OIE Collaborating Centres Reports Activities

Activities in 2021

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Name of writer:	Professor Kohei Makita

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

Food safety	
Title of activity	**Scope**
Extension of herd health management	RGU assists dairy farmers in Japan and Asia and Pacific region for herd health management.
Antimicrobial drug resistance risk assessments	RGU develops the methods of rapid diagnoses of AMR and assessing the risks of AMR in animal source foods and vegetables collaborating with NVAL, Japan, and other partners.
Researches on brucellosis in animals and humans	RGU conducts epidemiological and socio-economic studies of brucellosis in Sri Lanka, Myanmar and Tanzania.
Organizing Food Toxicology Conference	NCFS organised the Food Toxicology Conference focusing on the opportunities and challenges for the safe use of nanomaterials in food was organised from 26-29 Jan 2021, Singapore.
Teaching laboratory development competence development to postgraduate students	NCFS gave a presentation titled, “Enhancing Laboratory Competence Development in ASEAN” to Rakuno Gakuen University on 19 Jan 2021.
ASEAN Training Workshop	NCFS organised the ASEAN Training Workshop on Risk Analysis for AMR Arising from Use of Antimicrobial Agents in Aquaculture was organised from 1-3 Feb 2021, Singapore.
ASEAN Consultative Meeting	NCFS participated in the ASEAN Consultative Meeting to develop 5-year Regional Plan of Action on AMR in Aquaculture was organised from 4-5 Feb 2021, Singapore.
Food Safety Risk Analysis training for postgraduate students	RGU provided 2-weeks Risk Analysis training for PhD students from Swedish Agriculture University (March) and Addis Ababa University (June).
WHO Virtual Roundtables	NCFS participated in the WHO Virtual Roundtables: Advancing the Implementation of the Regional Framework for Action on Food Safety in the Western Pacific on 16 March 2021.
Food Safety Risk Analysis training for OIE Members	RGU/RCFS/NCFS together with IZSAM organised Food Safety Risk Analysis training course for OIE Members in Asia and Pacific between May 31 to June 9.
JICA online training on herd health and epidemiology in Mongolia	RGU provided JICA online training in Mongolia for public officers, university researchers and private sector veterinarians.

Bovine mastitis control research and education	RGU conducts education and research on bovine mastitis control.
Food safety risk assessment and mathematical modelling	RGU conducts mathematical modelling for disease control, carcass cooling, and food safety for research, extension and education.
Streptococcus suis disease control	Monitoring of Stretococcus suis in pig farms to prevent outbreak of the disease at University of Tokyo.
Researches on prudent use of AMR in food animals	University of Tokyo researches on prudent use of AMR in food animals under collaboration with National Veterinary Assay Laboratory, Japan.
Control of zoonotic bacterial and viral pathogens in humans and animals	University of Tokyo researches on control of zoonotic bacterial and viral pathogens in humans and animals.
Food testing technical expertise, inter-laboratory comparison, training commercial laboratories	NCFS provides technical expertise, inter-laboratory comparison studies and has trained commercial food testing laboratories under the Singapore Food Agency (SFA) Laboratory Recognition Programme (LRP) in the following domain areas: a) Drug Residues b) Food Radioactivity c) Food Microbiology
Provision of scientific data to enhance public awareness	NCFS provides scientific data to enhance public awareness through: a) Monitoring and research studies on food safety risks b) Data analytics and statistical modelling c) Evaluation of food safety risks
Supporting ASEAN Food Reference Laboratories (AFRLs)	NCFS contributes our domain expertise as the ASEAN Food Reference Laboratories (AFRLs) in the following areas: a) Pesticide Residue b) Environmental Contaminants c) Mycotoxins d) Marine Biotoxins and Scombrotoxin
Research on diseases of small and large animals	University of Tokyo conducts diagnostic, pathological, epidemiological and therapeutic studies on diseases of small and large animals.

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
FAO Risk profile - Group B Streptococcus (GBS) - Streptococcus agalactiae sequence type (ST) 283 in freshwater fish	RGU Dr Makita contributed to FAO risk profile as an expert. Bangkok. https://doi.org/10.4060/cb5067en	☐Surveillance and control of animal diseases ☒Food safety ☐Animal welfare
WHO/WPRO draft manual on mitigation of public health risks in traditional food markets in the Asia-Pacific Region	RGU Dr Makita contributed to manual development as a temporal expert	☐Surveillance and control of animal diseases ☒Food safety ☐Animal welfare
Food Safety Commission AMR Working Group, Cabinet Office of Japan	RGU Dr Makita contributed to amendment of guideline of risk assessment for AMR by use of antimicrobials to livestock	☐Surveillance and control of animal diseases ☒Food safety ☐Animal welfare
Working Group Endorsement of Methods of Analysis and Sampling Meeting	NCFS participated in the preparation for the endorsement of the methods of analysis and sampling to be put forward at CCMAS41 for consideration	☐Surveillance and control of animal diseases ☒Food safety ☐Animal welfare
ASEAN Consultative Meeting on AMR	NCFS participated in the development of the following: • 5-Year Regional Plan of Action on Antimicrobial Resistance in Aquaculture • ASEAN Guideline on Techniques for Veterinary Drug Residue Detection in Aquaculture Products • ASEAN Guideline for the Prudent Use of Antimicrobials in Aquaculture • ASEAN guideline on Performing Risk Analysis for Antimicrobial Resistance arising from the use of Antimicrobial Agents in Aquaculture Plan of Action for the ASEAN Cooperation in Combatting AMR in Aquaculture Sector	☐Surveillance and control of animal diseases ☒Food safety ☐Animal welfare
Japan Food Research Laboratories (JFRL)	NCFS participated in the verification of LC-MS/MS method for detection of ciguatoxins	☐Surveillance and control of animal diseases ☒Food safety ☐Animal welfare

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
Instituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise G.Caporale (IZSAM)	Italy	☐Africa ☐Americas ☐Asia and Pacific ☒Europe ☐Middle East	Conduct a joint training program of risk analysis
3rd OIE Regional Meeting for OIE Reference Centres in Asia and the Pacific	Singapore	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	NCFS participated in the following RCs/CCs activities: • Exploration on lab twinning and possible collaborations Held from 24-25 Feb 2021. (Virtual platform)
18th AFTLC Meeting	Singapore	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	NCFS reviewed the on-site visit reports for 5-year term renewal of AFRLs submitted by the panel of experts from 4-5 Mar 2021. (Virtual platform)
APEC High Level Policy Dialogue on Agricultural Biotechnology – Virtual Workshop on Building Regulatory Capacities for Biotechnology (Genetic Engineering)	Singapore	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	NCFS participated in the dialogue to raise the awareness of APEC member economies on the various policy and regulatory approaches toward agricultural biotechnologies that would facilitate the adoption, use, and commercialization of biotech products from 27-28 Apr 2021. (Virtual platform)

APEC Workshop – Discussing the Strategies Promoting the Application of Shared Responsibility	Singapore	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	NCFS participated in the discussion on APEC Food Safety Modernisation Framework to the Management of Import and Export Food Safety in the APEC Region on 22 May 21. (Virtual platform)
14th session of the Codex Committee of Contaminants in Food	Singapore	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	NCFS participated in the discussion on maximum levels of contaminants such as heavy metals and toxins in different food commodities and the Cope of Practice for reduction of contaminants were discussed from 3-7, 13 May 21. (Virtual platform)
41st session of the Codex Committee on Methods of Analysis and Sampling	Singapore	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	NCFS participated in the discussion on international quality standards for analysis and sampling of foods, and these standards then become binding for all parties involved in food analysis from 17-25 May 21. (Virtual platform)
WHO Workshop on Regulatory and food safety aspects of alternative proteins for conventional animal products	Singapore	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	NCFS participated in the discussion on regulatory perspectives and food safety aspects of alternative proteins on 20 May 21. (Virtual platform)
25th Meeting of Expert Working Group on the Harmonization of MRLs of Pesticides among ASEAN Member States (EWG-MRLs)	Singapore	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	NCFS participated in the discussion on issues and maximum levels of pesticides for harmonization from 24-25 May 21. (Virtual platform)
1st Meeting of the AMR Technical Advisory Group of the South Asian Association of Regional Cooperation	Singapore	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	NCFS participated in the discussion on development the Terms of References for the TAG, as well as discuss emerging technical issues on AMR surveillance and current needs in setting up and sustaining a harmonized AMR surveillance within countries and across the region from 5-7 Jul 21. (Virtual platform)
18th Meeting of the ASEAN Genetically Modified Food Testing Network (GMFNet)	Singapore	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	NCFS participated in the discussion on issues related to GM food analysis on 15 Jul 21. (Virtual platform)
25th session of the Codex Committee on Residues of Veterinary Drugs (CCRVDF) in Food	Singapore	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	NCFS participated in the discussion on maximum residues levels (MRLs) of various drug residues were discussed from 12-16 and 20 Jul 2021. (Virtual platform)

52nd Session of Codex Committee on Pesticide Residues (CCPR) in Food	Singapore	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	NCFS participated in the discussion on maximum residues levels (MRLs) of various drug residues were discussed from 26-30 Jul & 3 Aug 21. (Virtual platform)
2021 International Workshop for Non-Animals Approaches in Food Sector – An Overview of The Current Situation & Avenues for Further Research	Singapore	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	NCFS participated in the discussion on current non-animal approaches to toxicological and allergenicity detection from 21-22 Oct 21. (Virtual platform)
11th Annual Global Summit on Regulatory Science	Singapore	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	NCFS participated in the discussion on discussion on regulatory Sciences for Food/Drug Safety with Real-World Data and Artificial Intelligence (AI) from 4-6 Oct 21. (Virtual platform)
WHO SEARO Regional Roundtable Meeting	Singapore	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	NCFS participated on the following: • Updated progress made in implementation of Framework for Action on Food Safety in WHO South-East Asia Region. • Discussed various (regulatory and technical) aspects of National Food Control System under Framework for Action on Food Safety including a regional networking. • Proposed key recommendations to accelerate implementation of the Framework for Action on Action on Food Safety. Held from 25-28 Oct 21. (Virtual platform)
Recent Advances in Food Analysis (RAFA 2021)	Singapore	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	NCFS participated in the discussion on insights into contemporary trends in analytical & bioanalytical strategies in food quality and safety control and discuss challenges / novel approaches in food and natural product analysis from 3-4 Nov 21. (Virtual platform)

The 18th Asia Nano Forum Summit (ANFoS2021) - Nanosafety Forum on Country Experiences and Predictive Model Developments for Safety Guidelines and Standardization	Singapore	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	NCFS participated in the discussion on an update on the status of nanotechnology development in their countries and share experiences among peers to promote collaboration in the future from 5-8 Aug 21. (Virtual platform)
WHO Biregional Advocacy Meeting on Risk Mitigation In Traditional Food Markets in the Asia Pacific Region	Philippines	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	RGU participated in the Biregional Advocacy Meeting on Risk Mitigation In Traditional Food Markets in the Asia Pacific Region on 1 and 2 September, 2021 (virtual platform)

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?

Yes

Name of OIE CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
National Veterinary Assay Laboratory	Japan	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Joint research on antimicrobial drug resistance in livestock and vegetables by RGU, and on prudent use by University of Tokyo
Onderstepoort Veterinary Research Institute, the OIE Reference Laboratory for rabies	South Africa	☒Africa ☐Americas ☐Asia and Pacific ☐Europe ☐Middle East	Joint research on rabies in wildlife/ domestic dogs and humans
National Institute of Animal Health	Japan	☐Africa ☐Americas ☒Asia and Pacific ☐Europe ☐Middle East	Joint epidemiological research in classical swine fever

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?

No

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: 140
b) Seminars: 1755
c) Hands-on training courses: 115
d) Internships (>1 month): 1

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
a	KPMG visit to understand various capabilities at the SFA's National Centre for Food Science	Singapore	5
a	Minister visit to understand various capabilities at the SFA's National Centre for Food Science	Singapore	3
a	NUS FST Student visit to understand various capabilities at the SFA's National Centre for Food Science	Singapore	132
b	Rabies prevention officers youtube seminar by Ministry of Health, Labour and Welfare of Japan: Animal rabies during outbreaks – Japan, Vietnam and South Africa. Prof Makita at RGU, February 2021	Japan	200
b	Japan Veterinary Association online seminar: Classical swine fever in wild boar. Prof Makita at RGU, March 6, 2021	Japan	200
b	OIE-CC for Food Safety in Asia and Pacific and Europe risk analysis webinar. May 31, 2021	Bhutan, Brunei, China, Ethiopia, Fiji, Hong Kong, India, Indonesia, Japan, Malaysia, Maldives, Mongolia, Nepal, New Caledonia, New Zealand, Singapore, Taiwan, Thailand, Timor L'este, Vanuatu, and Vietnam	71
b	The 8th One health research forum: Impact of COVID-19 on the present and future (RGU and online platform). May 13, 2021	Japan, Thailand, Cambodia	50
b	Assessment of exposure of agricultural agents and health effects. by Prof Ikenaka at Hokkaido University, hosted by RGU (June 17, 2021)	Japan and other Asian and African countries	13

b	Japan Association of Livestock Clinics online seminar: What epidemiology makes change? Prof Makita, RGU, July 9, 2021	Japan	30
b	Hokkaido University online zoonosis control expert lecture series: Control of brucellosis in Uganda and Tanzania. Prof Makita at RGU, September 2, 2021	Bangladesh, China, Japan, Mongolia, Sri Lanka, Thailand, Zambia	30
b	OIE-CC online seminar at Japan Society for Veterinary Science: The heart and shape of veterinary extension. Prof Oikawa and Prof Makita, September 9, 2021	Japan	100
b	Dr Calvin Yeo gave a presentation titled, “Enhancing Laboratory Competence Development in ASEAN” to Rakuno Gakuen University on 19 Jan 2021.	Japan	30
b	Japan Livestock Industry Association online seminar: Classical swine fever in wild boar. Prof Makita at RGU, September 17, 2021	Japan	200
b	Elanco online seminar: Action for AMR toward sustainable production and provision of animal-source foods. Prof Makita at RGU, October 1-31, 2021	Japan	200
b	Hokkaido University online One Health seminar: Control of brucellosis in Uganda and Tanzania. Prof Makita at RGU, November 15, 2021	Bangladesh, China, Japan, Mongolia, Sri Lanka, Thailand, Zambia	31
b	Association of Animal Clinical Medicine online seminar: Effects of COVID-19 on veterinary clinics. Prof Makita, November 20, 2021	Japan	200
b	The 6th One Health Lecture Series on Solutions to Global One Health Challenges Towards Human Animals and Environmental Health. Prof Makita, Prof Usui, Prof Asakawa, and Dr. Uchida at RGU, and researchers from Hokkaido University and Thammasat University, December 10-11, 2021	Japan, Thailand, Cambodia, other countries	200
b	Joint Conference between University Tokyo and National Taipei University College of Bio-Resources and Agriculture.	Chinese Taipei	100
b	Commemorative Symposium on One Health for the Completion of OIE Veterinary Education Establishments (VEE) Twinning Project between University Tokyo and Royal University of Agriculture, Cambodia.	Cambodia	100
c	Swedish University of Agricultural Science PhD program ‘Risk analysis hands on online course’. Main tutor Prof Makita at RGU, March 8-19, 2021.	Sweden, Cambodia, Italy, Thailand, Vietnam	20

c	OIE-CC for Food Safety Risk Analysis online course for the OIE Member countries. May 31 – June 11	Bhutan, Brunei, China, Ethiopia, Fiji, Hong Kong, India, Indonesia, Japan, Malaysia, Maldives, Mongolia, Nepal, New Caledonia, New Zealand, Singapore, Taiwan, Thailand, Timor L'este, Vanuatu, Vietnam	35
c	JICA online hands-on training course: Veterinary epidemiology and herd health. Prof Makita, November 24, 2021.	Mongolia	60
d	Ph.D. program on epidemiology in avian influenza at RGU	South Africa	1

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	Food safety risk analysis course for the OIE Member Countries in Asia and Pacific region; open webinar	OIE-CC for Food Safety in Europe/ILRI/ Addis Ababa University	05/21	Virtual	71
International	Joint FAO/WHO/UNEP/OIE/WFP event for Asia and the Pacific, Together we make food safe: One Health approach; presenting 'Animal Production and Health' on behalf of the OIE	FAO/WHO/UNEP/WFP	06/21	Virtual	200
International	OIE Regional Workshop on Animal Feed Safety FAMIC Virtual Training on Heavy metals; contributed as a moderator	FAMIC, Japan	11/21	Virtual	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: 67

1. Churak A, Poolkhet C, Tamura Y, Sato T, Fukuda A, Thongratsakul S. 2021. Evaluation of nosocomial infections through contact patterns in a small animal hospital using social network analysis and genotyping techniques. Scientific Reports. 11:1647.

2. Fukuda A, Nakamura H, Umeda K, Yamamoto K, Hirai Y, Usui M, Ogasawara J. 2021. Seven-year surveillance of the prevalence of antimicrobial-resistant Escherichia coli isolates, with a focus on ST131 clones, among healthy people in Osaka, Japan. Int J Antimicrob Agents 57:106298.

3. Fukuda A, Usui M, Ushiyama K, Shrestha D, Hashimoto N, Sakata MK, Minamoto T, Yoshida O, Murakami K, Tamura Y, Asai T. 2021. Prevalence of Antimicrobial-Resistant Escherichia coli in Migratory Greater White-Fronted Geese (Anser albifrons) and their Habitat in Miyajimanuma, Japan. J Wildl Dis 57:954-958.

4. Katada S, Fukuda A, Nakajima C, Suzuki Y, Azuma T, Takei A, Takada H, Okamoto E, Kato T, Tamura Y, Usui M. 2021. Aerobic Composting and Anaerobic Digestion Decrease the Copy Numbers of Antibiotic-Resistant Genes and the Levels of Lactose-Degrading Enterobacteriaceae in Dairy Farms in Hokkaido, Japan. Frontiers in Microbiology 12.

5. Kudo H, Sugiura T, Higashi S, Oka K, Takahashi M, Kamiya S, Tamura Y, Usui M. 2021. Characterization of Reproductive Microbiota of Primiparous Cows During Early Postpartum Periods in the Presence and Absence of Endometritis. Frontiers in Veterinary Science 8.

6. Nakamura K, Fujiki J, Furusawa T, Nakamura T, Gonsaira S, Sasaki M, Usui M, Higuchi H, Sawa H, Tamura Y, Iwano H. 2021. Complete Genome Sequence of a Veterinary Pseudomonas aeruginosa Isolate, Pa12. Microbiol Resour Announc 10:e0039821.

7. Nakamura K, Fujiki J, Nakamura T, Furusawa T, Gonsaira S, Usui M, Higuchi H, Tamura Y, Iwano H. 2021. Fluctuating Bacteriophage-induced galU Deficiency Region is Involved in Trade-off Effects on the Phage and Fluoroquinolone Sensitivity in Pseudomonas aeruginosa. Virus Research 306:198596.

8. Odoi JO, Takayanagi S, Sugiyama M, Usui M, Tamura Y, Asai T. 2021. Prevalence of Colistin-Resistant Bacteria among Retail Meats in Japan. Food Saf (Tokyo) 9:48-56.

9. Sabala RF, Usui M, Tamura Y, Abd-Elghany SM, Sallam KI, Elgazzar MM. 2021. Prevalence of colistin-resistant Escherichia coli harbouring mcr-1 in raw beef and ready-to-eat beef products in Egypt. Food Control 119:107436.

10. Sato T, Usui M, Harada K, Fukushima Y, Nakajima C, Suzuki Y, Yokota SI. 2021. Complete Genome Sequence of an mcr-10-Possessing Enterobacter roggenkampii Strain Isolated from a Dog in Japan. Microbiol Resour Announc 10:e0042621.

11. Sato T, Usui M, Harada K, Fukushima Y, Nakajima C, Suzuki Y, Yokota SI. 2021. Complete Genome Sequence of an mcr-9-Possessing Enterobacter asburiae Strain Isolated from a Cat in Japan. Microbiol Resour Announc 10:e0028121.

12. Tsunoda R, Usui M, Tagaki C, Fukuda A, Boonla C, Anomasiri W, Sukpanyatham N, Akapelwa ML, Nakajima C, Tamura Y, Suzuki Y. 2021. Genetic characterization of coliform bacterial isolates from environmental water in Thailand. J Infect Chemother 27:722-728.

13. Umeda K, Nakamura H, Fukuda A, Matsumoto Y, Motooka D, Nakamura S, Yasui Y, Yoshida H, Kawahara R. 2021. Genomic characterization of clinical Enterobacter roggenkampii co-harboring blaIMP-1- and blaGES-5-encoding IncP6 and mcr-9-encoding IncHI2 plasmids isolated in Japan. Journal of Global Antimicrobial Resistance. 24:220–227.

14. Usui M, Nozawa Y, Fukuda A, Sato T, Yamada M, Makita K, Tamura Y. 2021. Decreased colistin resistance and mcr-1 prevalence in pig-derived Escherichia coli in Japan after banning colistin as a feed additive. J Glob

Antimicrob Resist 24:383-386.

15. Usui M, Tase J, Onozaki M, Suzuki Y, Tamura Y, Nakajima C. 2021. Campylobacter Express Resistance Array for detecting the presence of fluoroquinolone- and macrolide-resistant Campylobacter jejuni and Campylobacter coli in broiler farms. J Appl Microbiol doi:10.1111/jam.15390.

16. Usui M, Tateno S, Onozaki M, Misawa N, Suzuki Y, Tamura Y, Nakajima C. 2021. Rapid and simultaneous detection of fluoroquinolone- and macrolide-resistant Campylobacter jejuni/coli in retail chicken meat using CAMpylobacter Express Resistance Array (CAMERA). Food Control 123:107815.

17. Fujiki J, Yoshida S, Nakamura T, Nakamura K, Amano Y, Nishida K, Nishi K, Sasaki M, Iwasaki T, Iwasaki T, Sawa H, Komatsuzawa H, Hijioka H, Iwano H. 2021. Novel Virulent Bacteriophage ΦSG005, Which Infects Steptococcus gordonii, Forms a Distinct Clade among Streptococcus Viruses. Viruses. 13(10):1964.

18. Otsuka M, Sugiyama M, Ito T, Tsukano K, Oikawa S, Suzuki K. 2021. Diagnostic utility of measuring serum amyloid A with a latex agglutination turbidimetric immunoassay in bovine mastitis: Comparison with haptoglobin and alpha-1 acid glycoprotein. J. Vet. Med. Sci. 83:329-332.

19. Elmeligy E, Oikawa S, Mousa SA, Bayoumi SA, Hafez A, Mohamed RH, Al-lethie AA, Hassan D, Khalphallah A. 2021. Role of insulin, insulin sensitivity, and abomasal functions monitors in evaluation of the therapeutic regimen in ketotic dairy cattle using combination therapy with referring to milk yield rates. Open Vet. J. 11:228-237.

20. Fukumori R, Takayama T, Izumi K, Oikawa S. 2021. Effects of digestive drug containing betaine hydrochloride on dry matter intake, rumen profiles, and blood concentrations of gut hormones in non-lactating cows. The Japanese Journal of Animal Hygiene 47(4) in press.

21. Sarentonglaga B, Ahibe S, Kato T, Atchalalt K, Fukumori R, Nagao Y. 2021. The effects of glutathione ethyl ester in in vitro maturation on the developmental ability of oocytes derived from cattle with liver abnormalities. Theriogenology 170 85-90.

22. Fukumori R, Shi W, Oikawa S, Oba M. 2021. Evaluation of relationship between ruminal pH and the proportion of de novo fatty acids in milk. JDS Communications 2(3) 123-126.

23. Fukumori R, Ikeno R, Izumi K, Doi K, Otsuka O, Suzuki K, Oikawa S. 2021. The effect of sodium butyrate supplementation on ruminal and fecal pH and serum lipopolysaccharide-binding protein after ruminal acidosis challenge in non-lactating cows. Animal Science Journal (accepted)

24. Nagahata H, Kine M, Watanabe H, Tanaka A, Takahashi A, Gonsaira S, Higuchi H. 2021. Somatic cell and innate immune responses in mammary glands of lactating cows to intramammary infusion of Bifidobacterium breve atpre-drying off period. J Vet Med Sci 82(12) 1845-1851.

25. Ganbaatar O, Konnai S, Okagawa T, Nojima Y, Maekawa N, Ichikawa Y, Kobayashi A, Shibahara T, Yanagawa Y, Higuchi H, Kato Y, Suzuki Y, Murata S, Ohashi K. 2021. Programmed death-ligand 1 expression in swine chronic infections and enhancement of interleukin-2 production via programmed death-1/programmed death-ligand 1 blockade. Immun. Inflamm. Epub 2021.

26. Nishi K, Gonsaira S, Okamoto M, Matsuda K, Sato A, Kato T, Sasagawa M, Tanaka T, Higuchi H. 2021. Inflammatory cytokine mRNA and protein levels in the synovial fluid of Mycoplasma arthritis calves. J Vet Med Sci 83(1):31-35

27. Gonsaira S, Nishi K, Fujiki J, Iwano H, Watanabe R, Eguchi A, Hirano Y, Higuchi H, Nagahata H. 2021. Innate immune response in bovine neutrophils stimulated with Mycoplasma bovis. Vet Res 52(1):58.

28. Nishi K, Hirano Y, Sato A, Eguchi A, Matsuda K, Toda M, Watanabe T, Iwasaki T, Takahashi N, Hosotani M, Watanabe R, Kato T, Ohtsuka H, Gonsaira S, Higuchi H. 2021. Effects of intra-articular inoculation with Mycoplasma bovis on immunological responses in calf joints. Vet immunol immunopathol, in press.

29. Kitano N, Kiku Y, Gonsaira S, Takahashi T. Effect of sampling volume for viable bacterial count and somatic cell count in cows' foremilk. 2021. Jp J Anim Hyg 46:189-193.

30. Hagiwara K, Matsumoto T, Tsedendamba P, Baba K, Hoshino B. 2021. Bacterial Characteristics of Dust Particle

Saltation in Gobi Dust Sites, Mongolia. Atmosphere, 12:1456.

31. Sukmak M, Okamoto M, ANDO T., Hagiwara K. 2021. Genetic stability of the open reading frame 2 (ORF2) of borna disease virus 1 (BoDV-1) distributed in cattle in Hokkaido. J Vet Med Sci, 21:155.

32. Kato-Mori Y, Okamura T, Kawashita N, Hagiwara K. 2021. Characterization of a variant CD4 molecule in Japanese Black cattle. Vet Immunol immunopathol, 232:110167.

33. Luvai EAC, Uchida L, Tun MMN, Inoue S, Weiyin H, Shimoda H, Morita K, Hayasaka D. 2021. Seroepidemiological surveys of tick-borne encephalitis virus and novel tick-borne viruses in wild boar in Nagasaki, Japan. Ticks Tick Borne Dis 13(1):101860.

34. Shimooka M, Sakurai Y, Muramatsu Y, Uchida L. 2021. Isolation and Characterization of Mosquito-Associated Spiroplasma cantharicola from Aedes japonicus Collected in Hokkaido, Japan. Insects 12(12) 1056.

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Vietnamese cattle. Journal of Veterinary Medical Science, DOI:10.1292/jvms.21-0190

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b) International conferences: 16

1. Usui M, One Health approach against antibiotic resistance in Japan. OIE Collaborating Centre Consortium for Food Safety in Asia and Pacific and Europe/ Addis Ababa University/ILRI webinar on risk analysis, 2021. May. 31.

2. Makita K. Introduction to risk assessment. OIE Collaborating Centre Consortium for Food Safety in Asia and Pacific and Europe/ Addis Ababa University/ILRI webinar on risk analysis, 2021. May. 31.

3. Li A. Introduction to risk management and communication. OIE Collaborating Centre Consortium for Food Safety in Asia and Pacific and Europe/ Addis Ababa University/ILRI webinar on risk analysis, 2021. May. 31.

4. Yokoyama T. BSE. OIE Collaborating Centre Consortium for Food Safety in Asia and Pacific and Europe/ Addis Ababa University/ILRI webinar on risk analysis, 2021. May. 31.

5. Ping S. Points of Food Safety problem: Drugs & Residues. OIE Collaborating Centre Consortium for Food Safety in Asia and Pacific and Europe/ Addis Ababa University/ILRI webinar on risk analysis, 2021. May. 31.

6. Kudo H, Higashi S, Oka K, Takahashi M, Tamura Y, Usui M. Complete genome sequencing and transcriptome analysis of Extended-Spectrum Beta-lactamase-producing
Escherichia coli exposed to flavophospholipol. ECCMID2021. 2021. July. 9-12.

7. Usui M, Current situation and future prospect of antibiotic-resistant bacteria derived from animals. FFTC-TLRI symposium. 2021. November. 17

8. Uchida L, Zika Virus Potential Vectors among Aedes Mosquitoes from Northern Japan. Joint International Tropical Medicine Meeting (JITMM 2021). 2021. December. 15.

9. Uchida L. Zika Virus Potential Vectors among Aedes Mosquitoes in Hokkaido, Northern Japan. The 6th One Health Lecture Series on Solutions to Global One Health Challenges Towards Human Animals and Environmental Health. December 10, 2021.

10. Usui M. Antibiotic resistant bacteria and antibiotic resistance genes in livestock environment in Japan. The 6th One Health Lecture Series on Solutions to Global One Health Challenges Towards Human Animals and Environmental Health. December 10, 2021.

11. Asakawa M. Platyhelminthes as pathogens of fish diseases from captive fishes in aquariums in Japan. The 6th One Health Lecture Series on Solutions to Global One Health Challenges Towards Human Animals and Environmental Health. December 11, 2021.

12. Noda J. Bioaerosol science and environmental health: essential aspects and further challenges. The 6th One Health Lecture Series on Solutions to Global One Health Challenges Towards Human Animals and Environmental Health. December 11, 2021.

13. Noda J, Aoyama T, Maki T, Morimoto K, Mitarai, S. Atmospheric Air pollution and bioaerosols: Soot as attributing factor for UV resistance. 4th International Chemical Hazard Symposium. 2021 March. 3.

14. Wu Q. 2021. Establishment of a Transferable Untargeted Screening Strategy and Its Application in Food Safety Early Alert. Rapid Method Europe conference from 1 Feb to 3 Feb 2021.

15. Ching KW. 2021. Rapid Susceptibility Profiling of Aeromonas dhakensis Using A Microscan: A High Prevalence of Carbapenem-Resistant In Clinical Strains. 1st International Electronic Conference on Antibiotics- The Equal Power of Antibiotics and Antimicrobial Resistance on 8-17 May 2021.

16. Ching KR. 2021. Benchmarking NGS platforms for WGS analysis to support foodborne outbreak investigations. Rapid Method Europe 2021.

c) National conferences: 35
1. Nakamura K, Fujiki J, Furusawa T, Mumby M, Nakamura T, Usui M, Gondaira S, Higuchi H, Tamura Y, Iwano H. Fluctuating Bacteriophage-induced galU Deficiency Region is Involved in Trade-off Effects on the Phage and Fluoroquinolone Sensitivity in Pseudomonas aeruginosa. 2021. March. 24. Japanese Society for Bacteriology. Japan.

2. Fukuda A. Role of flies on the dissemination of antimicrobial resistant bacteria in environment. 2021. April 24. Symposium. Study group of Antibacteria for animals. Japan.

3. Fukuda A, Usui M, Suzuki M, Makita K. Quantitative analysis of dissemination of antimicrobial resistant bacteria and antimicrobial resistance genes to soils and crops by the immigration of livestock waste. 2021. September 7-9. Japan Society for Veterinary Medical Science. Japan.

4. Suzuki K, Fukuda A, Nakajima C, Suzuki Y, Usui M. Repeated exposure of high concentration antimicrobials increases the spore formation rate in Clostridioides difficile. 2021. September 7. Japan Society for Veterinary Medical Science. Japan.

5. EnamiM, Fukuda A, Nakajima C, Suzuki Y, Usui M. Heated scallop shell powder and lime nitrogen could control antibiotic-resistant bacteria in composting. 2021. September 7. Japan Society for Veterinary Medical Science. Japan.

6. Fukuda A, Usui M, Suzuki M, Makita K. Elucidation of the amount of propagation of antibiotic resistance in soil and crops by applying livestock wastes. 2021. September 7. Japan Society for Veterinary Medical Science. Japan.

7. Uchiyama T, Fukuda A, Azuma T, Usui M. Survey of ESBL-producing and carbapenem-resistant Escherichia coli in aquatic environment 2021. September 7. Japan Society for Veterinary Medical Science. Japan.

8. Usui M. The relationship between antibiotic resistance and livestock wastes. October 28, 2021. Japanese Society of Water Treatment Biology. Japan.

9. Uchida L, Sakurai Y, Muramatsu Y. Survey of arboviruses in Aedes mosquitoes collected in Hokkaido, Japan. September 7, 2021. Japan Society for Veterinary Medical Science. Japan.

10. Miki K, Iwamoto K, Eshita Y, Orba Y, Sawa H, Muramatsu Y. Evaluation of Zika viral quasispecies generated in Aedes japonicus. September 7, 2021. Japan Society for Veterinary Medical Science. Japan.

11. Kawae S, Iwamoto K, Eshita Y, Orba Y, Sawa H, Muramatsu Y. Comparison of Zika virus susceptibility of Aedes japonicus, Aedes albopictus, and Aedes aegypti. September 7, 2021. Japan Society for Veterinary Medical Science. Japan.

12. Muramatsu Y., Itani, H., Nomura M., Uchida L., and Kooriyama T. Comparison between oral microbiome and frequency on bacterial detection from oral cavities of dogs and their owners. September 7, 2021. Japan Society for Veterinary Medical Science. Japan.

13. Shoji J, Fukumori R, Eguchi A, Gondaira S, Chisato K, Oikawa S. The relationship between de novo fatty acids in milk and milk production, diseases and plasma concentrations of metabolic hormones in dairy cows. September 11, 2021. The Japanese Society of Animal Science. Japan.

14. Sato H, Kumano R, Osada T, Kamata M. Shimada K, Izumi K, Fukumori R, Chisato K, Oikawa S. Effects of starch

contents in calf starter on feed intake, growth and plasma concentrations of metabolic hormones in dairy calves. September 11, 2021. The Japanese Society of Animal Science. Japan.

15. Takamatsu Y, Chisato K, Fukumori R, Kusayanagi A, Taguchi T. Oikawa S. Blood VLDL concentration in primiparous and multiparous cows. September 7, 2021. The Japanese Society of Veterinary Medical Science. Japan.

16. Kumano R. Sato H, Osada T, Kamata M, Taguchi T, Kusayanaghi A, Izumi K, Fukumori R. Chisato K, Oikawa S. Changes in serum lipoprotein concentrations before and after colostrum feeding in dairy calves. September 7, 2021. The Japanese Society of Veterinary Medical Science. Japan.

17. Sato H, Kumano R, Osada T, Kamata M, Shimada K, Izumi K, Fukumori R, Chisato K, Oikawa S. Effects of starch contents in calf starter on growth, plasma biochemical component concentrations and fecal scores in dairy calves. September 7, 2021. The Japanese Society of Veterinary Medical Science. Japan.

18. Shoji J, Fukumori R, Eguchi A, Gonsaira S. Chisato K, Oikawa S. The relationship between de novo fatty acids in milk and blood BHBA concentrations in dairy cows. September 7, 2021. The Japanese Society of Veterinary Medical Science, Japan.

19. Osada S, Chisato K, Fukumori R, Kusayanagi A, Taguchi T, Oikawa S. Changes in serum lipoprotein concentrations before and after calving in primiparous and multiparous cows. September 7, 2021. The Japanese Society of Veterinary Medical Science, Japan

20. Fusada K, Eguchi A, Nishi K, Gonsaira S, Higuchi H, Intracellular invasion mechanism of Mycoplasma bovis into bovine mammary epithelial cells. October 23, 2021. The Japanese Society of Bovine Mastitis. Japan

21. Tachibana A, Nishi K, Eguchi A, Matsuda K, Sato A, Kato T, Gondaira S, Higuchi H. Intracellular kinetics of Mycoplasma bovis using endosome vesicles. September 7-13, 2021. The Japan Society for Veterinary Medical Science, Japan.

22. Eguchi A, Watanabe R, Nishi K, Inoue H, Gondaira S, Higuchi H. Dynamic changes in free amino acids in milk in bovine mastitis. September 7-13, 2021. The Japan Society for Veterinary Medical Science, Japan.

23. Eguchi A, Watanabe R, Nishi K, Inoue H, Gondaira S, Higuchi H. Effects of free amino acids in milk on immune response in the mammary gland in bovine mastitis. June 26, 2021. The Japanese Society of Animal Hygiene.

24. Takahashi T, Yumoto S, Nakamura H, Eguchi A, Watanabe R, Hirano Y, Nishi K, Gondaira S, Higuchi H. Evaluation of serum antibody titers in bovine mycoplasma infection. 2021. June 26. The Japanese Society of Animal Hygiene.

25. Kure S, Fukuhara T, Hayashi T, Nagasawa Y, Tajima Y, Kosenda K, Otsuka H. The relationship between immune factors from macrophages in milk and milk composition in dairy cattle. December 5, 2021. The Society of Farm Animal in Infectious Diseases.

26. Shimazaki H, Bahame D, Bugeza J, Nsereko G, Byaruhanga J, Anzai M, Muramatsu Y, Vudriko P, Mwebembezi W, Makita K. Understanding dairy value chain in Mbarara district, Uganda. March 6, 2021. Japan Society of Veterinary Epidemiology.

27. Okamura A, Yokoyama A, Makita K. Estimating carcass center temperature for export of beef to foreign countries. March 6, 2021. Japan Society of Veterinary Epidemiology.

28. Tokunaga N, Usui M, Fukuda A, Asai T, Makita K. The risk profile of beta-lactam antibiotics resistance bacteria of livestock origin through consumption of vegetables. March 6, 2021. Japan Society of Veterinary Epidemiology.

29. Ukita M, Kuwata K, Tanaka E, Isoda N, Sakoda Y, Makita K. Prediction of the change of CSF antibody titers of sow herds by generation using a simulation model. March 6, 2021. Japan Society of Veterinary Epidemiology.

30. Makita K, Kamata Y, Tojinbara K. Evaluation of the effects of rabies control in the elimination in Japan using effective reproductive number. March 6, 2021. Japan Society of Veterinary Epidemiology.

31. Ukita M, Kuwata K, Tanaka E, Isoda N, Sakoda Y, Makita K. Consideration of prefecture specific classical swine fever vaccination program based on the timing of starting pig farm vaccination by simulation model. September

9, 2021. Japanese Society of Veterinary Medical Science, Japan.

32. Makita K, Suzuki T, Mogano K, Chirima G, Sabeta C. Characterizing rabies transmission dynamics in northern South Africa by genome analysis. September 9, 2021. Japanese Society of Veterinary Medical Science, Japan.

33. Fukumoto F, Makita K, Kimura Y, Hori A, Tanaka A, Tsutsumi A. Effect of COVID-19 on Japanese pet animal clinics. September 9, 2021. Japanese Society of Veterinary Medical Science, Japan.

34. Ota C, Noda J, Morimoto K, Mitarai S. The protective effect of soot on Mycobacteria from UV-Abactericidal effect of ozone on the bioaerosol in the barn. September 7-13, 2021. Japan Society for Veterinary Medical Science. Japan.

35. Osaki N, Narikawa S, Noda J, Kon K, Goto M, Kishida M, Takahasi T. bactericidal effect of ozone on the bioaerosol in the barn. September 7-13, 2021. Japan Society for Veterinary Medical Science. Japan.

d) Other
(Provide website address or link to appropriate information): 15
Invited speeches:
1. Makita K. Animal rabies during outbreaks – Japan, Vietnam and South Africa. Rabies prevention officers youtube seminar by Ministry of Health, Labour and Welfare of Japan, February 2021.

2. Makita K. Japan Veterinary Association online seminar: Classical swine fever in wild boar. March 6, 2021.

3. Takahashi Y. The Relationship between Religious Cultures and the Number of Educational Post Mortem Dissection of Companion Animals. Association of Bioethics in Kyoto, March, 2021

4. Takahashi Y. Humanistic-Social Disciplines and COVID-19. The 8th One health research forum: Impact of COVID-19 on the present and future. May 13, 2021.

5. Makita K. Animal Production and Health. Joint FAO/WHO/UNEP/OIE/WFP event for Asia and the Pacific, Together we make food safe: One Health approach, June 21, 2021.

6. Makita K. What epidemiology makes a change? Japan Association of Livestock Clinics online seminar, July 9, 2021.

7. Oikawa S, Fukumori R, Chisato K. Field activities of Rakuno Gakuen University. OIE-CC online seminar at Japan Society for Veterinary Science: The heart and shape of veterinary extension. September 9, 2021.

8. Makita K. Veterinary extension in international frameworks. OIE-CC online seminar at Japan Society for Veterinary Science: The heart and shape of veterinary extension. September 9, 2021.

9. Makita K. Classical swine fever in wild boar. Japan Livestock Industry Association online seminar, September 17, 2021

10. Takahashi Y. The Characteristics of Animal Ethical Theory of Bernard E. Rollin: A Comparison with Peter Singer. Japanese Association of Ethics, October, 2021.

11. Makita K. Action for AMR toward sustainable production and provision of animal-source foods. Elanco online seminar, October 1-31, 2021.

12. Makita K. Control of brucellosis in Uganda and Tanzania. Hokkaido University online One Health seminar, November 15, 2021

13. Makita K. Effects of COVID-19 on veterinary clinics. Association of Animal Clinical Medicine online seminar, November 20, 2021.

14. Makita K. Learning from ecohealth and history of rabies to achieve "Zero by 30". Special lecture, The 6th One Health Lecture Series on Solutions to Global One Health Challenges Towards Human Animals and Environmental Health. December 11, 2021.

15. Makita K. International veterinary extension activities. The 10th JICA-JISNAS –New movement of international education and research using international students network. December 20, 2021, online.

9. Additional comments regarding your report: