

UW College of Agriculture and Natural Resources
Global Perspectives Grant Program
Project Report Instructions

Award Period (e.g. Spring 2012): Spring 2014

Principle Investigator(s): Dr. Bledar Bisha **Department**: Animal Science

Email: bbisha@uwyo.edu

Project Title from Application: Travel Expenses to Establish a Research and Instruction Relationship with the Faculty of Agriculture and Veterinary Medicine, University of Prishtina, Kosovo

Amount spent: \$3,113.02 (Note: The remaining \$254.02 from the initial award of \$3,368 will be used to partially cover the cost of shipping bacterial isolates from Kosovo to the laboratory of Dr. Bisha at the University of Wyoming).

Non-technical summary (max 1500 characters plus spaces): The main goal of this project was to provide the initial support to develop research and instruction collaborations between the University of Wyoming and the University of Prishtina in Kosovo, a newly formed country following the breakup of former Yugoslavia. Postwar Kosovo experienced a partial to total breakdown in the public health network, which led to several outbreaks of infectious disease, including tularemia and Crimean-Congo Hemorrhagic fever. In addition, there is a pressing need to estimate and mitigate the burden of foodborne disease considering the scarcity of scientific studies on the epidemiology and ecology of foodborne pathogens in the farm-to-fork continuum.

During his visit, Dr. Bisha meet with leading officials fro the University of Prishtina and the National Institute of Public health to identify needs for research in the areas of public health and food safety as well as potential for collaboration with the University of Wyoming. In addition, he meet with students, field veterinarians and farmers and lectured at the International Prishtina Summer University. Field and laboratory-based research was conducted to isolate antimicrobial resistant microorganisms from commercial dairy operations and involved a team from the University of Wyoming (Dr. Bisha and a postdoctoral fellow from his laboratory, Dr. Jeffrey Chandler), Dr. Afrim Hamidi from the University of Prishtina, as well as multiple students and faculty from the University of Prishtina. Future work will involve molecular characterization of these isolates and publication of this research in peer-reviewed scientific journals. Dr. Bisha and Dr. Hamidi are currently working together to develop a course for the International Prishtina Summer University 2015.

2. REPORT: Maximum of two pages of text; please also include **photos**. Must be written in a style understandable by the lay person.

- 1. Main results of activities planned in the proposal.**

Regional conflicts, ethnic tensions, and limited resources and expertise within the newly formed country have greatly reduced Kosovo's ability to survey and control the use antibiotics, particularly in agricultural settings. Nevertheless, the AMR problem in Kosovo is becoming increasingly evident. Between 2008 and 2010 the University Clinical Center of Kosovo intensive care unit reported increased incidences of methicillin-resistant *Staphylococcus aureus* infections.

Between 2002 and 2007, a 32% increase of *Klebsiella* spp. resistant to third generation cephalosporins was reported. Three patients in Kosovo were found infected with bacteria containing the New Delhi metallo- β -lactamase (NDM), a protein which confers resistance to many penicillin, cephalosporin, and carbapenem antibiotics.

Following initial meetings between Dr. Bisha and the host faculty at the University of Prishtina, it was determined that there was a pressing need to conduct research aimed at evaluating the occurrence and distribution of antimicrobial resistant (AMR) bacteria in commercial livestock operations.

Specific Aim 1: Evaluation of dairy operations and sampling methodology for the foodborne pathogen prevalence study

In the summer of 2014, UWYO Department of Animal Science Assistant Professor Bledar Bisha traveled to Kosovo to lead a joint effort with Associate Professor Afrim Hamidi of the Universiteti of Prishtina Faculty of Agriculture and Veterinary Science to conduct the first country-wide survey of AMR bacteria in Kosovo's livestock industry. Sampling locations included dairy farms in the regions of Malisheve, Suhareke, Ferizaj, Vushtri, Prizren, Ferizaj, Gjakove, Kline, Gjilan, Peje, Mitrovice etc., providing a truly comprehensive and representative coverage of the country. Dr. Bisha's team also included postdoctoral fellow Dr. Jeffrey Chandler, whose travel was supported through funding from the Animal Science Department. Over a two-week period, the UWYO team collected fecal samples from over 52 dairy farms ranging from very small to large and presumptively identified over 637 AMR bacteria. Additionally, ample information was collected on antibiotic use history, feed and water sources, breeds, farm practices, etc. Several veterinary students and field veterinarians were involved in the project to allow for swift and effective field sampling and laboratory processing of samples and the isolates under the leadership of Drs. Bisha and Hamidi.

Specific Aim 2: Evaluation of food microbiology laboratory facilities at the University of Prishtina and training in sample preparation of isolates for molecular characterization

Laboratory facilities at the University of Prishtina were used for all laboratory work involving processing of fecal samples and isolation of AMR bacteria. Dr. Bisha provided training for all laboratory personnel on microbiological techniques used in isolation and identification of microorganisms of importance to food safety and animal health. The need to upgrade the laboratory infrastructure, especially the need for instrumentation used in molecular microbiology was identified. Drs. Bisha and Hamidi are currently working together to identify suitable Real-Time PCR instrumentation for the University of Prishtina laboratory facilities (funding is available through a capacity building grant from the European Union). A joint proposal written by Drs. Hamidi and Bisha to the Embassy of United States in Prishtina to allow for the acquisition of Pulsed-Field Gel Electrophoresis (PFGE) equipment useful for molecular epidemiology studies was not funded.

Specific Aim 3: Planning a course for the Prishtina International Summer University 2015

Drs. Bisha and Hamidi have already initiated planning for teaching a course as part of the 2015 International Prishtina Summer University. The course will cover primarily rapid diagnostics for foodborne pathogens and the applications are due in early 2015. Work is ongoing to define the curriculum for this short course. Involvement in the International Prishtina Summer University (PISU) will provide enhanced visibility for the University of Wyoming as the course is commonly attended by large numbers of students from Central, Eastern and Southern Europe.

Specific Aim 4: Establishing formal relationships with the University of Prishtina, other agencies and student recruiting

Dr. Bisha met with officials from several institutions involved public health and regulation of food safety in Kosovo. He collaborated closely in research projects with Dr. Afrim Hamidi, Head of Department of Veterinary Medicine within the College of Agriculture and Veterinary at the University of Prishtina. He met with the Dean of the College of Agriculture and Veterinary, Dr. Bedri Dragusha and discussed future collaborative work. In addition Dr. Bisha had a work meeting with Dr. Naser Ramadani, Director of the National Institute of Public Health of Kosovo and laid out the framework for future joint research. In particular mode, the need for research in control of brucellosis in cattle and small ruminants was identified which aligns well with ongoing work at the University of Wyoming. In addition, Dr. Bisha lectured at the PISU 2014, interacted with veterinary students, field veterinarians, faculty members of the University of Prishtina, and farmers and had the opportunity to speak to a broad audience about the University of Wyoming and the state of Wyoming.

2. Describe any future plans

Upon shipment of the isolates from Kosovo to Dr. Bisha's laboratory at the University of Wyoming, work on molecular characterization of the isolates will initiate. It is expected this work will result in at least one peer-reviewed publication, which will be the first report of its kind from the region. The PI believes this work will serve as a springboard to other studies at the farm and processing plant level and studies on epidemiology of pathogens in the environment and clinical isolates.

3. Outline potential impacts to a) the College of Agriculture and Natural Resources, b) the University of Wyoming, and c) the State of Wyoming

Such work is expected to have a beneficial impact on public health policies aimed at controlling foodborne disease and spread of AMR bacteria in Kosovo. It is anticipated that this study will also serve as a springboard to other joint efforts between UWYO and the Universiteti of Prishtina at the farm and processing plant level. A genuine desire for collaboration in future projects were identified in meetings with the Director of the National Institute of Public Health of Kosovo and the Dean of the Faculty of Agriculture and Veterinary of the Universiteti i Prishtinës. It is anticipated that research cooperation between the PI and academic and regulatory entities in Kosovo will increase international visibility as a leader in agriculture for the College of Agriculture and Natural Resources, the University of Wyoming, and ultimately the State of Wyoming. It is believed that the acquisition of such valuable data will provide the basis to apply for funding from non-governmental organizations, the United States Embassy in Prishtina, USAID, the Gates Foundation, the European Union or other potential funding agencies, which will also also benefit UW, the college and the state.

4. Photos—be sure you have necessary permissions to be posted to the AES website.

Attached several photos (more available upon request).

QUESTIONS? Contact Joanne Newcomb in the Agricultural Experiment Station office at aes@uwyo.edu or (307) 766-3667.



Kosovo barn. Dr. Bisha and others
sampling



Kosovo goat pen



Dairy products produced at goat facility produced in this building



Kosovo barn



Bledar collecting manure in barn



Bledar and Afrim talking to farmers



Pasture land



Bledar sampling manure in a holding pen



Jeff and Afrim, Bledar sampling in background



Bledar and Afrim photo op



Kosovo barn



Milking system



Farmer inspecting milking system



Farm yard



Cows out to pasture



Afrim with Farmers



Milking system



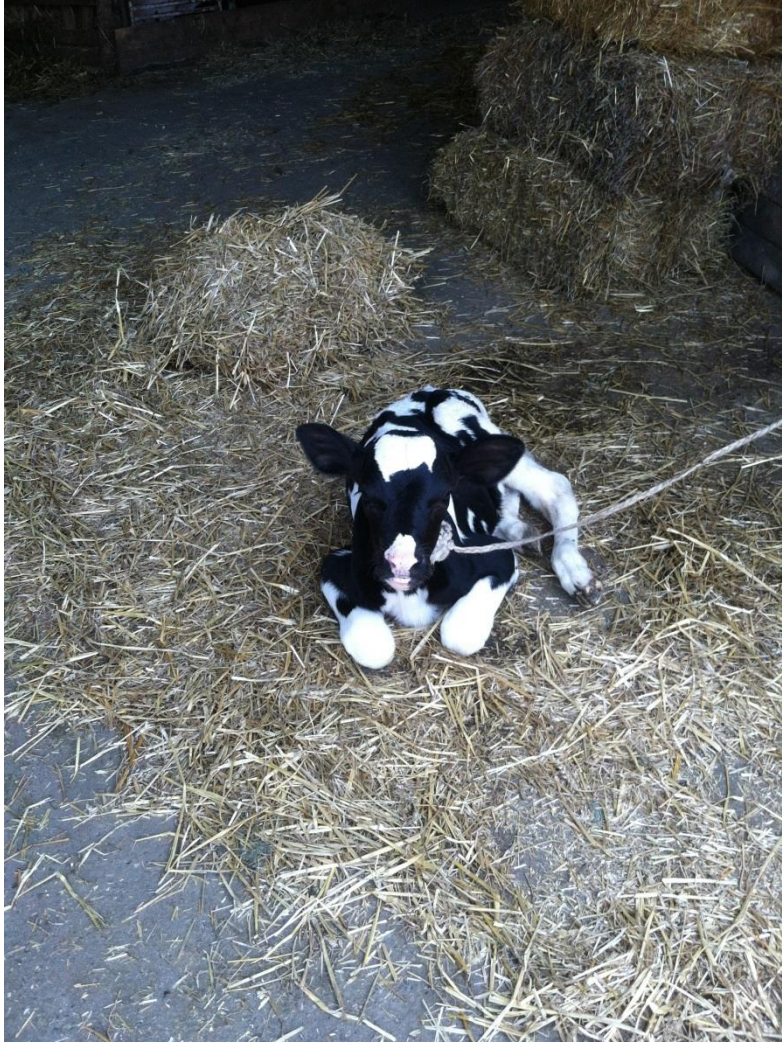
Bledar standing in front of the Peace Garden (the line that separates the Serbian and Albanian populations of the city of Mitrovica). The bridge is guarded by international military forces.



UP faculty (Dr. Hamidi and Sylejmani) collecting manure samples



Holding area



Calf