School feeding in low-income settings:

A snapshot of the evidence on education

Aulo Gelli, Research Fellow, IFPRI.

Feed and Read: Improving Access to School Meals and Quality Education Around the World”
USDA MCGOVERN-DOLE AND USAID PANEL AT THE 2015 USAID GLOBAL EDUCATION SUMMIT
2nd of November 2015, Silver Spring, MD.
Simple idea…but…

• School feeding programmes can be very complex
  – No one size fits all, very context specific
  – Impacts and costs also heterogeneous

• Can be seen as a strategy with multiple goals in different but interrelated domains
  – Social protection, education, nutrition & health …even agriculture…

• Opportunity to assist governments in improving scale-up of national programmes
  – What works where?
  – How much does it cost?

• Next slides focus on education domain…
Getting children into school?

• Effects on school participation
  – Enrolment, new evidence from 2 RCTs
    • Uganda, 9% increase in the share of children aged 6–13 who started school (Alderman, Gilligan, & Lehrer 2010).
    • Burkina Faso, enrollment increased by about 3 to 5 points (Kazianga, de Walque and Alderman 2012).
  – Attendance, from systematic review
    • 4-7 extra days of schooling per year (~4%) (Kristjansson et al, forthcoming)
More on effects on enrolment

- Observational study, meta-analysis across 32 countries in Sub-Saharan Africa
  - Effect size of about 10% (Gelli, 2015)
Learning in school?

• Effects on achievement depend on age and skills most affected
  – Effects can result from spending more time in school, enhanced learning in school, or both
  – Impact on learning also depends on classroom organization, and on timing and quality of meals
  – Systematic review found effects on math scores (0.31 SD on WRAT)
  – Systematic review found effects on cognition (0.17 SD on WISC)
  – Health-nutrition pathway…
Large variations in costs

<table>
<thead>
<tr>
<th>Modality</th>
<th>School feeding project cost/child</th>
<th>Standardized school feeding cost/child</th>
<th>Standardized cost/child — range</th>
<th>Standardized cost/100 kcal</th>
<th>Standardized cost/g protein</th>
<th>Standardized cost/100 μg iron</th>
<th>Standardized cost/100 μg vitamin A</th>
<th>Standardized cost/100 μg iodine</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-site meals (n = 43)</td>
<td>27</td>
<td>44</td>
<td>17–122</td>
<td>6.2</td>
<td>2.4</td>
<td>7.2</td>
<td>23</td>
<td>1,742</td>
</tr>
<tr>
<td>Biscuits (n = 6)</td>
<td>11</td>
<td>23</td>
<td>15–25</td>
<td>7.5</td>
<td>2.9</td>
<td>2.9</td>
<td>9.4</td>
<td>34</td>
</tr>
<tr>
<td>THRIs (n = 6)</td>
<td>43</td>
<td>75</td>
<td>29–213</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>On-site meals and THRIs (n = 22)</td>
<td>36</td>
<td>61</td>
<td>23–140</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Total (n = 77)</td>
<td>29</td>
<td>48</td>
<td>15–213</td>
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</tr>
</tbody>
</table>

THRs, take-home rations

(Gelli et al, 2011)
Ratio of per child cost of school feeding in relation to per child cost of basic education, versus GDP per capita.
Thank you!

Photo: WFP

www.a4nh.cgiar.org
368 million children receive school meals with up to $75 billion invested each year.
**Some trade-offs: Back of the envelope figures relative to cooked meals**

<table>
<thead>
<tr>
<th>Dimension \ Modality</th>
<th>Biscuits</th>
<th>Cooked meals</th>
<th>Take-home rations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcomes (education)</td>
<td>~1</td>
<td>1</td>
<td>1+</td>
</tr>
<tr>
<td>Food quantity per child per year</td>
<td>0.3</td>
<td>1 (25 kg)</td>
<td>3</td>
</tr>
<tr>
<td>Cost per child per year</td>
<td>0.5 ($25)</td>
<td>1 ($50)</td>
<td>1.5 ($75)</td>
</tr>
<tr>
<td>(School level cost per child per year)</td>
<td>~0.4 ($2.4)</td>
<td>1 ($6)</td>
<td>~0.4 ($2.4)</td>
</tr>
<tr>
<td>Cost/protein or energy output</td>
<td>~1</td>
<td>1</td>
<td>NA</td>
</tr>
<tr>
<td>Cost/micronutrient output</td>
<td>0.3</td>
<td>1</td>
<td>NA</td>
</tr>
</tbody>
</table>
Nutrition pathways

Context (SF standards)
- policy
- financing
- institutional capacity & coordination
- community involvement

Intervention outputs and process

School meals/snacks
(fortified/not-fortified)

Health interventions
(deworming, water, sanitation....

School based nutrition education

Service delivery
(targeting, coverage, uptake, quality, quantity, timeliness, acceptability...)

Substitution

Food consumption
-energy
-micronutrients

Child physical health
- anthropometry
- micronutrient status
- physical activity level
- basal metabolic rate

Child development
- growth
- cognition

Child psychosocial health
- motivation
- attention

Intermediate outcomes

Outcomes
Direct effects

Medium term
Indirect effects

Determinants

Household characteristics
-income, preferences, education, preferences...

Child characteristics
-baseline health & nutrition status, preferences...

Some reflections…

• Multisectoral intervention
  – Working across traditional disciplines…

• Data collection timings and seasonality
  – e.g. agriculture, schooling, health…

• Evaluation around scale-up of national programme
  – Buy-in from policymakers…

• Changing political context
  – Coup d'état + invasion in Mali, elections in Ghana…
<table>
<thead>
<tr>
<th>Cost</th>
<th>Cost per extra day of attendance</th>
<th>Cost per additional centimeter of height</th>
<th>Cost per additional kilogram of weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range of costs for RCTs</td>
<td>4.7–15.8</td>
<td>112.0–252.0</td>
<td>112.0–252.0</td>
</tr>
<tr>
<td>Average cost per average for RCTs</td>
<td>8.0</td>
<td>160</td>
<td>160</td>
</tr>
<tr>
<td>Range of costs for CBAs</td>
<td>1.7–3.8</td>
<td>10.4–23.3 (5–6 yr of age)</td>
<td>38.4–86.3</td>
</tr>
<tr>
<td>Average cost per average for CBAs</td>
<td>2.4</td>
<td>14.8 (5–6 yr of age)</td>
<td>54.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>31.0 (6–8 yr of age)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>27.2 (average)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost</th>
<th>Cost per point on Raven’s Progressive Matrices</th>
<th>Cost per IQ point</th>
<th>Cost per point on math achievement or aptitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range of costs for RCTs</td>
<td>82.4–185.3</td>
<td>Not in the analysis</td>
<td>31.5–70.8 (WRAT) 155.6–350.0 (Math subtest of WISC)</td>
</tr>
<tr>
<td>Average cost per average for RCTs</td>
<td>117.6</td>
<td>Not in the analysis</td>
<td>44.9 (WRAT) 222.2 (Math subtest of WISC)</td>
</tr>
<tr>
<td>Range of costs for CBAs</td>
<td>Not in the analysis</td>
<td>12.7–28.6</td>
<td>23.3–52.5</td>
</tr>
<tr>
<td>Average cost per average for CBAs</td>
<td>Not in the analysis</td>
<td>18.2</td>
<td>33.3</td>
</tr>
</tbody>
</table>

CBA, controlled before-and-after study; RCT, randomized, controlled trial; WISC, Weschler Intelligence Scale for Children; WRAT, Wide Range Achievement Test

<table>
<thead>
<tr>
<th></th>
<th>Full costs (USD)</th>
<th>Energy (kcals)</th>
<th>Iron (mg)</th>
<th>Protein (g)</th>
<th>std. cost per 100 kcals delivered</th>
<th>std. cost per (g) protein delivered</th>
<th>std. cost per (mg) iron delivered</th>
<th>std. cost per 100 (mcg) vitamin A delivered</th>
</tr>
</thead>
<tbody>
<tr>
<td>School meals (n=44)</td>
<td>48</td>
<td>735</td>
<td>9</td>
<td>20</td>
<td>7</td>
<td>3</td>
<td>8</td>
<td>25</td>
</tr>
<tr>
<td>Fortified biscuits (n=8)</td>
<td>23</td>
<td>262</td>
<td>7</td>
<td>7</td>
<td>8</td>
<td>3</td>
<td>3</td>
<td>9</td>
</tr>
</tbody>
</table>

- Take home rations, targeted to households, cost US$ 75 per child per year
- Share of food costs: school meals (56%), biscuits (74%), take-home rations (68%)