

# Serological and molecular investigation for brucellosis in swine in selected districts of Uganda

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**Abstract** Brucellosis is a notifiable zoonotic disease affecting livestock, humans, and wildlife in Uganda. Pigs can be infected with human pathogenic *Brucella suis* biovars 1 and 3 and can be a significant source of brucellosis for humans. Uganda has a rapidly growing pig population, and the pork consumption per capita is the highest in East Africa. The objective of this work was to determine the seroprevalence of brucellosis in Ugandan pigs. A cross-sectional serosurvey of pigs was conducted in three of the major pig-keeping districts in Uganda (Masaka ( $n=381$  samples), Mukono ( $n=398$ ), and Kamuli ( $n=414$ )). In addition, pigs originating from these districts were sampled in the major pig abattoir in Kampala ( $n=472$ ). In total, 1665 serum samples were investigated by serological and molecular tests. Only three putative brucellosis-positive samples were detected serologically using indirect ELISA. These sera were found negative for *Brucella* antibodies by CFT; however, two had antibodies against *Yersinia enterocolitica* as determined by SAT. Presence of antibodies against *Yersinia* was confirmed by

*Y. enterocolitica* antibody-specific ELISA. The two *Yersinia* ELISA-positive samples were brucellosis negative using real-time PCR. We tested additional 142 sera from the 1665 samples with real-time PCR. All tested negative. Under this type of production system, we expect a maximum *B. suis* prevalence of less than 1 % at 95 % confidence level, and therefore, the risk of acquiring brucellosis from the pigs or their products is negligible. However, pigs may harbor the zoonotic *Y. enterocolitica*. This is the first study to investigate the occurrence of brucellosis in pigs in Uganda and the first study to report *Y. enterocolitica* antibodies in swine in Uganda.

**Keywords** Screening · Porcine brucellosis · Yersiniosis · Masaka · Mukono · Kamuli districts

## Introduction

Brucellosis is a notifiable zoonotic disease affecting people, livestock, and wildlife globally (Perry and Sones 2007). It is widespread causing significant human suffering and serious economic losses in livestock (Nakavuma and Opuda-Asibo 1999; McDermott et al. 2013). Although national statistics are lacking, there is considerable concern about brucellosis in Uganda. A seroprevalence of 12 and 7 % was reported among beef abattoir workers in Kampala and Mbarara district, respectively (Nabukenya et al. 2013). In Mulago National Referral Hospital, located in Kampala City, 652 cases of brucellosis were diagnosed between June 2004 and May 2006 alone (Makita et al. 2008).

Brucellosis, caused by *Brucella suis*, is a major disease of pigs causing infertility, production of small litters, and abortion in sows. *B. suis* is a notable occupational hazard particularly to abattoir workers, farmers, and veterinarians (Radostits

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