

IVCC 2016 Final Report
Western Institute for Food Safety and Security,
School of Veterinary Medicine, UC Davis
November 7, 2016

During September 6 – 17, 2016 the Western Institute for Food Safety and Security (WIFSS) hosted a Food Animal Residue Avoidance Database (FARAD) and One Health Curriculum Workshop. This workshop was sponsored through a grant from the International Veterinary Collaboration for China (IVCC) and Zoetis. Three faculty from Nanjing Agricultural University (NJAU) College of Veterinary Medicine to UC Davis/WIFSS attended this intensive 10 day program: Professors Ruqian Zhao, Liping Wang, and Ruibing Cao. The detailed program for the workshop is attached (see Appendix A).

Session topics during week 1 included One Health in Food Safety, curriculum development related to One Health in Food Safety, antibiotic residues and regulatory issues affecting the USA, outreach activities to improve dairy operations, and methods for blended learning for adult learners. Participating speakers during week 1 included Ria de Grassi, an agricultural issues and policy strategist and Dr. Jessica Light of Zoetis, along with faculty and staff from the School of Veterinary Medicine and WIFSS, including Drs. John Angelos, Amanda Arens, Bennie Osburn, Michael Payne, Birgit Puschner, and David Goldenberg and Heather Johnson. In week 2 the visiting faculty attended sessions led by Dr. Lisa Tell and her FARAD team including Dr. Tara Marmulak, Scott Wetzlich, and Maaike Clapham, of UC Davis and Carolyn Whitford from the University of Florida. These sessions provided information on how FARAD functions to assist veterinarians and producers in maintaining a food supply free of drug residues. It is hoped that through this program future working relationships can become established between WIFSS/SVM and NJAU to increase educational and research collaborations related to One Health in Food Safety and food supply drug residue avoidance.

During the first week of the program group discussions were incorporated into the daily schedule to help identify challenges, opportunities, and future steps needed to develop a formal curriculum in One Health in Food Safety at NAU and to help determine how WIFSS, SVM, and UC Davis can work with NJAU in establishing this training curriculum. Questions/topics addressed in these sessions included the following:

- a) Is One Health applicable in China?
- b) What are ways to apply One Health in NAU/UCD collaborations?
- c) How are antibiotics regulated in China and does China provide effective oversight of antibiotic use?
- d) How can NAU and UCD work together to develop a One Health in Food Safety curriculum?
- e) Blended Learning and its use in student instruction at NAU
- f) How can NAU faculty implement improvements in agricultural industry practices?
- g) Develop an Action Plan; Brainstorm Curriculum Development; Prioritize Next Steps for Curricular Development

In these discussions WIFSS and NJAU faculty exchanged ideas on how the One Health effort at the One Health Center at NJAU could be supported. Visiting NJAU faculty felt that the curriculum development process using teaching methods that are good for adult learners (for

example, problem-based learning, blended learning) could be useful in developing a One Health in food safety training curriculum at NJAU. Faculty felt that the curricular framework in One Health in Food Safety developed at WIFSS during 2015-2016 could be useful in this effort, however, this curriculum as discussed was too broad to consider adopting in its entirety at this time.

One idea that was discussed and that received support from NJAU faculty was the idea of developing an online course for undergrads that could be included in the 3-week student conference that happens at UCD annually and that WIFSS coordinates. Ideas that emerged included the possibility of enrolling 300 NJAU undergraduates to do online work, to select from this group a smaller group to come to the US and participate in the 3-week student conference. The class/program could also be open to graduate students as well. Within the curriculum itself there could be 3 levels taught (undergrad, graduate, and industry/government staff and workers). Doing so would require that the content is not too general or broad and that learning objectives are clearly defined in several different areas of interest/discipline/focus.

Visiting NJAU faculty encouraged WIFSS to discuss further development of the curriculum with NJAU senior administration who would be visiting campus in October 2016. NJAU faculty would also have to discuss curriculum development with those at NJAU who are responsible for curricular development and discuss the idea of adding a One Health emphasis that could complement their current programs. The Department of Education at NJAU is the deciding body on how many credits are assigned to any newly proposed courses. Discussions with these other schools/offices at NJAU would also be important: a) the Graduate School (manages courses for grad students – may be appealing to the school because students would have the opportunity to gain a wider/broader view of the world); b) the Counselor Office (manages undergraduate courses); and c) the College of International Education (manages courses for foreign students). Also, the Veterinary College could be involved in these discussions.

Regarding funding for course development/student activities, the Ministry of Education and individual universities provide funding for students on a competitive bases. Faculty have different sources of funding to support travel to the USA for teaching experiences. NJAU faculty indicated that education and teaching is becoming more important for funding and that new course development and course improvement funds are available, however, this is limited to 50,000 RMB (~\$7,300 US). It was mentioned that in China, money suddenly can become available and availability is not always predictable; as such, faculty must be alert to funding opportunities (for example, from the Ministry of Agriculture).

Additional topics discussed included WIFSS and NJAU faculty working together to design and develop an undergraduate course (food safety awareness) covering: a) general information about One Health; b) animal science; c) plant science; d) environmental health (wildlife, water, air, soil, pollution). Another idea that was discussed was creation by WIFSS of an undergraduate freshman seminar. Relative to curricular content, it was felt that young faculty might become involved in building and developing teaching materials, programs, and presentations. Outreach, faculty and student exchanges between NJAU and UCD, and summer programs were also discussed.

Based on feedback received during discussions between Profs. Cao, Zhao, Wang, Tell, and Angelos following the FARAD program (week 2) on September 16, 2016, the NJAU faculty felt that the week 2 program was well received and comprehensive. The visiting faculty believe that FARAD is an excellent way to provide service to the animal agriculture industry and veterinarians. Importantly, visiting NJAU faculty expressed that it is important for the USA and China to pay more attention to antimicrobial resistance as it relates to food animal products. The development of large databases (with, for example, pharmacokinetic information) could be very attractive to the Chinese government. FARAD has had some international endeavors in the past and perhaps these can be revitalized given renewed global interest in antibiotic use/regulation.

NJAU faculty suggested that to improve future educational programs related to FARAD, it would be good to include information on the adverse effects of antibiotic use, specifically scientific evidence related to why antibiotic use should be controlled beyond just antimicrobial resistance. NJAU faculty suggested that future participating faculty in such training and educational programs should be made aware of the wide spectrum of reasons for why antibiotic use should be controlled and/or not used (in some instances). It was also expressed that inclusion of the following could be very helpful for future programs:

- a) *How industries in the USA are surviving without the use of antibiotics.* NJAU faculty mentioned that there is considerable concern amongst Chinese producers of agricultural animal products about how they can maintain their livelihoods without using antibiotics. Expressed concerns include that animals would die, and as a result, producers would lose incomes. Faculty believed that it would be helpful to see examples of how antibiotics are being phased out and how industries are doing this and handling the fallout (if any) from these changes.
- b) *Regulation/surveillance and monitoring of antibiotic use.* How is this done in the USA? In future programs it would be good to include regulatory professionals who work for the actual regulatory bodies.
- c) *Consider visiting Tulare to see large animal agriculture in the central California valley.*

Other suggestions included use of a survey prior to future programs to gather more information regarding program participants and (from a logistical standpoint) using a tablet that is simultaneously projected on a screen to assist in program lessons. Finally, NJAU faculty encouraged increased relationships with the veterinary students who are here from NJAU. Currently 2 freshman veterinary students are enrolled in the UCD DVM program.

In summary, this IVCC-Zoetis funded program was well received by the NJAU faculty. Our discussions suggest that there could be opportunities for future establishment of a One Health in Food Safety curriculum at NJAU as well as education surrounding appropriate antibiotic use as a way to advance food safety in China. Future funding from IVCC will assist in helping educate future generations of faculty, researchers, farmers, and veterinarians in China on the importance of One Health and the important role for collaborations between workers in different disciplines in helping to establish better food safety while also establishing and maintaining healthy people, animals, and the environment.

APPENDIX A

出访活动日程表 (表式)

Food Animal Residue Avoidance Database (FARAD) and
One Health Curriculum Workshop
University of California, Davis
September 6 – 17, 2016



WEEK ONE

Date	Time	Activity	Location
Sept 7	9:00 – 9:45	Introduction and Overview – <i>Bennie Osburn</i>	WIFSS Conf Room
	9:45 – 10:15	Ice Breaker - <i>All Participants</i>	WIFSS Conf Room
	10:15 – 10:30	BREAK	
	10:30 – 11:15	Veterinary Medicine and One Health – <i>Amanda Arens</i>	WIFSS Conf Room
	11:15 – 12:00	Group Discussion: Is One Health applicable in China? What are ways to apply One Health in NAU/UCD collaborations?	WIFSS Conf Room
	12:00 – 1:30	LUNCH	Local Restaurant
	1:30 – 2:15	Common Residue Problems in the USA (including beef, dairy, veal, poultry, swine) – <i>Jessica Light, Zoetis</i>	
	2:15 – 2:45	BREAK	WIFSS Conf Room
	2:45 – 3:00	Antibiotic Use in Food Animal Production: Regulatory Developments in the United States – <i>Ria de Grassi, Agricultural Issues & Policy Strategist</i>	WIFSS Conf Room
Sept 8	3:45 – 4:15	Group Discussion: How are antibiotics regulated in China? Does China provide effective oversight of antibiotic use?	WIFSS Conf Room
	9:00 – 9:45	Overview of One Health Curricular Framework for WIFSS and NAU; Antibiotics Curriculum and Application of One Health – <i>John Angelos</i>	WIFSS Conf Room
	9:45 – 10:00	BREAK	WIFSS Conf Room

Date	Time	Activity	Location
Sept 8	10:00 – 11:30	Group Discussion: How can NAU and UCD work together to develop a One Health in Food Safety curriculum?	WIFSS Conf Room
	11:30 – 1:30	LUNCH	Local Restaurant
	1:30 – 2:15	Teaching Adult Learners An overview of effective teaching methods for adult learners studying complex topics such as One Health Food Safety <i>Heather Johnson</i>	WIFSS Conf Room
	2:15 – 2:45	BREAK	
	3:00 – 3:45	Discussion about the use of Hybrid (Blended) Learning with a UC Davis School of Veterinary Medicine faculty member who is currently teaching a hybrid class <i>Birgit Puschner</i>	WIFSS Conf Room
	3:45 – 4:15	Introduction Blended Learning Experience “Foodborne Outbreak Investigation” – <i>Heather Johnson and David Goldenberg</i>	WIFSS Conf Room
	6:00 – 8:00	DINNER	Seasons Restaurant 102 F St, Davis
Sept 9	9:00 – 9:45	St. Patrick’s Day Revenge – <i>David Goldenberg</i>	WIFSS Conf Room
	9:45 – 10:15	Group Discussion: Blended Learning and its use in student instruction at NAU	WIFSS Conf Room
	10:15 – 11:30	Group Discussion: How is outreach used to implement change on dairies? <i>Michael Payne</i>	WIFSS Conf Room
	11:30 – 12:00	Group Discussion: How can NAU faculty implement improvements in agricultural industry practices?	WIFSS Conf Room
	12:00 – 1:30	LUNCH	Local Restaurant
	1:30 – 4:00	Group Discussion: Develop an Action Plan; Brainstorm Curriculum Development; Prioritize Next Steps for Curricular Development	WIFSS Conf Room

WEEK TWO

Date	Time	Activity	Location
Sept 12	9:00 – 10:00	Introduction and Discussion on Scientific Interests/Drug Regulatory Framework in China – <i>All Participants</i>	2013 Valley
	10:00 – 10:45	FARAD Program Overview – <i>Lisa Tell</i>	2013 Valley
	10:45 – 11:00	BREAK	
	11:00 – 12:30	Videos (4) on FARAD Website; Review of FARAD Website and www.learnfarad.com ; Overview of Answering Extra-Label Drug Use Calls in the US – <i>Tara Marmulak, Lisa Tell</i>	2013 Valley
	12:30 – 1:30	LUNCH	Open
	1:30 – 3:00	FARAD Farm Call Cases; High Dose; ELDU Cases – <i>Tara Marmulak</i>	2013 Valley
	3:00 – 3:15	BREAK	
	3:15 – 4:00	FARAD Farm Call Cases, High Dose; ELDU Cases, Continued, and Low Dose ELDU Cases – <i>Tara Marmulak</i>	2013 Valley
Sept 13	9:00 – 10:45	FARAD Farm Call Cases, Unlabeled Species – <i>Tara Marmulak</i>	2013 Valley
	10:45 – 11:00	BREAK	
	11:00 – 12:30	The Ins and Outs of FARAD's VetGram – <i>Carolyn Whitford (University of Florida)</i>	2013 Valley
	12:30 – 2:00	LUNCH with Xinbin Chen's Laboratory Team	Location TBD
	2:00 – 3:00	FARAD Farm Call Cases, Unlabeled Species Continued. Extended Treatment Duration Cases – <i>Tara Marmulak</i>	2013 Valley
Sept 14	9:00 – 10:45	FARAD Farm Call Cases: Volume Per Injection Site – <i>Tara Marmulak</i>	2013 Valley
	10:45 – 11:00	BREAK	
	11:00 – 12:30	FARAD Farm Call Cases: Beef Drugs in Dairy Cattle – <i>Tara Marmulak</i>	2013 Valley
	12:30 – 2:00	LUNCH	Open
	2:00 – 3:00	Kinetic Database: UnScan It Program for Data Extraction WinNonLin; Interlocution to Full Extractions – <i>Scott Wetzlich and Maaike Clapham</i>	2013 Valley

Date	Time	Activity	Location
Sept 14	3:00 – 3:15	BREAK	
	3:15 – 4:00	Kinetic Database: Full Extractions Continued – <i>Scott Wetzlich and Maaike Clapham</i>	2013 Valley
Sept 15	9:00 – 10:45	FARAD Farm Call Cases: Water Medication – <i>Tara Marmulak</i>	2013 Valley
	10:45 – 11:00	BREAK	
	11:00 – 12:30	FARAD Farm Call Cases: Pesticide Spray – <i>Tara Marmulak</i>	2013 Valley
	12:30 – 2:00	LUNCH	Open
	2:00 – 3:00	Kinetic Database: Full Extractions Continued – <i>Scott Wetzlich, Maaike Clapham</i>	2013 Valley
	3:00 – 3:15	BREAK	
	3:15 – 4:00	Full Extractions Continued – <i>Scott Wetzlich, Maaike Clapham</i>	
	5:30 – 7:30	GROUP DINNER	Buckhorn Steakhouse, Winters
Sept 16	9:00 – 10:45	FARAD Farm Call Cases: Prohibited Drugs and Unlabeled Administration Route – <i>Tara Marmulak</i>	2013 Valley
	10:45 – 11:00	BREAK	
	11:00 – 12:30	FARAD Farm Call Cases: – Prohibited Drugs and Unlabeled Administration Route Continued – <i>Tara Marmulak</i>	2013 Valley
	12:30 – 1:30	LUNCH	Open
	1:30 – 3:00	Wrap Up – <i>Lisa Tell, Tara Marmulak, Scott Wetzlich, Maaike Clapham</i>	2013 Valley

WORKSHOP PARTICIPANTS

John Angelos

Dr. John Angelos is Chair of the Department of Medicine and Epidemiology at the School of Veterinary Medicine and Professor of Veterinary Medicine, Infectious Diseases. His professional interests include internal medicine and infectious diseases of food producing animals and development of improved vaccination/vaccine delivery strategies to support sustainable food production practices. At WIFSS Dr. Angelos serves as a subject matter expert in livestock veterinary practice and food safety. He is a Diplomate of the American College of Veterinary Internal Medicine (Large Animal).

Amanda Arens

Dr. Amanda Arens is Program Manager at the Western Institute for Food Safety and Security, (WIFSS), and provides coordination and oversight for outreach projects, and a team of scientific researchers and educational specialists. Additionally, she provides expertise and experience in program development, assessment and evaluation. Dr. Arens has a strong research background in translational medicine and her current position places her at the interface of humans, animals and the environment in a One Health approach to food safety.

Ruibing Cao

Dr. Ruibing Cao is Vice Dean of the College of Veterinary Medicine at Nanjing Agricultural University. His research focuses on the epidemiology, infection and immunity of Japanese encephalitis virus and duck Tembusu virus.

Xinbin Chen

Dr. Xinbin Chen is Professor at UC Davis Schools of Medicine and Veterinary Medicine. He is leader of the Comparative Oncology Program at the two schools. The comparative oncology program has the goal of drawing on key strengths of UC Davis in animal research pertaining to the disease mechanisms that are implicated in the genesis and progression of cancer. Dr. Chen's research focuses on the function of the p53 family in tumor suppression, development, and aging.

Maaiké Clapham

Maaiké Clapham has a Bachelor's of Science in Animal Science and Management with an emphasis in livestock from University of California, Davis. As an undergraduate at UC Davis she was a student manager of the UC Davis Swine Center and a necropsy technician at California Animal Health and Food Safety Laboratory. She is currently a research assistant within the FARAD laboratory, additionally she manages the T.S. and K.D. Glide Foundation which is home to 120 horses and other animals.

Ria de Grassi

Ria de Grassi, M.S., is an agricultural issues and policy strategist who consults on special projects vital to agricultural research, animal health and welfare, and food and agriculture critical infrastructure. Ms. de Grassi worked for an agricultural nonprofit for more than 25 years representing the food animal sector. She helped initiate the California Dairy Quality Assurance Program and continues to advise the School of Veterinary Medicine's Center for Food Animal Health at UC Davis.

David Goldenberg

David Goldenberg is an instructor in food safety with the Western Institute for Food Safety and Security. He contributes to food safety projects for the U.S. Food and Drug Administration (FDA) Integrated Food Safety System (IFSS). He is involved in the produce investigations course and is working on integrating video and table top exercises to enhance adult learning principles.

Heather Johnson

Heather Johnson, M.S., is an instructional systems designer and educational specialist at WIFSS. She oversees the instructional design component of WIFSS training and educational projects in accordance with certification standards that meet local, state and federal agency requirements. She designs blended learning educational materials specifically using principles of adult education.

Jessica Light

Dr. Jessica Light is a Senior Veterinarian in the Zoetis Dairy Technical Services Team. Dr. Light works with veterinarians and dairy producers to improve dairy cattle care and productivity. She currently serves on the Agriculture Committee of the California Veterinary Medical Association and as a Zoetis Master.

Tara Marmulak

Dr. Tara Marmulak is the Food Animal Residue Avoidance & Depletion (FARAD) Coordinator in the Department of Medicine and Epidemiology at UC Davis, School of Veterinary Medicine. She advises veterinarians on appropriate withdrawal intervals for extra label drug use in food animals. Dr. Marmulak's background as a pharmacist and resident in veterinary medicine make her uniquely qualified to assess the pharmacokinetics of drugs in food animals.

Bennie Osburn

Dr. Bennie Osburn is Director of Outreach and Training at the Western Institute for Food Safety and Security. He is Dean Emeritus of the School of Veterinary Medicine, UC Davis. Dr. Osburn's research has focused on infectious diseases of livestock, zoonotic diseases, including foodborne pathogens, and the ecology of infectious agents. He is interested in applying a One Health approach to food safety.

Michael Payne

Dr. Michael Payne is a researcher and outreach coordinator at WIFSS. Dr. Payne has worked as a veterinarian in extension, academics and private practice. He is director of the California Dairy Quality Assurance Program, an industry, academic regulatory partnership which promotes the health and welfare of livestock, consumers and the environment through outreach, education and research.

Birgit Puschner

Dr. Birgit Puschner, Professor, and Chair, of the Department of Molecular Biosciences, School of Veterinary Medicine, focuses her research on diagnostic veterinary toxicology; poisonous plants; algal toxins; and natural toxins. She teaches toxicology in the veterinary professional curriculum and pharmacology and toxicology in the graduate curriculum. In the past 3 years, she developed an undergraduate course that utilizes online and hybrid teaching modalities to provide an introductory course in toxicology/pharmacology.

Lisa Tell

Lisa Tell, DVM, has been a UC Davis School of Veterinary Medicine faculty member since 1997. She is board certified with the American College of Zoological Medicine and the American Board of Veterinary Practitioners (Avian Specialty). Her academic research career initially focused on treatment of avian infectious diseases and evolved into drug residues in animal derived human food products. She is currently the director of the Western Region Food Animal Residue Avoidance and Depletion program that focus on public health and mitigating drug residues in animal derived food products.

Liping Wang

Dr. Liping Wang is a professor in the College of Veterinary Medicine at Nanjing Agricultural University. Her research focuses on establishing information systems on antimicrobial use and the emergence of bacterial resistance in animal populations in China. Dr. Wang studies the association between drug exposure and the emergence of bacterial resistance in animal populations under different dosage regimen conditions.

Scott Wetzlich

Scott Wetzlich is a staff research associate in the Department of Medicine and Epidemiology at the UC Davis School of Veterinary Medicine. He manages the research activities in the laboratory of Dr. Lisa Tell which includes FARAD and the minor use /minor species animal drug program (NRSP-7). He has 28 years of analytical experience focused on projects related to obtaining drug approval for minor food animal species.

Carolyn Whitford

Carolyn Whitford is an IT Project Manager at the University of Florida and provides database and web site support for FARAD. She is responsible for updating the SQL data used for VetGRAM applications and oversees the development of the Android and Apple versions. She also perpetuates the FARAD website, Facebook Page and Twitter accounts. Carolyn has been with FARAD since April of 1999.

Ruqian Zhao

Dr. Ruiqian Zhao is a professor in the Laboratory of Animal Physiology and Biochemistry in the College of Veterinary Medicine at Nanjing Agricultural University. Her research focuses metabolic and biochemical pathways in lactating adults and neonatal animals. She also has served as an administrator in the College of Veterinary Medicine.