The epidemiology of bovine cysticercosis infections in Ethiopia

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Bovine cysticercosis is an infection of cattle with the metacestodes (cysticerci) of the tapeworm *Taenia saginata.* The life cycle of *T. saginata* involves humans as final and cattle as intermediate hosts (Lees *et al*. 2002). Human beings acquire infection by ingestion of raw or undercooked beef containing the metacestode larval stage, which developes into a tapeworm (taeniosis). It is only the consumption of viable cysts that can lead to taeniosis, which may lead to mostly mild symptoms (Murrell *et al*., 2006; Abuseir *et al*., 2006). Cattle become infected by ingesting tapeworm eggs with feed and water contaminated by stool of infected people. Inside the intestines of cattle, the oncosphere migrates to active muscles and other tissues to develop into cysticerci that will become infective to humans after 10 weeks. The clinical effect of natural cysticercosis infection on cattle is generally not significant. But, it has a great economic impact due to the downgrading and condemnation of infected carcasses, resources involved in routine meat inspection and intensified livestock control at farm level (Gracey *et al*., 2009; Allan *et al*., 2005) .

T. saginata taeniosis and bovine cysticercosis occur nearly all over the world. Its prevalence in developed countries is usually assumed very low. High prevalence rates of bovine cysticercosis occur in Sub- Saharan Africa, particularly in Eastern Africa, causing an important economic loss due to condemnation of meat (Allan *et al*., 2005). In Ethiopia, taeniosis has been known since the seventeenth century (Webb, 1957). Based on meat inspection, prevalence of bovine cysticercosis in Ethiopia has been reported to vary between 1.6% (Edao *et al*., 2016) and 30% (Solomon 1980). On the other hand, questionnaire based surveys of *T. saginata* infection in humans showed a prevalence rate ranging from 31% in Kombolcha (North central Ethiopia) (Edris and Nigusie, 2011) to 82.6% in Jimma (South Western Ethiopia) (Tesfaye *et al*., 2013).

The prevalence of bovine cysticercosis reported by various researchers in Ethiopia might be an underestimation, since majority of the reports were exclusively based on routine meat

inspection, which has a known low sensitivity (Dorny *et al*., 2000; Jansen *et al*., 2017). Hence, the actual prevalence in cattle could be beyond what has been reported. This implies that there is a need for improved diagnostic techniques to detect bovine cysticercosis so as to aid its control.

General objective: To study the epidemiology of bovine cysticercosis in Ethiopia

Specific objectives:

- To estimate the prevalence of bovine cysticercosis using detailed meat inspection and Ag-ELISA;
- To identify Taenia spps. infecting cattle using molecular tools on tissue sample collected from carcasses of cattle from abattoir;
- To determine the risk factors for the occurrence of bovine cysticercosis in west Shewa zone of Oromia region, Ethiopia;
- To assess the survival of *T. saginata* eggs under laboratory conditions simulating Ethiopian environmental conditions;
- To study the knowledge, attitude and practice (KAP) of the community to taeniosis /cysticercosis, and
- To assess the risk of exposure to *T. saginata* infection and associated costs in selected three towns of Ethiopia.