Improving Nutrition in Children Under Two Through Increased Egg Consumption in Burkina Faso

Sarah McKune, June 5, 2019
Assistant Professor, Environmental and Global Health, University of Florida, smckune@ufl.edu

Photo Credits: Heather Anderson, Sarah McKune, Anteneh Omer, Christian Oueoraogo, Aida Sanou, Iliasse Tiemtore
RESEARCH TEAM

• Dr. Sarah McKune – University of Florida
  Dr. Heather Anderson
  McKune Research Lab

• Dr. Aissatta N’Diaye Wereme – Institut de l’Environnement et de
  Recherches Agricoles (INERA)
  Zare Yacouba – INERA
  Mahamoudou Gnabriga - INERA
  Kamboinsé Agricultural Environmental and Training Research Center (CREAF)
  Christian Oueoraogo, Aida Sanou, Iliasse Tiemtore

• Antoneh Omer – Hawassa University, Ethiopia
RESEARCH BACKGROUND & QUESTION

• Ionatti et al., 2017 study in Ecuador found providing one egg a day to children 6 to 9 months old for a year reduced stunting and underweight by 47 and 74%, respectively, nutritional benefits much greater than those achieved by previous interventions.

• Omer et al., 2016 study in Ethiopia used religious leaders to gift chickens to children, increasing the number of children consuming 3 or more eggs a week from 5% to 70%.

• Can gifting of chickens to young children (6-12 months) by community champions increase egg consumption and improve nutritional outcomes?
RESEARCH OBJECTIVES

• Increase egg consumption in children under five
• Increase household poultry production
• Improve poultry practices
• Improve knowledge and attitudes about nutrition and ASF consumption

Overarching aim: to improve child nutrition
METHODS: STUDY DESIGN

- Community intervention trial
- Three study arms: full intervention, partial intervention, and control arms

**Full**
- 4 chickens, 3 gifted by community champion
- Monthly training

**Partial**
- Monthly training (will receive 2 chickens at end of project)

**Control**
- No intervention (will receive 2 chickens at end of project)

- Targeted 90 children per arm, n=270 children
- 18 clusters of 15 HH, 6 clusters each study arm
METHODS: STUDY SITES

- The 18 study villages were randomly selected from all villages (n=70) in the Kaya District, excluding those within Kaya town.
- Villages were then randomly assigned to a treatment arm of the study.

<table>
<thead>
<tr>
<th>Full Intervention (Gifting of chicken and INA trainings)</th>
<th>Partial Intervention (INA trainings only)</th>
<th>Control (no intervention)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basnéré</td>
<td>Dem</td>
<td>Dashima</td>
</tr>
<tr>
<td>Franka</td>
<td>Kalambaogo</td>
<td>Bakòuta</td>
</tr>
<tr>
<td>Kokin</td>
<td>Oualga</td>
<td>Gâh</td>
</tr>
<tr>
<td>Ilyalla</td>
<td>Songodin</td>
<td>Dapologo</td>
</tr>
<tr>
<td>Nyangado</td>
<td>Tiffou</td>
<td>Légouré</td>
</tr>
<tr>
<td>Sian</td>
<td>Zandogo</td>
<td>Sangro</td>
</tr>
</tbody>
</table>
METHODS: SAMPLE SELECTION

- Census of all children 6-12 months was taken for the 18 communities.
- From all age-eligible mother/child dyads in each village, 15 were randomly selected for participation.
- Only one twin was included in each of 3 cases where twins were identified (participating child randomly selected by study team).
- In villages where less than or equal to 15 dyads were available, all dyads were included.
- Total of 266 children and mother/child dyads were enrolled, due to low numbers available in three villages.
- Final distribution: 86 full intervention, 90 partial intervention, 90 control.
METHODS: PROJECT IMPLEMENTATION
JULY 2018-MAY 2019

- Baseline, midline, and end line survey (July, Dec, April)
- Gifting of chickens by community champions (July)
- Three trainings of local community health workers (CHW) and animal extension workers (AEW) by partner INERA
- Monthly Integrated Nutrition and Agriculture (INA) training of mothers by CHW and AEW: WASH, human nutrition, animal management, and child illness (July through May)
- Brief monthly monitoring visits and counseling with all mothers using survey questionnaire and flipbooks (July through May)
- Monitoring and Evaluation visit (Nov/Dec)
- Final Closing Ceremony (May 28, 2019)
BEHAVIOR CHANGE COMMUNICATION PACKAGE

- Engagement of community leaders as champions
- Gifting of three chickens to child in local ceremony
- Family contribution of +1 chicken to child flock
- Monthly training of mothers
- Development and distribution of locally appropriate flip books for mothers
- Project jingle, “One child, one egg, each day”
- Individual counseling of mothers on target areas not met, monthly during data collection
BCC: FLIPBOOKS

- Flip books distributed to partial and full intervention groups, to reinforce messages from monthly trainings
- At data collection each month, using the flipbooks the students counseled mothers on target areas not met, identified barriers, and provided feedback to project staff
BCC: JINGLE

*Biig a yeyn daar Fãa gell a yeyn*

- Creation of social cohesion through common imagery and jingle that the women would sing together at each gathering
ACTIVITIES: GIFTING OF CHICKENS
ACTIVITIES: MONTHLY INA TRAININGS
ACTIVITIES: DATA COLLECTION AND COUNSELING
RESULTS: BASELINE DATA

Mother’s information

- Average mothers age: 27 (16-45)
- Average age at first birth: 18 years
- Average number of live births: 3.5 (1-9)
- Literacy: 82% illiterate
- Religion: 77% Muslim
  20% Catholic
  2% Protestant
- Livelihood:
  97% crop production
  58% livestock husbandry
RESULTS: BASELINE DATA

Child data

- Sex: 48.3% female, 51.7% male
- Average age: 9.8 months (median 9 m; range 6-18 m)
- Currently breastfeeding: 100% currently
- Exclusively BF: 94.6%
- Child ever hospitalized: 33%

- No children had consumed eggs in the 24 hours prior to the baseline survey
RESULTS: BASELINE DATA

Poultry production:

- 97% keep livestock
- 87% keep chickens (average 10.5; median 4; range 1-100)
- 80% report never receiving nutritional education regarding value of eggs
- Average egg production 3.1/day; median 1/day
- 98.4% of eggs are allowed to hatch
- 25% of households have chicken sleep inside the house
- 16.8% of children have their own chickens (mean 1.4; range 1-5)
- **9.7% report ever feeding the child eggs**
NUMBER OF CHICKENS PER HOUSEHOLD

Baseline
Midline
Month 7
Endline

* ANOVA p = 0.00
CHILD WEEKLY EGG CONSUMPTION

* ANOVA p = 0.00
Women Reporting "Self" as Decision Maker about Chickens in the Household

Endline
Baseline

Full  Partial  Control
DIETARY DIVERSITY

- Minimum Dietary Diversity not met my most, pre or post intervention
- 3 children (full and partial intervention arms) met MDD (4 or more of 7 food groups) by endline

Age of children (less EBF) and seasonality
WASTING (WLZ)

**ANOVA:** p = 0.00014*

Tukey HSD:
- Partial-full p=0.23
- Control-full p=0.00*
- Control-partial p=0.02*
UNDERWEIGHT (WAZ)

FULL

PARTIAL

CONTROL

Baseline

Endline

ANOVA: p = 0.00015 *
Tukey HSD: partial-full p=0.52
control-full p=0.00*
control-partial p=0.01*
STUNTING (LAZ)

FULL

PARTIAL

CONTROL

Baseline
Endline

ANOVA: p = .66
KEY FINDINGS

- Behavior change communication package increased household chicken flock size, with and without distribution of livestock asset.
- Behavior change communication package increased egg consumption in targeted child with and without distribution of livestock asset.
- Acute malnutrition (wasting) was reduced significantly in both full and partial intervention groups.
- Underweight was reduced significantly in both full and partial intervention groups.
- Chronic malnutrition was not significantly reduced in any group.
- Significantly greater behavior change occurred when chickens were gifted to the child than with education alone.
IMPLICATIONS AND NEXT STEPS

- In areas where acute malnutrition in high and resources are limited, findings hold significant implications for low cost improvements in child health and reductions in child mortality.
- Continued analysis of quantitative data, including models to explore women’s empowerment, analysis of poultry management practices and potential relationship with stunting.
- Analysis of qualitative data, including focus groups with 9 communities conducted at the end of the project.
- Investigating possibilities for post hoc assessment of cognitive impact.
- Next step – does gifting of the chicken improve behavior change beyond that of livestock asset alone?
- ENHANCE project launched May 1, 2019.
THANKS TO OUR TEAM!