: School-Related Social Assistance Programs



Source: Lindert et al. 2006.

Note: Absolute incidence of school-related social assistance instruments in Latin America and the Caribbean. Absolute incidence is a measure of the portion of the transfer's budget that reaches each income quintile of the population. Quintile 1 is the poorest, and quintile 5 is the richest.

school feeding programs are often part of a very limited choice of immediately available social protection instruments.

Cost-Effectiveness

School feeding programs have rather high nontransfer costs compared with other safety net programs. This is largely because all programs must transport and store food, an inherently costly proposition. Programs that serve hot meals must also cook the food, which implies additional labor costs and the provision of at least minimal equipment and infrastructure

for this purpose. These costs can run substantially higher than those for cash transfer programs. Median administrative costs for cash transfers are 9 percent, but 21 percent for all food programs.

The administrative costs of school feeding programs vary by modality. The nonfood costs of on-site meals are quite high as a result of preparation, transportation, and handling. In one analysis, administrative costs were found to account for 30 percent (range 10 percent to 55 percent) of total program costs (Grosh et al. 2008), while an analysis of the costs of programs in Kenya, Lesotho, Malawi, and The Gambia finds administrative costs of 40 percent (Galloway et al. forthcoming). Programs delivering snacks have lower nonfood costs of about 20 percent, according to analysis in Bangladesh, India, and Indonesia (Gelli et al. forthcoming). Take-home rations may have administrative costs of greater than 35 percent (Ahmed et al. 2007) because they require transportation of relatively larger quantities of food and require monitoring of student attendance to determine eligibility, but there is a specific lack of cost data on take-home rations. More details on costs of school feeding programs can be found in chapter 4.

Incentive Compatibility and Long-Term Benefits

Safety net programs try not to disrupt recipient household's choices about time use and labor in ways that would lower their income. On the contrary, where possible they aim to help households increase their independent welfare. With school feeding programs the objective of increasing independence is sought by encouraging the participation of children in education and, where possible, by promoting their learning. This will not immediately increase household income, and may in fact reduce income by making the children unavailable for work, but in the long run additional schooling should increase the child's income as an adult and help interrupt the intergenerational cycle of poverty. Thus, school feeding programs are among the several safety net programs that can have significant long-term benefits beyond the value of the immediate transfer.

Table 3.1 reviews the key criteria used to judge safety net policy (see Grosh, del Ninno, and Tesliuc 2008 for further discussion of these criteria) and applies them to school feeding programs.

Take-Home Rations versus In-School Meals

A recurrent theme throughout this consideration of school feeding as social safety net programs is that take-home rations and in-school meals are different in both their inputs and outcomes. Take-home rations can be

Table 3.1 To What Extent Is School Feeding a Good Safety Net?

<i>Criteria</i>	<i>Definition</i>	<i>School feeding modalities (meals, snacks, take-home rations)</i>
Appropriate	The program responds to the particular needs of a country and is customized to the context.	<ul style="list-style-type: none"> • All three modalities can respond to the particular needs of a country and be used to customize the program to the context.
Adequate	The program should provide full coverage and meaningful benefits to the population it is trying to assist.	<ul style="list-style-type: none"> • <i>Meals</i> benefit schoolchildren directly. The size of transfer can be on the order of 10 percent of base household income or more, and is thus in line with common practice. There may be additional benefits from educational achievement that are not costed. Household benefit would increase with the number of children in school receiving the meal. • <i>Snacks and biscuits</i> give benefits similar to those of meals with some differences. The size of the transfer may be less than with meals, and they may have less of an effect on enrollment and attendance. • <i>Take-home rations</i> benefit the child and the household that receives the rations. While meals and biscuits are capped in the value of the transfer, the size of the take-home rations may be expanded.
Equitable	The program should provide the same benefits to individuals or households that are equal in all important respects (horizontal equity) and may provide more benefits to the poorest (vertical equity).	<ul style="list-style-type: none"> • <i>Meals and snacks</i> are difficult to target on an individual basis, but can be targeted geographically to poor schools. • <i>Take-home rations</i> may be targeted individually to reach certain vulnerable groups or households.
Cost-effective	The program should run efficiently with the minimum resources required to achieve the desired impact, but with sufficient resources to carry out all program functions well.	<ul style="list-style-type: none"> • <i>Meals</i> programs have high nontransfer costs of around 30 percent resulting from preparation and transport costs. • <i>Snacks and biscuits</i> may have lower nontransfer costs than meals, of around 20 percent. • <i>Take-home rations</i> appear to have surprisingly high nontransfer costs of around 35 percent.

Incentive compatible	The program should avoid changing households' behavior in a negative way, may even encourage positive changes.	<ul style="list-style-type: none"> • <i>Meals</i> may have significant educational benefits beyond the value of the immediate transfer related to enrollment, attendance, dropout, educational achievement, and cognition. • <i>Snacks and biscuits</i> may have similar educational benefits beyond the value of the immediate transfer related to educational achievement and cognition, but lower benefits on enrollment and attendance. • <i>Take-home rations</i> may have benefits beyond the value of the transfer on enrollment, attendance, and dropout.
Sustainable	The program should be politically and financially sustainable. Programs started with donor support should be gradually incorporated into the public sector.	<ul style="list-style-type: none"> • <i>Political sustainability.</i> Meals have strong political and community support; this is less clear for snacks or take-home rations. • <i>Financial sustainability.</i> In low-income countries, the unit costs are highly variable and may provide opportunities for significant cost reduction. Additionally, as per capita income increases in a country, the relative cost of the program decreases.
Dynamic	The program should evolve over time as the economy grows.	<ul style="list-style-type: none"> • <i>Meals</i> may be more difficult to change or adapt because of complex management systems. • <i>Snacks and biscuits</i> are more amenable to change or improvement. • <i>Take-home rations</i> may be more flexible and adaptable, especially for scale-up in crises.

Source: Adapted from Grosh et al. 2008.

more finely targeted, can give higher value transfers, and have lower administrative costs, yet apparently result in increases in enrollment on a similar scale to in-school meal programs. Thus, from a social protection point of view, and depending on context, they may be preferred to in-school meal programs. Take-home rations are considered particularly appropriate in providing support to orphans and vulnerable children, for example. Although take-home rations programs tend to have somewhat higher administrative costs than conditional cash transfer programs, they otherwise offer potential similar to that of these well-evaluated, currently favored tools in social protection (Fiszbein et al. 2009).

Compared with take-home rations, in-school meals tend to be less finely targeted, capped in the value of their transfer, and incur higher administrative costs. From a strictly transfer point of view, meals may therefore be less preferred. But in-school meals have the potential not only to increase enrollment, but to act more directly on learning by reducing hunger and increasing attention during the school day. Therefore, it is critical to understand whether this potential benefit is actually accruing and how large it is, as is explored in the following section.

The Educational Benefits of School Feeding

School feeding programs can help to get children into school and help to keep them there, through enhancing enrollment and reducing absenteeism; and once the children are in school, the programs can contribute to their learning, through avoiding hunger and enhancing cognitive abilities. These effects may be potentiated by complementary actions, especially deworming and providing micronutrients. The analysis presented here benefited from early work in this area (Levinger 1986, 1996, 2005; Del Rosso and Marek 1996; Del Rosso 1999; Bundy and Strickland 2000) and from three recent reviews (Kristjansson et al. 2007; Adelman, Gilligan, and Lehrer 2008; Jukes, Drake, and Bundy 2008), which arrive at similar conclusions about the direction of the effects. What is less clear is the scale of effect.

Educators seem rarely to participate in these studies, and are notably absent from some of the review teams. Perhaps as a consequence, the education perspective is seldom represented in the literature on school feeding, and education texts seldom address school feeding considerations. We also note that critical interpretation of cognitive and education test outcomes in some reviews might benefit from expertise in psychometrics and education measurement. One particularly important issue

with regard to the effect of health on education is that improved health may have educational benefits for the child, for example, enhancing participation and cognition, but whether this then translates into improved educational outcomes will depend upon endogenous factors such as the quality of teaching and the availability of textbooks. Helping children to be more able and available to learn will not improve education achievement unless it is matched by the delivery of quality education. This review was prepared by a multisectoral team to seek to partially redress the traditional sectoral imbalances.

School Participation

The decision to enroll a child in school and, thereafter, for the child to attend regularly is influenced by many factors, including the perceived value of education, the availability of employment opportunities, the direct and indirect costs of schooling, and the availability and quality of school facilities. Food incentives offered to students, such as school meals, or food incentives offered to families, such as take-home rations (especially for girls, orphans, and vulnerable children), compensate parents for direct educational costs and opportunity costs from the loss of child labor when children go to school.

Implementation of school feeding programs is associated with increased enrollment, particularly for girls. A recent meta-analysis of WFP survey data from 32 countries in Sub-Saharan Africa (Gelli, Meir, and Espejo 2007) grouped 4,000 primary schools according to the type and length of the school feeding program: those with established programs (on-site meals or take-home rations), those with programs of less than 12 months, and those that had yet to initiate a program and so could serve as proxy controls. During the first year of school feeding assistance, absolute enrollment increased by 28 percent for girls and 22 percent for boys. After the first year, enrollment trends varied according to the type of program. When only on-site meals were provided, there was a change only in the first year of the program; after that the rate of absolute enrollment of girls reverted to levels similar to those before implementation. However, in the highest primary grade, with school feeding programs combining on-site feeding and take-home rations, girls' absolute enrollment increased by 46 percent per year, more than twice the yearly increase in the same grade in schools implementing only on-site feeding. The provision of take-home rations appeared to support the progression of girls through the primary school grades, suggesting a reduction in the dropout rate of female students, particularly in the higher primary school

grades. An evaluation of India's Mid-Day Meals (MDM) program, the largest school feeding program in the world, found that female school participation was approximately 15 percent higher in schools that provided the MDM program than in schools that did not (Drèze and Kingdon 2001). However, the MDM program did not appear to have a detectable effect on the enrollment of boys.

Evidence from randomized controlled trials also demonstrates increases in attendance and enrollment and a reduction in dropout with in-school feeding. One study in Jamaica gave breakfast to children for a year and found that attendance rose by 2.3 percentage points more than it rose for the control group from a very high baseline, relative to other low-income countries, of around 80 percent (Powell et al. 1998). A randomized controlled trial of a school breakfast program in Peru also found higher attendance rates in treatment versus control schools (Jacoby, Cueto, and Pollitt 1996), and similar results were seen in a study of Kenyan preschool children receiving breakfast, where school participation of students in the treatment group was 8.5 percent higher than in the control group (Vermeersch and Kremer 2004). Combining an in-school snack with micronutrient fortification (iron, iodine, and vitamin A precursor) in primary schools in South Africa (van Stuijvenberg et al. 1999) resulted in a fall in (diarrhea-related) absenteeism from 79 days to 52 days, an increase in attendance of approximately 15 percent. A fortified biscuit program in Bangladesh appeared to have increased net enrollment rates by 10 percent, increased attendance by 1.3 days per month, and reduced the probability of dropping out by 7.5 percent (Ahmed 2004). A systematic review of these and other school feeding studies in low-income countries also found greater attendance for students receiving in-school meals compared with students in control groups (Kristjansson et al. 2007). On average, the per child increase in school attendance was four to six days a year.

Evaluation of take-home rations programs further shows impact on enrollment. In Pakistan (WFP Pakistan 2005), overall enrollment of girls in assisted schools grew 135 percent between 1998/99 and 2003/04, compared with 29 percent in control schools during the same period, and was particularly strong in the first grade of primary school: 211 percent versus 5 percent in control schools. The program also appeared to increase awareness of the benefits of girls' education: before the program started, 48 percent of households did not send any of their daughters to school; afterward, all households educated at least one daughter. Similarly, the take-home rations program in Bangladesh increased girls' enrollment in

program schools by 44 percent, and boys' enrollment by 28 percent, while in nonprogram schools, enrollment increased by 2.5 percent during the same period (Ahmed and del Ninno 2002). An analysis of the Bangladesh school feeding program showed the increase in attendance was significant even when taking account of the endogeneity of program participation (Ravallion and Wodon 1998).

In areas with high HIV prevalence, emerging evidence shows that school feeding has the potential of enhancing enrollment, attendance, and progression of orphans and other vulnerable children (Edström et al. 2008). Schools are viewed by UNESCO and UNICEF as centers for care and support for vulnerable children; hence, the enhanced enrollment of orphans and vulnerable children would be seen as a particular advantage of school feeding.

Cognitive Abilities and Educational Achievement

Having brought more children into school, the challenge is then for children to learn; school feeding programs can also contribute to this. Poor health and poor nutrition among school-age children diminish their cognitive performance either through physiological changes or by reducing their ability to participate in learning experiences, or both. Short-term hunger, common in children who do not eat before going to school, results in difficulty concentrating and performing complex tasks, even if the child is otherwise well nourished.

Students in school feeding programs have the potential for improved educational attainment, as evidenced by results of several randomized controlled trials. A study in Jamaica found scores in arithmetic improved by 0.11 standard deviation (SD) for the youngest children (in grade 2 at the beginning of the study) (Jukes, Drake, and Bundy 2008). Analyses suggested that this improvement was because children attended school more frequently and because they studied more effectively while at school (Simeon 1998). The feeding program did not improve arithmetic in older children or reading and spelling in children of any age. In Kenya, schoolchildren were given milk, meat, or energy supplements for 21 months (Whaley et al. 2003). Children who were given meat improved their arithmetic scores by 0.15 SD and their performance on the Raven's Progressive Matrices Test (a test of nonverbal reasoning) by 0.16 SD, but they did not improve on verbal comprehension. An evaluation of a fortified biscuit program in Bangladesh also found that participation was associated with a 15.7 percent increase in test scores, with particularly strong improvements in mathematics (Ahmed 2004). A study in the Philippines

found that school feeding led to improved achievement in English and, when combined with a program to develop parent-teacher partnerships, also improved achievement in mathematics (Tan, Lane, and Lassibille 1999). A study in Uganda found that take-home rations improved mathematics scores for older children and led to an improvement in performance on the Primary Leaving Examination (Adelman, Alderman, Gilligan, and Lehrer 2008). In-school feeding improved mathematics scores for children who had delayed school entry and also led to a slight improvement in literacy scores for all children. Both feeding interventions improved performance on one test of cognitive function. Further evidence comes from a meta-analysis of controlled before-and-after studies, which found a mean improvement in mathematics test scores of 0.66 SD as a result of school feeding programs (Kristjansson et al. 2007).

Because school feeding has the potential to alleviate short-term hunger, the effects of hunger on cognition are also important to consider. In one study in Jamaica, eating breakfast improved scores of malnourished children by 0.25 SD more than the scores of adequately nourished children without breakfast in three cognitive tests of memory and speed of processing and one test of arithmetic taken later that day (Simeon and Grantham-McGregor 1989). The findings suggest that missing breakfast impairs performance to a greater extent for children of poor nutritional status. The results of another trial also indicate that chronically undernourished school-age children are likely to have poorer cognitive abilities. Working with undernourished children in Colombian families of low socioeconomic status, a study found that a program of nutritional supplementation, health care, and education was able to narrow the gap in cognitive abilities between program participants and wealthier peers (McKay et al. 1978).

A study in England addressed the question of whether there are any educational benefits from improvements in food quality for children (Belot and James 2009). As part of Celebrity Chef Jamie Oliver's "Feed Me Better" campaign, primary schools in an area of London shifted from low-budget processed foods toward healthier options. Using a difference-in-difference approach for a comparison with areas that had yet to make the change, the study found significant improvements in English and sciences. This study suggests that food quality affects education outcomes even for children in a rich country who are not undernourished. This may be an important area for future study in low-income settings, especially given the finding from a study in Kenya that meat, but not milk or energy supplements, had an impact on education measures (Whaley et al. 2003).

Complementary Interventions: Deworming, Micronutrient Fortification of Food, and Micronutrient Supplementation

The analyses above show that school feeding can improve school participation; alleviate short-term hunger; and increase children's ability to concentrate, learn, and perform specific tasks. These effects are not limited to but are greater among children who are also chronically undernourished. If the food is fortified and combined with deworming, there may be additional benefits for children's cognitive abilities and educational achievement.

Evidence suggests that the integration of deworming into school feeding programs has the potential to augment educational benefits. Deworming has significant impacts on school participation; a large randomized controlled trial in Kenya found that treatment increased school participation by 7 percent, amounting to a 25 percent decline in total absence (Miguel and Kremer 2004). A comprehensive review of studies found that schoolchildren infected with worms performed poorly in tests of cognitive function (Watkins and Pollitt 1997). Results from randomized controlled trials show that those heavily infected showed improvements in cognitive function after deworming treatment (Nokes et al. 1992; Grigorenko et al. 2006). The effects of deworming depend on children's nutritional status. A study in Tanzania found that a heavy infection with schistosomiasis delayed reaction time only for those children who were also undernourished (Jukes et al. 2002). Intervention studies have also found that children with poor nutritional status benefit the most from deworming (Simeon, Grantham-McGregor, and Wong 1995). Deworming is exceptionally low in cost—less than US\$1.00 per year per child to treat all the common worms—and is among the most cost effective of education interventions (Abdul Latif Jameel Poverty Action Lab 2005; Bleakley 2007).

There is also good evidence linking iron deficiency anemia with poor cognitive abilities in children (Grantham-McGregor and Ani 2001). Further experimental studies with school-age children have found that iron supplementation improves performance on memory, visual/motor coordination, and concentration tests as well as on school exams (Soemantri, Pollitt, and Kim 1985; Seshadri and Gopaldas 1989). Even though many of these improvements are large (approximately 0.5 SD in some cases), the appropriateness of delivering iron supplementation along with deworming should also be considered, given that schistosomes and hookworms contribute to anemia. Vitamin A also affects iron metabolism, and the ease of the pill regimen promotes inclusion

of vitamin A supplementation in school-based health programs. The impact of multiple micronutrient fortification, including iron, iodine, and beta-carotene (a precursor of vitamin A), was studied in KwaZulu-Natal, South Africa. Children receiving fortified biscuits for 43 weeks demonstrated improved short-term memory compared with children in the control group (van Stuijvenberg et al. 1999). Because performance on other tests was mixed, multiple micronutrient fortification may be a particularly promising area of research. Both supplementation and fortification are very low-cost interventions.

As recently highlighted in an assessment of school feeding (Adelman, Gilligan, and Lehrer 2008), despite a large literature on impact, many studies suffer from methodological shortcomings that limit the quality of their contributions, and more carefully designed studies are needed. However, based on the evidence summarized in this section, table 3.2 provides a qualitative assessment of the relative effect of school feeding and complementary interventions. It is clear that all of these actions have effects on key educational indicators. Meals distributed to girls and boys can have relatively higher effects on enrollment of girls than of boys, although this may be context specific (Alderman and King 1998; Dréze and Kingdon 2001). The stronger effects of take-home rations on school access of girls depend on whether they are targeted to girls or other disadvantaged groups. Both meals and take-home rations increase cognition and educational achievement. While there may be more studies showing this effect with meals, the only two studies (Uganda and Burkina Faso) that compare meals and take-home rations under similar contexts found little

Table 3.2 An Assessment of the Effect of School Feeding and Complementary Actions on Education Outcomes and Cognitive Abilities

<i>School feeding activity</i>	<i>Enrollment</i>	<i>Attendance</i>	<i>Educational achievement</i>	<i>Cognitive abilities</i>
In-school meals	+ (♀ effect)	+++	+++	+++
Take-home rations	+ (♀ effect)	+	++	++
Fortified biscuits	+	++	+	++
Supplementation	+	+++	+++	+++
Deworming	n.a.	+++	++	++

Source: Authors' compilation. See text for data sources.

Note: n.a. = Not assessed.

+ = evidence from quasi-experimental evaluation.

++ = evidence from at least one randomized controlled trial.

+++ = evidence from more than one randomized controlled trial.

♀ effect = enhances enrollment of girls.

difference (Alderman, Gilligan, and Lehrer 2008). There is also a paucity of studies examining the relationship between education and fortified foods, which may explain why the relative benefits of fortification versus supplementation are less well understood. Deworming shows its strongest effects on attendance and cognitive abilities, although the impact on enrollment has yet to be directly assessed.

To advise policy makers correctly, there is an urgent need to run long-term randomized controlled trials of school feeding programs in low-income countries and to determine the effects of age and nutritional status of the children, the quality of the education, and the timing of the meal. The special needs of orphans and vulnerable children should also be considered.

The Nutritional Benefits of School Feeding

The priority in nutrition interventions is to prevent malnutrition during fetal development and the early years of life—the most critical period for growth and development. Thus, the most cost-effective nutrition interventions are those that target the first 24 months of life, and those that promote maternal nutrition and thus intrauterine growth. There is substantial evidence that investing in early nutrition has profound consequences for subsequent development. Early child development programs show significant long-term impacts on subsequent growth and development, including school performance. Similarly, avoidable early deficits have long-term negative consequences.

From this perspective, providing food to school-age children cannot reverse the damage of early nutritional deficits. A schoolchild who is short for age was stunted by inadequate nutrition at an earlier age, and early nutrition intervention would have been required to address this. Although the most recent systematic review shows that providing meals at schools can have a significant impact on the growth of school-age children (Kristjansson et al. 2007), the effect is small and probably cannot reverse the consequences of earlier malnutrition.

There are intergenerational benefits for younger children. The links between school feeding and increased enrollment point to a positive effect on the well-being of the next generation because both maternal and paternal education levels are strong determinants of child growth and development as measured by stunting. The odds of having a stunted child decrease by about 4–5 percent for every additional year of formal education achieved by mothers (Semba et al. 2008).

There is emerging evidence that take-home rations can contribute to enhanced growth of young children, presumably by increasing the availability of food or financial resources in the household. Recent randomized controlled trials of take-home rations programs in Burkina Faso show a significant increase in weight (weight-for-age and weight-for-height z-scores) of children ages 12 to 60 months (Kazianga, de Walque, and Alderman 2009). In these programs, the families were allocated 10 kilograms of meal on condition that the school-age child attended school. Girls of school age and their younger siblings of both sexes exhibited significant improvements in anthropometric measures. There is also evidence from two studies (Ahmed 2004; Lukito et al. 2006) that schoolchildren shared biscuits they received in school with their younger sisters or brothers at home, potentially creating a spillover effect and reaching younger children in some households.

There is good evidence that activities complementary to school feeding, especially deworming and micronutrient supplementation and fortification, can offer important nutritional benefits.

Micronutrients

Micronutrient deficiency can occur at any age and is common in schoolchildren. For example, estimates suggest that in Sub-Saharan Africa and in India, half of the schoolchildren in poor communities are deficient in iron. Intervention at school age offers direct benefits for the schoolchild, because current micronutrient deficiencies, unlike stunting and other long-term consequences of earlier malnutrition, are rapidly reversible at any age. There are clear nutritional benefits for schoolchildren of providing foods that have been fortified with micronutrients. The recent Uganda studies, for example, found declines in anemia prevalence with both meals and take-home rations (Adelman, Alderman, Gilligan, and Konde-Lule 2008). A randomized placebo-controlled trial in children ages 6–11 years in South Africa showed that fortified biscuits reduced the prevalence of low serum retinol, low serum ferritin, anemia, and low urinary iodine (van Stuijvenberg et al. 1999). Similarly, a randomized placebo-controlled trial in children ages 3–8 years in Kenya showed that iron-fortified whole maize flour improved indicators of iron status (Andang'o et al. 2007). While ensuring the fortification of foods included in school feeding programs presents some logistical challenges (see chapter 4), it is very cost effective.

Deworming

Infection with common roundworms and bilharzia (schistosomiasis) tends to be most prevalent and intense in children of school age who,

therefore, benefit disproportionately from deworming (Bundy 2005). Although it is difficult to detect changes in growth in schoolchildren, because growth has slowed down by this age, there is evidence of growth in randomized controlled trials, as well as evidence for some catch-up growth. Equally important, there is evidence of significant reduction in

Box 3.1

School-Based Deworming: Evolution of an Education Policy Priority

In 2000, the FRESH (Focusing Resources on Effective School Health) framework was launched at the World Education Forum in Dakar, Senegal, with UNESCO, UNICEF, WFP, WHO, and the World Bank among the early partners. The expanded commentary on the Dakar Framework for Action, which describes health as an *input and condition necessary for learning*, and the FRESH framework promoted a core group of cost-effective activities, including deworming, to deliver on the promise of Education for All.

WHO, through a World Health Assembly Resolution in 2001, urged all member states where worm infections were common to attain a *minimum target of regular administration of chemotherapy to at least 75 percent of all school-age children at risk of morbidity by 2010*, recognizing school-based deworming as among the most cost-effective delivery mechanisms.

More recently, Deworm the World (a global coalition of partners launched by the Young Global Leaders of the World Economic Forum) has promoted understanding of the remarkable cost-effectiveness of school-based deworming as an education intervention, and is helping countries to develop large-scale, sustainable, education sector-led programs.

At the 2008 World Economic Forum in Davos, Switzerland, the Executive Director of WFP announced, “The United Nations World Food Programme is scaling up deworming activities to include in all its school-feeding programmes where parasitic worms are a serious problem. In 2008, WFP dewormed 11 million of the 22 million school-age children we feed in school. Deworm the World and WFP will continue to work together to increase coverage to treat an additional 2 million children in 12 more countries in 2009 under WFP assisted school feeding programmes.”

In 2009, the Education for All-Fast Track Initiative Secretariat and Partnership are working with all these partners to respond to country demand for quality, school-based deworming programs led by the education sector (<http://www.education-fast-track.org>).

Source: Authors.

anemia with deworming (Gulani et al. 2007; Brooker et al. 2008). The fact that worm infections affect some 500 million schoolchildren argues that deworming can make an additional nutritional contribution if included in the school feeding package. Programmatic evidence suggests that deworming through schools is safe, cheap, and remarkably cost effective (Abdul Latif Jameel Poverty Action Lab 2005; Bleakley 2007), whether implemented as a stand-alone intervention through schools or implemented at the margins of a school feeding program.

Defining Objectives in Practice: Safety Net, Education, or Nutrition?

In today's world, the primary drivers for increased support for school feeding are the benefits for social protection and for education. The social safety net roles of school feeding programs include an immediate response to social shocks as well as social protection over the longer term. School feeding can benefit education indicators in enrollment, attendance, cognition, and educational achievement, although the scale of benefit and the evidence of effect vary with feeding modality. Well-designed school feeding programs, which include micronutrient fortification and deworming, can provide nutritional benefits and should seek to complement and not compete with nutrition programs for younger children, which remain a clear priority for targeting malnutrition overall.

The focus on school feeding as both a social protection and an education intervention has led to some tensions between the two sectors, but this proves to be a false dichotomy. As we will see in subsequent chapters, the creation of effective safety nets through school feeding programs requires the commitment of a cast of actors that crucially includes the education sector. Policy analysis shows that the effectiveness and sustainability of school feeding programs, whatever their purpose, is dependent upon embedding the programs within education sector policy. The clear education benefits of the programs are a strong justification for the education sector to own and implement the programs, while these same education outcomes contribute to the incentive compatibility of the programs for social protection. Hence, the value of school feeding as a safety net, and the motivation of the education sector to implement the programs, are both enhanced by the extent to which there are also education benefits.

School feeding programs also offer other benefits. For example, appropriately designed programs can make a significant contribution to gender equity in education at the same time as they target the social vulnerability of girls. Similarly, programs can be designed, for example,

to provide targeted transfers and strengthen educational access to address vulnerability resulting from disability or the effects of HIV on the household. Apart from these individual, household, and social benefits, there is growing evidence that the programs can help create a stable demand for food at the local level, which, in turn, has important multiplier effects on the local economy and the local community. These issues are explored further in the next chapter.

Box 3.2

Case Studies: School Feeding Programs in Transition from Stage 2 to Stage 3 (for further details, see table 4.1)

Cambodia

The school feeding program in Cambodia reaches about 580,000 children with school meals, and 19,000 children (mostly girls) receive take-home rations (WFP 2007b). The program is implemented as part of the country's Education for All National Plan 2003–2015 and Education Sector Plan 2006–2010 to tackle problems related to high dropout rates, particularly in the upper-primary grades, and low completion rates. In these two sector plans, school feeding is identified as a strategy to improve equitable access to education services for disadvantaged children, especially girls, and improve the quality of education provided.

Integrating the program into national policy. A programming mission for the Education for All-Fast Track Initiative to Cambodia in 2007 found that school feeding was the main channel to provide subsidies to poor students in primary schools. Conditional cash transfer schemes focused largely on lower-secondary schools and had limited outreach. However, school feeding depended almost exclusively on WFP for funding and implementation support, and the national Ministry of Education lacked a strategy for school feeding, despite its mention in education sector plans. The mission, therefore, recommended several initiatives to develop a sustainable strategy for cash and food-based incentive schemes in primary education.

Mali

The government of Mali works predominantly with WFP and Catholic Relief Services (CRS) to support school feeding in the country. During the 2007–08 school year, the school feeding program provided cereal, pulses, and oil that were used to serve hot noontime meals to 108,524 children in 712 rural public elementary schools, which equates to about 8 percent of the nation's school-age children (Lambers 2008).

(continued)

Box 3.2 (Continued)

Data indicate that the program has increased attendance and enrollment rates over the years. Of the children enrolled in school, attendance rates for 2007 were above 90 percent for both boys and girls in schools offering school feeding. National school enrollment rates in public and community schools without the program rose 5.9 percent between 2006 and 2007, whereas enrollment in school feeding schools rose 20 percent during the same period, with enrollment for girls increasing 23 percent (Mali Ministry of Basic Education 2008).

Integrating the program into national policy. Recently, the Ministry of Education, in collaboration with the Ministries of Agriculture; Health; Water; Social Development; and Promotion of Women, Children and Families; and the Food Security Commission drafted a national policy for school feeding that is currently awaiting a final approval by the Legislative Assembly. The national policy includes a five-year plan to gradually establish 3,000 government-run school canteens. Initially, the government will cover 90 percent of the associated costs, with this percentage decreasing each year as schools and communities become increasingly able to maintain and operate programs (Mali Ministry of Basic Education 2008). The government of Mali has committed approximately US\$8 million for school canteens in 2009 using a combination of funds from the national budget and funds from donor countries (Traore and Maiga 2008).^a The plan includes provisions that support local purchases of commodities, which augments the incomes of smallholder farmers and saves on transport costs.

Information for this case study provided by Rachel Winch, Global Child Nutrition Foundation.

a. Personal interview with Adama Moussa Traore, Associate National Director of Basic Education, and Dr. Bonaventure Maiga, Technical Advisor for the Ministry of National Education.