"*Un Oeuf*"

Improving nutrition in children under two through increased egg consumption in Burkina Faso

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Principal Investigator

- Dr. Sarah McKune, University of Florida

Co-PI and Collaborators

- Dr. Aissata Wereme, *Institute de l'Environnement et de Recherche Agricole,* INERA Burkina Faso
- Anteneh Omer, Hawassa University, Ethiopia
- Dr. Heather Anderson, University of Florida

Objectives

1) Increase ASF production through gifting of chickens and provision of monthly agricultural training on proper chicken husbandry.
2) Increase ASF consumption, particularly eggs, through innovative behavior change package and culturally-tailored, integrated nutrition and agriculture trainings.
3) Build resiliency by increasing food security in targeted households.
4) Promote gender equality by engaging women in animal extension services and training female caregivers in chicken husbandry practices to increase flock size.
5) Reduce zoonotic diseases through integrated nutrition and agriculture training and WASH sanitation education.

Behavior change to increase egg consumption

S. McKune, H. Anderson, A. Sapp, E. Moore, A. Omer, A. Wereme

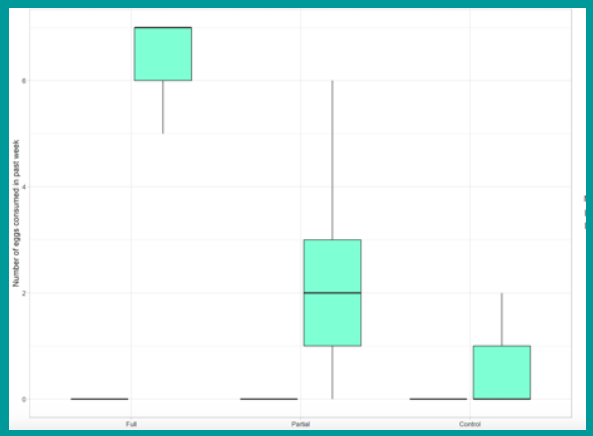
Introduction

- Animal source foods are nutritionally valuable food.
- Training of women has been associated with improved child nutrition.

Methods

1. Cluster randomized controlled trial tested a behavior change intervention with (full) and without (partial) chickens.
2. 90 children/women per arm were targeted (n=270); 250 used in final analysis.
3. Chickens were gifted to the children in full intervention group by a community champion; the chickens belonged to the child.
4. Mothers of all children in the full and partial intervention groups received monthly training on poultry production and human nutrition for 10 months.
5. Egg consumption was reported by the mother at baseline and endline.

Trainings that target mothers with information on poultry and human nutrition can increase child egg consumption (from 0 to over 2 eggs per week); when combined with increased poultry numbers, egg consumption increases further (from 0 to over six eggs per week!).



Number of eggs consumed by children in the past week, at baseline and endline by full, partial, and control arms

Results

- The full (β=4.3, p= 6.6x10-12) and the partial (β=1.0, p= 0.02) interventions significantly increased egg consumption.

Recommendations

- Targeted behavior change, such as trainings, should engage women in a One Health approach, linking livestock, human nutrition, and the value of ASF.
- Interventions must be culturally appropriate

Research gaps or future opportunities

- The gifting of chickens by a champion should be separated from the increase in assets to understand the role of cultural traction in observed behavior change

ASF Consumption and Child Growth

S. McKune, H. Anderson, A. Sapp, E. Moore, A. Omer, A. Wereme

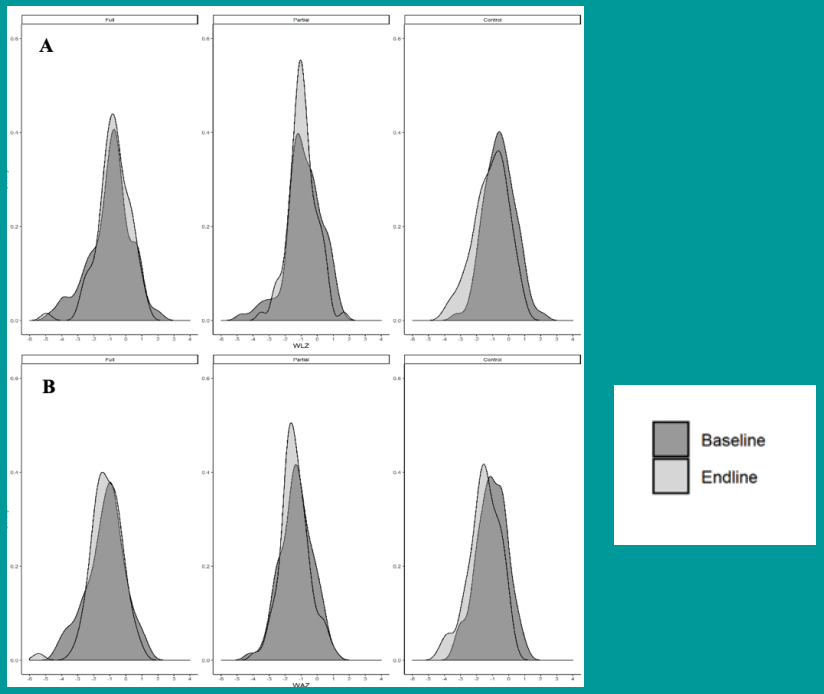
Introduction

- Animal source foods are nutritionally valuable food.
- Infants and young children have distinct nutritional needs and small stomachs.

Methods

1. Cluster randomized controlled trial tested a behavior change intervention with (full) and without (partial) chickens.
2. 90 children/women per arm were targeted (n=270); 250 used in final analysis.
3. Chickens were gifted to the children in full intervention group by a community champion; the chickens belonged to the child.
4. Mothers of all children in the full and partial intervention groups received monthly training on poultry production and human nutrition for 10 months.
5. Egg consumption was reported by the mother at baseline and endline.

Trainings of mothers (on poultry production and human nutrition) + the gifting of three (3) chickens to a young child = improved child growth.



Distribution of child z-scores. A) Wasting by intervention arm; baseline compared to endline. B) Underweight by intervention arm; baseline compared to endline.

Results

- A significant difference in children's WLZ (β=0.58, p= 0.03) and WAZ (β=0.47, p= 0.02) were demonstrated by the full intervention.

Recommendations

- Targeted behavior change, such as trainings, should engage women in a One Health approach, linking livestock, human nutrition, and the value of ASF.
- Interventions must be culturally appropriate.

Research gaps or future opportunities

- Thresholds of ASF consumption to improve child growth need more research. How many eggs is sufficient for a child's health and growth?

Women's Decision Making and ASF Consumption

S. McKune, H. Anderson, A. Sapp, E. Moore, A. Omer, A. Wereme

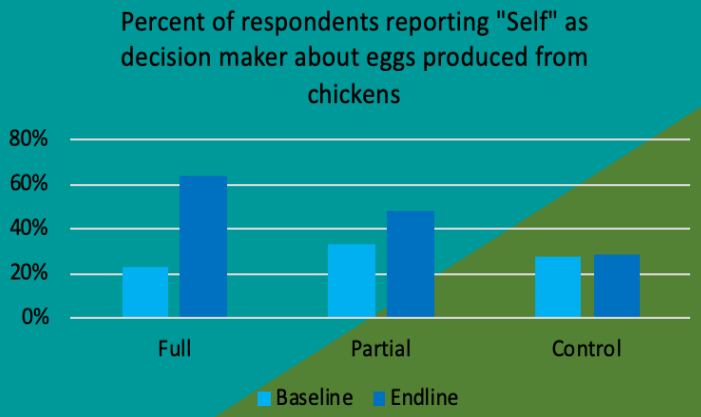
Introduction

- Training of women has been associated with improved child nutrition.
- Women's decision making is an important component of women's empowerment.

Methods

1. Cluster randomized controlled trial tested a behavior change intervention with (full) and without (partial) chickens.
2. 90 children/women per arm were targeted (n=270); 250 used in final analysis.
3. Mothers of all children in the full and partial intervention groups received monthly training on poultry production and human nutrition for 10 months.
4. Women were asked who makes decisions about what to do with eggs in the household. Answers were coded as "self" and all others.

Targeted training of mothers + poultry assets can increase decision-making about ASF consumption among children.



Results

- The full intervention significantly increased decision-making among women about egg consumption within their household.

Recommendations

- Continue to leverage domains of women's empowerment as a pathway to improve nutritional outcomes in chidlren.

Research gaps or future opportunities

- Research to understand the role of integrated trainings, which combine poultry production and human nutritional information, compared to traditional agricultural or human health trainings is needed.

Poultry Production Increased through Targeted INA Training

S. McKune, H. Anderson, A. Sapp, A. Omer, A. Wereme

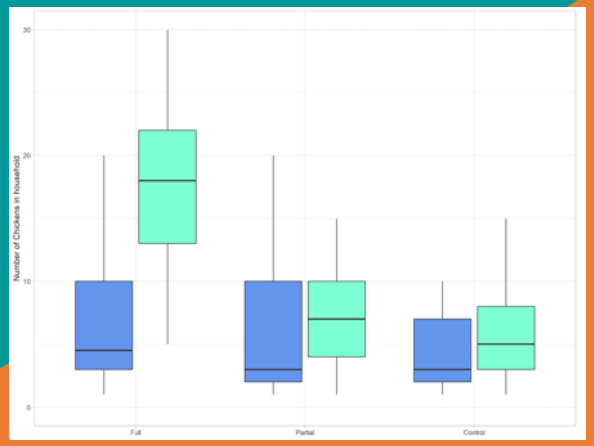
Introduction

- Training of women has been associated with improved child nutrition.
- Household livestock assets have been associated with increased ASF consumption.

Methods

1. Cluster randomized controlled trial tested a behavior change intervention with (full) and without (partial) chickens
2. 90 children/women per arm were targeted (n=270); 250 used in final analysis
3. Mothers of all children in the full and partial intervention groups received monthly training on poultry production and human nutrition for 10 months.
4. The number of poultry in the household was reported at baseline and at endline.

Integrated nutrition and agriculture trainings for mothers, coupled with gifting of three chickens, can significantly increase poultry production.



Number of chickens per household in the full, partial and control groups, at baseline (blue) and endline (green)

Results

- The full intervention significantly increased poultry production (β=11.6, 95% CI 8.3 to 15; p= 1.1^{-05}).

Recommendations

- Targeted behavior change, such as trainings, should engage women in a One Health approach, linking livestock, human nutrition, and the value of ASF.
- Interventions must be culturally appropriate.

Research gaps or future opportunities

- Improved understanding of women's relationship to livestock species (ownership, co-ownership, caretaker, decision-maker)

Effectiveness of Timing Models to Increase Egg Consumption in CU5

E. Moore, Y. Yang, A. Sapp, Y. Zaré, H. Anderson, S. McKune

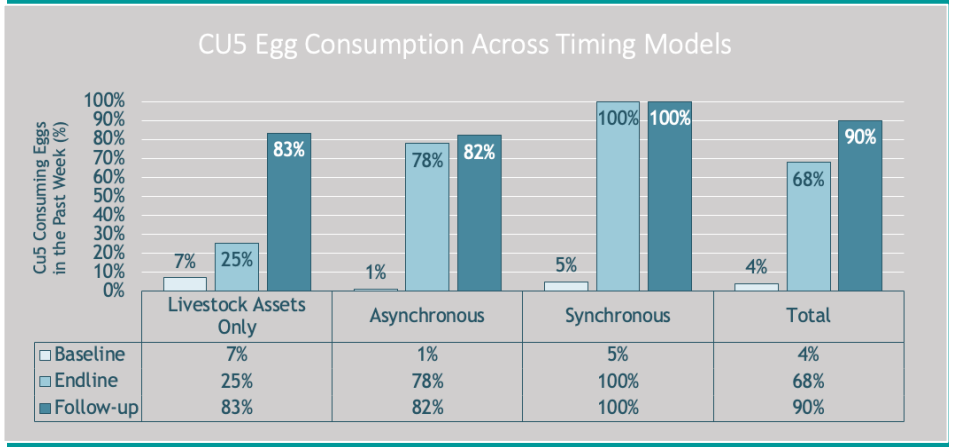
Introduction

- Eggs have been associated with mitigating malnutrition in children under 5 (CU5)

Methods

1. Three unique timing models were utilized in a cluster-randomized controlled trial delivering livestock assets and an integrated nutrition and agriculture (INA) training program to mothers of CU5
2. A total of 90 mother-child dyads were targeted for each research arm (N=270, n=90 per arm); N=260 used for analysis
3. The synchronous timing model increased the **child's flock** by **4 chickens** prior mother's participating in the training program
4. Mothers in the asynchronous timing model participated in the training program **before** receiving **2 chickens** for the **household**
5. Livestock Assets Only households received **2 chicken**s and no training

A synchronous timing model of simultaneously delivering livestock assets and training yielded the most significant behavior change of increasing egg consumption in CU5.



Results

- Linear regressions were performed to examine the egg consumption between the synchronous and asynchronous models from baseline to endline. Egg consumption between the two groups was found to be statistically significant ($p < .0005$)
- No significant difference was observed in the egg consumption between the Asynchronous and Livestock Assets Only models from Endline to Follow-up

Recommendations

- Synchronous timing models should be considered to attain best results within a nutrition-sensitive livestock program

Future opportunities

- Examining timing models in nutrition-sensitive agriculture research to increase nutrition

Impact of the *Un Oeuf* study on women's household decision-making

E. Moore, L. Wood, R. Serra, A. Sapp, H. Anderson, S. McKune

Introduction

- A woman's household decision-making over household animal source foods (ASF) has been shown to be associated with ASF consumption and nutrition-related health outcomes in CU5

Methods

1. A total of 90 mother-child dyads were targeted for each research arm of a cluster randomized controlled trial with three research arms (N=270, n=90 per arm); N=260 used for analysis
2. The full group increased the **child's flock** by **4 chickens** prior to mothers participating in the training program
3. Mothers in the partial group participated in the training program **before** receiving **2 c hickens** for the **household**
4. Logistic regressions examined the likelihood of egg consumption at endline based on HHDM-E

Both synchronous and asynchronous timing models a combination were shown to have a significant impact on a woman's household decision-making on decisions concerning how household eggs are used (HHMD-E).

Logistic Regression Predicting Likelihood of Egg Consumption at Endline based on HHDM-E across Research Arms

Predictor	*B*	S.E.	Wald	df	p	Odds Ratio	95% CI for	
							Lower	Upper
Research Arm (Control)			17.950	2	.000			
Research Arm (Partial)	.782	.319	5.999	1	.014*	2.186	1.169	4.088
Research Arm (Full)	1.398	.331	17.862	1	.000*	4.045	2.116	7.734
Constant	-.126	.132	.916	1	.338	.881		

Results

- The *Un Oeuf* project significantly impacted the HHDM-E of mothers in the full group (p.000).
- The *Un Oeuf* project significantly impacted the HHDM-E of mothers in the partial group (p.014).

Recommendations

- Integrated nutrition and agriculture programs should be incorporated into agriculture programs to help ensure an increase in household nutrition.
- Agriculture projects should always seek to incorporate nutrition training

Future opportunities

- Focus on animal source food consumption in livestock projects

Sustainability of Egg Consumption in CU5 in Burkina Faso

E. Moore, L. Wood, S. McKune

Introduction

- Livestock ownership has been shown to have a relationship with animal source food consumption
- The purpose of this project was to increase egg consumption in the diets of children under 5 (CU5) to mitigate malnutrition through a behavior change intervention that included training and increasing livestock assets

Methods

1. A cluster-randomized controlled trial sought to increase egg consumption in CU5 in rural, Burkina Faso
2. Full Group received 4 chickens for the child's flock prior to a 10-month integrated nutrition
3. Partial Group received a 10-month training program (including a flipbook) and 2 chickens after completion
4. Control Group received one training session, a flip book, and 2 chickens after project completion
5. Focus group discussions (FGDs) were conducted in a subset of the study population (N=18, n=9); a total of 9 villages (n=3 per research arm) were used for analysis

Egg consumption in children under five in Burkina Faso is sustainable through behavior change that increases knowledge on nutrition and agriculture

Control	Partial	Full
"We will take care of the chickens to always have eggs."	"We will use our flipbooks. Our flipbooks contain information that help us to put into practice what we learned during training sessions."	"We will use our flipbooks to remember."
"We will remind each other what we must do."	"We have our flipbooks that will help us to continue [to] remember everything we learned during our training and put it into practice."	"We will vaccinate our chickens. [T]here are people who are in the villages who can vaccinate our chickens."
"We will take care of the chickens to have eggs at all times."		"[I] will always apply the creed: 'a child an egg a day,' even if [I] give birth to another child."

Results

- Focus group discussion results showed that mothers in all groups had the desire to sustain feeding their children eggs
- Mothers reported during the importance of the flipbooks for helping to remember the training on nutrition, food handling, and caring for the chickens
- Mothers reported the desire to sustain care for chickens to ensure eggs for their children

Recommendations

- Flipbooks are useful training aids that should be included in agriculture programs for retaining and sharing project knowledge, post-project

Future opportunities

- Radio messaging campaign to prime the population prior to intervention