Determination of risk factors contributing to microbial contamination in milk and identification of presence of selected pathogenic bacteria along the dairy value chain in Tanzania

Fortunate Shija, Hezron Nonga, Lusato R. Kurwijila,
Kristina Roesel, Delia Grace and Gerald Misinzo

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The sale of unpasteurized milk is a common practice in Tanzania

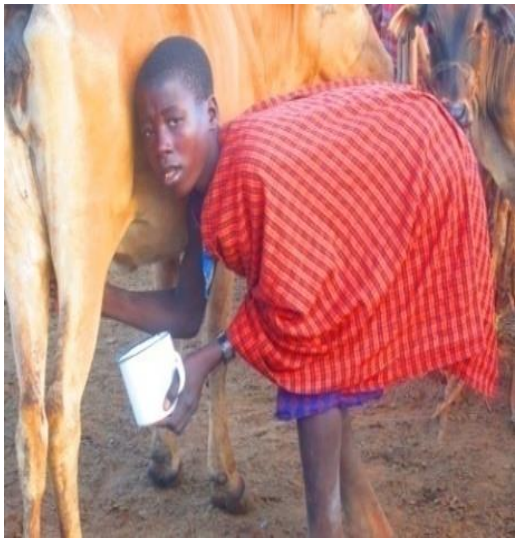
Dairy industry in Tanzania is also characterized by informal markets

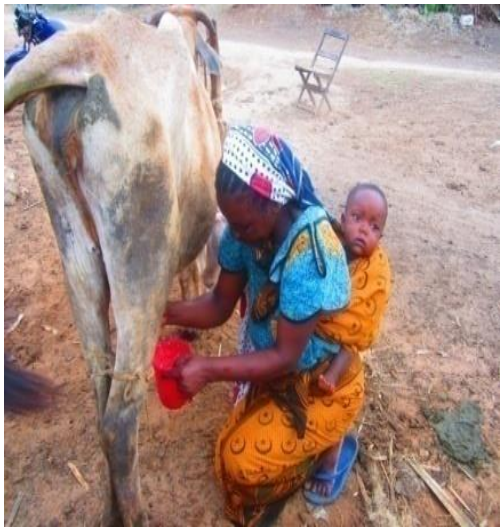
Milk is predisposed to bacterial contamination that may cause spoilage and zoonotic diseases

Objective

To assess milk handling practices, bacterial contamination and determine selected milk borne zoonotic pathogens along the dairy value chain in Lushoto and Handeni districts of Tanga region

Milk sample collection





166 milk samples were collected from farmers, vendors, restaurants/kiosks, milk collection centers and consumers

Laboratory sample analysis

Microbial isolation: total and coliform plate counts

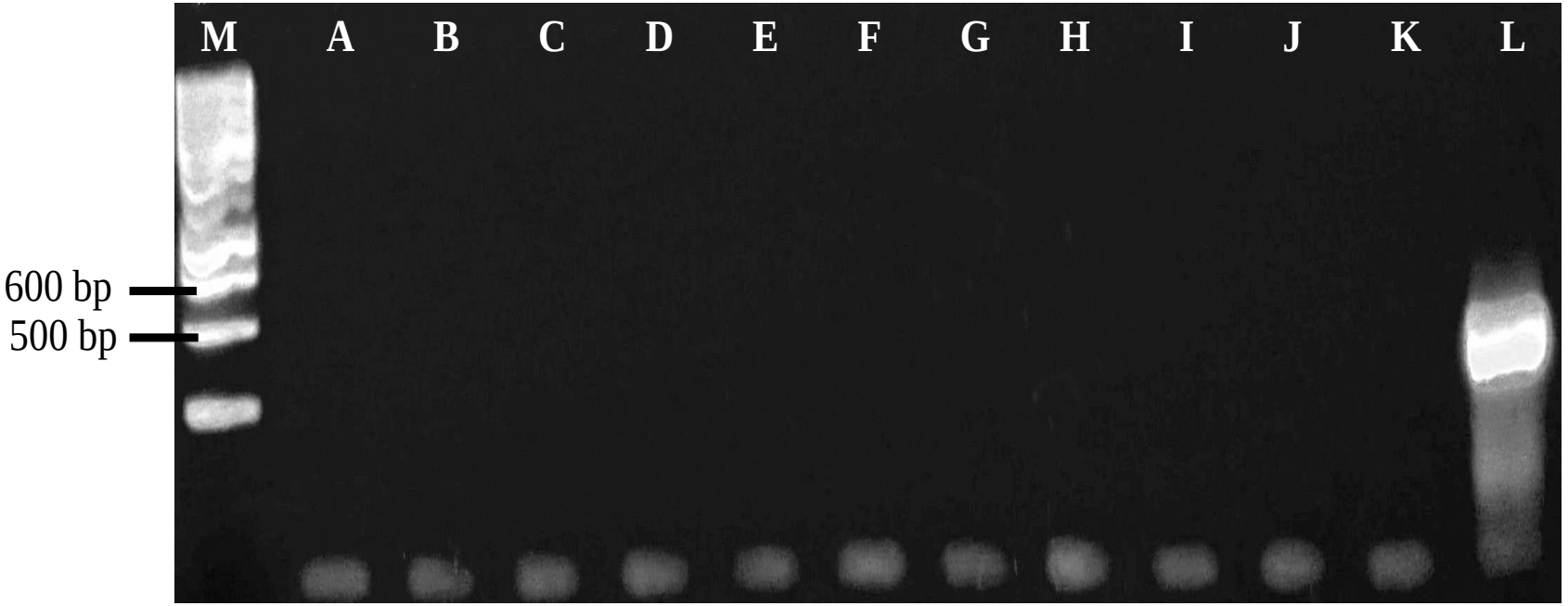
Laboratory sample analysis

Polymerase chain reaction:

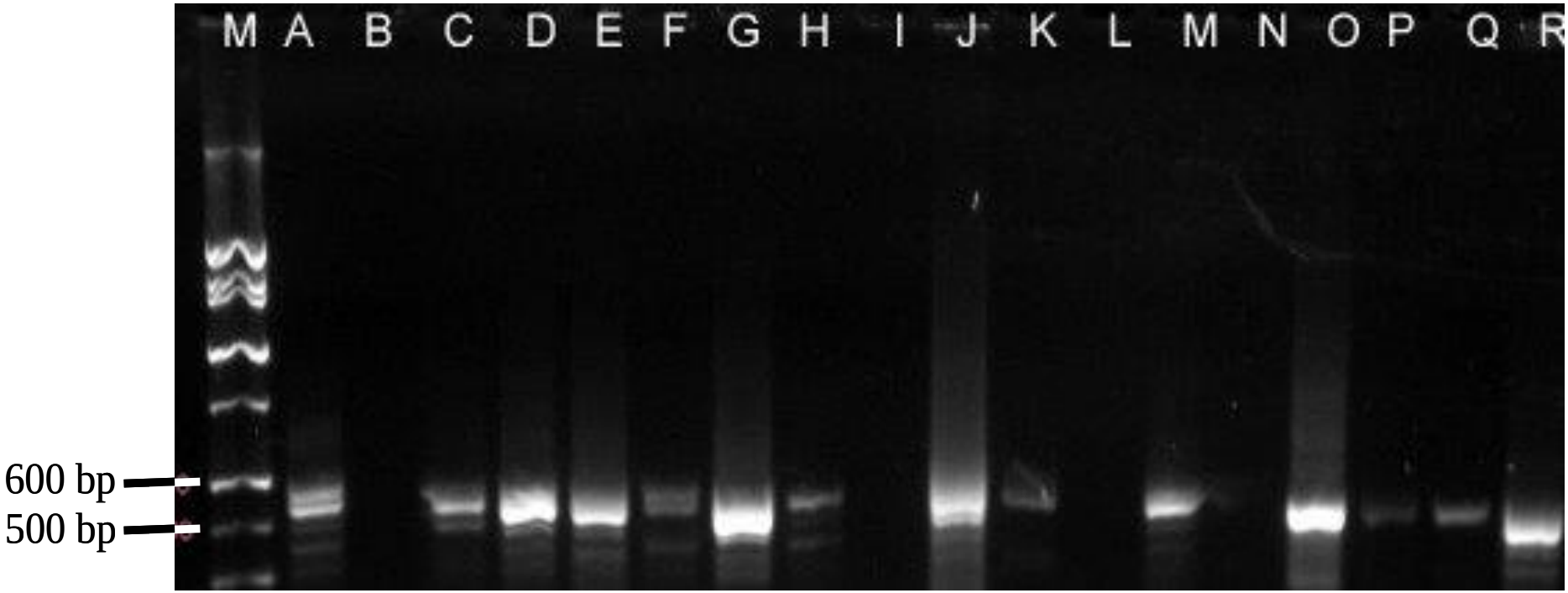
Escherichia coli O157:H7
(O157-3 and O157-4)

Brucella abortus
(BRU P5 and BRU P8)

Detection of *Escherichia coli* O157:H7



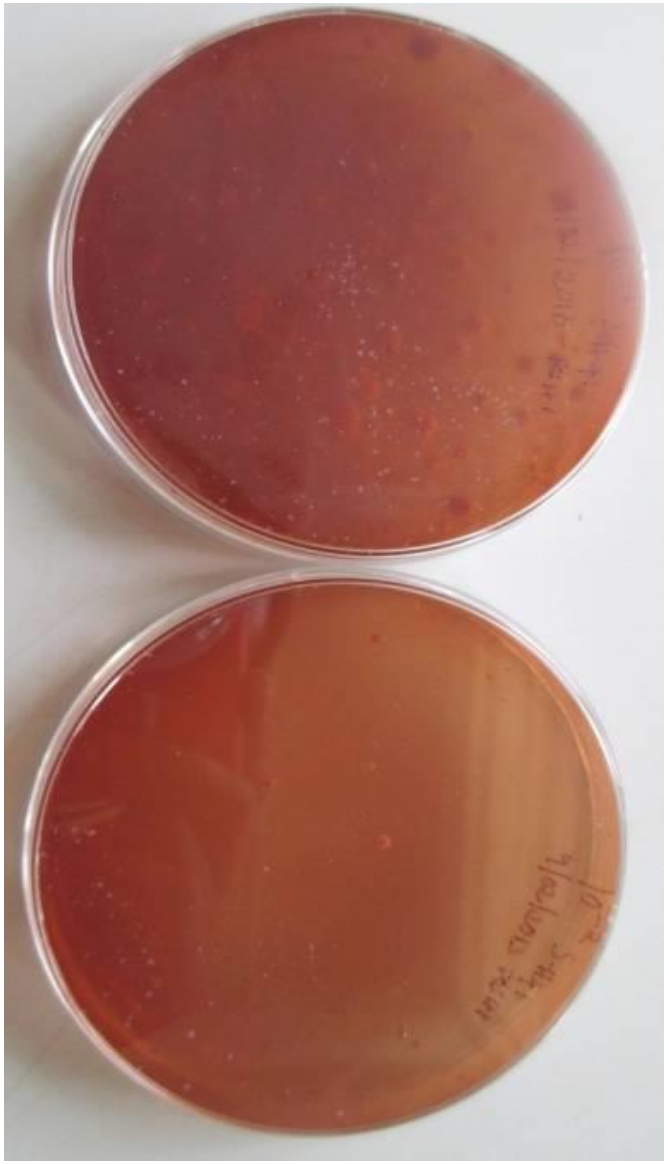
Detection of *B. abortus*: 42% positive



General practices during milking storage and delivery

Variable	Category	No. (%) farmers respondents
Sources of water	Tap	26 (40.0)
	Wells	21 (32.3)
	Dams and/or streams	19 (29.3)
Milking practices	Cleaning animal shed before milking	28 (43.1)
	Wash hands before milking	46 (70.7)
	Wash cow's teats before milking	41 (63.1)
	Wash hands after milking	47 (72.3)
Containers used for milk storage	wide necked aluminum vessel	2 (03.1)
	Wide necked plastic vessel	56 (86.1)
	Used water and oil bottles	6 (09.2)
	Cooking pan "sufuria"	1 (01.5)
Containers used for delivery/transportation	wide necked aluminum vessel	0 (0.0)
	Wide necked plastick vessel	38 (58.5)
	Used water and oil bottles	8 (12.3)
	Cooking pan "sufuria"	3 (4.6)
	Others e.g traditional pots	16 (24.6)
Means of delivery	On foot	37 (56.9)
	By bicycle	9 (13.8)
	By motorcycle	3 (4.6)

Total plate counts and coliform plate counts



Total plate counts and coliform plate counts

Variable	Observations	Mean (log10 cfu/ml)	Std. Dev (log10)	Min	Max
		Total Plate Count			
Farmers	21	5.3	5.4	3.3	5.8
Vendors	5	5.8	5.7	4.6	6.1
Restaurants	7	4.9	4.9	0	5.3
		Coliform plate count			
Farmers	22	4.8	4.9	2.5	5.5
Vendors	4	4.8	5.1	3.3	5.4
Restaurants	7	3.6	3.9	0	4.3

Conlusions

- Unhygienic practices at milking and selling places contributes to increase in microbial contaminations
- Milk is highly contaminated with coliforms
- The presence of *B. abortus* but not *Escherichia coli* O157:H7 in milk samples was confirmed

Recommendations

- Veterinary/extension services should be provided to livestock farmers on proper handling of milk
- Consumer practices, such as milk boiling should be further encouraged
- Further study to relate these findings with human brucellosis in Lushoto and Handeni should be carried out

Acknowledgements

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