

The Milk Delivery Chain and Presence of *Brucella* Spp. Antibodies in Bulk Milk in Uganda

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Abstract

This study examined the influence of informal milk delivery chains on the risk of human exposure to *Brucella* spp. through milk consumption in two regions of Uganda (Gulu and Soroti Districts). The work involved describing milk delivery chains, investigating brucellosis awareness amongst milk deliverers and determining the presence of *Brucella* spp. antibodies in cattle milk on delivery to primary collection points (boiling points and dairies). Milk samples (n= 331) were collected from deliverers at primary collection points and from street vendors at point of sale and analysed using indirect enzyme-linked immunosorbent assay (I-ELISA). A written questionnaire was used to collect data from deliverers (n= 279) on their milk delivery chains and their brucellosis awareness. The most common delivery points in Gulu District were small dairies and in Soroti District boiling points. The presence of *Brucella* spp. antibodies in milk samples was higher in Soroti (40%) than in Gulu (11%) ($P < 0.0001$). There are possible public health risk consequences of this finding as 42% of deliverers in Soroti District reported drinking raw milk, compared with 15% in Gulu District ($P < 0.0001$). Awareness of brucellosis was low, with 70% of all milk deliverers reporting not having heard of the disease or the bacterium. Application of quality controls for milk (colour and odour) along the delivery chain varied depending upon supply and demand. This study provides evidence of the diversity of informal milk markets in low-income countries and of the potential public health risks of consuming unpasteurised milk. These results can be useful to those planning interventions to reduce brucellosis.

Keywords: Brucellosis, Livestock, milk, Food security, Zoonosis, Small holder, Sub-Saharan Africa