

Health risk in informal milk value chain: Needs of a people-centric collective and integrated approach to address it

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ILRI

International Livestock Research Institute

Background

- 78-80% milk in India is marketed by informal sector (97% in Assam)
- Milk vendors are considered as bad element of milk business
- Hygiene and quality of milk marketed by them is not satisfactory
- Several Govt. agencies are responsible for dairy sector
- None is responsible to correct the wrong doing of market actors
- Poor coordination & cooperation among the agencies
- Mistrust between the govt. agencies & informal market actors

High risk factor (in Assam's context)

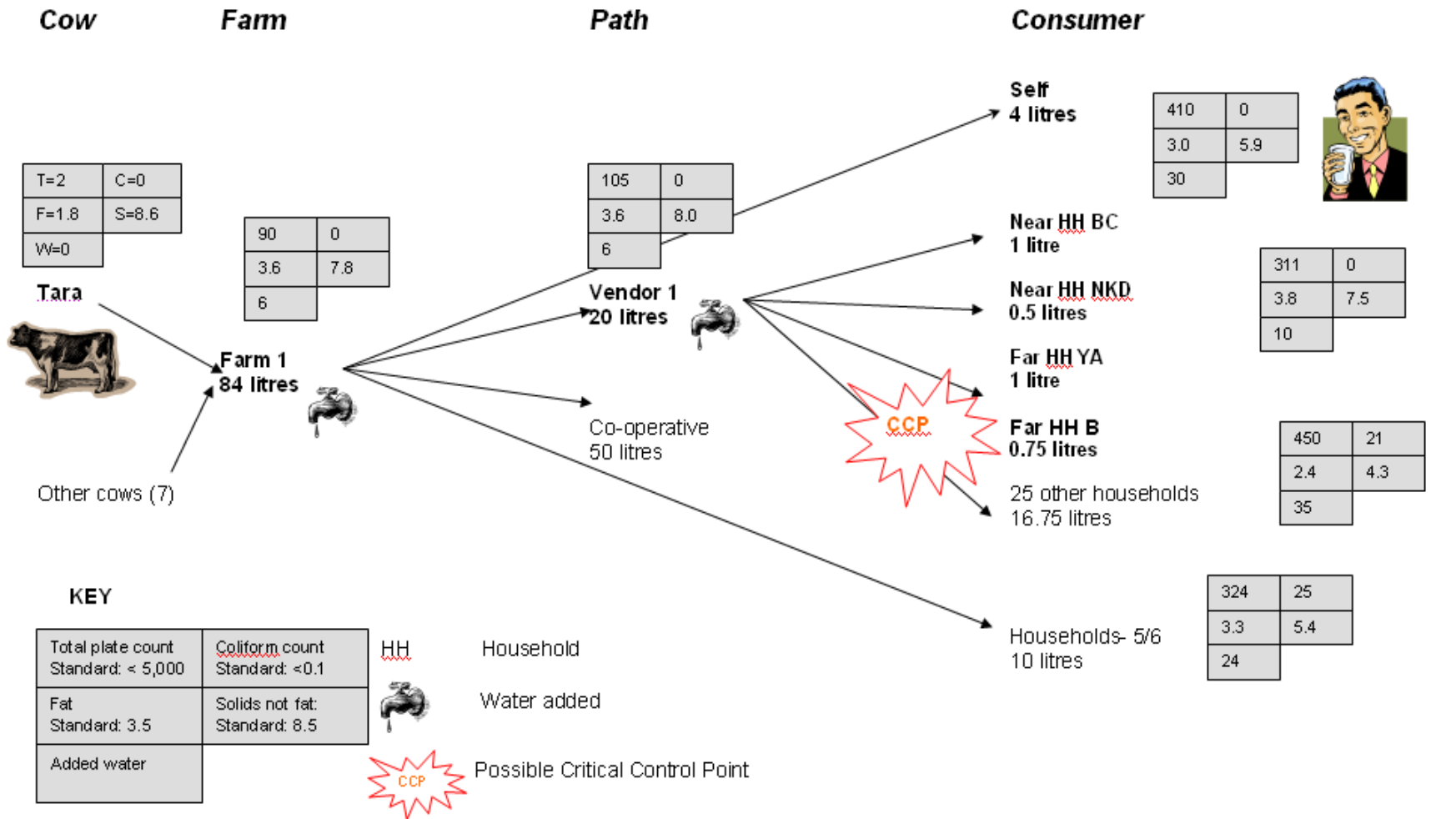
- Adulteration with water – 20%
- Total bacterial count (log)- 6.1
- Total coliform count (log)- 4.1
- Sample do not have acceptable coliform count- 50%
- Antibiotic residue- 85% samples (Neo-Streptomycin)
- Aflatoxin- 4% samples
- Sero-positive for brucellosis: 13-65% samples

Source: Comprehensive dairy sector study in Assam by ILRI, 2007, and Impact assessment study by SLU students, 2014

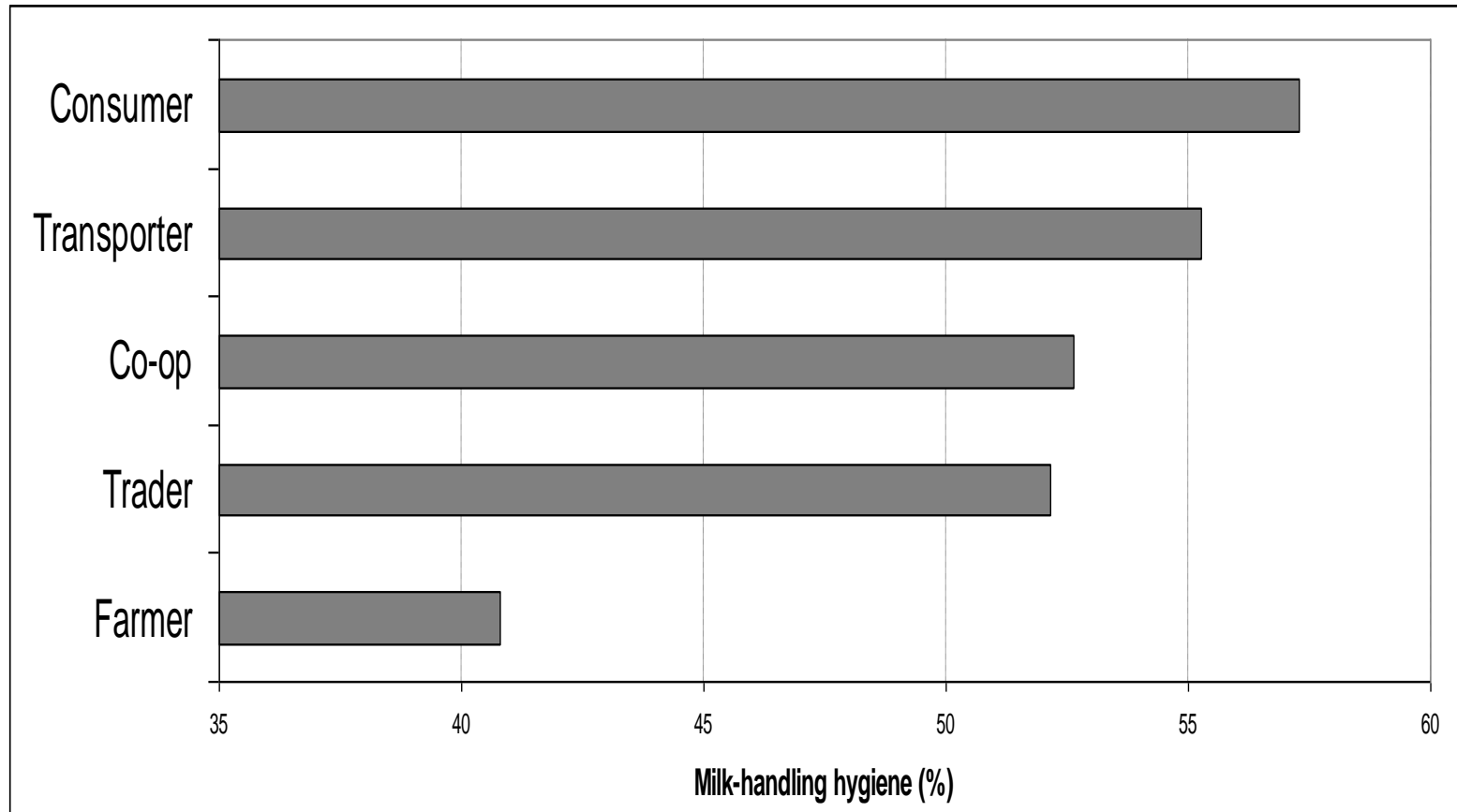
Commonly found pathogens in milk

- *Salmonella*
- *E. coli*
- *Staphylococcus*
- *Streptococcus aureus*
- *Mycobacterium*
- *Brucella*

Critical control point in milk pathway

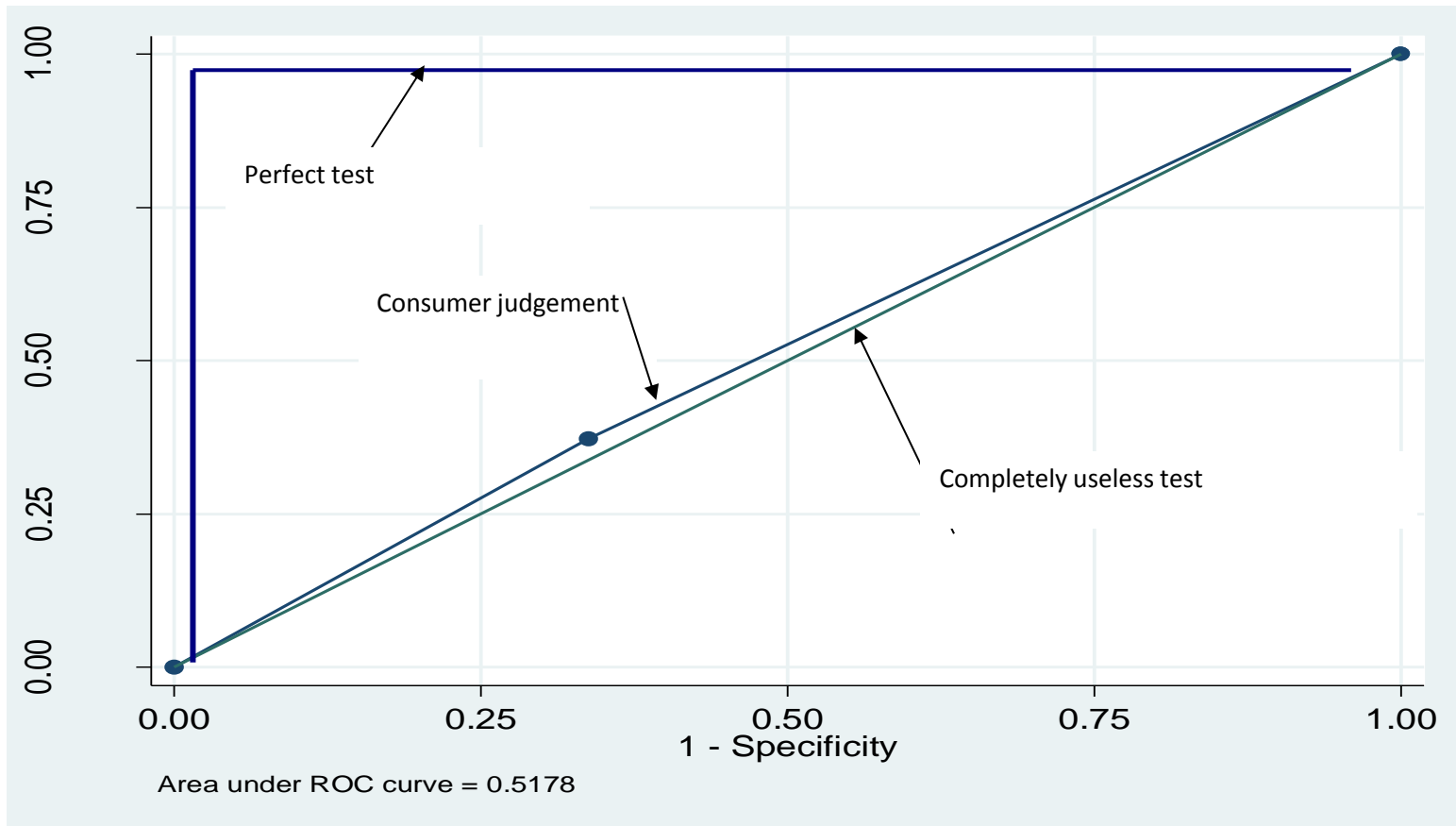


Mean hygiene scores of different actors (n=75)



Source: Comprehensive dairy sector study in Assam by ILRI, 2007

Consumers' capacity to judge the quality of milk



Source: Comprehensive dairy sector study in Assam by ILRI, 2007

The questions lies....

- Are we not responsible for 80% milk consumers who are consuming milk supplied by informal sector?
- Do we have strategy to improve the hygiene and quality of milk marketed by informal market actors?
- Would it be possible to transform whole informal to formal within a few years?
- If not.....

Piloted a collective integrated approach

Brought all relevant agencies together to constitute a common platform - JCMC

- Dairy Development Department
- Animal Health and Veterinary Department
- Department of Health Services
- Municipal Corporation
- Assam Agricultural University
- ILRI

What we did

- Dovetailed individual departmental initiative towards the common cause
- Developed friendly relation with market actors
- Assessed their knowledge, attitude & practices
- Developed customised training manuals after training needs assessment
- Implemented training & monitoring program throughout the pathway
- Designed consumers' awareness program
- Designed an incentive plan

Progress

- A baseline survey was conducted covering producers , traders, sweet makers and consumers in 2009
- 263 milk traders trained & monitored in 2010-11
- 356 milk producers trained & monitored
- The same baseline survey was repeated in 2012 to see the difference before and after and with and without

Added water in milk

| | 2009 | 2012 |
|-----------|-------|--------|
| Producers | 0-66% | 0-28 % |
| Traders | 2-55% | 0-31 % |

Can diseases be transmitted from dung?

Believe diseases can be transmitted from dung

Producers

| | |
|------------------|-------------------------|
| 2009 | 2.7% (11/404) |
| 2012 | 37.2% (60/161)*** |
| Trained (2012) | 69.8% (37/53)*** |
| Untrained (2012) | 21.3% (23/108) |

Traders

| | |
|------------------|--------------------------|
| 2009 | 1.1% (2/175) |
| 2012 | 47.1% (106/225)*** |
| Trained (2012) | 63.9% (78/122)*** |
| Untrained (2012) | 27.2% (28/103) |

Can diseases be transmitted by milk?

Believe diseases can be transmitted from milk

Producers

| | |
|------------------|-------------------|
| 2009 | 13.0% (52/401) |
| 2012 | 35.4% (57/161)*** |
| Trained (2012) | 64.2% (34/53)*** |
| Untrained (2012) | 21.3% (23/108) |

Traders

| | |
|------------------|-------------------|
| 2009 | 9.1% (16/175) |
| 2012 | 41.5% (93/224)*** |
| Trained (2012) | 64.8% (79/122)*** |
| Untrained (2012) | 13.7% (14/102) |

Is the milk completely safe after boiling?

| | Believe milk is completely safe after boiling |
|------------------|---|
| Producers | |
| 2009 | 96.0% (380/396) |
| 2012 | 93.1% (148/159) |
| Trained (2012) | 86.8% (46/53)* |
| Untrained (2012) | 96.2% (102/106) |
| Traders | |
| 2009 | 89.1% (156/175) |
| 2012 | 93.8% (212/226) |
| Trained (2012) | 91.8% (112/122) |
| Untrained (2012) | 96.2% (100/104)* |

Which diseases can be transmitted?

| | Tuberculosis | Food poisoning/ gastrointestinal disease | General disease symptoms (fever, cough, cold) | Worms |
|------------------|-------------------|--|---|----------------|
| Producers | | | | |
| 2009 | 3.5% (14/405) | 18.3% (74/405) | 0.3% (1/405) | 4.7% (19/405) |
| 2012 | 8.7% (14/161)** | 36.0% (58/161)*** | 11.2% (18/161)*** | 9.3% (15/161)* |
| Trained (2012) | 18.9% (10/53)*** | 64.2% (34/53)*** | 20.8% (11/53)** | 9.4% (5/53) |
| Untrained (2012) | 3.7% (4/108) | 22.2% (24/108) | 6.5% (7/108)*** | 9.3% (10/108) |
| Traders | | | | |
| 2009 | 4.0% (7/175) | 9.7% (17/175) | 0% (0/175) | 2.9% (5/175) |
| 2012 | 13.7% (31/226)*** | 42.9% (97/226)*** | 11.5% (26/226)*** | 4.0% (9/226) |
| Trained (2012) | 23.8% (29/122)*** | 61.5% (75/122)*** | 20.5% (25/122)*** | 6.6% (8/122)* |
| Untrained (2012) | 1.9% (2/104) | 21.2% (22/104)** | 1.0% (1/104) | 1.0% (1/104) |

What do you use most often to wash your hands?

- Producers
 - Untrained- 53% answered soap
 - Trained – 92% answered soap (p<0.001)
- Traders
 - Untrained- 74% answered soap
 - Trained – 92% answered soap (p<0.001)



Some specks of dirt in the milk are not harmful

- Producers
 - Untrained – 58% agree
 - Trained – **77% agree** ($p=0.046$)
- Traders
 - Untrained – 37.5% agree
 - Trained – **28% agree**



You can tell if milk is safe to drink

- Producers
 - Untrained – 96% agree
 - Trained – **77% agree** ($p < 0.001$)
- Traders
 - Untrained – 96% agree
 - Trained – **89% agree**



It is good for the cow if you add water to the milk

- Producers
 - Untrained – 76% agree
 - Trained – 64% agree (p=0.052)
- Traders
 - Untrained – 72% agree
 - Trained – 53% agree (p<0.001)



In practice

- Producers

- No difference in the number of milk containers were free from dirt (92% were not)
- No difference in if milk was free from dirt (2.5% were not)
- **79% of** trained producers had clean clothes, compared to **68%** of untrained ($p < 0.001$)

- Traders

- No difference in if milk was free from dirt (3.5% were not)
- **82% of** trained traders had clean clothes, compared to **50%** of untrained ($p < 0.001$)



Comparison of training effects on milk trading indicators, exposed and control

| | With training | | Without training | |
|--|---------------|---------|------------------|---------|
| | Mean | STD | Mean | STD |
| 1. Total milk procured per day (liter) | 146.79 | 266.50 | 86.03 | 181.19 |
| 2. Total milk sold per day (liter) | 151.56 | 266.43 | 90.15 | 186.74 |
| 3. Cost of milk procured per day (RS) | 4129.70 | 8085.92 | 2236.20 | 5530.79 |
| 4. Cost of operations per day (RS) | 260.47 | 325.29 | 153.68 | 139.81 |
| 5. Total costs/day (3+4) (RS) | 4390.17 | 8375.34 | 2389.88 | 5661.26 |
| Cost/liter milk sold (RS) | 28.97 | 11.50 | 26.51 | 13.77 |

Benefits realised by producers

- Prevalence of sub clinical mastitis come down among the cows of trained farmers.
- Productivity of milk in dairy cows of trained farmers increased by 11.7%

Conclusion

People centric collective and integrated initiative was useful for changing knowledge, attitude & practices

Strength

- Collaborative effort worked effectively
- Friendly approach was useful for building trust
- Training & monitoring programmed was delivered in true spirit

Weakness

- Some external factors were beyond the control of the project that influenced the outcome
- Tangible incentives, consumers' awareness & BDS programme could not be implemented

Thank You

