

# OIE Collaborating Centres Reports Activities

## *Activities in 2018*

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<b>Name (including Title and Position) of Head of the Collaborating Centre (formally OIE Contact Point):</b>	Dr. Tongkorn Meeyam Director of OIE Collaborating Centre, Faculty of Veterinary Medicine, Chiang Mai University Dr. Thanawat Tiensin, Head International Livestock Trade and Regulation Group Department of Livestock Development, Thailand
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**ToR: To provide services to the OIE, in particular within the region, in the designated specialty, in support of the implementation of OIE policies and, where required, seek for collaboration with OIE Reference Laboratories**

**ToR: To identify and maintain existing expertise, in particular within its region**

**1. Activities as a centre of research, expertise, standardisation and dissemination of techniques within the remit of the mandate given by the OIE**

<b>Epidemiology, surveillance, risk assessment, modelling</b>	
<b>Title of activity</b>	<b>Scope</b>
Antibody Response of Ducks Vaccinated with Influenza H5N1 Virus Vaccine	This experimental study under field conditions aims to evaluate the humoral immune response of meat-type ducks following an early course of vaccination against H5N1 HPAI the vaccine currently used in southern Vietnam.
Factors Associated with Rabies Antibody Titer of Vaccinated Dogs in Kathmandu Valley, Nepal	This cross sectional study was designed to determine the awareness and practices of dog owners regarding rabies in 110 dog owners in Kathmandu, Bhaktapur and Lalitpur districts of Kathmandu Valley.
Epidemiology of Foot and Mouth Disease Outbreak in Cattle Farms in Chiang Mai	This study aims to describe outbreak status and determine risk factors for FMD outbreak in Chiang Mai during 2015-2016.
<b>Training, capacity building</b>	
<b>Title of activity</b>	<b>Scope</b>

<p>Training course: Global Health Leadership at the convergence at animal, human and environment for Outbreak responding in AMR</p>	<p>Global Health is a grand challenge, since the world is interconnected politically, financially, biologically, and socially through trade, travel, and commerce. These factors drive grand challenges at the convergence of animal, human, and environmental health issues like global food security, the impacts of climate change and antimicrobial resistance. One Health is about working collaboratively across disciplines and professions to be more effective deal with these complex dilemmas because it is no longer possible to focus on any single domain without impacting upon, and including, others. The Global Health Institute - Thailand (GHIT) provides an opportunity for working professionals in government and the private sector, university teaching staff and graduate students from across the Southeast Asia region to examine the impact of globalization on health and to identify leadership strategies that support a healthy and productive global workforce. Antimicrobial resistance is one of sustainable development goals for health target, which will be used as a case study for practicing collaborative skills. The intensive program of study offered at this GHI will focus on developing One Health leadership and technical capacity, which are both critical elements in transforming the current and future workforce to ensure preparedness for new and emerging public health challenges.</p>
<p>Training course: Application of Molecular Epidemiology for Global Grand Challenges Molecular epidemiology and food safety</p>	<p>Over the last years, molecular approaches were introduced in food microbiology to improve epidemiological approaches in zoonoses research. Genotyping methods can support surveillance and risk assessment of zoonotic agents improve outbreak investigations. The development and implementation of Next generation sequencing (NGS) techniques has made it possible to perform high-throughput analyzes, such as genome and metagenome analyzes, and transcriptome and meta-transcriptome analyzes. NGS techniques have greatly improved molecular epidemiological investigations. Genome sequencing is already a major contributor to outbreak investigations and tracking of microbial transmission pathways. Within the course, the underlying basics of genotyping are presented, an overview of genotyping methods used in molecular epidemiology is given and software applications routinely used for genotyping are demonstrated. Exemplary data are used to perform sequence analysis and genotyping. By using these data sets, dendrograms or phylogenetic trees will be created and evaluated.</p>

<p>Training course:Risk Analysis in practice to improve food system</p>	<p>This course will provide the necessary risk- and science-based tools to evaluate and mitigate the microbial and chemical risks in a food production chain-from the farm until consumption-. Participants will be divided in small interdisciplinary groups to mimic a real risk analysis team and develop a real-case scenario (different for each group). The attendants will follow the risk analysis process as an integral part of a science-based decision-making (risk prioritization, risk assessment, risk management and risk communication) to estimate and manage the food safety risks.</p> <p>The attendants will apply different qualitative (hazard analysis, decision matrices) and quantitative (risk prioritization, modeling and web-based software) tools by using a computer. The participants will present the main outcomes from the analyses and will evaluate possible mitigation options to reduce the risk in a cost-effective way.</p>
<p>Training course:Geographical Information Systems (GIS) and Spatial Analysis: Better presenting your research works using visualization tools</p>	<p>The study of the spatio-temporal distribution of cases of disease is one of the basis of epidemiology, and ignoring the spatio-temporal dimension in disease investigations can lead to major biases and mistaken results. This course will provide the basis to understand the usefulness of Geographical Information Systems and spatiotemporal analyses to provide an increased precision to the qualitative and quantitative assessment of disease outbreaks, compare different populations/settings through the use of quantitative and objective criteria and detect significant phenomenon that may be imperceptible otherwise.</p>
<p>The 5th Food Safety and Zoonoses Symposium: Date 7-8 July 2018</p>	<p>The international symposium has been successfully conducted in every 2 years, the event brings our alumni to meet, exchange and provide new ideas and body of knowledge. Together with every level of researchers, the symposium also is a great opportunity for lecturers, students, veterinarians, epidemiologist, scientists, and researchers, in Thailand and other countries to share and strengthen academic and research in food safety and zoonoses area in South East Asia and Asia region. This symposium will call for abstract in oral or poster presentation with a peer-review full paper proceeding. Speakers and participants who are interested in the following themes are welcomed. Keynote speakers will be invited to each session. The objective of this symposium is to strengthen international academic, research and operating collaboration for transferring knowledge, experiences, problems and taking appropriate action on food safety and zoonoses in the Asia Pacific region.</p>

<p>Basic Techniques in Molecular Biology, Primer Design, Sequences Data Analysis and Phylogenetic Tree Construction: Date 2 – 4 October 2018</p>	<p>An International Training on Basic Techniques in Molecular Biology, Primer Design, Sequences Data Analysis and Phylogenetic Tree Construction was organized by VPHCAP and Excellent Center of Veterinary Public Health, Chiang Mai University in collaboration with Obihiro University of Agriculture and Veterinary Medicine, Japan.</p> <p>We have an honor from Prof. Dr. Hisao Kurazono and Asst. Prof. Dr. Kayo Okumura from Obihiro University of Agriculture and Veterinary Medicine and Dr. Warangkhan Chaisowwong from Chiang Mai University as instructors. The study of molecular biology plays a key role in discovering new knowledge and creating new innovation in many fields along with medicine, veterinary medicine and as well as in public health. Laboratory practice needs basic techniques. Primer design, sequences data analysis and phylogenetic tree are one of those basic techniques required for analysis of genetic correlation. Better understanding of the basic techniques will lead to research effectively.</p>
<b>Diagnosis, biotechnology and laboratory</b>	
<b>Title of activity</b>	<b>Scope</b>
<p>Genotypic Characteristics of Liver Fluke (<i>Fasciola</i> spp.) from Cattle and Buffalo in Cambodia</p>	<p>The objective of this study was to access the morphological and molecular characterization of liver flukes from cattle in Cambodia.</p>
<p>Molecular Characterization of Virulence Associated Genes and Antimicrobial Resistance Profiles in <i>Escherichia coli</i> Isolated from Poultry with Colibacillosis in Thailand</p>	<p>The objective of this study was to identify the antimicrobial resistance of APEC isolates from colibacillosis lesions.</p>
<b>Food safety</b>	
<b>Title of activity</b>	<b>Scope</b>

<p>Occurrence of Liver Fluke (<i>Opisthorchis viverrini</i>) Metacercariae Stage of Cyprinids Fish in Phrao and Doi Lo Districts, Chiang Mai Province</p>	<p>The study aimed to determine the occurrence of <i>O. viverrini</i> metacercariae in fresh cyprinid fish from local market in Phrao district and Mae Taeng district.</p>
<p>Characterization of Beta-lactam Resistant Genes in Enterobacteriaceae and Vibrionaceae Contaminated in Meat and Fresh Seafood in South Asia and South East Asia</p>	<p>To determine the antimicrobial susceptibility pattern of <i>E. coli</i>, <i>Salmonella</i> 2017 including 275 <i>E. coli</i>, 251 <i>Salmonella</i> spp. and 175 <i>Vibrio</i> spp. Agar dilution method was performed for antimicrobial susceptibility testing according to CLSI standard.</p>
<p>Quantification and Associated Factors of <i>Campylobacter jejuni</i> and <i>Campylobacter coli</i> Contamination during Duck Slaughtering Process</p>	<p>This study aimed to determine the prevalence of <i>C. jejuni</i> and <i>C. coli</i> contamination in duck slaughtering process. A total of 150 samples, including cloacal swab after bleeding (50), carcass rinsing after evisceration (50) and after chilling (50), were collected during August to December 2017. <i>Campylobacter</i> spp. was isolated from all samples based on modified ISO 10272:2006 (E) and confirmed by multiplex PCR.</p>
<p>Prevalence and Antimicrobial Resistance of <i>Salmonella</i> Isolated from Meat and Eggs in Chiang Mai Province</p>	<p>The study aimed to determine prevalence and antimicrobial resistance pattern of <i>Salmonella</i> from meat and eggs that sold in Chiang Mai province, Thailand.</p>
<p>Contamination of <i>Campylobacter</i> on Chicken Carcasses at Retail Markets in Hanoi, Vietnam</p>	<p>This study was conducted to determine the prevalence of <i>Campylobacter</i> on fresh chicken carcasses at retail markets.</p>
<p>Factors Associated with Antibiotic Residues in Raw Bovine Milk in Special Region of Yogyakarta Province, Indonesia</p>	<p>This study aims to detect the presence of antimicrobial residues in raw bovine milk and to describe the practice of antibiotic uses in dairy farm.</p>
<p>Stakeholder Workshop on Food Production from Farm to Consumers using One Health and EcoHealth Network: Date 5 April 2018</p>	<p>Veterinary Public Health Centre for Asia Pacific (VPHCAP) in collaboration with the Excellent Center of Veterinary Public Health and the OIE Collaborating Centre for Capacity Building in Veterinary Services, Faculty of Veterinary Medicine, Chiang Mai University has conducted the project to promote "Safe Food Production from Farm to Table through Thai and ASEAN Ways". The Stakeholder Workshop on Food Production from Farm to Consumers using One Health and EcoHealth Network is held on 5th April 2018 at Kantary Hills Hotel in Chiang Mai. In this workshop, we get support from the stakeholders who involved in slaughterhouses, food processing plants, and government sector to brainstorm and discuss about applicable regulations related to food production, certification systems, and trilingual educational media for workers in the processing line.</p>
<p>Safe Food Production from Farm to Table through Thai and ASEAN Ways Project</p>	<p>This project included food safety stakeholder in Chiang Mai to brainstorm the gap needs and share the goal of this project. It took a year to visit and monitor food enterprise. The last activity named 'Brainstorming Activity of Stakeholders in the Development of Food Production Standardization Systems and the Use to Support Local Production Standards', is held on 7th December 2018 at Kantary Hills Hotel in Chiang Mai. In this workshop, we got support from our partners to give special talks in topics 'Workers' health &amp; Consumer Safety', 'Food Standards in Meat and Milk Production', and 'Food Safety Laws and Regulations relate to Public Health'. In the second session, the staff presented the laboratory results of food samples taken from slaughterhouses and food processing plants that joined in the project and discussed the ways to sustain safe food production for consumers. The workshop also included the presentation of trilingual media such as personal hygiene handbook, video animation, and hand washing poster.</p>

**ToR : To propose or develop methods and procedures that facilitate harmonisation of international standards and guidelines applicable to the designated specialty**

**2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the surveillance and control of animal diseases, food safety or animal welfare**

Proposal title	Scope/Content	Applicable area
PODD project	<p>Participatory Onehealth Disease Detection (PODD) is an innovative way of disease outbreak surveillance using</p> <p style="text-align: center;">mobile</p> <p>application to track any disease outbreaks in animals by volunteer of each sub-district in Chiang Mai province, Thailand</p> <p>(pilot project) to help reduce the chance of human infections.</p>	<p><input checked="" type="checkbox"/> Surveillance and control of animal diseases</p> <p><input type="checkbox"/> Food safety</p> <p><input type="checkbox"/> Animal welfare</p>

**ToR: To establish and maintain a network with other OIE Collaborating Centres designated for the same specialty, and should the need arise, with Collaborating Centres in other disciplines**

**ToR: To carry out and/or coordinate scientific and technical studies in collaboration with other centres, laboratories or organisations**

**3. Did your Collaborating Centre maintain a network with other OIE Collaborating Centres (CC), Reference Laboratories (RL), or organisations designated for the same specialty, to coordinate scientific and technical studies?**

Yes

Name of OIE CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
Ecole Nationale des Services Veterinaires (ENSV)	France	<p><input type="checkbox"/> Africa</p> <p><input type="checkbox"/> Americas</p> <p><input type="checkbox"/> Asia and Pacific</p> <p><input checked="" type="checkbox"/> Europe</p> <p><input type="checkbox"/> Middle East</p>	<p>Five global organizations have begun to plan strategies to bolster agricultural- and livestock-based economies in developing countries while improving the health and wellness of animals, humans and the environment. The participants were convened this spring by the University of Minnesota Center for Animal Health and Food Safety (CAHFS)</p>

Centro Buenos Aires para la Capacitación de los Servicios Veterinarios	Argentina	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East	Five global organizations have begun to plan strategies to bolster agricultural- and livestock-based economies in developing countries while improving the health and wellness of animals, humans and the environment. The participants were convened this spring by the University of Minnesota Center for Animal Health and Food Safety (CAHFS)
Ecole Inter Etats des Sciences et Medecine Veterinaires of Dakar, Senegal	Senegal	<input checked="" type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East	Five global organizations have begun to plan strategies to bolster agricultural- and livestock-based economies in developing countries while improving the health and wellness of animals, humans and the environment. The participants were convened this spring by the University of Minnesota Center for Animal Health and Food Safety (CAHFS)
Center for Animal Health and Food Safety at the University of Minnesota	USA	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East	Five global organizations have begun to plan strategies to bolster agricultural- and livestock-based economies in developing countries while improving the health and wellness of animals, humans and the environment. The participants were convened this spring by the University of Minnesota Center for Animal Health and Food Safety (CAHFS)

**4. Did your Collaborating Centre maintain a network with other OIE Collaborating Centres, Reference laboratories, or organisations in other disciplines, to coordinate scientific and technical studies?**

No

**ToR: To place expert consultants at the disposal of the OIE.**

**5. Did your Collaborating Centre place expert consultants at the disposal of the OIE?**

Yes

Name of expert	Kind of consultancy	Subject
Tongkorn Meeyam	Facilitator	2nd Regional Workshop for Veterinary Education Establishments (VEEs) and Veterinary Statutory Bodies (VSBs)
Tongkorn Meeyam	Speaker	Antemortem and Postmortem inspection for risk analysis in meat hygiene
Warangkana Chaisowwong	Speaker	Antemortem and Postmortem inspection for risk analysis in meat hygiene
Warangkana Chaisowwong	Speaker	Training program for inspector in the slaughter houses



Warangkana Chaisowwong	Speaker	Global Health Institute 2018 short course training on Food Safety Risk Analysis
Warangkana Chaisowwong	Speaker	International Training on Basic Techniques in Molecular Biology, Primer Design, Sequences Data Analysis and Phylogenetic Tree Construction
Tongkorn Meeyam	Speaker	Training course: Global Health Leadership at the convergence at animal, human and environment for Outbreak responding in AMR
Tongkorn Meeyam	Speaker	Implication of Food Safety Assurance in pig slaughterhouse and processing plant
Veerasak Punyapornwithaya	Speaker	Statistics and Research Designs Using Animals

**ToR: To provide, within the designated specialty, scientific and technical training to personnel from OIE Member Countries**

**6. Did your Collaborating Centre provide scientific and technical training, within the remit of the mandate given by the OIE, to personnel from OIE Member Countries?**

Yes

a) Technical visits: 0

b) Seminars: 1

c) Hands-on training courses: 4

d) Internships (>1 month): 0

Type of technical training provided (a, b, c or d)	Content	Country of origin of the expert(s) provided with training	No. participants from the corresponding country
b	The 5th Food Safety and Zoonoses Symposium  Date 7-8 July 2018	7	121
c	Global Health Leadership at the convergence at animal, human and environment for Outbreak responding in AMR	2	30
c	Application of Molecular Epidemiology for Global Grand Challenges Molecular epidemiology and food safety	3	17
c	Risk Analysis in practice to improve food system	4	13
c	Geographical Information Systems (GIS) and Spatial Analysis: Better presenting your research works using visualization tools	1	10

**ToR: To organise and participate in scientific meetings and other activities on behalf of the OIE**

**7. Did your Collaborating Centre organise or participate in the organisation of scientific meetings on behalf of the OIE?**

Yes

National/International	Title of event	Co-organiser	Date (mm/yy)	Location	No. Participants
International	2nd Regional Workshop for Veterinary Education Establishments (VEEs) and  Veterinary Statutory Bodies (VSBs)  Tokyo, Japan	Ministry of  Agriculture, Forestry and Fisheries (MAFF)	19 - 20 November 2018	Tokyo, Japan	70

**ToR: To collect, process, analyse, publish and disseminate data and information relevant to the designated specialty**

**8. Publication and dissemination of any information within the remit of the mandate given by the OIE that may be useful to Member Countries of the OIE**

a) Articles published in peer-reviewed journals: 8

1) Wasan Katip, Penkarn Kajanarat, Tongkorn Meeyem, Usanee Anukool, Raktham Mektrirat, Penninah Oberdorfer, Nongyao Kasatpibal. 2018. Using One Health Approach to Address Challenges of Antimicrobial Resistance and Inappropriate Use of Antibiotics Through Training of Future Health Workforces. Southeast Asian J Trop Med Public Health 49: 35 - 43.

2) Paramintra Vinitchaikul, Witaya Suriyasathaporn, Panuwat Yamsakul, Khwanchai Kreausukon. 2018. Effect of season and bull breed of semen on pregnancy rate in beef cattle. J. Anim. Sci. Vol. 85: 252 - 252.

3) Ubeyratne, JKH., Srikitjakarn, L., Pfeiffer, D., Kohnle, L., Sunil-Chandra, N.P., Chaisowwong, W., Hemwan, P. 2018. Canine Rabies and its Implications for Human Health in Sri Lanka. Research & Reviews: Journal of Veterinary Sciences; 4(2) December 2018: 1-10.

4) Yano, T., Phornwisetsirikun, S., Susumpow, P., Visrutaratna, S., Chanachai, K., Phetra, P., Chaisowwong, W., Trakarnsirinont, P., Hemwan, P., Kaewpinta, B., Singhapreecha, C., Kreausukon, K., Charoenpanyanet, A., Robert, C.S., Robert, L., Rodtian, P., Mahasing, S., Laiya, E., Pattamakaew, S., Tankitiyanon, T., Sansamur, C., Srikitjakarn, L. 2018. A Participatory System for Preventing Pandemics of Animal Origins: Pilot Study of the Participatory One Health Disease Detection (PODD) System. JMIR Public Health and Surveillance; 4(1) e25: 1-11.

- 5) Chaisowwong, W., Saksangawong, C., Warin, R., Boripun, R., Lertsri, J., Intanon, M. 2018. Performance of test kit for antimicrobial residue in meats using microbial inhibition assay. *Chiang Mai Veterinary Journal*; 16(1): 23-31. (in Thai)
- 6) Mangkhang K, Punyapornwithaya V, Tankae W, Pongkan W, Chattipakorn N, Boonyapakorn C. Plasma humanin as a prognostic biomarker for canine myxomatous mitral valve disease: a comparison with plasma NT-roBNP. *Pol J Vet Sci*. 2018 Dec;21(4):673-680. doi: 10.24425/124305.  
Bansiddhi P, Brown JL, Thitaram C, Punyapornwithaya V, Somgird C, Edwards KL, Nganvongpanit K. Changing trends in elephant camp management in northern Thailand and implications for welfare. *PeerJ*. 2018 Nov 23;6:e5996. doi: 10.7717/peerj.5996. eCollection 2018.
- 7) Norkaew T, Brown JL, Bansiddhi P, Somgird C, Thitaram C, Punyapornwithaya V, Punturee K, Vongchan P, Somboon N, Khonmee J. Body condition and adrenal glucocorticoid activity affects metabolic marker and lipid profiles in captive female elephants in Thailand. *PLoS One*. 2018 Oct 2;13(10):e0204965. doi: 10.1371/journal.pone.0204965. eCollection 2018.
- 8) Malila Y, U-Chupaj J, Srimarut Y, Chaiwiwattrakul P, Uengwetwanit T, Arayamethakorn S, Punyapornwithaya V, Sansamur C, Kirschke CP, Huang L, Tapaamorndech S, Petracci M, Rungrassamee W, Visessanguan W. Monitoring of white striping and wooden breast cases and impacts on quality of breast meat collected from commercial broilers (*Gallus gallus*). *Asian-Australas J Anim Sci*. 2018 Nov;31(11):1807-1817. doi: 10.5713/ajas.18.0355. Epub 2018 Aug 27.
- b) International conferences: 13
- 1) Tongkorn Meeyam. 2018. Emerging Needs and Opportunities for Capacity Building in South East Asia. The 3rd Annual International Conference on One Medicine One Science (iCOMOS) April 29 - May 3, 2018, Minnesota, USA.
- 2) Rimal S., Chaisowwong W., Ojha K., Sirimalisuwan A. Awareness and Practices of Dog Owners regarding Rabies in Kathmandu Valley. The 5th Food Safety and Zoonoses Symposium for Asia Pacific, 6-7 July 2018 at Holiday Inn Chiang Mai Hotel. P.86-89
- 3) Chanawanit K., Pichpol D., Phimpraphai W., Saengthongpinit C., Meeyam T. 2018. Presence of *Campylobacter jejuni* and *Campylobacter coli* in Duck Slaughtering. The 5th Food Safety and Zoonoses Symposium for Asia Pacific, 6-7 July 2018 at Holiday Inn Chiang Mai Hotel. P.46-49
- 4) Ishiyama Hamid N., Pichpol D., Ayu Widiastih D., Intanon M., Unger F., Meeyam T. 2018. Antimicrobial Residues and Antimicrobial Uses in Dairy Farms in Cangkringan and Pakem Sub-district, Indonesia. The 5th Food Safety and Zoonoses Symposium for Asia Pacific, 6-7 July 2018 at Holiday Inn Chiang Mai Hotel. P.64-68
- 5) Homjan P., Awaiwanont N., Meeyam T., Ngamsanga P., Punyapornwithaya V., Pichpol D. 2018. Antimicrobial Resistance against Avian Pathogenic *Escherichia Coli* (APEC) Isolated from Colibacillosis in Chicken, The 5th Food Safety and Zoonoses Symposium for Asia Pacific, 6-7 July 2018 at Holiday Inn Chiang Mai Hotel. P. 69-72
- 6) Begum R., Sarker S., Ngamsanga P., Pulsrikarn C., Pichpol D., Meeyam T., Chaisowwong W. 2018. Prevalence and Antimicrobial Resistance of *Salmonella* Isolated from Meat and Eggs in Muang District in Chiang Mai Province, Thailand. The 5th Food Safety and Zoonoses Symposium for Asia Pacific, 6-7 July 2018 at Holiday Inn Chiang Mai Hotel. P. 73-79
- 7) Sarker MS., Begum R., Boonyayatra S., Pichpol D. 2018. Antimicrobial Susceptibility Patterns of *E. coli*, *Salmonella* spp. and *Vibrio* spp. Isolated from Food Animals in Southeast Asia, Thailand. The 5th Food Safety and Zoonoses Symposium for Asia Pacific, 6-7 July 2018 at Holiday Inn Chiang Mai Hotel. P. 55-59
- 8) Set Pwint Aung H., Na Lampang K., Meeyam T., Punyapornwithaya V. Epidemiology of Foot and Mouth Disease Outbreak in Dairy Farms in Chiang Mai, Thailand. The 5th Food Safety and Zoonoses Symposium for Asia Pacific, 6-7 July 2018 at Holiday Inn Chiang Mai Hotel. P.35-39
- 9) Hoa Thi Thanh H., Tan Truong L., Thanh Le H., Meeyam., Punyapornwithaya V. Serological Immunity to Highly Pathogenic Avian Influenza H1N1 Vaccination of Meat-type Ducks in Household Farms in a Province in Mekong Delta in Vietnam. Thailand. The 5th Food Safety and Zoonoses Symposium for Asia Pacific, 6-7 July 2018 at Holiday Inn Chiang Mai Hotel. P. 40-45

10) Loeurng V., Chaisowwong W., Wannasan A., Sothyra T., Tiwananthagorn S. Morphological and Molecular Characteristics of Fasciola Isolated from Slaughtered Cattle in Cambodia. The 5th Food Safety and Zoonoses Symposium for Asia Pacific, 6-7 July 2018 at Holiday Inn Chiang Mai Hotel. P. 110-115

11) Phumkrachai B., Intanon M., Na Lampang K. The Occurrence of Opisthorchis viverrini Metacercariae Stage in Cyprinid Fish in Phroa Districts and Mae Taeng District, Chiang Mai, Thailand. The 5th Food Safety and Zoonoses Symposium for Asia Pacific, 6-7 July 2018 at Holiday Inn Chiang Mai Hotel. P. 18-22

12) Vu DM., Golz G., Alter T., Truong Thi Huong G., Pham Thi N., Dang Xuan S., Unger F., Meeyam T., Pichpol D. Prevalence of Campylobacter spp. on Chicken Carcasses from Retail Markets in Urban Districts in Hanoi, Vietnam. The 5th Food Safety and Zoonoses Symposium for Asia Pacific, 6-7 July 2018 at Holiday Inn Chiang Mai Hotel. P. 116-119

13) Khwanchai Kreausukon participated and Oral presentation: Antimicrobials use and Extended Spectrum Beta-Lactamase Producing Escherichia coli (ESBLs producing E. coli) in small holder dairy farms in Chiang Mai, Thailand. The 30th World Buiatrics Congress 2018 Sapporo, 28 August - 1 September 2018, Sapporo Convention Center, Japan.

c) National conferences: 1

1) Tongkorn Meeyam. Applying the One Health Concept to AMR and RDU education. Rational Drug Use Symposium for Health personal on Jun 20-22, 2018, at Rama Garden Hotel, Bangkok, Thailand

d) Other

(Provide website address or link to appropriate information): 0