



Challenge and Prevalence of Fasciolosis in Cattle in Pursat Province, Cambodia

Research article

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Abstract Poor nutrition and fasciolosis have significantly decreased cattle productivity. Flood is one of the well-known Climate Changes affected cattle production in Cambodia. The present of permanent water bodies in these inundated areas may be provided favorable environment for lymnaeid snail, the intermediate host of *Fasciola gigantica*. Therefore, the study aimed to identify challenges in cattle production and the risk factors of *F. gigantica* infection in cattle after flood in Ou Tapong, Bakan, Pursat, Cambodia during December 2014 to June 2015. The 88 households were interviewed on challenges and risks of husbandry practice by using questionnaire. The total 171 fecal samples from flooding area (n=108) and non-flood area (n=63) depend on the number cattle in each area. Age, sex and health status were determined individually. Fecal were examined by using Modified Balivat Fasciola egg and counting technique. The result found that there was significance ($p < 0.001$) between the prevalence of fasciolosis in flooded areas (25.00%) and non-flooded areas (1.60%). It was noted that higher infection rates in female (19.70%) and male (2.90%) were found. The present of *F. gigantica* was found in older cattle (≥ 3 years) that was significantly higher than young cattle (< 3 years) at the rates of 23.20 % and 7.90 %, respectively ($p < 0.01$). The prevalence *F. gigantica* was highly different ($p < 0.001$) among emaciated, thin, medium and fat of body condition score of cattle. Risk factor for cattle fasciolosis infection was demonstrated that cattle was fed by cut and carry water grass derived from inundated area (natural lake) and had significant association ($OR = 0.61$) with prevalence of fasciolosis in cattle through logistic regression model. Following by focused group discussions, problems encountered in cattle raising caused flood including pen flooding, lack of feed and susceptible to disease. However, only 25.00% prepared feed before flood season and others did as habitation in local. Therefore, flood may be a factor to contribute to occurrence of fasciolosis in cattle. Traditional adaptation in cattle raising of farmers seems to be neglected to improve cattle production.

Keywords *Fasciola gigantica*, cattle, prevalence, flood, climate change, Cambodia

INTRODUCTION

Cattle production plays a vital role in the rural Cambodia economy, providing draught power, cash income and as a source of fertilizer. In 2013, livestock accounted for 14 percent of total agriculture

GDP (MAFF, 2014). Climate change has various impacts on the livelihoods of rural farmers in Cambodia as they majorly depend on agriculture for living. Flood, one of the well-known climate changes, is a core factor for low cattle productivity due to the loss of grazing pasture and shelter and occurrence of diseases (MoE, 2014). The presence of permanent water bodies in these inundated areas provided favorable environment for lymnaeid snail, the intermediate host of *Fasciola gigantica*. The lymnaeid snail population and its habitat are disturbed by flooding as they are dispersed by floodwater (Copeman, 2008). Alves et al. (2011) stated that flood might be associated with the presence of lymnaeid snail where prevalence fasciolosis in cattle was higher in flooded areas than non-flood areas. Cambodia experiences with flood every year, particularly the provinces along Mekong River and Tonle Sap (Leng, 2014). The anticipated impact of climate change and variability on agriculture include frequency increase and intensity of flood and incidence increase of pests and disease (MOE and UNDP, 2011). Flood causes economic loss, crop, and livestock destruction. As consequence, NCDM (2014) reported that an estimated cost that flood damaged and lost livestock was about US\$3.33 million in 2013. Stock, poultry, and pig losses together with dying cattle during flood also found.

F. gigantica is being the major internal parasite of cattle health problem in Cambodia (Soun et al., 2006). Losses due to fasciolosis are mainly reduced meat production, draught performance, and lower fertility in infected animals (Spithill et al., 1999). The net benefit per head of cattle and buffalo in these high-risk zones of Cambodia is US\$76-91. These losses and the costs were taken into account of implementing control program (Sothoeun, 2007). Tum et al. (2004) developed a geographic information system model for mapping the risk of fascioliasis in cattle and buffaloes in Cambodia. Mainly around Tonle Sap Lake and along the Mekong River and Bassac River, estimating that 28% of cattle Cambodia is potentially at risk of fascioliasis, with areas of high and moderate risk concentrated in southern and central areas. However, knowledge of the prevalence of parasitic infection including fasciolosis in relation to seasonal flood and challenge cattle production cause flood in these selected study areas is poor documented.

OBJECTIVE

The study aimed (i) to identify problems encountered in cattle and the solutions farmers responded to flood, and (ii) to estimate the prevalence and associated risk factors of fasciolosis in cattle in study area.

METHODOLOGY

Study Area

Two villages in Ou Tapong, Bakan, Pursat province were selected for this study and were taken place from December 2014 to June 2015. Geographically, Ou Tapong commune Bakan district is a peninsular area situated along Tonle Sap River, and these villages are different from Sdock klouk situated in the lower plain of Tonle Sap and are susceptible to flood damage in rainy season, while Robaoh Reang village is a higher land (non- flood area).

Survey of Fasciolosis

Fecal samples were sampling from 63 and 107 of the animals in Robaoh Rang and Sdock Khlouk villages, respectively. Samples were selected out from all cattle in both villages. Two cattle were sampling from household raise at least two cattle and a cattle from a household raise only one. They were randomly collected from male and female cattle with the age of less than 3 years old and above 3 years. Approximately 5-10 g fecal samples were collected from rectum.

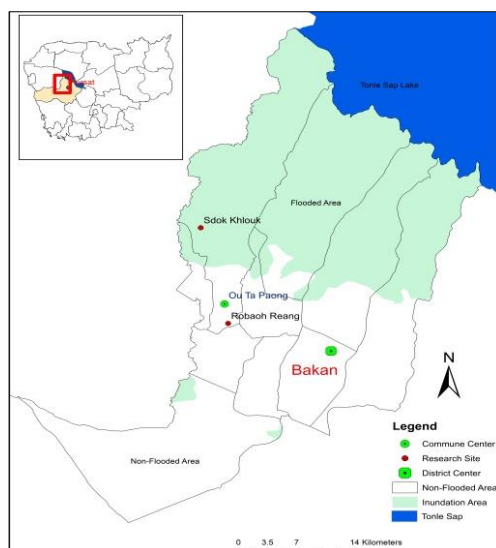


Fig. 1 Map of study area

The samples were independently labeled with the age, sex, body condition score, and village name and were stored in a cooled box containing ice. The samples were transported to Parasitology Laboratory of Research and Extension at Royal University of Agriculture and were analyzed using a Modified Balivat Fasciola egg counting technique to find prevalence of fasciolosis. The association between the independent factors and the prevalence of fasciolosis was calculated by using the Chi-square and confidence level was held at 95%. As part of the study, all cattle owners were selected for interviewing by a set of structured questionnaire that covered aspects of challenges and responses of farmers to flooding in cattle production and possible risk factors for fasciola, for example, feeding and water management, and presence of lymnaeid snail in particular site. Focused group discussion was also done for validation. Risk factors associated with case of fasciolosis were analyzed using a logistic regression model. All statistical analyses were conducted using SPSS version 16.0.

RESULTS AND DISCUSSION

General Characteristics of Cattle Production

Cattle production is considered the second major economic activity for smallholders while the main job is rice production. The majority of cattle production in both villages was raised for breeding purpose, as savings in family. Generally, cattle were grazed together on available pastures in the area, which was depended on the season and availability of feed. The cattle feeds were mainly grasses, rice straw, and stubble. After rice harvest, cattle were herded together in the grazing area where pasture and water are available, especially at floodplain and surrounding natural lake near Tonle sap river. The cattle were released from morning to evening in Sdock Khlouk. Unlike the cattle in Robaoh Reang, they were freely released to grass in paddy field or grassland (farm) with additional feed, such as rice straw.

Problems Faced by Farmers in Cattle Raising

Cattle raising in Sdock Klouk village is very sensitive to be impacted by flood. Water grass such as *Brachiaria* (buffalo grass) and *Oryza rufipogon* from flood plain and flooded natural lake are the main feeds for cattle in flood events.