



# Enhancing production, quality and consumption of milk for income and improved nutrition in Rwanda

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## Principal Investigator

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## Objectives

- 1) Evaluate the impact of a nutrition education intervention on ASF consumption and nutrition outcomes among children 12-29 months of age and pregnant and lactating women
- 2) Assess and enhance performance and capacity of dairy cooperatives to improve market access for smallholder milk producers
- 3) Evaluate the costs and benefits to value chain agents of supplying milk that meets the Seal of Quality (SOQ) standards, currently referred to as Dairy Best Practices program

# Impact of animal source food (ASF) social behavior change communication (SBCC) on nutrition in Girinka households

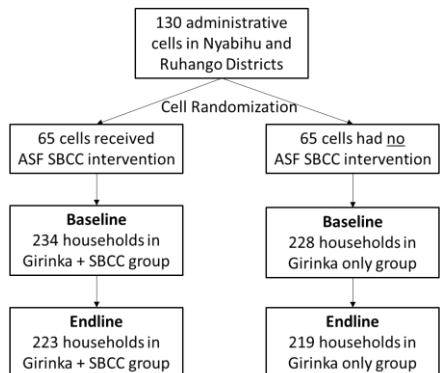
Valerie Flax, Emily Ouma, Lambert Izerimana, Mary-Ann Schreiner, Alice Brower, Eugene Niyonzima, Carine Nyilimana, Anita Usimwe

## Introduction

- The Government of Rwanda provides an exotic or cross-bred cow to poor families (Girinka program), but child milk intake and dietary diversity is low

## Methods

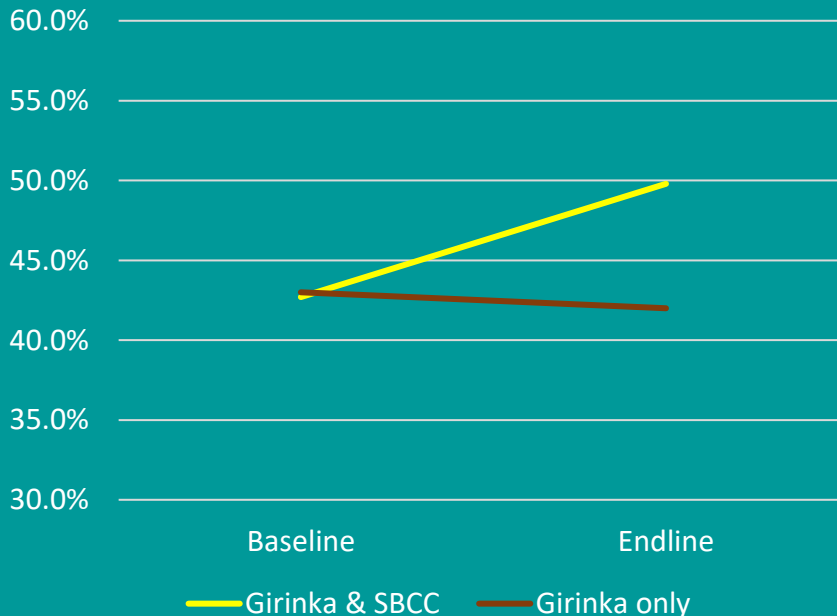
- Cluster-randomized trial to test if ASF SBCC increases milk intake from own production
- SBCC was implemented by community health workers from February-October 2019
- Enrolled a cohort of mothers with child 12-29 months in Girinka households



The Government of Rwanda's livestock asset transfer (Girinka) program plus SBCC promoting ASF consumption increased maternal knowledge and awareness but not child 24-hour milk intake, dietary diversity, or growth.

We found a trend toward increased frequency of child milk intake in the Girinka & SBCC group.

Fresh cow milk consumption  $\geq 2$  times/week



## Results

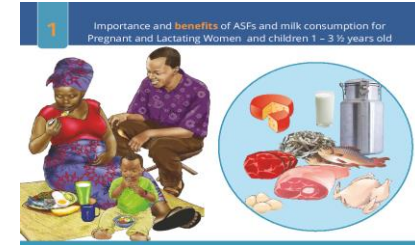
- Knowledge of types of ASFs, timing of milk introduction, and milk food safety higher in SBCC group
- Awareness of feeding child ASFs, drinking 1 cup of milk daily, and starting to give milk at 12 months higher in SBCC group
- Height-for age did not decline in either group

## Recommendations

- Scale up ASF SBCC by community health workers
- Longer duration for intervention
- Other supports so households don't have to sell milk

## Research gaps or future opportunities

- Does the 'own production' or 'sale of milk' pathway have more impact on child nutrition outcomes in this context?



# Impact of Girinka program on child nutritional status and household food security

Emily Ouma, Valerie Flax, Lambert Izerimana, Eugene Niyonzima, and Carine Nyilimana

## Introduction

- The Government of Rwanda and its partners are implementing a livestock asset transfer program, “Girinka” since 2006 to improve incomes, nutrition, soil fertility and social integration
- Evidence of the impact of the program on nutrition outcomes is lacking

## Methods

- Applied a quasi-experimental evaluation method - propensity score matching technique, specifically nearest neighbor matching and inverse probability weighted estimators
- Utilized baseline data collected from the cluster randomized controlled trial study arms - Girinka households and non-Girinka households (n = 686 households)

Girinka program has a **significant and positive impact on milk consumption among children and household food security.**

The program is associated with **higher child growth (by 0.26 HAZ)** and **lower malnutrition (by 0.21 WAZ)**, but no impact on child dietary diversity.

Outcome variables	Mean of outcome variables		Average Treatment Effect on the Treated
	Girinka	Control	
Height for age z-score	-1.722	-1.989	0.260** (2.17)
Weight for age z-score	-0.701	-0.884	0.208** (2.20)
% of children consuming milk more than twice in a week	0.416	0.203	0.217*** (5.13)
Household food insecurity access score	12.780	14.082	-1.305** (-2.00)

z-values in parenthesis. \*\* and \*\*\* denotes significance at 5% and 1% levels respectively

## Results

- The positive impact of Girinka program on child milk consumption and household food security is significant for households with relatively larger livestock herd size (> 1 tropical livestock units) and land size more than 0.1 acres.

## Recommendations

- Better targeting of households by Girinka program



## Research gaps or future opportunities

- What are the potentials of an integrated intervention package comprising improved cow productivity, gender empowerment and nutrition education in achieving positive nutrition outcomes?

# Microbacteriological quality of milk consumed in Kigali and Musanze cities (Rwanda).

Eugène Niyonzima , Olivier Kamana, Emily Ouma, Valerie Flax, Lambert Izerimana, Ben Bizinde, Mary-Ann Schreiner.

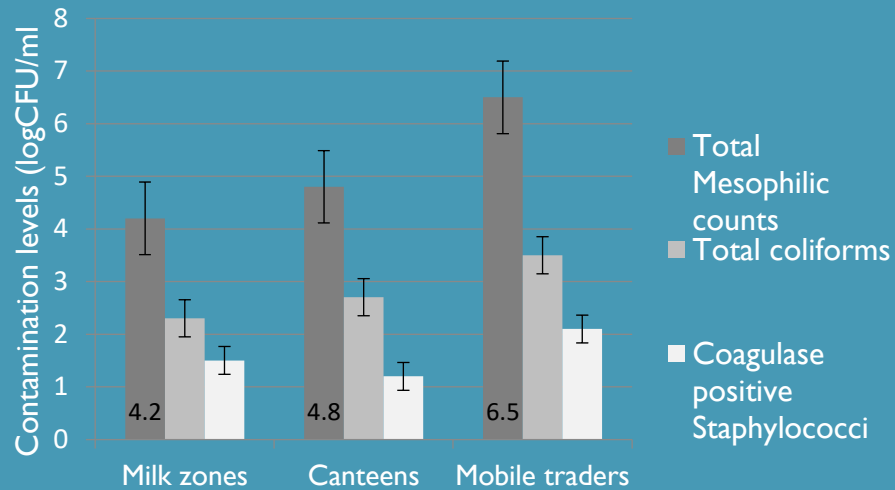
## Introduction

- Thanks to programs like GIRINKA that support the dairy sector, the Rwandan milk production has significantly increased during the last decades.
- Important efforts need to be deployed to assure the produced milk is of good quality and safe for the consumers.

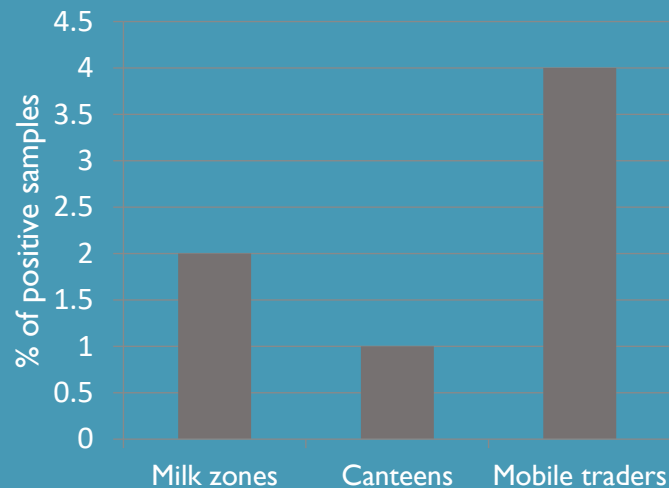
## Methods

- Milk consumption: Milk handling & consumption practices at the household level assessed through a structured survey.
- Milk contamination: Milk samples analyzed for the total mesophilic count , Total coliforms, Coagulase positive staphylococci and qualitative detection of *Salmonella* by using conventional cultural methods.

## Milk contamination by hygiene indicator bacteria



## Occurrence of *Salmonella* in the commercialized milk



## Results

- Levels of milk contamination by hygiene indicator bacteria and *Salmonella* prevalence is relatively high
- Highest contamination levels recorded in milk commercialized by **mobile traders**
- Contamination principally associated to the lack of cooling infrastructures as well as knowledge & skills in hygienic handling of milk.

## Recommendations

- Enhancing the knowledge & skills of vendors on hygienic handling of milk.
- Strengthening regulations regarding the commercialization of milk.
- Supporting, through their respective cooperatives, milk vendors especially mobile traders in acquiring required infrastructure and equipment to maintain the quality and safety of milk along its distribution.

## Future opportunities

- Molecular characterization of *Salmonella* strains isolated from milk and assess their possible antibiotic resistance.

# Impact of targeted business and governance capacity development on performance of dairy cooperatives in Rwanda

Ben Bizinde, Emily Ouma, and Julie Kariuki

## Introduction

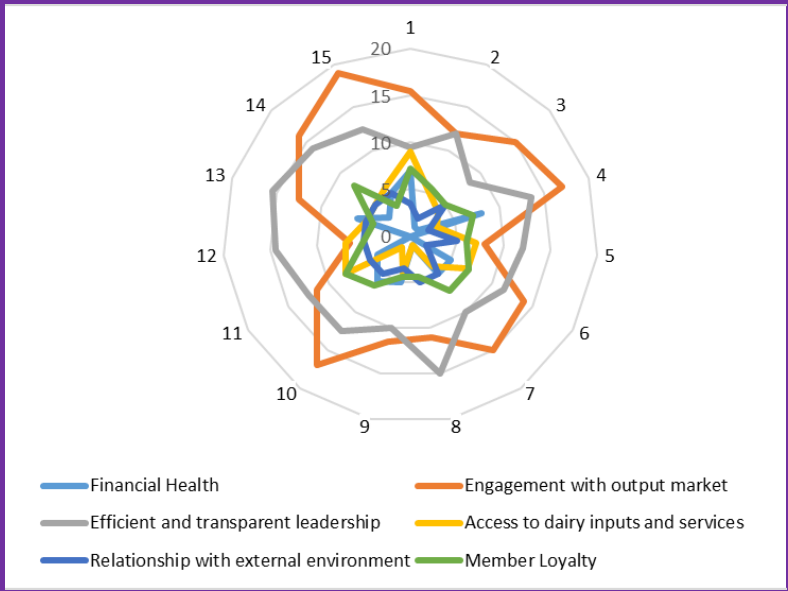
- Majority of existing Milk Collection Centers (MCCs) are owned by dairy cooperatives.
- Most MCCs are poorly managed, lack capacity in business management, and lack cold chain maintenance.
- This study assesses the impact of a business and governance capacity development intervention on performance of dairy cooperatives.

## Methods

- Conducted a business sustainability assessment of 30 dairy cooperatives from 4 milk sheds using AgPOSA tool at baseline and endline. AgPOSA is a harmonized tool from Producer Organization Sustainability Assessment and AgroPro.
- Implemented interventions in 4 cooperatives for 1 year and a market systems intervention in 16 cooperatives for 6 months.
- Applied a quasi-experimental before-after design.

The capacity development intervention resulted in **significant improvement in performance** of the dairy cooperatives.

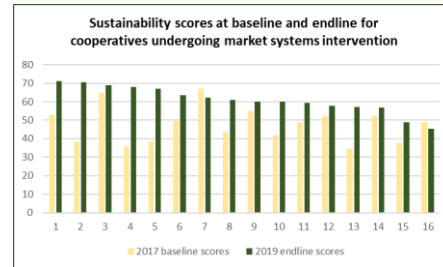
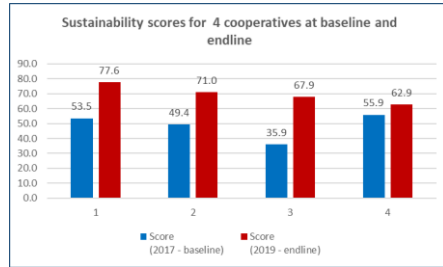
The improvement sustainability dimensions included **engagement with output markets, effective and transparent leadership, integration of women and youth in leadership positions, and member loyalty.**



Sustainability dimensions and scores for cooperatives in stage 3 at endline

## Results

- Both interventions resulted in improved business sustainability scores for 80% of the cooperatives.
- Specific outcomes included improved operations, governance, and financial management, ultimately leading to improved value proposition to members.



## Recommendations

- Even though there was an improvement in integration of women and youth in the cooperatives' leadership, continuous coaching and mentoring is needed for further empowerment and sustainability of the gains.