Survey of selected zoonotic and animal pathogens in muskoxen (*Ovibos moschatus wardi*) of Victoria Island, Nunavut, Canada

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The purpose of this study was to determine baseline prevalence of zoonotic and animal pathogens in muskoxen on Victoria Island, Nunavut, Canada. Muskoxen are hunted for subsistence, commercial sale, and sport; however, there are concerns for food safety, human health, and animal health. This information will provide the basis of a long term surveillance plan for the management of food security and food safety in northern communities. Muskoxen from two geographically distinct regions (one commercial harvest and two community harvests) were sampled during the winter of 2010. Tissues, feces, and sera were collected and tested for 18 different pathogens. Test methods included serology, bacterial culture, polymerase chain reaction, immunofluorescence assay, fecal flotation, Baermann, and histology. A total of 216 muskoxen were sampled. Positive seroprevalence results included: *Neospora caninum* (3/49), *Toxoplasma gondii* (1/49), and pestivirus (1/44). Samples tested negative for the following pathogens: alphaherpesvirus (n=44), *Mycobacterium avium* paratuberculosis (n=67), *Chlamydophila* sp. (n=49), *Yersinia* sp. (n=67), *Giardia* sp. (n=202), *Cryptosporidium* sp. (n=202), and *Besnoitia* sp. (n=199). The lungworm *Umingmakstrongylus pallikuukensis* was present in all animals examined from the community hunts (n=26), but absent from commercially harvested animals (n=62). Overall, a low prevalence of pathogens significant to humans and animals was detected by the tests utilized. Additional work is required in validating these diagnostic test methodologies in this species. These results have contributed to the development of surveillance methodology to be used for monitoring changes in prevalence and changes in geographical distribution of pathogens, especially those of concern for human health.

Live bird markets as potential avian influenza A (H5N1) virus reservoirs in Vietnam and Cambodia: field survey and mathematical models of transmission

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In many parts of the world, wet markets are a key component of formal and informal food chains, providing fresh meat for consumers. They may, however, promote the emergence, spread and maintenance of livestock pathogens, including zoonoses. A survey was conducted to assess the potential of Vietnamese and Cambodian live bird markets (LBMs) to sustain circulation of highly pathogenic avian influenza virus subtype H5N1 (HPAIV H5N1). In 30 Vietnamese and 8 Cambodian LBMs, structured interviews were conducted with the market managers and 561 Vietnamese and 84 Cambodian traders. Multivariate and cluster analyses were used to construct a typology of traders based on their poultry management practices. Stochastic meta-population models of HPAIV H5N1 transmission were developed to assess the potential of LBMs to become virus reservoirs. As a result of their practices and large poultry surplus (unsold poultry reoffered for sale the following day), some poultry traders were shown to promote conditions favourable for perpetuating HPAIV H5N1 in LBMs. More than 80% of these traders operated in LBMs located in the most densely populated areas, Hanoi and Phnom Penh. The profiles of sellers operating at a given LBM could be reliably predicted using basic information about the location and type of market. Consequently, the risk of a given LBM becoming a virus reservoir could be relatively easily assessed and control strategies appropriately targeted to those markets. These findings are of particular relevance to resource-scarce settings with extensively developed LBM systems, commonly found in South-East Asia.