

# 食の安全／人獣共通感染症

《運営協力》

公益社団法人日本獣医学会

《座長》

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《発題》

「Field-Validation of Minimum Application Intervals for Use of Raw  
Animal Manure as a Soil Amendment in the Central Valley, California」  
Saharuetai Jeamsripong, D.V.M, MPVM, PhD (Western Center for  
Food Safety, University of California, Davis, Davis, CA)

「Linkages between Pathogens and Cattle Fecal Loads and Microbial  
Water Quality in Aquatic Ecosystem in Sierra Nevada Meadows of  
California」

Anyarat Thiptara (Department of Population Health and  
Reproduction, School of Veterinary Medicine, University of California,  
Davis, CA, USA. / Epidemiology Section, Veterinary Research and  
Development Center (Southern Region), Thung Song, Nakhon Si  
Thammarat, Thailand.)

「Risk of Rabies Exposure among the Foreign Backpackers and its  
impact on Tourism Industry in Thailand」  
Priyakamon Khan (Eastern Asia University, Thailand / SIAM Health  
Care, Thailand-Bangladesh / SIAM Health Foundation, Thailand-  
Bangladesh)

## Oral Session 1

オーラルセッション1

### “Food Safety / Zoonosis”

Session Management: Japan Veterinary Medical Association

Chairperson:

Hiroyuki NAKAYAMA, DVM, PhD (Chairperson, Japan Veterinary Medical Association / Professor, Department of Veterinary Pathology, Graduate School of Agricultural and Life Sciences, The University of Tokyo)

Speakers:

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## 1. 「食の安全／人獣共通感染症」

“Food Safety / Zoonosis”

運営協力：公益社団法人 日本獣医学会

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**Saharuetai Jeamsripong<sup>1</sup> / Patricia D. Millner<sup>2</sup> / Manan Sharma<sup>2</sup> / Edward R. Atwill<sup>1</sup> / Michele Jay-Russell<sup>1</sup>**

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**“Field-Validation of Minimum Application Intervals for Use of Raw Animal Manure as a Soil Amendment in the Central Valley, California”**

Biological soil amendments of animal origin have been identified as a potential source of contamination of fresh produce with enteric pathogens. The original FDA Produce Safety Rule proposed a 9-month interval between application of raw manure and crop harvest; in contrast, the USDA National Organic Program (NOP) standard requires 120- and 90-day intervals for crops with and without soil contact, respectively. A 12-month experimental field trial was conducted to examine the survival of a three-strain cocktail of rifampicin-resistant generic *Escherichia coli* applied to soil amended with different animal manure types in California’s Central Valley. High (107 CFU/ml) and low (104 CFU/ml) inoculum were separately applied by spraying the *E. coli* cocktail onto 4 untreated horse-, cattle-, goat-, and chicken litter- amended soil and control plots (2m x 1m) at the UC Davis vegetable crop field station. Soil samples were collected from November 2013 to October 2014 to determine the generic *E. coli* population by direct plating and MPN methods. The study was initiated during a time when the region was experiencing extreme drought conditions. We observed a 7.16 log reduction after 120 days from manure application. The generic *E. coli* populations survived longest in untreated chicken litter followed by horse, cattle and goat manure. *E. coli* populations increased after heavy rains by 5.87 and 5.61 log CFU in high and low inoculum plots, respectively. Time and manure type were statistically significant ( $P < 0.0001$ ) and predicted the concentration of indicator *E. coli* in a linear regression model. Although die-off was observed in soil by day 120 during a fall-winter period, resuscitation was observed for all manure types following heavy spring rains. The findings suggest that generic *E. coli* experiences multiple log reductions over 120 days, but exposures to rain fall can contemporarily reverse these reductions.

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## “Linkages between Pathogens and Cattle Fecal Loads and Microbial Water Quality in Aquatic Ecosystem in Sierra Nevada Meadows of California”

Water-related diseases remain the leading cause of morbidity and mortality, particularly affecting children in developing countries. Livestock grazing increases risk of waterborne pathogen contamination and related recreational diseases. This cross-sectional study clarifies the link between waterborne pathogens and cattle grazing practices in California’s Sierra Nevada. Range cattle feces and creek water samples around Lake Davis in Plumas County were collected to detect *Salmonella*, *E. coli* O157H:7, *Cryptosporidium*, *Giardia* and fecal indicator bacteria during the 2011 summer grazing season. Neither *Salmonella* nor *E. coli* O157H:7 were found in fecal and water samples. *Cryptosporidium* and *Giardia* loads (adjusted for percent recovery) in meadow creek water ranged from 0-2.8 oocysts/L and 0-2.3 cysts/L, respectively. Waterborne protozoa were found in both grazing and non-grazing areas, suggesting non-bovine sources exist in this watershed. Sequence analyses confirmed *C. parvum* and possible mixed concentrations of *G. intestinalis* assemblages B and C. Based on these water volume concentrations, ingestion of 3.6-9.1 and 4.3-14.3 L of creek water yields a 50% infection probability, assuming that all (oo)cysts are pathogenic and infectious. Overall prevalence of *Giardia* and *Cryptosporidium* in range cattle at this site was 19.5% (8/41) and 2.4% (1/41), respectively. Percentages of *Giardia* positivity were 60% (3/5) and 14% (5/36) with excretion intensities of 6,169 cysts/g and 42,694 cysts/g of feces in calves and adults, respectively. Calves had 4.3 times higher risk of yielding a positive test result for *Giardia* than were adults (95% CI 1.31-14.21;  $P = 0.04$ ). Genotyping of positive feces revealed *C. andersoni* and *G. intestinalis* assemblage E. Because *Cryptosporidium* and *Giardia* found in creek water and cattle feces were different assemblages, the source of protozoa was unlikely to be cattle, and no association was found between fresh bovine fecal loads and concentration of waterborne protozoa.

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## “Risk of Rabies Exposure among the Foreign Backpackers and its impact on Tourism Industry in Thailand”

Rabies, a very big public health problem in the Southeast Asia where large numbers of backpackers visit each year. During July to December 2014, a survey was conducted by our team among the foreign backpackers in Bangkok, Thailand to assess their risk of rabies exposure as well as effects on tourism. One thousand five hundreds and eighty five filled questionnaires were collected and analyzed. Tourism was the main reason (76.6%) for travelling to Thailand. The majority of the backpackers were within the age group 25 to 35 years old. Most of them were from European (47.7%), followed by North American (26.9%). Rest was from Asia and Africa. 90% had sought health information before traveling but only 41.8% had received information about rabies. Most (65.9%) of the backpackers had not been vaccinated for rabies at all. Only 22.6% had completed pre-exposure rabies vaccination course before travel. The cost

of the vaccine was the major reason (80.9%) those who had not been vaccinated. Almost all backpackers (89.9%) knew that they could get rabies if bitten or licked on broken skin by an infected animal. 91.1% European and American knew that bats are the major reason for human rabies transmission along with 56.1% knew dogs also transmit this. Almost all (99.2%) Asian and African knew that dogs are the main source for rabies transmission. In this study, the incidence of being bitten and or licked was 5.54%. Among the 74.6% of European and American backpackers, 54.9% will think once more (whether they will visit or not) before they plan to visit South East Asia and 35.7% will inform their friends/relatives about the risk of rabies exposure in South East Asia which might decrease the number of tourists in this region (especially in Thailand) and finally may impact negative effects on the tourism industry.