Prevalence, risk factors and spatial analysis of liver fluke infections in Danish cattle herds - DTU Orbit (18/03/2019)

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Background: Fasciola hepatica, a trematode parasite (liver fluke), infects a wide range of host species causing fasciolosis. The disease is prevalent world-wide and causes considerable economic losses to the livestock industry. Fasciolosis is regarded as an emerging food-borne zoonosis. To promote awareness among farmers and to implement strategies to control the infection, this study examined the prevalence, spatial distribution and risk factors for Fasciola hepatica infection in Danish cattle herds. Methods: A retrospective population based study was performed using meat inspection data of approximately 1.5 million cattle slaughtered in the period 2011 to 2013. Annual cumulative prevalence of recorded liver fluke findings was calculated for each year. Global and local spatial cluster analysis was used to identify and map spatial patterns of Fasciola hepatica positive and negative herds to explore environmental indicators of infection. Herd level, trade and environmental risk factors were evaluated for association with infection using logistic regression. Herd infection status as predicted from the final risk factor model was compared with the observed status using heat maps to assess how well the model fitted the observed spatial pattern. Results: During the investigated period (2011-2013), an increase in annual herd prevalence was noted (2011-25.6%; 2012-28.4%; 2013-29.3%). The spatial analysis suggested significant clustering of positive and negative herds. Presence of streams, wetlands and pastures on farms showed a significant association with the presence of infection in cattle herds. Buying animals from positive herds was a risk factor on conventional farms. Additionally, risk of being infected with Fasciola hepatica was higher in non-dairy herds of medium size (>= 30 and <100) when compared to dairy and large (> = 100) cattle herds. The observed spatial pattern could be reproduced by predictions of the risk factor model. Conclusions: This study showed an increase in annual herd level prevalence (2011 to 2013) indicating that an increasing proportion of herds are infected with Fasciola hepatica infection every year in Denmark. Fasciolosis was found to be associated with both herd and environmental factors where the infection was influenced by local factors that clustered geographically.

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