

INTER-AMERICAN INSTITUTE FOR COOPERATION ON AGRICULTURE
THE OHIO STATE UNIVERSITY

Antimicrobial Use and Antimicrobial Resistance in Agriculture Training

Columbus, Ohio
(December 07-18, 2015)

COURSE PROFILE

The Inter-American Institute for Cooperation on Agriculture (IICA) is committed to supporting efforts to detect, control and prevent the spread of antimicrobial resistance in agriculture. In an effort to strengthen the capacities of surveillance and control activities in Member States, IICA has collaborated with The Ohio State University (OSU) College of Veterinary Medicine, to offer advanced training on antibiotic use and antimicrobial resistance in food production animals and food products of animal origin.

This capacity building action on *Antimicrobial Use and Antimicrobial Resistance in Agriculture*, is an opportunity for early to mid-career public health professionals to participate in a comprehensive two week training course designed to provide participants with the knowledge and skills needed to control and monitor the emergence and spread of antibiotic resistance in food production systems, as well as throughout the food chain from the farm to the consumer.

This training activity is aimed at antimicrobial management teams, microbiologists, diagnosticians, epidemiologists, veterinarians, food safety specialists, and other public health and agricultural related professionals working with this issue.

Scope

Training activities will broadly cover the scope of antimicrobial resistance concerns in agriculture, including an overview of antibiotic use and regulation in different food production systems, major pathways for transmission, regulatory guidance, epidemiology and surveillance, diagnostic techniques, preventive and control strategies, impact on trade and public and animal health, and lastly outreach and engagement, among other topics.

Expectations of Participants

Participants will be expected to actively engage in what will be an intensive training program. This will include the participants delivering a short presentation in a seminar style forum designed to provide an overview of their respective country's most pressing issues related to antimicrobial resistance.

During the final three sessions participants will also have the opportunity to develop pilot project proposals based on the current needs of their respective countries. Projects focused on antimicrobial use and antimicrobial resistance can include:

- The development of outreach and engagement projects for specific targeted audiences (i.e. general population, producers, professionals, etc.)
- Strengthening capacity building through the development of professional training opportunities (i.e. training on laboratory and diagnostic techniques, molecular epidemiological methods, epidemiology and data analysis, disease modeling, etc.)
- Pilot projects aimed at designing and developing new surveillance and monitoring strategies (i.e. surveying antimicrobial use at the farm level, to monitoring foodborne pathogens and their antimicrobial resistance at slaughter/processing plants, to apply surveillance of finished product at the consumer level)
- Enhancing project to support or expand current surveillance and monitoring programs already in place.

The most relevant and feasible project proposals will be submitted in a later stage for funding. If funded, participants will have the opportunity to lead the execution of these pilot projects within a three year time frame upon returning to their home institutions.

Funding for the course is through the 10th EDF SPS Project "*Support to the Caribbean Forum of ACP States in the Implementation of Commitments Undertaken under the Economic Partnership Agreement (EPA): Sanitary and Phytosanitary Measures (SPS)*".

**TRAINING ON ANTIMICROBIAL USE AND ANTIMICROBIAL
RESISTANCE IN AGRICULTURE: THE OHIO STATE UNIVERSITY
December 2015 Program**

ANTIMICROBIAL RESISTANCE TRAINING		
1st Week		
December 07th, Day 1, Monday		
Antimicrobial Use (AMD) and Antimicrobial Resistance(AMR) - Scope of the Problem		
8:30 am	Orientation including Introductions, Program Description and Logistics.	Drs. Armando Hoet and Gregory Habing
9:00 am	Action Items for Antimicrobial Resistance: Prevention, Control, & Management. <ul style="list-style-type: none"> ▪ <i>Describe major goals and objectives of WHO Global Action Plan for Reduction of AMD use and control of AMR.</i> ▪ <i>Identify how they integrate into regional and national programs.</i> 	Dr. Armando Hoet, Director Veterinary Public Health Program, OSU-CVM Faculty
9:30 am	Antimicrobial Resistance Mechanism: Basic Concepts. <ul style="list-style-type: none"> ▪ <i>Define what AMR is.</i> ▪ <i>Classify different AMR mechanisms and how they are related to public and animal health.</i> ▪ <i>Differentiate between co-resistance, multiresistance and co-selection.</i> 	Dr. Hoet
10:30 am	Coffee Break	
11:00 am	Key Note Speaker: USDA APHIS, VS – NAHMS: National Animal Health Monitoring System <ul style="list-style-type: none"> ▪ <i>Describe the collection systems, analysis, and dissemination of surveillance data on animal health, management, and productivity used in the USA.</i> 	Dr Charles Fossler, National Surveillance Unit, Centers for Epidemiology and Animal Health
12:00 noon	Round Table Discussion	
12:30 pm	LUNCH	
2:00 pm	Antimicrobial Use in Agriculture. <ul style="list-style-type: none"> ▪ <i>Description of AMD use in veterinary medicine and livestock production.</i> ▪ <i>Discussion on selective pressure as a driver of AMR.</i> ▪ <i>Associate and compare US approach to livestock and agricultural use of AMD with Latin America.</i> 	Dr. Jeff LeJeune, Director Food Animal Health Research Program, OSU-CVM Faculty

3:00 pm	Antimicrobial Resistance in Agriculture and Impact on Human, Animal, & Environmental Health. <ul style="list-style-type: none"> ▪ <i>Evolution of AMR in Agriculture.</i> ▪ <i>Resistance Issues associated to Human, Animal, & Environmental Health: examples in agriculture.</i> 	Dr. Greg Habing, OSU-CVM Faculty
4:00 pm	Coffee Break	
4:30 pm	Regulatory Agencies, International Regulations and AMR: Impact on Trade and Commerce in food products of animal origin. <ul style="list-style-type: none"> ▪ <i>Identify Intergovernmental Agencies involved in AMR.</i> ▪ <i>Describe International Standards (e.g. Codex Alimentarius) and AMR.</i> 	Dr. Hoet
5:30 pm	Round Table Discussion	
6:00 pm	DINNER	

December 8th, Day 2, Tuesday
Food Animal Production Systems & Antimicrobial Use and Antimicrobial Resistance

8:30 am	Dairy (Milk): <ul style="list-style-type: none"> ▪ <i>Describe production systems and their use of AMDs.</i> ▪ <i>Examine current regulations in regards to AMDs use.</i> ▪ <i>Describe surveillance programs in place.</i> ▪ <i>Examine current problems of AMR in this commodity.</i> 	Dr. Päivi Rajala-Schultz, OSU-CVM Faculty
9:30 am	Swine (Pork): <ul style="list-style-type: none"> ▪ <i>Describe production systems and their use of AMDs.</i> ▪ <i>Examine current regulations in regards to AMD use.</i> ▪ <i>Describe quality assurance and surveillance programs in place and target pathogens use.</i> ▪ <i>Examine current problems of AMR in this commodity and the potential impacts on trade.</i> 	Dr. Andrew S. Bowman, OSU-CVM Faculty
10:30 am	Coffee Break	
11:00 am	Key Note Speaker: USDA – FSIS: Office of Public Health Science. <ul style="list-style-type: none"> ▪ <i>Describe surveillance programs for identification of foodborne hazards and their risk to human health, foodborne disease outbreak investigations, and food safety emergency preparedness and response.</i> 	Dr. Karen Becker, Director, Applied Epidemiology FSIS/Office of Public Health Science
12:00	Round Table Discussion	
12:30 pm	LUNCH	

2:00 pm	Beef and Small Ruminants: <ul style="list-style-type: none"> ▪ Describe production systems and their use of AMDs. ▪ Examine current regulations in regards to AMD use. ▪ Describe quality assurance and surveillance programs in place. ▪ Examine current problems of AMR in this commodity. 	Dr. Jeffrey Lakritz, Vernon L. Tharp Professorship in Food Animal Medicine OSU- CVM Faculty
3:00 pm	Aquaculture: <ul style="list-style-type: none"> ▪ Describe production systems and their use of AMDs. ▪ Examine current regulations in regards to AMD use. ▪ Describe quality assurance and surveillance programs in place. ▪ Examine current problems of AMR in this commodity. 	Dr. Patricia Gaunt, Interim Director Fish Lab, Mississippi State University Faculty
4:00 pm	Coffee Break	
4:30 pm	Poultry (Meat and Eggs): <ul style="list-style-type: none"> ▪ Describe current poultry production systems and their use of AMDs. ▪ Examine current regulations in regards to AMD use. ▪ Describe quality assurance and surveillance programs in place and target pathogens use. ▪ Examine current problems of AMR in this commodity and the potential impacts on trade. 	Dr. Mohamed El-Gazzar, Poultry Extension Veterinarian, OSU- CVM Faculty
5:30 pm	Round Table Discussion	
6:00 pm	DINNER	

December 9th, Day 3, Wednesday		
Diagnostic Techniques and Antimicrobial Resistance		
8:00 am	Combating Antibiotic-Resistant Bacteria: an update <ul style="list-style-type: none"> ▪ Current Scope of the problem, PCAST report ▪ National Action Plan for Combating Antibiotic Resistant Bacteria ▪ White House Forum on Antibiotic Stewardship 	Dr. Lonnie King, Dean OSU-CVM, Chair, Task Force on AR in Production Agriculture
9:00 am	Antimicrobial Resistance Detection Techniques and Methods: <ul style="list-style-type: none"> ▪ Discriminate current methods of Antimicrobial Susceptibility Testing (AST) ▪ Recognize current guidelines established by the Clinical and Laboratory Standards Institute (CLSI) ▪ Understand Lab accreditation requirements 	Dr. Joshua Daniels, OSU-CVM Faculty
10:30 am	Coffee Break	
11:00 am	Key Note Speaker: Food Drug Administration (FDA): Antimicrobial Resistance Surveillance. <ul style="list-style-type: none"> ▪ Describe surveillance of AMR to “provide early warning of emerging problems, monitoring changing patterns of resistance, and targeting and evaluating prevention and control measures.” 	Dr Heather Tate, National Antimicrobial Resistance Monitoring System Office of Research, CVM-FDA

12:00 noon	ROUND TABLE DISCUSSION	
12:30 pm	LUNCH	
2:00 pm	Detection and Characterization of Foodborne Pathogens <ul style="list-style-type: none"> Describe target enteric pathogens used to monitor AMR emergence and evolution and discriminate detection/diagnostic techniques. 	Dr. Wondwossen Gebreyes, Director of Global Health Programs, OSU-CVM Faculty
3:00 pm	Antimicrobial Resistance in Zoonotic Pathogens: MRSA as a Model <ul style="list-style-type: none"> Describe veterinary pathogens used to monitor AMR emergence and evolution and discriminate detection/diagnostic techniques. Livestock associated MRSA and the Food supply 	Dr. Hoet
4:00 pm	Coffee Break	
4:30 pm	Attribution: Source Identification of Infectious Agents and Antimicrobial Resistance <ul style="list-style-type: none"> Describe current methods and protocols to attribute and identify the source of pathogens and related pathogenicity factors. 	Dr. Jiyoung Lee, OSU College of Public Health Faculty
5:30 pm	Round Table Discussion	
6:00 pm	DINNER	

December 10th, Day 4, Thursday		
Epidemiology and Surveillance of AMR		
8:30 am	Ideal Components of a Surveillance System <ul style="list-style-type: none"> Distinguish surveillance principles in livestock populations with regards to antimicrobial use and antimicrobial resistance 	Dr. Wittum
9:30 am	Sample Size and Surveillance <ul style="list-style-type: none"> Discriminate between different sampling methodologies applied in surveillance programs. 	Dr. Wittum
10:30 am	Coffee Break	
11:00 am	Key Note Speaker: CDC – NARMS: National Antimicrobial Resistance Monitoring System. <ul style="list-style-type: none"> Describe the national public health surveillance system focus on antimicrobial susceptibility of enteric pathogens. 	Drs Regan Rickert-Hartman, and Beth Karp Senior Epidemiologists
12:00 noon	Round Table Discussion	
12:30 pm	LUNCH	

2:00 pm	Sensitivity and Specificity of Diagnostic Techniques <ul style="list-style-type: none"> ▪ <i>Understand the characteristics use to evaluate diagnostic tests and their impact in their interpretation.</i> 	Dr. Wittum
3:00 pm	Current AMR Surveillance Programs in the USA: <ul style="list-style-type: none"> ▪ <i>Describe and compare surveillance programs in Agriculture, Food, and Humans.</i> 	Dr. Wittum
4:00 pm	Coffee Break	
4:30 pm	Outreach and Extension on Antimicrobial Resistance <ul style="list-style-type: none"> ▪ <i>Describe the process to build an extension program and transfer scientific research and new knowledge to agricultural practices through farmer and professional education.</i> 	Dr. Gustavo Schuenemann, Dairy Extension Veterinarian, OSU-CVM Faculty
5:30 pm	Round Table Discussion	
6:00 pm	DINNER	

December 11th, Day 5, Friday Country Seminars: Current Status of AMD use and AMR Surveillance in Participant Countries		
8:30 am	AMR Surveillance: CARICOM Experience <ul style="list-style-type: none"> ▪ <i>Description of current status of AMR surveillance in countries of the Caribbean Community (CARICOM)</i> 	CARPHA Representative.
9:30 am	AMR Surveillance: Chile Experience <ul style="list-style-type: none"> ▪ <i>Description of development and current status of AMR surveillance in Chile, and lessons learned.</i> 	Dra. Karla Carmona, ACHIPIA
10:00 am	AMR Surveillance: Colombia Experience <ul style="list-style-type: none"> ▪ <i>Description of development and current status of AMR surveillance in Colombia, and lessons learned.</i> 	Dra. Pilar Donado, Coordinator, Colombian Integrated Program for Antimicrobial Resistance Surveillance
10:30 am	Coffee Break	
11:00 am	Country Seminar 1: <ul style="list-style-type: none"> ➤ Description of current situation of this country in regards to monitoring of antimicrobial use and surveillance of antimicrobial resistance. ➤ Presentation of short term and midterm needs in regards to these subjects. 	Country 1 Attendees
11:30 am	Country Seminar 2:	Country 2 Attendees
12:00 noon	Round Table Discussion	
12:30 pm	LUNCH	

2:00 pm	Country seminar 3:	Country 3 Attendees
2:30 pm	Country seminar 4:	Country 4 Attendees
3:00 pm	Country seminar 5:	Country 5 Attendees
3:30 pm	Country seminar 6:	Country 6 Attendees
4:00 pm	Coffee Break	
4:30 pm	Country seminar 7:	Country 7 Attendees
5:00 pm	Country seminar 8:	Country 8 Attendees
5:30 pm	Round Table Discussion	

December 12th, Saturday		
8:00 am	Site Visit to Food Animal Health Research Program (FAHRP) at Wooster	

ANTIMICROBIAL RESISTANCE TRAINING

2nd Week

December 14th, Day 6, Monday

Tour Official Diagnostic Laboratories and Regulatory Agencies

8:30 am	Ohio Department of Agriculture (ODA), Ohio Animal Disease Diagnostic Laboratory (ADDL): Tour of the Facilities and Meeting with Officials	Dr. Beverly Byrum, Director of ADDL
10:30 am	Coffee Break	
11:00 am	ADDL Seminars: ➤ <i>Current services and surveillance programs.</i> ➤ <i>Accreditation procedures.</i>	Dr. Jing Cui, Microbiology Section Head
12:00 noon	Round Table Discussion with ADDL Representatives	
12:30 pm	LUNCH	
2:00 pm	ODA, Meat Inspection Division: ➤ <i>Program description and surveillance activities.</i>	Dr. Nicholas Wagner, Chief Meat Division
3:30 pm	Food Safety Division: ➤ <i>Program description and surveillance activities.</i>	Terri Gerhardt, Chief, Division of Food Safety
4:30 pm	Round Table Discussion with MI and FS Representatives	
5:00 pm	Round Table One Minute Discussion	
5:30 pm	DINNER	

December 15th, Day 7, Tuesday

Tour Official Diagnostic Laboratories and Regulatory Agencies

8:30 am	ODA, Ohio Consumer Protection Laboratory (CPL): Tour of the Facilities and Meeting with Officials	Dr. Beverly Byrum, Yamir Rosa & Jason Kong
10:30 am	Coffee Break	
11:00 am	CPL: ▪ <i>Current services and surveillance Programs</i> ▪ <i>Detection of AMD Residues</i> ▪ <i>Accreditation procedures</i>	Yamir Rosa & Jason Kong, Consumer Protection Laboratory
12:00 noon	Round Table Discussion with CPL Representatives	
12:30 pm	LUNCH – BUILDING 4 CONFERENCE ROOM	
2:00 pm	Ohio Department of Health (ODH), Public Health Laboratories (PHL): ▪ <i>Current Services and surveillance programs.</i>	Dr Tammy Bannerman, Laboratory Direct
4:00 noon	Round Table Discussion with PHL Representatives	
4:30 pm	Coffee Break	
5:00 pm	One Minute Discussion	
5:30 pm	DINNER	

December 16th, Day 8, Wednesday		
Laboratory Rotations		
8:30 am	Laboratory Rotations: Microbiological Methods	Multiple Laboratories
10:30 am	Coffee Break	
11:00 am	Laboratory Rotations: Microbiological Methods	Multiple Laboratories
12:00 noon	Round Table Discussion	
12:30 pm	LUNCH	
2:00 pm	Laboratory Rotations: Microbiological Methods	Multiple Laboratories
3:00 pm	Laboratory Rotations: Microbiological Methods	Multiple Laboratories
4:00 pm	Coffee Break	
4:30 pm	Laboratory Rotations: Microbiological Methods	Multiple Laboratories
5:30 pm	Round Table Discussion	
6:00 pm	DINNER	

December 17th, Day 9, Thursday		
Surveillance Program Development		
8:30 am	Working Groups	Drs. Hoet, Wittum, and Habing
10:30 am	Coffee Break	
11:00 am	Working Groups	Drs. Hoet, Wittum, and Habing
12:00 noon	Round Table Discussion	
12:30 pm	LUNCH	
2:00 pm	Working Groups	Drs. Hoet, Wittum, and Habing
3:00 pm	Working Groups	Drs. Hoet, Wittum, and Habing
4:00 pm	Coffee Break	
4:30 pm	Working Groups	Drs. Hoet, Wittum, and Habing
5:30 pm	Round Table Discussion	
6:00 pm	DINNER	

December 18th, Day 10, Friday		
Pilot Projects Development and Plenary Session		
8:30 am	Task Assignment and Identification of Needs	All participants and Instructors
10:30 am	Coffee Break	
11:00 am	Task Assignment and Identification of Needs	All participants and Instructors
12:30 pm	LUNCH	
2:00 pm	Closing remarks and participant evaluation of program	All participants and Instructors
3:00 pm	The Ohio State University OSU – Tour	
6:00 pm	FAREWELL DINNER	