

ABSTRACT

Mycotoxin and *Brucella abortus* contamination of milk along the dairy value chain is of public health concern and contributes to food insecurity. Animal feeds that are contaminated with mycotoxin causing fungi pass the contamination to the milk. Inhygienic handling of milk can lead to *Brucella* contamination of milk. This study aimed at determining the on-farm risk factors associated with Mycotoxins and *B. abortus* occurrence and their prevalence on smallholder farms at rural and peri-urban dairy sub-value chains in Nakuru County. A cross-sectional survey using semi-structured questionnaires was administered randomly to 280 farmers and raw milk market players. Alongside, milk samples (317), blood for serum ((n=245) and animal feed (74) samples were collected. Feed samples were analyzed for Aflatoxin (AFs) concentration and Deoxynivalenol (DON) and milk samples for Aflatoxin M1 (AFM1) using commercial Enzyme Linked Immune Sorbent Assay (ELISA). Serum samples were first screened for antibodies against *B. abortus* using milk ring test (MRT) and Rose Bengal Plate test (RBPT). Positive reactors were further confirmed by Complementary Fixation Test (CFT) and competitive enzyme linked immunoassay (c-ELISA) test. Data was analyzed using SPSS version 20 for qualitative data and SAS version 9 for the quantitative data and Means were compared using least significant differences (LSD) at 95% confidence level. The study identified three risk factors for mycotoxin contamination of animal feeds at the farm level; 1) the type of feeds, 2) condition of feed and 3) storage method. Type and condition of animal feeds were found to be significant $P < 0.05$ risk factors for infestation of mycotoxigenic mold. The feed samples had 0 - 147.86 $\mu\text{g/kg}$ AFs concentration with 56% above the European Union (EU) limits of $5\mu\text{g/kg}$ and Deoxynivalenol concentration ranged between 0 and 179.89 $\mu\text{g/kg}$ and positive in 63% of the samples. All milk samples from the rural dairy value chain were below the EU limits of $0.05\mu\text{g/L}$. Milk samples, 68% from peri-urban dairy farms, 29% from transporters, 40% from cooperatives and 17% milk bars had a concentration of 0-0.083 $\mu\text{g/L}$ and exceeded the EU limits of $0.05\mu\text{g/L}$. The study identified the risk factors for brucellosis at the farm level; method of breeding, thus use of a bull was significant $P < 0.05$ as a risk factor for brucellosis. The prevalence of brucellosis was 1.3% and 1.7% in peri-urban and rural dairy systems respectively. Milk safety in rural and peri-urban dairy systems is a concern for public health. Mycotoxins from animal feeds and brucellosis due to usage of bulls for breeding are the major risks

Keywords

Brucella abortus and mycotoxin -- Animal feeds