African swine fever surveillance of warthogs: challenges and opportunities of non-invasive, rope-bait sampling

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Objective
Non-invasive sampling of wildlife has become an viable means of confirming disease presence in an area, and has been used successfully for sampling wild boar populations for African swine fever (ASF) virus infection in northern hemisphere countries to which the genotype II virus has been introduced. The utility of these methods in the sylvatic setting in sub-Saharan Africa has not been explored but represents a potentially powerful means of determining the ASF status in areas inhabited by warthogs and by the Ornithodoros soft ticks that vector the virus. Based on the successes achieved with deploying rope baits to sample saliva from wild boars in Europe, we undertook a preliminary assessment of the applicability of this approach in a southern African savannah setting.

Methods
A range of rope baits were considered for the study, including (i) pig feed encased in a wax coating, (ii) feed encased in a wax coating infused with truffle oil, (iii) knuckle baits with a molasses attractant, (iv) knuckle baits with a fermented yeast attractant and (v) traditional maize baits. In addition, variations in deployment strategies were also considered, eg. hanging versus ground baits and single versus multiple baits. Finally, the degree of warthog habituation to natural versus transformed environments was assessed. All interactions with the baits were monitored using camera traps deployed at the baiting sites.

Results
Our results indicate that warthogs in natural areas interact the least with the baits, whereas those in transformed sites are more likely to interact with baits, particularly if non-target wildlife species display an interest in the baits. The warthogs most likely to interact with and consume the baits are those that are habituated to areas where feed and feeding occur regularly. Non-target species interacting with the baits also differed substantially between the different baiting environments that were assessed, with jackal, porcupines and squirrels being the dominant non-target species at the natural site, and baboons being the dominant non-target species at transformed/habituated sites.

Conclusions
Despite the limited success with oral baits in natural areas, rope baits appear to hold promise for sampling warthogs in those areas which pose the highest risk of transmission to domestic pigs, namely sites occupied by humans where feed or feeding can occur on a regular basis. This suggests that with additional refinement that rope baits may provide a cost-effective alternative to warthog surveillance efforts that traditionally have involved immobilization for sampling, particularly in those areas where an active wildlife-domestic interface exists and the risk of ASF transmission is highest.

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