Food safety as a pathway to nutrition: the MoreMilk project

Silvia Alonso, Delia Grace
and members of the MoreMilk project research team

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Food safety, Agenda 2030 and the SDGs
Where food safety and nutrition meet

Some of the most nutritious products are also the less safe (animal source foods)

Foods implicated in foodborne disease

World Health Organisation, 2017
Where food safety and nutrition meet

Some of the most nutritious products are also the less safe (animal source foods)

Disease interferes with food intake and utilization

Some food safety hazards may decrease food nutrient content (e.g. adulteration)
What are (IN)formal markets?
Food safety and informal markets

Food products “informal markets”  unsafe/risky

- Limited infrastructure (unavailability of toilets, running water, structures not easy to disinfect, flies,...) – if you sample it, you’ll find it!!
Food safety in LMIC

• 100% of milk in Assam and 40% in Nairobi doesn’t meet standards
• 98% of beef in Ibadan, 52% pork in Hanoi, unacceptable bacteria counts
• 92% of Addis milk and 46% of Nairobi milk had aflatoxins over EU standards
• 30% of chicken from commercial broilers in Pretoria unacceptable for *S. aureus*
• 24% of boiled milk in Abidjan unacceptable *S. aureus*
Hazard assessment in Vietnam (pork)


Bacterial load in milk in Kenya

Table 1
Microbiological quality of milk samples from the formal and informal markets.

<table>
<thead>
<tr>
<th>Type of market</th>
<th>Type of milk</th>
<th>TBC</th>
<th>Coliforms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>mean (SD)</td>
<td>% positive</td>
</tr>
<tr>
<td>Informal market</td>
<td>raw (n = 40)</td>
<td>7.85<em>10^8 (2.66</em>10^9)</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>boiled (n = 21)</td>
<td>9.64<em>10^8 (3.00</em>10^9)</td>
<td>90*</td>
</tr>
<tr>
<td>Formal market</td>
<td>pasteurized (n = 24)</td>
<td>1.28<em>10^9 (3.37</em>10^9)</td>
<td>-**</td>
</tr>
</tbody>
</table>

Beyond food safety: Socio-economic effects of training informal dairy vendors in Kenya

Silvia Alonso\textsuperscript{a},\textsuperscript{b}, Emmanuel Muunda\textsuperscript{b}, Sara Ahlberg\textsuperscript{b}, Emma Blackmore\textsuperscript{c}, Delia Grace\textsuperscript{b}
Quality of pasteurized milk

40 samples from 4 different brands

Nato et al., 2016. Quality of pasteurized market milk in Kenya
Food safety and informal markets

Food products “informal markets” $\not\subseteq$ unsafe/risky

- Limited infrastructure (unavailability of toilets, running water, structures not easy to disinfect, flies,...) – if you sample it, you’ll find it!!

“Informal not necessarily unsafe; Formal not necessarily safer”

photo credit: ILRI/Stevie Mann
Formal markets and modern retailing

The ultimate goal, but be wary:

- *False* perception of safety
- Unrealistic short-term goal
- Compromises equitable food accessibility
- Social-equality impacts

While in the long term markets will formalize, in the short and medium terms interventions that seek to suppress informal markets can be **ineffective, anti-poor** and **gender-inequitable**
MoreMilk: Making the most of milk

https://cgspace.cgiar.org/handle/10568/82842 (MoreMilk project brief)
https://cgspace.cgiar.org/handle/10568/82776 (MoreMilk outputs collection)
The “informal” (raw milk) dairy sector

- Poor infrastructure, lack of cold chain, informal agreement mechanisms between actors, often unlicensed, poorly regulated (government and self-regulation)

- But... Informal dairy markets FEEDS MANY:
  - Food security (especially diet and nutrition needs of children)
  - Source of livelihoods for the population (higher prices for producers, gives jobs to a good amount of people)
  - Support women and youth
## Dairy intake of children

### Table 1: Intake of dairy products by children between 6 and 48 months (peri-urban Nairobi)

<table>
<thead>
<tr>
<th></th>
<th>% of children consuming dairy products*</th>
<th>Mean consumption per children in ml/ week**</th>
<th>% of children consuming dairy products as it is*</th>
<th>% of children consuming dairy product as part of a dish*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unpacked raw milk</td>
<td>98.7</td>
<td>693.0</td>
<td>36.8</td>
<td>77.5</td>
</tr>
<tr>
<td></td>
<td>(228)</td>
<td>(585.34)</td>
<td>(85)</td>
<td>(179)</td>
</tr>
<tr>
<td>Unpacked fermented milk</td>
<td>1.7</td>
<td>0.6</td>
<td>0.9</td>
<td>0</td>
</tr>
<tr>
<td>(mala)</td>
<td>(4)</td>
<td>(0.74)</td>
<td>(2)</td>
<td>(0)</td>
</tr>
<tr>
<td>Unpacked yoghurt</td>
<td>0.9</td>
<td>0.2</td>
<td>0.4</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(2)</td>
<td>(0.3)</td>
<td>(1)</td>
<td>(0)</td>
</tr>
<tr>
<td>Packed pasteurized whole fresh milk</td>
<td>16.5</td>
<td>29.2</td>
<td>6.1</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td>(38)</td>
<td>(31.80)</td>
<td>(14)</td>
<td>(23)</td>
</tr>
<tr>
<td>Packed fermented milk</td>
<td>2.6</td>
<td>0.8</td>
<td>2.2</td>
<td>0</td>
</tr>
<tr>
<td>(mala)</td>
<td>(6)</td>
<td>(1.03)</td>
<td>(5)</td>
<td>(0)</td>
</tr>
<tr>
<td>Packed yoghurt</td>
<td>39.4</td>
<td>58.2</td>
<td>35.5</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(91)</td>
<td>(147.27)</td>
<td>(82)</td>
<td>(0)</td>
</tr>
<tr>
<td>UHT milk</td>
<td>6.5</td>
<td>12.9</td>
<td>3.0</td>
<td>4.8</td>
</tr>
<tr>
<td></td>
<td>(15)</td>
<td>(11.59)</td>
<td>(7)</td>
<td>(11)</td>
</tr>
</tbody>
</table>

* Count in between brackets, ** Standard deviation in between brackets
The MoreMilk project

Two main LEVERAGE POINTS:

- “If we can improve food safety, we will legitimize the sector and protect health and nutrition security” (governance pathway)
- “We can empower the actors in the dairy informal sector to improve food safety and promote nutrition” (industry pathway)
The MoreMilk project

“MoreMilk: making the most of milk” project (2016-2021)

**TCM scheme** to improve *milk safety* and *health & nutrition outcomes* in children in peri-urban Nairobi

- **Training**: milk quality, safety and hygiene
- **Certification**: “branding”
- **Marketing**: milk consumption messages to mothers/consumers
The Governance pathway

Formal - *small and influential*

Informal - *big and under-represented*

Addressing public health concerns - Generating evidence for policy

**MILK SAFETY IN KENYA**
Awareness and Compliance with Regulations among Farmers and Vendors

LAHRA HARCOURT BROWN, SILVIA ALONSO, JOHANNA LINDAHL, HANNAH VARNELL, VIVIAN HOFFMANN, AND DELIA GRACE *
The industry pathway

- Incentive-based food safety interventions
- Capitalize on *pride* and community accountability to make food businesses health and nutrition champions!
Gender, food safety and nutrition

Women - 50% of operators in informal dairy sector, and face women-specific challenges

A gender-sensitive TCM will achieve:

- Gender equitable access to benefits
- Women-trader empowerment
- Women-consumer empowerment
Interventions that address food safety in LMIC

African Food Safety Capacity Building
Mapping Current Efforts to Improve Targeting and Coordination

Contains spoilers!
• Size of investment does not match food safety burden
• Most investments by few donors

Substantial focus on –
• National control systems
• Exports and other formal markets
• Chemical hazards

Little focus on –
• Market-based and demand-led approaches
• Informal sector where most foods are sold
• Biological hazards and risks to human
Interventions that make the difference

Three-legged stool approach:

- Training and technologies
- Enabling environment
- Motivation and incentives
1. **Health first:** Better address the health of domestic consumers dependent on informal markets.

2. **Risk-based:** Build capacity for well-governed, evidence-and risk-based food safety systems.

3. **Market-led:** Harness marketplace drivers of progress on food safety.

**How can governments work with the informal sector towards food safety?**
better lives through livestock

ilri.org