WVA/WMA GLOBAL CONFERENCE ON ONE HEALTH

Drivers towards One Health
“Strengthening collaboration between Physicians and Veterinarians”

POSTER ABSTRACTS

The WVA/WMA would like to thank very much the A.M.A. insurance company for the great contribution to the organization of the One Health Conference and for the support of the Spanish health professionals.

A.M.A. is specialized in providing insurance services to health sector professionals (physicians, veterinarians, pharmacists).
One Health Approach to Combating Zoonotic Rabies in Grenada, West Indies

Wayne Sylvester1, Sarah Addison1, Maggie Mottram1, Ashley Marshall1, Nitasha Sharma1, Natalie Watson1, Ailin Corella1

1St. George’s University

The faculty, staff and students of St. George’s University (SGU), Grenada, play a significant role in combating endemic zoonotic rabies in Grenada. SGU has embraced the One Health Approach to tackling this deadly disease; we collaborate on a continuous basis with The Government of Grenada as well as with other local, regional and international partners. Our primary areas of focus are education, research, diagnostic testing, and community outreach. Through our One Health One Medicine outreach clinics, we vaccinate approximately 500 small and large animals in various communities throughout Grenada per year against rabies and other infectious diseases. The students, under the supervision of clinicians, perform free wellness exams, vaccinate and deworm, both pets and livestock. Supervised medical students provide free examinations to local Grenadians, including free vision and hearing tests, blood pressure tests, blood sugar tests, and breast exams. An additional 1900 small animals are vaccinated by clinicians against rabies annually at the University campus. With regard to rabies education and awareness programs, we use the outreach clinics as an opportunity to interact with and educate Grenadians about infectious diseases including rabies. Special attention is given to rabies prevention through vaccination of all animals, and protocols to follow in cases of animal bites. We also utilize live national television interviews, live radio interviews and social media, as forums to raise rabies awareness in the community. We host a rabies run, an annual gala for rabies awareness, multiple fundraising events and outreach seminars to increase rabies awareness in Grenada. The Rabies Diagnostic Laboratory and the Necropsy/Histopathology Laboratory at SGU are the only animal diagnostic laboratories available in Grenada. All suspected rabid animals are submitted to the University’s Laboratories for testing; approximately, 15 cases of rabies in animals are confirmed annually. St. George’s University has made a positive impact on increasing awareness of rabies, and reducing exposure of animals and humans to rabies in Grenada.
Treating People who treat the Health System: The Training of New Animal and human Health Workforce Generation under One Health

E. Farag1, A. Hummaida1, S. Himatt1, M. Al-Hajri1, H. Al-Romaihi1, M. Nour1, A. Elsayed1, M. Al-Thani, S. Al-Marri, M. Hussni2, M. Koopmans3

1Supreme Council of Health, Qatar; 2Weill Cornell University – Doha, Qatar; 3Erasmus MC, Netherlands

Background: Recently, the world witnessed the emergence of novel diseases such as avian influenza, H5N1, MERS-CoV and another outbreak of Ebola. With the growing realization that pathogens do not respect traditional epistemological divides, initiatives such as the “One Health” approach have emerged to advocate for closer collaboration across the health disciplines and has provided a new agenda for health professionals’ education in the new area. Against this background, and after seeing the benefits of such approaches, we have made an effort to envision the possible limitations of current training programs that have to be developed in order to generate a cadre of animal and human health professionals with a broader understanding of disease control and prevention.

Methods:
A Conceptual framework was developed to assess the quality of training based on the Kirkpatrick Model. Emphasis was made on the fourth level, measuring the quality of care in light of National and International infectious disease program outcomes. Common factors that hinder program objectives were compiled into three main categories, components of the training curriculum were recommended.

Conclusion:
Medical training programs around the world adopt a reductionist approach, focusing exclusively either on the human or the animal component of the zoonotic paradigm. This approach failed to produce trained cadre that are armed with knowledge and skills to address the factors that led to the evolution, introduction, transmission, and perpetuation of these diseases.

Recommendations:
Academic and Professional training programs for both Graduate and professional of animal and human health care personals need to continuously evolve especially with emerging and re-emerging diseases. To fully understand the current knowledge and training gaps that need to be addressed, Further research on similar limitations to the training of healthcare professionals needs to be carried out in order to guide the evolution of training programs that can effectively combat emerging and re-emerging diseases.
Human Brucellosis: An Investigation of Knowledge and Practices in a Rural Community in Kajiado County, Kenya.

Co-authors: Agnes Maina1, Prof. Peter Gatongi2, Dr. Purity Nguhiu3.

1Master of Public Health and Epidemiology Student, Moi University, Kenya.
2Thesis Supervisor, and Lecturer, College of Health Sciences, Moi University, Kenya.
3Thesis Supervisor, and Lecturer, Kenyatta University, Nairobi, Kenya.

BACKGROUND

Human brucellosis, a neglected disease is endemic in Kenya, and has public health and economic significance. Awareness about the disease and its preventive measures among pastoralist communities where the disease burden is highest is inadequate. The study objective was to determine the link between the knowledge and practices related to the disease in a pastoralist community.

METHODS

Cross-sectional study design using systematic sampling was employed for data collection in Kajiado County, Kenya. Data on brucellosis knowledge and practices was collected through questionnaire surveys and key informant guides. Respondents consisted of male and female livestock farmers, aged between 18 – 55 years for the surveys; and health workers for the key informant interviews. Data analysis was by determination of means, frequencies, chi square and logistic regression using SPSS. Approved ethics procedure was followed.

RESULTS

Statistically significant predictors of practices related to brucellosis knowledge; respondent education status (p value 0.002 [CI 0.272 – 0.749] OR 0.451), knowledge of pre-purchase breeding soundness relevance (0.007 [CI 1.207 – 3.356] OR 2.013), and knowledge that livestock abortions cause human disease (0.027 [CI 1.070 – 2.974] OR 1.783).

CONCLUSION

All practices undertaken by the community, except milk hygiene practices, placed the community at risk of contracting brucellosis from livestock. Knowledge on most risk factors was low thus the community was at risk of contracting brucellosis from their livestock. The only risk factor in which the community had adequate knowledge of was the importance of boiling milk before consumption. The statistically significant predictors of practices that predisposed the community to human brucellosis were respondent’s education status, knowledge of importance of pre-purchase livestock examination for breeding soundness and knowledge of human disease due to livestock abortions. Recommendations were made to raise awareness on the risk factors of human brucellosis to enable the community adopt protective practices.
Evaluation of the awareness of One-health approach towards rabies transmission, prevention and control among human and veterinary medical students in Ibadan, Nigeria

Adeaga, E.A.1, Oyebanji, V.O.2, Olugasa, B.O.1

1 Department of Veterinary Public Health and Preventive Medicine, University of Ibadan, Nigeria. 2 Department of Pathology, University of Ibadan

The awareness of one-health approach towards Rabies transmission, control and prevention were evaluated among selected clinical year Human and Veterinary medical students, University of Ibadan, Ibadan, Nigeria based on their response to a questionnaire designed to achieve the above objective. An audio-visual material was then presented to them after which they were questioned post-viewing. Among the Human medical students, results showed 10% awareness about rabies fatality, 23.3% awareness about transmission through organ transplant, 26.7% awareness about possible nosocomial infection, 6.7% awareness about the limitation of control in either animal or human population without one-health approach and 36.7% awareness about prevention through organ donor screening. Correspondingly, among Veterinary students, 30% showed awareness about rabies fatality, 15% awareness about transmission through organ transplant, 25% awareness about possible nosocomial infection, 25% awareness about the limitation of control in either animal or human population without one-health approach while 35% awareness about prevention through organ donor screening. However after viewing the audio-visual, human medical student showed the following increases in awareness; 73.3% about rabies fatality (p<0.001), 73.4% about the role of organ transplant in rabies transmission (p=0.001), 63.3% about the possibility of nosocomial mode of infection (p<0.001), 20% about the limitations of control in either animal or human without one-health approach (p=0.04), 63.3% about the importance of prevention through organ donor screening (p<0.001).While Veterinary medical student showed the following increases in awareness; 33.4% about rabies fatality (p=0.05), 53.3% about the role of organ transplant in rabies transmission (p=0.001), 46.6% about possible nosocomial mode of infection (p=0.007), 73% about the limitations of control in either animal or human without one-health approach (p=0.001) and 27% about the importance of prevention through organ donor screening (p=0.005). This study reveals a gap in the awareness of the efficacy of one-health approach in rabies transmission, control and prevention among Human and Veterinary medical students. Knowing that these are key professionals in the wholesome approach towards the curb of rabies menace especially in developing countries, it is therefore pertinent that approaches aimed at increasing the awareness of such approach be incorporated into training curricular of health personnel at all levels.
HALF OF CENTURY OF COMPARATIVE MEDICINE – COMPONENT PART OF THE NEW ONE HEALTH MEDICAL CONCEPT IN ROMANIA

Nicolae Manolescu1, Irinel Popescu 2, Vasile Cepoi3, Alexandru Irimie4, Alcansadru Ioan Baba5, Emilia Balint6, Alexandru Supeanu1

1 The Romanian Academy, 2 The Romanian Academy of Medical Sciences, 3 The National Forum of Comparative Medicine, 4 The University of Medicine “Iuliu Hateganu” in Cluj-Napoca, 5 The Faculty of Veterinary Medicine in Cluj-Napoca, 6 The Faculty of Veterinary Medicine in Bucharest

The authors present from both a historical as well as from a progressive point of view the taking on of a great challenge for the global medicine – comparative medicine. In Romania, comparative medicine was born half a century ago, as a result of the development of comparative oncology by the intense collaboration between the Bucharest Institute of Oncology and the Faculty of Veterinary Medicine in Bucharest. The second crucial moment for the development of this novel concept was the establishment, in 1999, of the Romanian Institute of Comparative Medicine, the first of its kind based on our knowledge. In Romania, the recent years have been dedicated to the advocacy of the Comparative Medicine concept, a component part of the One Health concept, as well as for its implementation into the wide medical practice. Today, in Romania, the implementation of the One Health concept is coordinated by the “One Health New Medical Concept” Association, in collaboration with the National Forum of Comparative Medicine, a structure that is under the coordination of the Department of Comparative Medicine of the Romanian Academy of Medical Sciences. The major goals set forth are the following:

- The study of major zoonoses, including those that have a cross-border index;
- Studies on Comparative Oncology;
- Organizing the Environmental Medicine in Romania;
- Launching, in fall of 2015, the Post-Graduate courses of Comparative Medicine, a bilingual school (Romanian-English) hosted by the Faculty of Medicine in Cluj-Napoca and by the Faculty of Veterinary Medicine in Bucharest; the future students can be part of any profession in direct connection with the One Health concept, including physicians, veterinarians, biologists, biochemists, environment engineers, agronomists, biophysicists, etc. Following the completion of one year of studies in Comparative Medicine and based on a graduation thesis, the graduates will receive the title of “Specialist in Comparative Medicine”
- Developing a national network in the field of scientific research and compiling a theme related portfolio;
- Creating an international center having the task of monitoring the global evolution of the epidemiology of anthropological zoonosis.
Canine Leishmaniosis: Clinical Patterns and Social Perception, such us Zoonosis


Introduction:
Canine Leishmaniosis (CanL) is an important vector-borne disease caused by Leishmania infantum and transmitted by sandfly vector. Dogs are considered the peridomestic reservoir of Leishmania infection for the human beings. “One Health“ could be have an important impact on Public Health in controlling the infection. The aims of the present study were to know the frequency of the different clinical manifestations of CanL, the common preventive methods against infection in the dog (therapy against sandfly vector and immunomodulation drugs used) and to know if the dog’s owners are aware of the zoonotic potential of this infection in the influenced area of the Hospital Veterinario at Universidad de Zaragoza.

Material and Methods:
226 dogs were evaluated from April 2014 to November 2014 in this study. For each dog, sex, breed, age, levels of anti-Leishmania antibodies (ELISA serology) and presence/absence of clinical signs compatible of CanL were recorded. A phone interview survey was conducted to 162 owners (71.7%). They were asked about the following points: the kind of insecticide/repellents against sandfly vector and the combination or no-combination with immunomodulatory drugs available against Leishmania infection and whether this infection could have an implication on people.

Results:
Out of 226 dogs, 83 (36.7%) animals were seropositive to Leishmania infection, 25 dogs had no clinical signs compatible with CanL, whilst 58 were sick dog (positive serology with clinicopathological abnormalities). The main clinical signs were associated to skin lesions (64.1%), systemic alterations (56.45%) and followed by lameness (28.2%). In relation to skin lesions, two different dermatological clinical patterns were detected in most cases: Non-pruritic exfoliative dermatitis and erosive-ulcerative dermatitis. It is important to know, 37% of dog’s owners did not know the zoonotic risk of L. infantum infection and 85.2% of dogs have a preventive strategy against sandfly vector. The most common preventive measures evaluated against sandfly vectors were collar (58.9%), spot-on (34.5%) and spray (6.6). A 15.2% of dogs have a combination of immunomodulatory drug with repellent products against sandflies feeding.

Conclusions:
An important proportion of owners are aware of the connection between dog and man in Leishmania infection. Dog’s owners habits are aligned with the scientific evidence of Leishmania infection prevention in the dog.

References:

Source of funding: Self-funded
Conflict of interest: None declared
A ONE WELFARE APPROACH TO MANAGEMENT OF A RABIES OUTBREAK IN SOUTH AFRICA

I. Kati Loeffler1 and Cora Bailey2
1 International Fund for Animal Welfare, Massachusetts, USA, 2 Community Led Animal Welfare (CLAW), Johannesburg, South Africa

Mass rabies vaccination of dogs is usually approached as an essentially technical undertaking. Our experience suggests that community participation is imperative to ensure long-term vaccination rates for rabies eradication, and to control outbreaks efficiently and humanely. A case study compares responses by two groups to a rabies outbreak in Soweto, South Africa. The provincial Department of Agriculture and Rural Affairs (DARD) began with ring block vaccinations but abandoned the approach out of concern for danger to staff in Soweto townships and inefficiency. Instead, vaccination points (VPs) were set up in public locations on weekday mornings. These were staffed by teams who were trained only to vaccinate, but not to engage the public or to consult on veterinary or public health issues.

A door-to-door survey of 132 households was carried out in one township to understand why the VPs were poorly attended. Vaccination coverage in the township was only 12%, and 5 of the 8 VPs weren’t attended at all. Reasons given for not attending the VPs included lack of awareness about the campaign (50%) or commitments to work or school during the VP hours (28%). Additional reasons included inability to get to a VP or trouble handling dogs to bring them there. In the same township, the Community Led Animal Welfare (CLAW) project vaccinated more than 80% of dogs in 3 days, and more than 5000 dogs over 3 months overall, with no more than 10 staff. CLAW operates on the One Welfare principle that addresses the interdependence of animal and human health and welfare. Through its engagement with communities, and mobilization of local infrastructures, CLAW motivated people to actively participate, and thereby achieved more than passive compliance with the rabies vaccination campaign. Key to this effect was the engagement of children. There were no incidents of rabies-associated panic in these communities that might have resulted in animals being killed or abandoned. Key to CLAW’s approach is building trust through respect for local value systems, understanding social infrastructures, vaccinating livestock as well as dogs, engaging and educating the local human medical community, and addressing human needs.
The “One Health Concept” for zoonosis of pets, in animal health policy in Castilla-La Mancha.

Pérez de Diego, AC.1, Ruíz, JM.2, Vigo, M.3


Main zoonosis threats of pets, nowadays for Castilla-La Mancha (CLM), are Rabies, Leishmaniosis and Hydatidosis. Rabies was not present in mainland Spain since 1978 but in 2013 an imported case in a dog was notified in CLM. Fortunately, the pets in that area were under a biennial mandatory vaccination since one year before the notified case happens. But this was not always the same, in the past (one year before), vaccination was completely voluntary. Leishmaniosis is a well-known disease affecting pets in Spain, but sometimes veterinarians do not notify its occurrence, playing a role only in the clinical treatment of pets, forgetting their crucial role that should be played in public health surveillance. After reviewing epidemiological data, performing different reports including risk mapping for vector presence, and also critically analyzing the rabies episode, some new strategies and improving measures have been recommended and also developed. In the decision making process in animal health policy, the main measures adopted have been translated into legal regulation by a “comprehensive sanitary plan for dogs, cats and ferrets” that includes the rabies annual vaccination, compulsory electronic identification, measures against Echinococcus granulosus and the obligations for owners and veterinarians related to Leishmaniosis. The program was implemented in collaboration with the Council of Veterinary Associations of CLM. In this sense, the information originated through the sanitary plan for pets, and thanks to the “Informatic System for Animal Identification in CLM” developed, allow us to analyze the spatio-temporal patterns of L. infantum, and also to analyze the pet population location to improve the surveillance programs, not only for animal health, but also for public health purposes. As an example, the data obtained thanks to animal health strategies improved, are very useful for the entomological surveillance regional program, which is a priority in this One Health Approach, for recovering information of interest to prevent and be aware of other zoonosis as those produced by Rift Valley and West Nile viruses. To conclude, the animal health policy carried on nowadays in CLM is focused not only on livestock economics, but also in public health, even related to pets.
Outbreak of cutaneous, gastrointestinal and oropharyngeal anthrax in humans in Kenya, 2014

Authors: M Kung’u*1, A Mwatondo2, M Obonyo1, E Osoro3, A Bitek3


Background:
Lack of routine anthrax vaccination usually results in spontaneous outbreaks in livestock that end up affecting humans due to poor public health practices. On 24th February 2014, the Zoonotic Disease Unit received reports of human deaths in Nakuru County following consumption of tissues from livestock reported to have died suddenly. Samples from a dead cow in the area were positive for B. anthracis on microscopy. An outbreak investigation was carried out by to establish the existence of an outbreak and characterize the outbreak.

Methods:
We reviewed medical records of patients reporting to the health facilities around the outbreak area between 1st September 2013 and February 2014 followed up by an active case search using key informant interviews. We adapted Centers for Disease Control and Prevention anthrax case definition and administered a structured questionnaire to collect socio-demographic, clinical and exposure information. We collected soil samples to study soil characteristics in the affected area and reviewed the area’s rainfall records for the four months preceding the outbreak.

Results:
Sixteen suspected human anthrax exposures were traced. Six were verified as probable cases, two (33%) had gastrointestinal symptoms, three (50%) cutaneous lesions and one (17%) had oro-pharyngeal symptoms. The mean age of the six cases was 33 years (range 7-65) and five (83%) were male. None of the cases had completed secondary school education or was in formal employment. The two patients who developed signs of gastrointestinal symptoms died after an average of two days (case fatality rate of 33%). The average incubation period for cutaneous lesions, gastrointestinal symptoms and oro-pharyngeal symptoms was two days, one day and six days respectively. All the cutaneous cases had been involved in butchering of tissues from three cattle carcasses while the oropharyngeal and the gastrointestinal cases had butchered and consumed tissues from a cattle carcass. All soil samples had high levels of calcium and pH. The area had received below average rainfall in the four months preceding the outbreak.

Conclusion:
The human outbreak resulted from butchering and consumption of three anthrax infected carcasses. We recommended public health education on dangers of handling and slaughtering carcasses.
Cambridge University - One Health - Student Initiative

Joanne Harries
Group/ Organisation: Cambridge University One Health

In 2013 at Cambridge University, a group of veterinary and medical students formed a group with a common passion – One Health. We believe we are the first UK university to start such initiative, having held two annual conferences, with approximately 120 student attendees at each conference. Feedback reports from attendees and speakers have been very positive. Furthermore, following these events, student representatives from at least two other UK universities have approached our group with requests for recommendations on how to start similar initiatives within their universities. This demonstrates the interest for One Health amongst the student body in the UK. The overall aim of the Cambridge University One Health group is to encourage interdisciplinary collaboration at the level of the student body in targeting health issues worldwide. This is including but not limited to medics, veterinarians, conservationists and natural scientists. We believe that it is important that such interdisciplinary collaboration is promoted and maximised at the university level as it is here that students are in easy contact with industry experts of varying disciplines, live with their peers, who between them, study a range of subjects, (leading to interdisciplinary exchange of ideas) and have access to university resources and teaching support to further particular interests. We would like to share our experiences in advocating the One Health initiative at the university level. More specifically, by discussing our experiences in a case-based approach, we would like to demonstrate that there is enthusiasm to be involved in and discuss One Health issues across the student body within veterinary and medical schools across the UK, and those students appreciate opportunities to build One Health thinking into their respective professions and careers.
Multidisciplinary and transnational approach to research coordination on animal health in the Mediterranean: preliminary results from a provisional exercise

Stefano Messori1, Romano Zilli1, Valeria Mariano1 and Marina Bagni2
1Istituto Zooprofilattico Sperimentale delle Regioni Lazio e Toscana, Ufficio Ricerca, Sviluppo e Cooperazione Internazionale, via Appia Nuova, 1411, 0178 Ciampino, Roma, Italy. 2Ministero della Salute, Segretariato Generale, Ufficio II, Via Giorgio Ribotta, 5, 0144 Roma, Italy.

Climate change and increasing movement of humans, animals and food of animal origin pose risks of disease emergency and re-emergency across countries. In the Mediterranean area, due to its geographical, climatic and social peculiarities, these risks are greater, and the current reduction of funding availability to animal and public health services might exacerbate the impact of outbreaks. Adequate research in the animal health field will constitute the only possibility of having appropriate strategies and control tools to ensure preparedness for future challenges. The main livestock diseases and zoonosis are a global concern: disease outbreaks in one country soon represent an issue for the neighbouring ones, making the coordination of both human and veterinary health services fundamental. A concerted approach for animal health in an area such the Mediterranean is therefore necessary to protect local animal populations, ensuring food security, profitability of zootechnical production and food safety. Moreover, the emerging threats represent challenges for a number of different disciplines, requiring the cooperation of various organisations together. An holistic approach is essential to overcome barriers among the different disciplines and organisations.

This approach should involve a methodology being easily adaptable to societal changes and targeting problems innovatively, considering new progresses in knowledge and technology. In this framework, the Italian Ministry of Health promoted the FORE-Med (Foresight project for the Mediterranean area). This provisional study aimed at identifying future (15-years) challenges on animal health, in order to ensure the effective coordination of scientific research on animal health in the Mediterranean. The current situation was explored through a range of foresight techniques (e.g. STEEP, 7 questions, trend and driver analysis) and new solutions were formulated during two workshops. The overall process involved 100 experts from 11 Mediterranean countries, having a wide range of backgrounds (e.g. veterinary sciences, industry, climatology, ecology, social sciences). The implemented approach encountered a high level of appreciation across the scientific community involved, and allowed the definition of trans-disciplinary research priorities for the area, contributing also to create a multidisciplinary network of expertise. These outcomes would represent a sound basis to support crisis management on animal health related issue.
Joining efforts for antimicrobial resistance searching: the experience of a group of Veterinarian, Physicians and Molecular Biologists from Zaragoza and La Rioja (Spain)

Leticia Alcalá1, Carmen Simón1, Elena Gómez-Sanz2,4, Carla Andrea Alonso2, Myrian Zarazaga2, Jesús Orós1, Isabel Ferrer3, Antonio Rezusta3, Carmelo Ortega1, Carmen Torres2

1 Infectious Diseases. Animal Health Area. Veterinary Faculty of Zaragoza, Spain. 2 Biochemistry and Molecular Biology area, University of La Rioja, Logroño, Spain; 3 Service of Microbiology, Miguel Servet Hospital, Zaragoza (Spain); 4 Environmental Genomics and Systems Biology Research Group, ZHAW, Wädenswil, Switzerland

In September 2004, the Wildlife Conservation Society gathered health experts from around the world to discuss the movements of diseases among human, domestic animals, and wildlife populations, and delineated the priorities for an international, interdisciplinary approaching. Subsequently, the “One World, One Health” (OWOH) event, established the “Manhattan Principles”, with a list of 12 recommendations for global health improvement. The first OWOH congress (Brazil, 2008), restated the importance of unify efforts between different knowledge areas to face the menace of human diseases with animal origin, and the WHO (2008), assumed the “One Health initiative”, enhancing collaboration between physicians, veterinarians, other health and environmental professionals, eventually reflected in the document: “Contributing to One World, One Health; A strategic Framework for Reducing Risk of Infectious Diseases at the Animal-Human-Ecosystems Interface”. We expose some results obtained since 2008, after collaboration of a team of Physicians, Molecular Biologists and Veterinarians, searching for solutions on the tandem human-animal-environment health problems. The veterinarian group started on antimicrobial resistance of bacteria isolated from domestic animals and considered important for human health, listed by the WHO. This beginning made it possible to contact with Physician-Microbiology and Molecular-Biology researchers, crystallizing in the actual group working under the idea of OWOH. Antimicrobial resistance and its sharing between bacteria from the three statements is the main objective. Initially, working with bacteria isolated from domestic animals (pets and livestock) shared by humans, specially Methicillin-resistant Staphylococcus aureus and S. intermedius group, Vancomycin-resistant Enterococci and extended-spectrum β-lactamase Escherichia coli resistance. Currently, it is extended to the wildlife and environment.
Photodynamic therapy: Methylene blue application in the treatment of dermatophytosis caused by Trichophyton spp. in sheep


**Introduction:** Photodynamic therapy (PDT) is a novel approach in veterinary medicine for the treatment of different clinical entities such as equine sarcoids, cutaneous squamous cell carcinoma in cats or canine hemangiopericytoma1. The principle of this therapy is based on the particular interaction between photosensitizer with light and oxygen. Recently, new scientific information is available for the treatment of human dermatophytosis caused by Trichophyton species2; however, this type of information about this treatment in sheep is very scarce. The aim of the present study is to know the utility of PDT (1% methylene blue solution) for the treatment of dermatophytosis in a group of ten ewes affected by Trichophyton spp. Two different topical therapeutic protocols (weekly or two weekly applications) were evaluated. At the end of the study, treatment response was favorable in both cases, there were no differences between animals in relation to skin lesion resolution.

**Material and Methods:** A total of 10 ewes with skin lesions were presented. The main clinical dermatological patterns were non-pruritic exfoliative dermatitis with focal-multifocal alopecias. A differential list of possible causes was established including: dermatophilosis, staphylococcal folliculitis, dermatophytosis, contagious viral pustular dermatitis and zinc-responsive dermatitis. Hair plucking for direct microscopy examination, adhesive tape impressions, skin scrapping, skin cytology and coat brushing were performed. Samples of skin lesions were taken for fungal cultures (Sabouraud’s dextrose agar medium, Dermatophyte test medium, Potato dextrose agar added with of 50mg/l chloramphenicol).

**Results and Discussion:** The definitive clinical diagnosis was found by fungal culture; isolation and identification of the pathogen showed a Trichophyton spp. Two different topical therapeutic protocols with the same product (1% methylene blue solution) were evaluated during 4 weeks: one group of five animals were treated by one application weekly, follow by solar radiation and two weekly applications follow by solar radiation were made in the rest of the sheep.

**Conclusions:** The application of PDT based on 1% methylene blue solution in contact with dermatological lesions in combination with solar light had a positive effect to treat Trichoplyton spp. dermatophytosis in sheep. The results obtained in 4 weeks of treatment have been promising; skin lesions showed significant reduction after physical examination and all the studied sheep exhibited a complete recovery, showing no differences between groups. The interrelationship between Veterinary and Human Medicine is possible (“One Health approach”). In this communication, the Human Medicine knowledge available in the treatment of certain diseases such as human dermatophytosis and its zoonotic potential, is perfectly valid and can be applied to Veterinary Medicine.

**Source of fundings:** Self-funded

**Conflict of interest:** None declared
A holistic approach to harmonious co-existence between humans and dogs in communities

Co-authors: Dr. Emelie Fogelberg, Miss Ellie Parravani
World Animal Protection, Floor 5, 222 Grays Inn Road, WC1X 8HB, London, UK

Introduction
Large free roaming dog populations are considered a threat to public health in many countries and are sometimes dealt with by mass inhumane culling. It is a misconception that culling is the most effective method of reducing the problems associated with these dog populations. Instead, application of a full holistic cycle of dog population management methodology (as set out in the International Companion Animal Management Coalition guidelines), can humanely and sustainably tackle the problems associated with roaming dogs, such as disease transmission, human-animal conflict, and livestock predation.

Methods
World Animal Protection believes a ‘One Health’ approach and knowledge sharing are crucial for the sustainability of a dog population management programme. It is essential that human and animal health are tackled together and, crucially, the approach needs to be backed by political will and resources. Such an approach could encompass:

• Inter-ministerial cooperation and planning
• Pooling of financial resources
• Capacity building and training of individuals and agencies
• Community ownership
• Education

World Animal Protection plays a key role in facilitating this approach.

Results
By way of example, World Animal Protection has assisted countries such as Tanzania (Zanzibar), Kenya and Bangladesh in the development and implementation of successful National Rabies Elimination Strategies. Humane dog population control as part of these strategies, involve elements such as education on responsible dog ownership and safe interactions with dogs to prevent dog bites, and training in animal welfare friendly solutions. Through capacity building in Bangladesh, for example, dog culling staff have been retrained into dog friendly handlers. There are today more than 1000 expert dog handlers in the country and more than 60% of the dogs are caught by hand, without the need for use of equipment.

Conclusion
World Animal Protection supports a holistic approach, which sees animal and human health as inextricably connected, and works through cooperation between government agencies at local and national level, public health, and veterinary sectors. By coupling humane dog population management efforts with responsible ownership, conflicts between humans and dogs can be mitigated, creating harmonious co-existence.
Effect of humane and innovative measures of controlling rabies in street dogs


Human rabies is mainly infected through dog bites in Sri Lanka. Mass culling was practiced for population management, prevention and control of rabies in street dogs. Inhumane culling was restricted considering animal welfare benefits in 2006. Thereafter, health authorities adopted mass parenteral immunization and surgical sterilization of female dogs as a humane and innovative measure for controlling rabies and population management in street dogs. Objectives were to survey street dog population in Dehiwala Municipality area and to assess the effect of two consecutive mass parenteral immunizations of them. 8 wards out of 29 wards were randomly selected as samples for surveillance. Counting was carried out over five days between 6.30 am and 9.00 am. Maps of the respective wards were utilized to identify the boundaries and to cover the entire roads in the respective ward dogs visible on the roads at the time of counting were only considered. 1st and 2nd round immunizations were carried out ward by ward in a sequence to cover the entire 29 wards from October 2013 to May 2014 and from July 2014 to December 2014 respectively. Dogs were caught using catching nets and released to same locality after subcutaneous administration of vaccine, (Rabisin ®). Red and blue collars were applied for identification of immunized canines in 1st and 2nd round respectively. The total number of dogs counted in 8 sampling wards was 386. An estimated street dog population in Municipality area between 6.30 am and 9.30 am was 1398 (95% CI±381). The total number of dogs immunized was 1364 and 1302 in 1st and 2nd rounds respectively. The number of reported rabies positive cases was 9, 3, 5 and 0 for 1st, 2nd, 3rd and 4th quarters in 2013 respectively. Only 2 positive cases were reported in 2014 (for 4th quarter). This study revealed immunization can improve herd immunity and reduce the risk of human rabies due to street dogs. It is recommended to administer reliable high quality anti-rabies biologics with prolonged immunity for mass immunizations to maintain the immune status of animals.
Laboratory network for a One Health approach of vector-borne and respiratory viruses in the Mediterranean and Black Sea regions

Fanny CHERBLANC1, Camille ESCADAFAL2, Jean-Claude MANUGUERRA2, Miguel Angel JIMENEZ CLAVERO3, Elisa PEREZ RAMIREZ3, Vincent ROBERT4, Marie PICARD4, Maria Grazia DENTE5, Silvia DECLICH5, Flavia RICCARDO5, Kathleen VICTOIR1

1. Department of International Affairs, Institut Pasteur, Paris, France 2. Environment and Infectious Risks Research and Expertise Unit, Institut Pasteur, Paris, France 3. Centre for Research on Animal Health (CISA-INIA), Madrid, Spain 4. Institut de Recherche pour le Développement (IRD), Montpellier, France 5. Istituto Superiore di Sanità (ISS), Roma, Italy

As (re-)emerging viruses are threatening global health, the EU-funded MediLabSecure project (2014-2017) aims at enhancing the preparedness and response to viral threats by establishing an integrated network of laboratories in 19 non-EU countries of the Mediterranean and Black Sea areas in partnership with Institutes in 3 European countries. The MediLabSecure project is reinforcing the laboratory network established by the EpiSouth Plus project (2010-2013) by involving partners from animal virology and medical entomology laboratories additionally to previous partners from human virology laboratories and public health institutions. One laboratory per field of study (human virology, animal virology, medical entomology) and per country was selected in 2014. A first meeting held in Paris in January 2015, involved the heads of laboratories and aimed at first interdisciplinary interactions in the fields of interest. A “Needs assessment” questionnaire was implemented to assess laboratory capacities and needs regarding biosafety, diagnostic methods and integration of laboratory and epidemiological surveillance for emerging vector-borne and respiratory viruses. Fifty-two laboratories were selected to actively join the project. The January meeting allowed the project partners and head of laboratories to meet and exchange on the objectives and future steps of the project, their experiences, needs and expectations. Based on these discussions and on the responses to the “Needs assessment” questionnaire, a training curriculum was set up, of which the first workshops will be organized in June 2015, enabling laboratories to implement harmonized and up-to-date techniques to perform (1) laboratory diagnosis of vector-borne viral diseases such as West Nile, Dengue, Rift Valley Fever, Chikungunya and (2) tailored training on mosquito species determination. By enhancing diagnostic capacities and regional multidisciplinary cooperation, the Medilabssecure network could represent the cornerstone of a corporate preparedness and response to vector-borne and respiratory viral threats in the Mediterranean and Black Sea regions based on a One Health approach.
EVIDENCE FOR INTER-EPIDEMIC INFECTIONS OF RIFT VALLEY FEVER VIRUS IN WILDLIFE AND LIVESTOCK IN THE SERENGETI ECOSYSTEM, TANZANIA

Makuru J. Nyarobi, Robert D. Fyumagwa, Joram Buza, Sarah Cleaveland, Emily Goldstein, Brian Willet, Julius D. Keyyu

1Tanzania Wildlife Research Institute (TAWIRI), P.O.Box 661, Arusha, Tanzania; 2Nelson Mandela African Institute of Science and Technology (NM-AIST), P.O.Box 447, Arusha, Tanzania; 3Institute of Biodiversity, Animal Health and Comparative Medicine, University of Glasgow, Glasgow, G12 8QQ UK

Rift Valley fever (RVF) is a mosquito-borne zoonotic disease which presents in epizootic form over large areas of a country following heavy rains and flooding, and is characterized by high rates of abortion and neonatal mortality, primarily in sheep, goats and cattle; and fatal haemorrhagic syndrome in humans. In Southern and Eastern Africa, RVF occurs at intervals of between 5-12 years and the last outbreak was in 2006/2007. Little is known on where the virus is maintained during the inter-epidemic period; therefore this study was conducted to investigate sero-prevalence of RVF in wild and domestic ruminants, and small mammals during the inter-epidemic period. Serum samples from buffaloes, gazelles, cattle and rodents were tested for specific RVF IgG antibodies using the indirect enzyme-linked immunosorbent assay (I-ELISA) based on the recombinant nucleocapsid protein (rNp) of Rift Valley Fever Virus (RVFV). The results revealed that 31.4% of buffaloes (n=102), 23.1% of Grant’s gazelle (n=13), 14.5% of Thomson’s gazelle (n=69), 19% of Impala (n=21), 20% of hartebeest (n=20), 6.5% of topi (n=31), 2.3% of wildebeest (n=88), 11.6% of cattle (n=593), 4.5% of goats (n=110) and 3.8% of sheep (n=53) were sero-positive for RVF. It was interesting to note that some sero-positive animals including 7 buffaloes, 20 cattle, 4 goats, 1 sheep, 2 topi, 2 hartebeests, 1 Grant’s gazelle and 1 impala were born 1 to 4 years after the end of the last outbreak, indicating occurrence of new infections in the absence of overt clinical signs during the inter-epidemic period. These results indicate presence and circulation of RVFV within the Serengeti ecosystem five years after the last disease outbreak. The implications of the results in relation to the role of wildlife in the ecology of RVFV, surveillance, preparedness and response to RVF are discussed.
Antibiotic-resistance bacteria isolated from cow

Mindaugas Levickis1*, Vytuolis Zilaitis1, Anita Rokaityte2, Irmantas Rokaitis2

1Department of Non-infectious Diseases of the Veterinary Faculty of Lithuanian University of Health Sciences, Tilžės st. 18, Kaunas, LT-47181, Lithuania 2Department of Food Safety and Quality of the Veterinary Faculty of Lithuanian University of Health Sciences, Tilžės st. 18, Kaunas, LT-47181, Lithuania

Worldwide there is growing concern about the increased prevalence of antibiotic resistance. It is now generally accepted that the main risk factor for this increase in resistance in pathogenic bacteria is the increased use of antibiotics. Resistant commensal bacteria of food animals might contaminate meat and reach the intestinal tract of humans. Monitoring the prevalence of resistance in indicator bacteria such as faecal Escherichia coli and enterococci in different populations, animals, patients and healthy humans, makes it feasible to compare the prevalence of resistance and to detect transfer of resistant bacteria or resistance genes from animals to humans and vice versa. Resistance genes against antibiotics that are or have only been used in animals were found soon after their introduction, not only in animal bacteria but also in the commensal flora of humans, in zoonotic pathogens. This makes it clear that not only clonal spread of resistant strains occurs, but also transfer of resistance genes between human and animal bacteria. The objective of this study was to isolate bacteria from samples of cow’s lochia and to determine their antibiotic susceptibility patterns. Escherichia coli, Enterococcus faecalis, Staphylococcus aureus, Streptococcus spp., Bacillus spp. and Arcanobacterium pyogenes was isolated from cow’s lochia. All isolated bacteria strains were resistant to Penicillin G (PG) (10 μg), Ampicillin (AP) (10 μg), Amoxicillin-Clavulanic acid (AC) (30 μg), Ciprofloxacin (CIP) (5 μg), Erythromycin (E) (15 μg), Ceftriaxone (CRO) (30 μg), Gentamicin (G) (10 μg), Trimethoprim-Sulfamethoxazole (TMP-SMZ) (25 μg) Oxacillin (Ox) (1 μg), Oxytetracycline (OX) (30 μg), and Vancomycin (V) (30 μg). But all strains were sensitive to Cefapirin (CF) (10 μg). Based on our results, we can assert that to safeguard public health, the selection and dissemination of resistant bacteria from animals should be controlled. This can only be achieved by reducing the amounts and type of antibiotics used in animals.
BIOACTIVE COMPONENTS ANTIMICROBIAL ACTIVITY AGAINST THE REFERENCE STRAINS OF PATHOGENIC MICROORGANISMS MOSTLY FOUND IN FOOD PRODUCTS

Anita Rokaitytė1*, Gintarė Zaborskienė1
1 Department of Food Safety and Quality of the Veterinary Faculty of Lithuanian University of Health Sciences, Tilžės st. 18, Kaunas, LT-47181, Lithuania

The aim of this study was to evaluate the effect of natural bioactive components (lactic acid, linalool, thymol, dihydroquercetin) antimicrobial activity against the reference strains of pathogenic microorganisms mostly found in food products. The agar well diffusion method was used to determine the antimicrobial activity. Reference strains cultures of conditionally pathogenic Escherichia coli ATCC 25922 and pathogenic bacteria such as Staphylococcus aureus ATCC 25923, Salmonella typhimurium ATCC 13076, Bacillus cereus ATCC 11778, Listeria monocytogenes ATCC 19111 were used in this experiment. The results suggest that the bioactive components had different antimicrobial activity. Lactic acid (0.5%) and its mixtures with other bioactive components (linalool 0.03%, thymol 0.03% and dihydroquercetin 0.024%) had antimicrobial effect against all tested bacteria. The resulting inhibition zones diameter ranged from 12.5 ± 0.0 mm to 21.5 ± 0.0 mm. The higher inhibitory effect on E. coli and L. monocytogenes reference strains were demonstrated by the mixture of lactic acid and dihydroquercetin (inhibition zone diameter was 14.3 ± 0.2 mm, 21.5 ± 0.2 mm and 21.0 ± 0.1 mm, respectively). Linalool, lactic acid and dihydroquercetin mixture showed the higher antimicrobial activity on S. typhimurium reference strain compared to other bioactive components (inhibition zone diameter was 13.0 ± 0.2 mm). Linalool and thymol mixture had weak antimicrobial activity against B. cereus (inhibition zone diameter was 9.0 ± 0.0 mm). It was found that dihydroquercetin (0.024%) did not inhibit growth of any tested bacteria and linalool (0.03%), thymol (0.03%) had no antimicrobial effect on E. coli, S. aureus and S. typhimurium growth. Based on our results, we can assert that lactic acid (0.5%) and its mixtures with other bioactive components (linalool 0.03%, thymol 0.03% and dihydroquercetin 0.024%) could be used in food processing industry as supplements demonstrating the high inhibitory activity against pathogenic bacteria.
Study of the prevalence of Q fever in the population of sheep in Castilla y León (Spain)

García-Seco T1, Mínguez, O2, Grau A2, Pérez-Sancho M1, 3, Fernández LM2, González Y2, García N1, Domínguez L1, 4, Álvarez J5

1 VISAVET Health Surveillance Centre. Complutense University of Madrid. Avda. Puerta de Hierro s/n. 28040 Madrid, Spain. 2 Servicio de Sanidad Animal, Consejería de Agricultura y Ganadería, Dirección General de Producción Agropecuaria y Desarrollo Rural de la Junta de Castilla y León, C/ Rigoberto Cortejoso 14, 47014 Valladolid, Spain. 3 Politécnica University of Madrid (UPM)-Complutense University of Madrid (UCM), Ciudad Universitaria, Madrid 28040, Spain. 4 Departamento de Sanidad Animal, Facultad de Veterinaria, Complutense University of Madrid, Avda. Puerta de Hierro s/n. 28040 Madrid, Spain. 5 Department of Veterinary Population Medicine, University of Minnesota, St. Paul, MN, USA.

Q fever, caused by Coxiella burnetii, is a highly contagious zoonosis with a worldwide distribution. The main reservoirs are domestic ruminants, and small ruminants are the most frequently species involved in human outbreaks. In this study, Q fever prevalence and spatial distribution was estimated in sheep in Castilla y León, a region located in central Spain with a very large livestock population from which no recent information in animals is available. An average of 2,100 sheep flocks and 27,000 animals randomly selected in the region were sampled annually from 2009 to 2012. Sera samples were analyzed using a commercial ELISA test (ID screen Q fever indirect, IDVET). Sample size was calculated based on the expected flock and individual seroprevalence and the sensitivity and specificity of the test. Spatial analysis was performed employing the software SaTScan 9.4.1 and ArcGis 10.1. Results showed an overall flock seroprevalence of 64% (ranging from 59 to 76%) and an individual seroprevalence of 15% (ranging from 13% to 21%). Herd seroprevalence was significantly higher in dairy than in meet production flocks (73.5% vs. 56%) (Chi2, p<0.001). Significant spatial clustering of positive farms was observed throughout the four years of the study. In conclusion, the present results showed a large degree of exposure C. burnetii in sheep in Castilla y León, suggesting an active circulation of the bacteria, and an association of test results with spatial and flock characteristics. This information is useful for evaluation of the risk posed by livestock as sources of infection of this zoonotic pathogen.
Suitability of MALDI TOF-MS for Streptococcus suis identification

Pérez-Sancho M1,2; García-Seco T1; San Martín E1; Casamayor A1; Pulido E1; Fernández-Garayzábal JF1,3, Domínguez L1,2,3 Vela AI1,3
1Centro VISAVET, Universidad Complutense de Madrid, Spain 2Campus de Excelencia Internacional (CEI) Moncloa, Universidad Politécnica de Madrid (UPM)-Universidad Complutense de Madrid (UCM), Spain 3Departamento de Sanidad Animal, Facultad de Veterinaria, Universidad Complutense de Madrid, Spain

Background
Streptococcus suis is a worldwide important swine and human pathogen. Despite PCR-assays for identification of S. suis are available, in many diagnostic laboratories this identification is still based on bacteriological and biochemical criteria, mainly using commercial multi-test systems. However, there is a risk that some strains of S. suis can be misidentified using these commercial kits with other streptococcal species or even enterococci. More recently, MALDI-TOF MS (Matrix-Assisted Laser Desorption/Ionization- Time of Flight Mass spectrometry) has emerged as a reliable high-throughput tool for microbiological identification. However, particular identification of S. suis using this approach has not yet been thoroughly reported although this technique could overcome the drawbacks of current routine techniques and may contribute to a better understanding of its impact in animal production and public health.

Objective
Assessment of the reliability of MALDI-TOF MS for the identification of S. suis belonging to different serotype and hosts.

Methods
A total of 129 isolates (belonging to 2, 7, 9 and ‘less prevalent’ serotypes) recovered from swine, wild animals and humans were obtained from the culture collection of VISAVET. Species-specific gdh-PCR assay was considered the gold standard in this study. MALDI TOF results were compared with those obtained by biochemical identification (API 32 Strep). Mass spectra acquisition and analysis was performed on a Bruker UltraFlextrex platform (Bruker Daltonics) using MALDI Biotyper™ software in the automatic mode using a matrix of saturated solution of α-HCCA (α-Cyano-4-hydroxycinnamic acid).

Conclusions
A total of 31 S. suis isolates (24.03%) were correctly identified when the proposed Bruker´s score (2.300) for highly probable identification at species level was used. The remaining isolates (n= 79; 61.24%) showed score values between 2.000-2.299 (highly probable identification at genus level). Based on MALDI TOF results and PCR data a value ≥2.000 should be considered as threshold score for reliable identification at species level of S. suis. With this new score 79 additional isolates (total n=110; 85.3%) were correctly identified as S. suis. Our study demonstrates that proteomics identification using MALDI TOF could be a reliable approach for identifying and discriminating this microorganism.

Conflict of interest statement: None
Prevalence of the Ribosomal RNA methylase erm(B) gene and other macrolide-resistance factors in Campylobacter isolates from different sources.

Diego Florez-Cuadrado1, María Ugarte-Ruiz1,2, A. Quesada3, G. Palomo3, M.C. Porrero1 and L. Domínguez1

1Centro de Vigilancia Sanitaria Veterinaria (VISAVET), Universidad Complutense de Madrid. Avda. Puerta de Hierro, s/n 28040 Madrid, Spain 2Departamento de Sanidad Animal, Facultad de Veterinaria, Universidad Complutense de Madrid. Avda. Puerta de Hierro, s/n. 28040 Madrid, Spain 3Departamento de Bioquímica, Biología Molecular y Genética, Facultad de Veterinaria, Universidad de Extremadura, Cáceres, Spain

Thermophilic Campylobacter species, especially C. jejuni and C. coli, are recognized as the most common causative agents of human gastroenteritis worldwide. Even though the illness is usually self-limited, antimicrobial treatment is needed occasionally. Macrolides, such as erythromycin, are the drug of choice for campylobacteriosis treatment. Resistance to macrolides in Campylobacter is mainly related with efflux pumps and target mutations in the 23S rRNA gene (positions 2074 and 2075). Recently, the methylase gene erm(B) has been described as a new erythromycin resistance factor in Campylobacter and is located in a multidrug resistance genomic island. Eighty-eight erythromycin-resistant strains (MICs values determined by agar dilution ranged from 32 to >1024mg/L) of C. jejuni and C. coli from different sources (poultry, swine, cattle and sewage water) were selected in order to evaluate the molecular resistance mechanisms to erythromycin. Presence of erm(B) gene and target mutations in the 23S rRNA gene was tested by PCR plus sequencing. The 62.9% (56/89) of the Campylobacter strains present the mutation A2075G in the 23S rRNA gene and 1.1% (1/89) of them have the mutations A2074C and A2074G in one isolated single each. A 2.2% (2/89) of the Campylobacter isolates used in this study carry the erm(B) gene. The prevalence of the gene erm(B) in C. coli is lower than the target mutation A2075G in 23S rRNA gene but is related with high erythromycin-resistance levels. Additionally, the erm(B) gene is located in a multidrug resistance genomic island therefore this would imply a horizontal transfer of resistance to other strains of Campylobacter.
Virulence - Associated Genes and Antimicrobial Resistance in Shigatoxin-producing Escherichia coli isolates from healthy Spanish cattle

A.Cabala,b, C. Porreroa, ML de la Cruza, C. Bárcena, L. Domínguez, J. Álvarez,c,d

Authors affiliations:

a VISAVET Health Surveillance Centre, Universidad Complutense, Madrid, Spain. b SaBio IREC (CSIC-UCLM-JCCM), Ciudad Real, Spain; c Servicio de Microbiología, Hospital Universitario Ramón y Cajal and Instituto Ramón y Cajal de Investigación Sanitaria, Madrid, Spain. d Department of Veterinary Population Medicine, College of Veterinary Medicine, University of Minnesota, St. Paul, MN, USA.

Escherichia coli is a commensal bacteria, but some strains may be pathogenic for humans. Those with pathogenic potential are known as pathotypes. Six pathotypes have been described until now, being by far, the Shigatoxin-producing Escherichia coli (STEC) the most studied one. Ruminants (especially cattle), are considered the most important reservoir of STEC for humans through the consumption of their undercooked meat. Several outbreaks have been attributed specifically to O157:H7 serotype, hence its importance for the Public Health. However, non-O157 serogroups have become relevant in the last years as for example the O104:H4 STEC/EAEC hybrid strains. Antimicrobial resistance (AMR) among STEC strains is also an issue of concern due to the increase of resistances in the last years. The aim of this study was to identify the Virulence Associated Genes (VAGs), the AMR and the Pulsed Field Gel Electrophoresis (PFGE) patterns in a collection of STEC isolates obtained from the feces or hair of healthy cattle in Spain in 2011 (feces) and 2013 (hair). Sixty-four STEC isolates were recovered (prevalence of 10.67 and 15.44% in 2011 and 2013) and investigated by real-time PCR for the presence of nine VAGs belonging to five E. coli pathotypes (stx1, stx2, eae, ehxA, aggR, invA, bfpA, est, and elt) and ten serogroup-related genes related to hemolytic uremic syndrome (HUS). In addition, isolates were tested for twelve antimicrobials by broth microdilution and their genetic distance was assessed using PFGE. EhxA, stx2, eae, stx1 and est were the most frequently detected VAGs. BfpA was detected in one isolate and no positive isolates were found for aggR, elt and invA. 12.5% of the STEC isolates were O157:H7 whereas O26, O111, O91, O145 and O104 were detected only once or twice. Only one O104 positive isolate (serotype O104:H7) was found. 41% STEC/ETEC hybrid strains were detected among the non-O157 isolates. Regarding the AMR, 62.5% of the isolates presented resistances to at least one antimicrobial being the most prevalent resistances for sulfamethoxazole, streptomycin, tetracyclin and trimethoprim. No significant differences were found between O157 and non-O157 isolates. A maximum of 80% similarity among PFGE patterns was observed.
The “One Health” experience in Brazil: a partnership among veterinarians, physicians and other healthcare professionals

P.C.A.Souza1 & A.A.B.Carvalho2
1- Epidemiology and Public Health Department/Veterinarian Institute. Universidade Federal Rural do Rio de Janeiro (UFRRJ). Seropédica/RJ – Brazil. 2- Preventive Veterinary and Animal Reproduction Department of FCAV, Universidade Estadual Paulista (Unesp), Câmpus Jaboticabal/SP – Brazil.

Brazil has one of the most complex and complete healthcare systems in the world: the Unified Health System (SUS), which provides a wide range of services, from primary care to highly complex treatments. Among its policies is the Family Health Strategy (ESF), which focuses on primary care at the national level, but is coordinated at the municipal level. Its basic team is formed by a family doctor, a nurse, a nursing technician, a dentist and community health agents, who act in a specific territory. In 2008, the Family Health Support Nucleus (NASF) was created, which can be composed of different healthcare professionals. Each nucleus supports a specific number of ESF teams. In Brazil, veterinarians have been recognized as healthcare professionals by the Ministry of Health and the Ministry of Education since 1993, and in 2011 this profession was included among those composing the NASF teams. The direct interaction between the different healthcare professionals is enabled by the action of the ESF teams and allows practicing the “One Health” concept. The partnership between veterinarians and physicians in the NASF/ESF territory is one of the health surveillance aims and also of its constituents: epidemiological surveillance, sanitary surveillance and environmental monitoring. The main actions in this respect are: prevention, control and diagnosis of infectious diseases; prevention and control of food-borne diseases; and health education, focusing on the promotion of health and prevention and control of antropozoonotic diseases and other environmental risks, including natural catastrophes and also those caused by human activities. It is an enriching experience that will surely bring benefits to public health. This Brazilian initiative is expected to serve as an example to other countries, especially in Latin America and the Caribbean.
Presence of Aminoglycoside Resistance in Staphylococcus aureus

Tevfik Acar1, Ali AYDIN2, Aysen COBAN2, Mert SUDAGIDAN3

1Faculty of Veterinary Medicine, Istanbul University, 34320 Avcilar, Istanbul, Turkey
2Department of Food Hygiene and Technology, Faculty of Veterinary Medicine, Istanbul University, Avcilar 34320, Istanbul, TURKEY
3Konya Food & Agriculture University, Meram-Konya, TURKEY

Antibiotic resistance is an increasing global problem resulting from the pressure of antibiotic usage, greater mobility of the population, and industrialization. Nowadays, the importance of S. aureus, not only to cause hospital infections and intoxications, especially resistance to antimicrobials in humans and animals because of the limited treatment options due to perceived as a global public health problem. The aim of this study was to investigate of aminoglycoside resistance in S. aureus strains (n=80) from food contact surfaces (staff, equipment etc.). Sampling procedure was applied from food contact samples and subsequently isolation of S. aureus from samples was performed using conventional methods according to described standard procedure. Typical colonies on Baird Parker Agar were sub-cultured and identified by gram staining, catalase test, coagulase test, DNase activity, and mannitol fermentation. Genomic DNA extraction was performed for positive strains and 16S rRNA gene region was amplified by PCR using gene specific primers. Agar disc diffusion method was used to test some aminoglycoside group antibiotics (kanamycin, gentamicin and tobramycin). The resistance of gentamycin and tobramycin were determined of 4 (5%) and 4 (5%) of the tested strains, respectively. Kanamycin resistant S. aureus was not found any analyzed strains. Additionally, aminoglycoside modifying resistant genes (aac/aph, aph and ant) were investigated in gentamycin and tobramycin resistant S. aureus strains. Only aac/aph gene was found 2 resistant S. aureus (2.5%) strains. Previous studies showed that the aminoglycoside resistance S. aureus strains spread very quickly all of the world. In order to prevent growth of antimicrobial resistant bacteria, these antimicrobials should be used appropriate dosage in the environment include animals or food.
Presence of beta-lactam resistance in Staphylococcus aureus

Aysen COBAN1, Ali AYDIN1, Gulay Merve BAYRAKALI1, Mert SUDAGIDAN2

1Department of Food Hygiene and Technology, Faculty of Veterinary Medicine, Istanbul University, Avcilar 34320, Istanbul, TURKEY
2Konya Food & Agriculture University, Meram-Konya, TURKEY

Staphylococcus aureus is one of the important pathogens due to toxin production and development of resistance against antimicrobials. The use of antimicrobials in animals causes antimicrobial resistance and the subsequent transfer of resistance genes and bacteria among animals, animal products, human and the environment. Beta-lactams have a long history in the treatment of infectious diseases, though their use has been and continues to be confounded by the development of resistance in target organisms. Beta-lactamases, particularly in Gram-negative pathogens, are a major determinant of this resistance, although alterations in the beta-lactam targets, the penicillin-binding proteins (PBPs), are also important, especially in Gram-positive pathogens. The aim of this study was to investigate the antibiotic resistance S. aureus strains from food contact surfaces and determine of beta-lactam in S. aureus strains. In this study, 80 S. aureus strains were isolated from food contact surfaces (staff, equipment etc.). Sampling procedure was applied from food contact samples and subsequently isolation of S. aureus from samples was performed using conventional methods according to described standard procedure. Typical colonies on Baird Parker Agar (Oxoid) were sub-cultured and identified by gram staining, catalase test, coagulase test, DNase activity, and mannitol fermentation. Genomic DNA extraction was performed for positive strains and 16S rRNA gene region was amplified by PCR using gene specific primers. Agar disc diffusion method was used to test some beta-lactam group antibiotics (penicillin G, cefoxitin, cephalozin, and imipenem). Only, penicillin G resistance (n=55) was found in tested strains. Additionally, beta-lactam resistant genes (blaZ, blaI, and blaR) were investigated in penicillin G resistant S. aureus strains. Antibiotic resistance genes of positive S. aureus strains isolated from samples were found respectively according to genes, number of positive samples blaZ (n=68), blaI (n=58). blaR genes were not found any S. aureus strains. Present study demonstrated that S. aureus strains from food contact surfaces can be resistant to beta lactams and this possible contamination of various foods with these strains is very important for public health.
ONE HEALTH SUCCESS STORY FOR MANAGEMENT OF KYASANNUR FOREST DISEASE IN WAYANAD DISTRICT OF KERALA, INDIA

Prejit1, Vidya K. R*, Reghu Ravindran2, Asha K3 and Preethi Unnithan4
Centre for One Health Education, Advocacy, Research and Training (COHEART$) Pookode, Wayanad, Kerala

Kyasannur Forest Disease (KFD) is a tick borne flavir viral disease having significant zoonotic potential. This year (2015) reported the highest incidences and the first ever case of death due to KFD in Kerala. The death was reported from Poothady panchayath on 16th January 2015. Subsequent cases were recorded from tribal population adjoining forest areas of five other panchayaths. COHEART$ whose mandate was to implement One Health strategy, organized a stakeholder workshop on 11/2/2015 which was attended by 40 delegates from District Medical office (DMO-Health/Ayurveda/ Homeo Medicine), District Animal husbandry office, forest departments, faculties and policy makers of the district. This workshop formulated integrated guidelines for KFD control adopting One Health approach and also sensitized allied health departments. DMO(H) and Integrated Disease Surveillance project stood in the forefront of management of disease in Humans including house to house fever surveillance and vaccination of susceptible population. This authorities distributed repellent cream free to members of tribal hamlets adjacent to forest areas. The District Animal husbandry office was active in postmortem inspection of monkeys and vector control in domestic animals of the KFD prone areas. Forest department had promptly attended all cases of monkey deaths and were also involved in tick control. The tribal development officers distributed compensation for the bereaved families. COHEART in association with the District Medical office published and distributed public awareness leaflets to all affected areas and also conducted series of awareness camps in various parts of the district. The disease surveillance revealed a total of 59 positive cases (DSO report as on 30/03/2015), confirmed on the basis of molecular detection of the virus in serum at Manipal Centre for Virus Research. Of the 59 cases, mortality was reported from 7 cases. Over a period of three months, a drastic decline in fever incidences and KFD cases were observed in all the five affected panchayaths. The disease control is due to the collaborative multiple disciplinary One Health approach under the leadership of District Administrator.
CRISPR elements within Campylobacter

dé Cárdenas, I.1, Fernández-Garayzábal, J.F1,2, De La Cruz, M.L.1, Dominguez, L.1,2, Gómez, S.1
1 VISAVET Health Surveillance Centre. Universidad Complutense Madrid. 28040 Madrid. Spain
2 Departamento de Sanidad Animal. Facultad de Veterinaria. Universidad Complutense Madrid. 28040 Madrid. Spain

Campylobacteriosis remains to be the most commonly reported food-borne zoonosis at the EU level (EFSA, 2014). Similarly to many bacteria and most Archaea, Campylobacter harbors an adaptative immune system, named as CRISPR-cas system, made of a succession of direct repeats interspersed by unique “spacers” sequences. CRISPR (Clustered regularly interspaced palindromic repeats)-cas system provide the protection of the cell against viral infection, conjugative plasmids and other foreign genetic elements through spacer acquisition. As spacers are incorporated in sequential order, CRISPR loci reflect the history of viral infection of the host, so they provide an ecological and epidemiological record (Marraffini, Sorek et al. 2013).

We herein present a straightforward method consisting of a multiplex PCR and sequencing of the PCR products. We have designed the primers directed against all known Campylobacter CRISPR, both “confirmed” and “questionable”; these later had been disregarded up to date at genotyping. We were aware that, not only the combination “confirmed” + “questionable” is an excellent tool at Campylobacter genotyping, comparable or even better than other traditional typing methods such as flaA SVR, but also it allows traceability of the different strains. We also discuss the strong relationship among “confirmed” and “questionable” CRISPR.

Education meets Science in One Health


One Health Sweden is a research network initiated in 2010. Our mission is to improve human and animal health by connecting researchers and communicating the One Health concept to society. It is also important to encourage students to choose courses and programs within this wide field. To handle future challenges we need to have a good supply of interested and competent collaborators. This can only be guaranteed if One Health is part of the curriculum before students opt for higher studies and professional training. Our aim is to raise the awareness of the interaction between humans, animals and nature and explain how factors such as lifestyle, animal husbandry, and human prevention and intervention, influence the spread of infections and antibiotic resistance. One Health Sweden has developed an educational strategy program to promote the understanding of the multifaceted interplay between pathogens, hosts and the environment. We introduce this programme as early as in secondary school and high school. We provide quality teaching material and manuals free of charge to all schools in Sweden. The material is available as an Open Educational Resource (OER) on our website. For more information please visit http://www.onehealth.se/ohs/.

A total of 40,000 copies of our printed One Health material covering important topics, such as zoonotic diseases, vector control and antibiotic resistance, has been distributed, mainly to schools, veterinary and medical students and practicing veterinarians and physicians. Our electronically available material covers a pdf leaflet, teacher’s instruction, and links to web seminars. The material has been introduced to Swedish high school teachers at a national conference with 10 000 participants, and it has also been presented specifically to teachers working within the field of natural sciences. Local seminars where students have been given the opportunity to watch and discuss the movie “Contagion” in relation to One Health have also been arranged.

There is a large interest in information about One Health in general, and a high demand for relevant teaching material. It is our experience that such tailor-made material is highly appreciated, and that it is an effective way of introducing the One Health concept to young students.
MALDI Biotyper for the identification of Non Tuberculous Mycobacteria isolated from animal tissues.

Sánchez, N.1, Liandris, E.1, Romero, B.1, Pérez-Sancho M.1, Bezos J.1, Casal C.1, Allende, T.1, Gutiérrez, A.1, de Juan L1,2.

1 VISAVET Health Surveillance Centre, Complutense University of Madrid, Avda. Puerta de Hierro S/N, Madrid, Spain. 2 Departamento de Sanidad Animal, Facultad de Veterinaria, Universidad Complutense de Madrid, Avda. Puerta de Hierro S/N, 28040 Madrid, Spain

The genus Mycobacterium includes important zoonotic (Mycobacterium tuberculosis complex, MTBC), human (M. leprae) and animal (M. paratuberculosis) pathogens and saprophytic or opportunistic members, usually referred as Non Tuberculous Mycobacteria (NTM). Identification of mycobacteria at the species level has been based traditionally on biochemical tests, which require long incubation and have low discriminatory power. Advances in molecular and typing techniques have considerably decreased the time of identification and had led to the description of several new species. Matrix assisted laser desorption ionization time of flight spectrometry (MALDI TOF MS) has been recently introduced as a rapid and simple alternative for the identification of bacteria. The MALDI Biotyper platform developed by Bruker includes a mycobacteria library (version 1.0) composed of 94 species and 173 MSPs. In the present study, we tested the possibility to integrate the MALDI Biotyper platform in a veterinary mycobacteriology laboratory for the routine identification of mycobacteria other than tuberculosis. For this purpose, a total of 108 mycobacteria isolated from animal tissues during the period 2013-2014 were tested by MALDI Biotyper and the results were compared to those of molecular techniques. MALDI Biotyper identified almost 74% of the isolates when compared to sequencing. Among the misidentified species 4 belonged to species that are not included in the MALDI Biotyper library and 11 belonged to members of the group X of M. avium. When these isolates were excluded from the analysis, the percentage of concordance between MALDI Biotyper and molecular techniques rose up to 90% rendering MALDI Biotyper a valuable, simple and economic tool for the identification of mycobacterial species. The incorporation of MALDI Biotyper in the routine work of the mycobacteriology laboratory is expected to save time and decrease the cost of mycobacterial identification. However, more research is needed in improving the extraction protocol and broadening the species entries in the mycobacteria library. The authors declare that there are no conflicts of interest.
TOWARDS INSTITUTIONALIZING ‘ONE HEALTH’ IN NIGERIA

Babalobi, Olutayo (DVM, MPVM, PhD; FCVSN).  
Department of Veterinary Public Health and Preventive Medicine, Faculty of Veterinary Medicine,  
University of Ibadan, Nigeria.

From 2006 to 2009, Nigeria successfully ran a “One Health” collaborative joint Avian Influenza Control Project (AHIP), which enhanced emergency response performance and mitigated the impact of the H5N1 outbreak, and subsequently the H1N1 pandemic flu outbreak in Nigeria. The Nigerian Avian Influenza Control and Human Pandemic Preparedness and Response Project (NAICP) formally commenced in July 2006 and scheduled for completion by 31st May 2011. An Independent Impact Assessment of the World Bank-funded NAICP submitted on 21 April 2011 by the International Livestock Research Institute (ILRI) commended the inter-sectoral collaboration model developed and recommended that consideration be given to adopting this as a platform for addressing other problems at the intersection of animal and human health, such as food-borne diseases and zoonoses.

The Nigeria Field Epidemiology and Laboratory Training Program (NFELTP) and OneHealthNigeria@googlegroups.com (OHNe-group) are two other organs that have played significant role in efforts to institutionalize One Health in Nigeria. The NFELTP commenced in Nigeria in 2008 in response to the AI outbreak in Nigeria, and is the first that involved veterinarians in its training program. The NFELTP has resulted in collaboration and increased communication between the Federal Ministry of Agriculture veterinarians and Federal Ministry of Health physicians and laboratorians. Mutual relations and respect built between the three professionals and they worked together on AI surveillance, Brucellosis, Lead poisoning outbreak, Lassa surveillance, Tuberculosis and the recent Ebola investigation and control among others.

The <onehealthnigeria@googlegroups.com> is an interactive email discussion forum created on June 06 2011 to actively promote the institutionalization of One Health in Nigeria (OHN). It is a private initiative created by the author. To date, the https://groups.google.com/forum/#!forum/onehealthnigeria, has posted one thousand two hundred and thirty (1230) One Health related topics to mainly medical and veterinary subscribers.

Conclusion: While the Nigeria Veterinary Medical Association and the Veterinary Council of Nigeria has taken slow but concrete One Health steps, the counterpart Nigeria Medical Association, there is a call and challenge to the Nigerian Medical Association to have a ‘paradigm shift’ towards institutionalization of One Health in Nigeria, lest it suffers from ‘paradigm paralysis’.
Antimicrobial resistance in Canadian commercial meat rabbits: Cause for concern?

J. Kylie¹, R. Reid-Smith², S. McEwen³, J.S. Weese¹, P. Boerlin¹, P.V. Turner¹*

Departments of Pathobiology¹ and Population Medicine³, University of Guelph, Guelph, Canada Laboratory for Foodborne Zoonoses², Public Health Agency of Canada, Guelph, Canada

The number of commercial meat rabbits produced in the EU annually is second only to poultry production. There are few industry standards with respect to biosecurity and animal husbandry practices within the meat rabbit industry in North America, the EU, or Asia, which results in large variations in on-farm practices. Enteritis is common in commercial rabbit operations and is often treated empirically with antimicrobial agents. One area of significant concern is the off-label use of antimicrobials in rabbits and the potential for this to lead to the development of antimicrobial resistance, which may be transmitted to humans or other animals. The current study examined feces from Canadian commercial rabbit populations for two potentially zoonotic bacterial agents of diarrhea, Escherichia coli and Salmonella spp., and also examined whether these bacteria demonstrated antimicrobial resistance to commonly used antimicrobials using standard microbiology culture techniques. Fecal samples were collected from both does and fryers from 27 Ontario commercial rabbitries during winter and summer months (n=108 pooled samples from a total of 324 rabbits). E. coli was found to be present in at least one age group in all commercial rabbit farms, with 19% of positive samples demonstrating antimicrobial resistance to at least one class of antimicrobial agents. Salmonella spp. were identified in 5% of the commercial rabbitries, with Salmonella kentucky samples being resistant to several antimicrobials. These levels of antimicrobial resistance are consistent with or lower than levels in most other food animal species and suggest that Canadian meat rabbits do not pose a significant threat in terms of transmitting antimicrobial resistance to humans or other animals. However, isolation of Salmonella spp. in commercial meat rabbits raises some concerns regarding hygiene practices, cross-species bacterial contamination, and potential zoonoses, and supports the development of improved biosecurity practices on meat rabbit farms.

*presenting author – pvturner@uoguelph.ca
Survey on dog bites, dog ownerships and level of knowledge of rabies in the Saharawi refugee camps, Algeria.

Giorgia Angeloni1, Sara Di Lello2, Marco Martini3, Marco De Nardi4
1SIVtro-VSF I ONLUS Società Italiana di Veterinaria e Zootecnica Tropicale per la cooperazione internazionale - Veterinari Senza Frontiere Italia, Viale dell’Università 16, 35020 Legnaro, PD, Italy; 2Movimento Africa '70 ONG ONLUS, Via Missori 14 - 20900 MONZA; 3 Department of Animal Medicine, Production and Health (MAPS), Viale dell’Università 16, 35020 Legnaro, PD, Italy; 4 SAFOSO AG, Waldeggstrasse 1 CH-3097 Liebefeld, Switzerland

In November 2014 a survey was performed in the Saharwi refugee camps, (south-western Algeria) where, since 1974, 125000 persons are living in exile. The camps are currently rabies-free. The survey targeted households aiming at investigating the presence of dogs or other animals, ownership of dogs by local population, number of bites reported, people first reaction after a bite and level of knowledge about rabies. Data were collected thorough pre-tested questionnaires and the households targeted were selected randomly according the calculated sample size.

During the survey, an awareness campaign about rabies, proper dog management and actions to be implemented in case of bites was implemented. All activities were carried out in collaboration with the local veterinary unit. Finally, personnel of local hospitals were trained and provided with ad hoc questionnaire to investigate the incidence of dog’s bites in the camps. This activity is currently on going.

Overall, 199 people from 3 (out of 5) camps (wilayas) were interviewed. Nineteen persons reported to have been bitten or reported a relative been bitten by a dog in the previous two years. The median age of the victim was 20.5 years, lower than the median age of the interviewed sample (39yrs); 63.4% of the victims were women, most of them students (43.5%) and unemployed (36.4%). None of the victims bitten was the owner of the dog, although 57% of the biting animals did have an owner. Only 18% of the interviewed persons had a basic level of knowledge about rabies but, out of this group only 27.7% was able to correctly describe the ways of transmission of the disease. More than 70% of the respondents were not able to list any of the possible symptoms of the disease.

Our study shown the gaps in knowledge of rabies in Saharwi camps highlighting the importance of implementing an awareness campaign. The campaign should also be focused on dogs’ population management, a measure which would undoubtedly reduce the risk of biting events. Moreover, the scarce knowledge about the disease is worrisome considering that the disease is widespread in Algeria and the risk of introduction into the camps cannot be considered negligible.
AN ESTIMATE OF THE EXPOSURE LEVEL TO ANTIBIOTIC RESISTANT E. COLI ON A ROMANIAN TROUT FARM

C. GH. CERBU1, M.M. SAVU1, GH. F. BRUDAȘCĂ1, R. M. GIUPANĂ2, MIHAELA NICULAE1, ANAMARIA-IOANA PAȘTIU1, CARMEN DANA ȘANDRU1, MARINA SPÎNU1

1University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca 2Banat University of Agricultural Sciences and Veterinary Medicine Timisoara

Aquaculture industry, an important food source, represents a continuously growing economic sector in many regions of the world. Zoonotic bacteria are usually found in cultured fish at low levels, thus posing an insignificant professional or consumer risk when these products are cooked. It is not the case of bacteria, ie E. coli, associated with fecal contamination, which pose a broad health risk through culture waters or farmed fish. Furthermore, the extended and often unregulated use of antimicrobial agents to treat fish disease selects drug-resistant bacteria reservoirs in the aquatic environment. Fecal contaminants, accidentally present in culture waters, could acquire by horizontal transfer such resistance genes, and subsequently reach farm workers or consumers directly. The presence of strains resistant to antimicrobials frequently used against human pathogens restricts the therapeutic protocols in infections caused by these bacteria.

The study aimed to investigate the presence and antibiotic resistance of E. coli strains isolated from water on a Romanian trout farm. The bacteria were isolated from culture water sampled from three (33.33%) out of nine basins populated with trout for human consumption, at depths ranging from 0.1m to 1.7m. Classical microbiological techniques were used to culture the bacteria, while the biochemical identification of isolated strains was performed by use of API 20E test and specific software.

Resistance/susceptibility to antibiotics was monitored by the Kirby Bauer diffusion method, using amoxicilin, cephoperasone, norfloxacine, erithromicyne, gentamicine, kanamicyn, doxicycline, oxacyline and penicilline G standardized disks. The results indicated sensitivity only for one (11.11%, erithromicyne, 18 mm inhibition diameter) out of nine antibiotics. The results also indicated that fish from contaminated basins may represent a food source with increased infectious potential, due to the high antibiotic resistance of the isolated E.coli strains.

Considering the presence and high resistance of E. coli, efforts should be focused on improving the management procedures, on the regulatory control of antimicrobials’ use, on implementation of prudent use guidelines, and periodical monitoring the status of antimicrobial resistance.
THE CORRELATION OF INNATE AND ADAPTIVE IMMUNE RESPONSES IN SALMONELLA CARRIER HENS

Marina SPINU[1], A.UNGVARI[1], Aurel VASIU[1], Carmen Dana ŞANDRU[1], Emoke PALL[1], Constantin Gh.CERBU[1], Anamaria-Ioana PAŞTIU[1], Silvana POPESCU[1], Radu M. GIUPANĂ[2], Mihaela NICULAE[1]

[1] University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca Faculty of Veterinary Medicine, [2]Banat University of Agricultural Sciences and Veterinary Medicine Timisoara.

Salmonella species, one of the primary causes of human food poisoning throughout the world, are recognized as closely associated with the consumption of contaminated poultry and egg products. Systemic immunity, including humoral and cell mediated responses, plays an important role in the resistance and clearance of infection. Protection against salmonellosis by humoral mechanisms alone is unlikely, as Salmonella spp. are facultative intracellular organisms. Nevertheless, specific antibodies are recognized to increase phagocytosis of the bacteria. Simultaneous investigations of several immunological mechanisms could help in clarifying the persistence of Salmonella spp. in carrier hens and could improve the on-farm control of the disease risk.

The research aimed to evaluate the adaptive cell-mediated immune response as well as the interaction between lysozyme levels, antibody titers and phagocytosis in serologically positive, clinically healthy carrier hens. A total of 102 Rosso layers, 80 weeks of age, positive for Salmonella infection by microbiological and slow agglutination tests, were used to evaluate the interaction between Salmonella spp. and the host immune system. Agarose gel radial diffusion test against Micrococcus lysodeicticus was used to quantify the lysozyme levels, while the in vitro specific cell-mediated immune responses to Salmonella pullorum was monitored by lymphocyte blast transformation assay, performed on whole heparinised blood. Stimulation indices were calculated as a percent of the start-up medium RPMI glucose concentration. Relatively low levels of anti-Salmonella antibodies (1/10 – 1/160) were independent on both spontaneous and antigen induced in vitro stimulation (r=0.101 and 0.204, respectively), suggesting a statistically non-significant correlation between the two parameters in carrier hens. There was a reverse, but statistically non-significant correlation between the spontaneous phagocytosis and antibody titers, while antigen treated phagocytic cells reacted independently on antibody concentrations. Lysozyme levels, significantly (p<0.001) correlated (r=0.678) with antibody titers, suggesting that in carrier hens the innate humoral immune response was stronger than the non-specific cell mediated one. The in vitro specific reactivity towards the antigen showed that the responses were weak in chronically infected adult hens, suggesting the prevalent importance of the humoral response in carrier hens.
“One Health Initiatives in the U.S.A.: Where Does Pharmacy Fit?”

John Dellinger, PhD, and Nicia Lemoine, MS, Concordia University, School of Pharmacy, Mequon, Wisconsin, U.S.A.

Problem Description. Since the earliest of time, philosophers and writers have condensed the workings of the world to be one intertwined design. The Native Americans have ”Medicine Wheels” depicting the unity of health and embracing the codependent relationships between all animals (including humans) and plants. Several years ago, the American Veterinary Medical Association (AVMA), American Medical Association (AMA), and Centers for Disease Control & Prevention (CDC) joined the global One Health movement; and while the initial global case studies have focused on zoonosis and human health, the movement clearly encompasses numerous pharmacy-related topics (e.g., epidemiology, public health, toxicology and environmental health). The One Health concept builds from individual organisms, to populations and ecosystems embracing Chief Seattle’s concept of the ‘Web of Life’ where you can’t affect one strand without consequence throughout the web. Under Sweden’s One Health umbrella, all relevant health sciences disciplines are equal partners. However, unlike many schools of veterinary, human medicine and public health, pharmacy schools in the USA are not well represented in the global movement.

One Pharmacy School’s Response. At Concordia, we have created a 1 credit hour (40 student hours/semester) weekly workshop to explore and define the role that schools of pharmacy can have in building One Health. Several topics are being addressed and evaluated by the faculty, staff and upper class pharmacy students to assimilate an opinion on what roles pharmacy schools can fulfill in the initiative, example topics include: (a) Veterinary Pharmacy & Compounding Legal Issues, (b) Drug discovery in Agriculture and Veterinary Medicine, (c) Wildlife and Exotic Pharmacy Practice, (d) Pharmacoepidemiology & Pharmacoeconomics for Global One Health, (e) Environmental and Public Health Responses to Pandemic Outbreaks, (f) Comparative and Translational Pharmacology, (g) Zoonotic Infections and Antibiotic Resistance, and (h) Freshwater Sustainability and Pharmaceutics. These plus other student generated topics are being evaluated and will be summarized to produce a condensed statement of how schools of pharmacy can join the One Health global team.
One Healthy Village at a Time: Improving Interdisciplinary Ecosystem Health in Nicaragua and Haiti

Merrideth Holub, MS1; Cheryl A. Scott, DVM, RN2; Ruth L. Bush, MD, JD, MPH3; Rosina C. Krecek, PhD, MBA1; Thomas Jeffreys, MPH4; Ashton Richardson1; Christina Babu3; Ariel Loredo1; Sylvia Tangney1; Analise Rivero1

1 Texas A&M University College of Veterinary Medicine & Biomedical Sciences, College Station, Texas 77843, USA. 2 University of California at Davis, Davis, California, 95616, USA. 3 Texas A&M Health Science Center College of Medicine, Bryan, Texas 77807, USA. 4 Texas A&M Health Science Center School of Public Health, College Station, Texas 77843, USA

Health professionals are increasingly being faced with challenges that have elements of global relevance and world-wide consequences for humans, animals, and environment. Professional and graduate health science institutions are progressively incorporating global training into their curricula and offering specializations in international medicine, disease management, and population wellness. Students, faculty and staff from animal, human, and public health sciences at Texas A&M University, Texas A&M Health Science Center, and the University of California at Davis have ongoing research, education, and outreach programs in Nicaragua and Haiti. These programs partner with veterinary and medical professionals in village communities to implement the concepts of One Health. The ultimate goal is to create viable, interdisciplinary healthcare with the people and animals of Nicaragua and Haiti. These projects employ a translational medical approach by using current research to address priorities that impact human, animal, and environmental health in developing countries. Data was collected in Nicaragua using a Community Based Participatory Research (CBPR) model, and in Haiti clinical Chikungunya cases were studied. A major finding in Nicaragua was that the common human illnesses identified by doctors in the clinics were vastly different from individual health concerns reported by the community members. In Haiti, 16.1% of the human patients were presented with chronic Chikungunya symptomatology. These studies in human, animal, and environmental health will guide the direction of our future educational and research programs in these countries. The long term goals are to expand and develop community driven projects in Nicaragua and Haiti that remain locally affordable, sustainable, and relevant; and introduce students from multiple colleges to service programs and trans-disciplinary collaborations that will encourage future career endeavors with underserved populations.
From Concept to Assessment: Developing a One Health Learning Community

Merrideth Holub, MS1; Dr. Matthew Taylor, PhD 2

1 Texas A&M University College of Veterinary Medicine & Biomedical Sciences, College Station, Texas 77843, USA. 2 Texas A&M University College of Agriculture & Life Sciences, Animal Science Department, College Station, Texas 77843, USA

Learning communities are defined as, “explicitly designed opportunities to practice integrative and interdisciplinary learning” (Washington Center, Evergreen State College, Oregon, USA). The ability to use a unique model in this capacity is vital for future education of One Health. One Health is defined to the learners as the collaborative effort of multiple disciplines working locally, nationally, and globally to attain sustainable optimal health for the ecosystem. Combining the methodology of the learning community and One Health, and assessing the impact, is the objective of this study. The importance of exposing students to the broad concept of One Health at their freshman year of education is imperative so that they move forward the One Health concept is something they use throughout their education. The development process for an undergraduate One Health learning community is adaptable to other universities. Throughout the presentation the participants will be guided through a development process of concept, implementation, and an assessment tool for the conclusion of the learning community each semester. The undergraduate learning community offers students an opportunity to explore the One Health research, education, and outreach realm through hands-on experience and observational learning opportunities across campus through numerous colleges.

The Texas A&M University Undergraduate One Health Learning Community is constructed from a faculty member, an advisory committee, and the One Health program coordinator. This team developed a 16 week program for twenty-five students to attend one-hour weekly educational opportunities. The educational opportunities were interdisciplinary ranging from human and animal medicine, architecture, animal reproduction, water, climate change, food safety, and engineering. The assessment allowed us to complete in year two, of the program, a post survey and in year three a pre and post survey was collected. Each of these integral steps will be discussed in detail throughout the presentation. At the conclusion of the presentation, the participants will have gathered enough information to take back to their university to build a One Health undergraduate learning community.
A POTENTIAL HUMAN HEALTH THREAT FROM COW’S MILK: MICROCOCCUS SPP.

Radu M. GIUPANĂ[1], Julia Krisztina Rindt[2], Aurel VASIU[2], Mihaela NICULAE[2], Carmen Dana ŞANDRU[2], Emoke PALL[2], Constantin Gh.CERBU[2], Marina SPINU[2]

[1] Banat University of Agricultural Sciences and Veterinary Medicine Timisoara, [2] University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca Faculty of Veterinary Medicine,

Micrococcus spp. are considered normal inhabitants of mammalian skin, but can also be found on meat and dairy products, soil and water. In spite of the fact that infections due to Micrococcus species are rare, they recently became increasingly important, the bacteria being identified as a cause of different infections (folliculitis, pneumonia, cerebral cyst infection, infections of tissue surrounding prosthetic material, etc.). Usually, micrococcal infections occur at sites remote from the host defense systems, progressing to fatal systemic infections, especially in immunosuppressed patient populations. This study aimed to monitor the incidence of Micrococcus spp. in milk samples from cows with history of mastitis or with subclinical mastitis and also to evaluate the pathogenic potential of these bacteria by measuring their antibiotic resistance. Milk samples (n=116) were collected during the peak period of the lactation curve from Holstein and Simmenthal cows and were processed by classical microbiological techniques. The biochemical identification of isolated strains was performed by API Staph and specific software. Resistance/susceptibility to antibiotics was monitored by the Kirby Bauer diffusion method, using enrofloxacin (ENF), cloxacillin (OB), trimethoprim-sulfamethoxazole (SXT), oxytetracycline (OT), amoxiclav (AMC), penicillin (P), ampicillin (AMP) standardized disks.

Of the total isolated microbial strains (n=29), 24.14% were micrococci. Almost all micrococcal strains (n=5 of 7, 71.43%) were resistant (n=2, 40%) or partially resistant (n=3, 60%) to at least one of the antibiotics while two of the strains (28.57%) were sensitive to all antibiotics used. All strains were sensitive to OB (33.43±6.88 mm inhibition diameter). Total resistance appeared to towards broad spectrum antibiotics such as ENF and OT. In the strains showing total sensitivity, P was the most efficient (44.0±2.0 mm). Resistant collonies were observed in case of one (14.29%) to 5 antibiotics (71.43%), depending on the strain. The results indicate that milk from cows with subclinical mastitis represented a food source with increased micrococcal infectious potential, due to the number and high antibiotic resistance of the isolated Micrococcus spp. strains.
Effect of Carbendazim on the reproductive biology and some organo-somatic indices of female African Cat fish.

1Aina O. O, 1Ozegbe P. C, 2Adeyemo O. K.

1Department of Pathology, University of Ibadan. 2 Department of Veterinary Public Health and Preventive Medicine, University of Ibadan, Nigeria.

Carbendazim is a commonly used systemic fungicide for planting and post-harvest storage purposes. Its 6-12 months average half-life in soil makes it a high risk pollutant to water bodies and subsequent bioaccumulation in aquatic species. African Cat Fish (Clarias gariepinus) is a widely cultivated specie in Nigeria which is considered a delicacy and makes up for animal protein source. Hence the effect this pollutant will have from possible bioaccumulation on reproductive biology and organo-somatic indices of the above named fish species was investigated in this study. 30 juvenile female African catfish were randomly divided into two water tanks, control and carbendazim treated. Fish samples were taken from both groups by days 7 & 14 and then euthanized. Blood samples were taken for hormonal assay while organs such as gonads, brain, spleen and liver were harvested, weighed and processed for histology. Data obtained were analysed using two-way ANOVA test, presented as mean ± SEM with P value of <0.05 considered significant. Organo-somatic indices showed that renal, spleen and brain tissues of Carbendazim-treated group at day 14 were significantly reduced (P˂ 0.05) compared to the control. Histopathology of tissues harvested showed no visible pathology except the absence of final maturation stages i.e Vitellogenic stage in the ovaries of Catfish group in carbendazim treated water at both days. There was a concurrent significant reduction in plasma level of Vitellogenin hormone at day 7 and 14 of the experiment while oestrogen plasma concentration were only significantly reduced at day 7 in the treated group. In summary, environmental exposure to carbendazim pesticide could negatively impact this species by causing hormonal disruption, arrest of reproductive development and reduction in organ weight. There might be a risk of sub-lethal exposure to humans through frequent consumption. This could result in bioaccumulation with possible organo-somatic and reproductive changes. Further steps needs to be taken to investigate correlations between carbendazim exposed fish and likely resultant effects in the mammals that consume them. Also, the tropho-static feature seen in the fish viscera organs might be reproducible in other species.
RHODOCoccus EQUI: A POTENTIALLY EMERGING PATHOGEN FROM WILDLIFE?
FIRST REPORT ON PRESENCE IN ROMANIAN WILD BOARS

Dan Alexandru Nagyi1, Marina Spinu1, Lucjan Witkowski2, Jaroslaw Kaba2, Carmen Dana Sandru1, Gh. Florinel Brudasca1

1 Department of Infectious Disease, University of Agricultural Sciences and Veterinary Medicine, 2 Division of Infectious Disease and Epidemiology, Department of Large Animal Disease with the Clinic, Faculty of Veterinary Medicine, Warsaw University of Life Science.

In the last decades, numerous emerging and re-emerging microbial and parasitic agents causing zoonotic infections were subject to extended research. Rhodococcus equi, an intracellular bacteria, is a soil saprophyte and also a well-recognized animal pathogen, causing infection in animals, usually in young foals. Meanwhile, R. equi proved to be an emerging opportunistic agent in immunosuppressed human hosts, such as immunodeficiency virus infected patients causing pneumonia in two-thirds of the cases. In previously studies, the presence of Rhodococcus equi was demonstrated in feces and tissues from contaminated wild animals. This study described the isolation of Rhodococcus equi from sub-mandibular lymph nodes of free-range wild boars (Sus scrofa)(n=65) from different regions of Romania. The samples were first cultivated by classical microbiological techniques and the isolates were then identified as R. equi by their phenotypic properties. Further, the isolated strains were investigated by PCR to identify the plasmidic genes (VapA) associated with virulent R. equi. Three samples of 65 (4.62%) were positive for R. equi, 3 strains being isolated. Out of these, 2 (66.66%) were positive for the virulence plasmid (VapA) while one was classified as a vapA, vapB negative genotype. The results indicated that wild boars could represent an intermediate source of infection and/or contamination with virulent R. equi strains for environment, animals and also humans from certain risk categories (hunters, veterinarians, game meat consumers, etc.). This was the first report on the presence of R. equi in wild boars from Romania.
Antimicrobial susceptibility of the most common bacterial pathogens isolated from humans, dogs and cats from Porto, Portugal.

Mendes, Â.;1 Batista, A.;1 Martins, A.;1 Bessa, L.;1 Carvalho, H.;2 Pereira, P.;3 Ramos, H.;3 da Costa, P.1


Antimicrobial resistance is one of the most important challenges requiring a Global “One Health” approach. All sectors of society should join efforts to implement holistic and effective surveillance systems for antimicrobial resistance in humans, animals and environmental sources. A retrospective analysis of antimicrobial susceptibility findings of the most common bacterial pathogens isolated from dogs and cats between 2010 and 2014 was performed using the database of CEDIVET (veterinary diagnostic laboratory) and the results were compared with those obtained from humans in a central hospital of Porto. The bacterial specimens were identified and tested for antimicrobial susceptibility using an automated system. During the study period, 4772 microbiological analysis of samples obtained from dogs and cats were processed. Approximately one-quarter of the samples were urine (26.9%; n=1284) and another quarter were ear exudates and skin lesions (24.2%; n=1156). Among clinically significant isolates (32.3%; n=1542), the most common were Escherichia coli (24.4%; n=377), Staphylococcus aureus (19.1%; n=295), Pseudomonas aeruginosa (18.0%; n=277) and Proteus mirabilis (10.8%; n=167). The average percentages of non-susceptible (intermediate and resistant) isolates to the most used antimicrobials were the following: - amoxicillin/clavulanic acid (43.1%); - ciprofloxacin (27.1%); - gentamicin (13.7%); and, - trimethoprim-sulfamethoxazole (36.5%). For the main antimicrobial drugs, the prevalences, with 95% confidence limits, of non-susceptible isolates obtained from animals were closely related with those isolated from humans. However, some remarkable differences were identified, including the following:

- A higher proportion of non-susceptible E. coli to aminopenicillins in humans, contrasting with the higher proportion of isolates displaying resistance or intermediate susceptibility to amoxicillin combined with beta-lactamase inhibitors in animals.
- A higher proportion of non-susceptible S. aureus and P. aeruginosa to ciprofloxacin in humans;
- More than a double proportion of methicillin-resistant S. aureus in humans compared to animals.

Besides the valuable information regarding the prevalence of antimicrobial resistance among clinical isolates obtained from animals, this study highlights the need to assess its epidemiology taking into account (i) the selective pressure exerted in different host environments, (ii) the host range of species and isolates included in this study, and (iii) the intermingled ecological niches in which they circulate.
Texas A&M University One Health Program: Making a Difference

Rosina C. Krecek1, Mike Chaddock2, Merrideth Holub1, Audra Wilburn1, Ruth L. Bush3, Seth J. Sullivan4, Eleanor M. Green1

1 Texas A&M University College of Veterinary Medicine & Biomedical Sciences, College Station, Texas 77843, USA. 2 Michigan State University, College of Veterinary Medicine, East Lansing, MI 48824, USA. 3 Texas A&M Health Science Center, College of Medicine, Texas A&M University, College Station, TX 77807, USA. 4 Texas A&M Health Science Center, College of Medicine, 800 Scott and White Drive, College Station, TX 77845, USA

The Texas A&M University One Health Program was established in 2012 under the leadership of Dean Eleanor Green at the College of Veterinary Medicine & Biomedical Sciences and of Dean T. Samuel Shomaker, College of Medicine. This program soon spread across the university, and One Health was adopted as one of six Texas A&M Grand Challenges. A Texas A&M One Health Campus Council was formed to steer this initiative with participation from all university schools and colleges. This Council serves as an advisory body and promotes transdisciplinary One Health research, education, and outreach programs. In 2014, the university-wide One Health research program identified four major themes, and invited faculty from across the university to form interdisciplinary collaborative teams and submit transformative research projects. Of 23 project proposal submissions, four were selected and funded by the Texas A&M Vice President for Research and all schools/colleges.

The educational and outreach areas of this program include: teams of diverse disciplines working in Nicaragua, participation in exchange programs between our institution and others (e.g., University of California Davis and University of Florida), an undergraduate learning community, and learning opportunities with One Health professionals in governmental agencies in Washington, DC (e.g., Federal Drug Administration’s Center for Veterinary Medicine, and United States Department of Agriculture National Institute of Food and Agriculture). In addition, our students have established a Student One Health Association (SOHA) that embraces all Texas A&M undergraduate, graduate, and professional students, across all disciplines on campus.

The Texas A&M University One Health Program is making a difference. It is one of the first to engage all disciplines of its institution’s colleges and schools; whose students established a university wide association that includes all levels of students; and to facilitate multidisciplinary research teams comprising diverse disciplines and colleges across the campus.

The Texas A&M One Health program invites those who share a common vision, who are ready to attain sustainable optimal health for the ecosystem, and create high-impact research, education and outreach opportunities to contact us.
One Health Workshop, 26th February - 3rd March 2015

Skander Essafi, Ella Frau and Kornelia Jaceviciute
International Federation of Medical Students Associations (IFMSA)

One Health is a new concept of healthcare that is spread and implemented in the education of students more than ever before. Students who are aware of One Health develop a more efficient and comprehensive approach towards their subjects, whether it is human or veterinary medicine, and can therefore act upon that knowledge in a way that will benefit them and the society as a whole. Capacity Building within the students community is one of the strongest examples of One Health promotion (workshops, lectures, campaigns...), especially in occasion of international meetings, and empowerment to carry those events out on a local level. Recently, and for the first time, a One Health Workshop took place before the 64th General Assembly of the IFMSA, for the medical students by veterinary and medical students and professionals. The main objective of this workshop was to introduce medical students to basic and in-depth principles of One Health as well as promote interprofessionalism and enhanced communication between the main actors involved in One Health. Among many topics discussed, particular attention was put on the subject of Antimicrobial Resistance, Zoonotic Diseases and One Health initiatives development. Moreover, a focus is brought on bonds between the main principles of One Health such as environment - animals, and environment - human health. Through different practical exercises and activities such as a One Health Role Play or Disease Outbreak Simulations participants are able to have a more memorable and clarifying experience of the internal workings and basic communication with actors in regards to this multi-disciplinary and unifying concept of health.

Experiences of One Health in this workshop is that students acquire the knowledge, skills and empowerment to go back to their home countries and share this with their peers, as well as developing projects in collaboration with other healthcare students and professionals, further spreading this upcoming concept of all inclusive health.
One Health” master program as opportunity to improve cooperation and building capacity in interdisciplinary approaches and solutions for consumer health and protection in developing Western Balkan countries

Seric-Haracic S.a, Fejzic N.a, Hodzic A.a, Cavaljuga S.a, Bokonjić D.b, Hamidi A.c, Latifi F.c, Ramadani N.c, Faustino A.d, Gomes Neves E.d, Starič J.e, Juricic M.e, Martin Castillo M.f Nogueras Mas M.f, Sala V.g, Grieco V.g

aUniversity of Sarajevo; bUniversity of East Sarajevo; cUniversity of Prishtina; dInstituto de Ciências Biomédicas Abel Salazar-Universidade do Porto; eUniversity of Ljubljana; fUniversitat Autonoma de Barcelona, gDepartment of Veterinary Science and Public Health - Università degli Studi di Milano

One Health (OH) is advocated as sound solution for current increasing interdependencies between environment, human and animal health. In line with many OH initiatives worldwide is effort to create OH master program that will run simultaneously on several Universities in Western Balkan (WB) countries. This the aim of project 544182-TEMPUS-1-2013-1-IT-TEMPUS-JPCR (Public Health in the Western Balkans – Improvement in the field of Public Health and development of a “One Health” Educational and scientific architecture in Western Balkan Countries). During project, questionnaire survey of stakeholders in public health sectors in selected WB countries (Bosnia and Herzegovina, Kosovo) was done. Here the report of the survey, particularly regarding self-assessed proficiency of health workers (animal and human) and most priority training needs within the OH framework.

Targeted respondents were veterinary and medicine professionals working in faculties, government bodies, institutes, primary health care as well as senior year veterinary and medicine students. Survey responses were appropriately balanced between countries, veterinary and medical professions, gender and predefined age categories.

Average respondent dealing with animal or human public health most commonly deals with variety of tasks, most frequently with food safety and epidemiological surveillance. Respondents working predominantly on these tasks view their relevant skills as adequate. However, concern rises for self-evaluated competency in respondents occasionally involved (in case of an incident). Only 15,7% of respondents were familiar with OH concept. We investigated intensity of previous formal and informal education in contrast to current needs for training for following groups of public health disciplines:

- epidemiology, prevention and control of zoonoses,
- occupational health,
- hygiene and quality of food,
- health economics and
- public health management.

Our results show that less extensive training in public health disciplines during previous education does not automatically translates to most currently required training needs in the region. Even though most of respondents were interested in one year OH master program in domicile/neighboring country, only 14,3% (20) scaled perceived individual benefits to be sufficient for them to finance entire costs.
Antimicrobial resistance patterns of E. coli isolated from bovine mastitis

Mihaela Niculae, Enoke Pall, Carmen Dana Şandru, Anamaria Ioana Paştiu, Constantin Ioan Mateş, Constantin Cerbu, Radu Giupană, Marina Spînu

University of Agricultural Sciences and Veterinary Medicine, Faculty of Veterinary Medicine, Calea Mănăștur Street no 3-5, 400372, Cluj-Napoca, România

Escherichia coli is described as one of the most important pathogens in the aetiology of bovine mastitis, a pathology leading to significant financial loss to the dairy industry. Currently, the use of antimicrobials (both intramammary and parenteral – administered) in case of E. coli mastitis treatment is controversial and one of the most important consequences of the antimicrobial therapy is represented by the emergence of the antimicrobial resistance. The purpose of present study was to evaluate and characterize the antimicrobial resistance level of Escherichia coli strains isolated from dairybovine.

Material and method. 270 samples of mastitic milk collected from two Transylvanian farms were analyzed by classical microbiological methods, with the isolation of bacterial strains on a selective agar (Brilliance™ E. coli/coliform Selective Agar, Oxoid), while the in vitro susceptibility towards 11 antimicrobial drugs was investigated using Kirby-Bauer method according to CLSI guidelines.

Results and conclusions. The results pointed out antimicrobial resistance for all 46 isolated E. coli strains, involving several active substances of the commercial products recommended for bovine mastitis: penicillins, aminoglycosides and tetracyclines. The highest resistance was observed against novobiocin/neomycin/penicillin/ dihydrostreptomycin combination (82.6%), penicillin/streptomycin/neomycin combination (73.91%), tetracycline/ampicillin (65.21%), followed by lincomycin/neomycin (58.69%); lower resistance to ampicillin/cloxacin combination (34.78%) and amoxicillin/clavulanic acid (28.26%), respectively. Multidrug resistant phenotypes (resistance to more than 4 antimicrobials) was recorded for 18 isolates (36.95%). The number of the antimicrobials active against E. coli strains was limited and included only fluoroquinolones (enrofloxacin, marbofloxacin) and cephalosporins (cefquinome, cefoperazone).

Conclusion: The existence of multiple antimicrobial resistance underlines the need of monitoring the E. coli resistance profiles and the importance of rational use of antibiotics.

Acknowledgements: This research was published under the frame of European Social Fund, Human Resources Development Operational Programme 2007-2013, project no. POSDRU/159/1.5/S/136893.
Taenia solium (pork tapeworm) and T. saginata (beef tapeworm) cysticercosis (CC)/taeniosis are zoonoses of public health importance, with significant economic impacts on the health and meat (pork and beef) sectors within and outside the EU. Despite increased research efforts, an important number of gaps remain. For more than one third of the member states, data on occurrence of porcine/bovine/human CC and taeniosis are missing. Many questions remain on transmission dynamics, infection development/course and clinical manifestations. An improved knowledge on host-parasite interactions will create opportunities for new diagnostic targets, and vaccine candidates.

The COST Action TD1302 CYSTINET is a European multi-disciplinary scientific network with the aim to advance knowledge and understanding of the taeniosis/cysticercosis zoonotic disease complexes. The main objective of this Action is to build a strong, extensive, multi-disciplinary scientific network to induce sustainable collaborations with the aim to advance knowledge and understanding of these zoonotic disease complexes. Specific objectives include the development of innovative diagnostic and cost-efficient control tools, assessments of disease burden and economic impact, as well as the development of harmonized reporting and management procedures. Intra-European collaboration is essential to stop the development of these diseases within the EU and the threat of importing the disease back into EU. The Action is aimed at both European economical/societal needs and scientific/technological advances. The network will also aim to improve the communication/collaboration between the different sectors (Medical, Veterinary, Social, Water and Sanitation...), provide information/recommendations to public authorities, advocate with stakeholders and funding agencies within and outside the European Union and provide support to other Cysticercosis Working Groups in endemic areas.
Antimicrobial resistance of Yersinia enterocolitica in Europe

Suvi Joutsen, Maria Fredriksson-Ahomaa, Pilar Ortiz Martínez, Hannu Korkeala

Department of Food Hygiene and Environmental Health, Faculty of Veterinary Medicine, University of Helsinki, Helsinki, Finland

In recent years there has been increasing concern over antimicrobial resistance. Use of antimicrobials in food animal production has raised the question whether the resistance problem is developing further in farms. In this work we studied the antimicrobial resistance of human pathogenic Yersinia enterocolitica bioserotype 4:O3 strains, which had been isolated from pigs in Europe.

Antimicrobial resistance patterns for 13 antimicrobials of 1017 Y. enterocolitica bioserotype 4:O3 strains were studied with the broth microdilution method on VETMICTM plates. The strains were isolated from pigs in nine European countries (Belgium, England, Estonia, Finland, Germany, Italy, Latvia, Russia and Spain) between 1999 and 2005. Furthermore, the presence of beta-lactamase gene blaA was investigated with real-time PCR method from strains susceptible or intermediately resistant to ampicillin.

The antimicrobial resistance profiles of Y. enterocolitica 4:O3 strains varied widely between countries. All strains were susceptible to cefotaxime, ciprofloxacin, florfenicol, gentamicin and kanamycin, while resistance to ampicillin and streptomycin was found in every country. Low levels of antimicrobial resistance of Y. enterocolitica strains to other antimicrobials than ampicillin were found in Estonia, Finland, Latvia and Russia. The highest antimicrobial resistance levels were found in Italian and Spanish strains. Almost all of Spanish strains and more than half of Italian strains were resistant to at least three antimicrobials. Resistance against nalidixic acid was found in 10 % of Spanish strains. All strains susceptible or intermediately resistant to ampicillin were carrying the blaA gene.

These results indicate that in certain parts of Europe pork production may be a source of resistant Y. enterocolitica, which may cause a public health hazard. As Y. enterocolitica is frequently isolated from pork and meat products made of pork, contaminated pork products may be a remarkable vector of transmission of antimicrobial-resistant strains to humans in countries with high resistance levels. Resistant Y. enterocolitica strains may complicate the potential medication of the most severe human yersiniosis infections.
Network for Evaluation of One Health (NEOH) – working together to evaluate One Health

Houda Bennani1, Karin Artursson2, Margarita Martín Castillo3, Vlatko Ilieski4, other NEOH consortium members, Barbara Häslер1,5

1 Royal Veterinary College, Hatfield, United Kingdom. 2 National Veterinary Institute, Uppsala, Sweden. 3 Universitat Autònoma de Barcelona, Bellaterra, Spain. 4 Faculty for Veterinary Medicine, Skopje, FYR Macedonia. 5 Leverhulme Centre for Integrative Research on Agriculture and Health, London, United Kingdom

The importance of zoonoses has prompted experts and decision makers to look for holistic approaches that integrate health considerations of humans, animals and ecosystems in order to get a better understanding of their complex dynamics and to reduce national and global health risks. The “One Health” concept acknowledges this complexity and proposes the need for interdisciplinarity, in particular between natural and social sciences working in human and animal health sectors and with people involved in sustainable environments to alleviate and mitigate the health risks to the global community.

Several projects are working with this concept at the national, regional and global level and in general there is a consensus about the value of one health but there is a lack of evidence including metrics and associated methods to estimate One Health benefits in a systematic way. The new EU COST funded “Network for Evaluation of One Health” (NEOH, http://neoh.onehealthglobal.net/) aims to address this gap by bringing together researchers from all over Europe and associated partner countries from other parts of the world with the aim to elaborate approaches for quantitative evaluations of One Health activities and further the evidence base by developing and applying newly developed protocols.

An overview of NEOH will be presented explaining the different objectives, the strategy and the expected outcomes. The project is divided into four working groups (WG). The main objective of WG1 is the development of a standardised framework for the evaluation of One Health initiatives, an index and a protocol. In WG2, the framework, index and protocol developed will be applied to different one health initiatives. A meta-analysis of the available case studies will be conducted as a part of WG3, while WG4 is responsible for seeking a dialogue with national governments, NGOs, research organisations, and industry throughout the project. Activities include regular meetings, training schools, short term scientific missions, workshops and dissemination activities. The network is open for anybody to join with an interest in evaluation and/or One Health aspects.
Human-Animal-Ecosystem interaction during a natural disaster

Fabrizio De Massis, National Reference Centre for Veterinary Urban Hygiene and non-Epidemic Emergencies (IUVENE) - Italy

As a consequence of growing world human and animal populations and the rapid environmental changes, the interactions between human, animal, and environmental health are becoming more and more challenging to identify and to manage. Animals and humans share together the risks related to changing environments and the burden of this interdependence becomes clearly evident during natural disasters. Hydro-meteorological disasters such as destructive sudden rains, intense tropical storms, repeated flooding, tsunamis and droughts are responsible for a huge proportion of losses in large areas. Earthquakes, volcanic eruptions and the release (voluntary or not) of chemical or radioactive contaminants may also occur in a small or medium scale although they may assume a recurrent shape, so to periodically affect livelihoods and consequently hamper a sustainable economic development. In any case, the consequences of many disasters are made worse by poor natural resource management and by the degradation of the ecosystem due to human interventions. Human and animal population growth, urbanization and economic development entail accumulated risk and increasing potential for human, animal and economic losses. In particular, disasters are having a steady growing impact due also to the increasing number of people, animals and properties that are more and more located in areas at high risk of a catastrophic event. While a good emergency response system could save lives (human and animal) and properties, many of these losses can be reduced or even avoided if appropriate policies and programmes are implemented to prevent the causes of disasters and to plan in advance integrated preparedness and response actions. In this context, the objectives of veterinarians are really challenging, starting from the safeguard of animal health and welfare, passing through the contribution to the protection of human and environmental health, coming to the provision of their contribution in restoring the economical and social conditions. However, the components involved in disaster management are diverse and they should give an organised response with a multidisciplinary approach. In particular, human and animal health professionals should enhance intersectorial collaboration to increase the efficiency and effectiveness of health strategies to be implemented during a natural disaster. The relationships between human, animal, and ecosystem health and public health during a natural disaster and the challenges and opportunities that these interactions may present are discussed.
Henipavirus persistence in sympatric fruit bat colonies in Ghana

RIESLE SILKE1,2,3, SARGAN DAVID1, WONG LOUISE2, BAKER KATE4, PEEL ALISON1, BRODER CHRIS5, AMPONSAH-MENSAH KOFI3, SUU-IRE RICHARD3, NTIAMOA-BAIDU YAA3, CUNNINGHAM ANDREW2, AND WOOD JAMES1

1University of Cambridge, Department of Veterinary Medicine, Disease Dynamics Unit, Cambridge, UK; 2Institute of Zoology, Zoological Society of London, London, UK; 3University of Ghana, Centre for African Wetlands, Accra, Ghana; 4Wellcome Trust Sanger Institute, Hinxton, UK; 5Uniformed Services University, Maryland, USA; sasr3@cam.ac.uk

In recent years bats have been shown to serve as reservoirs for a multitude of infectious agents (Calisher, Childs et al. 2006), such as: Lyssaviruses (Banyard, Hayman et al. 2011), Coronaviruses (Li, Shi et al, 2005), Henipaviruses (Hayman, Suu-Ire et al. 2008), and Filoviruses (Leroy, Kumulungui et al. 2005). As surveillance and research on infectious diseases increases, so does the number of emerging viruses found in bat species (Weiss, Witkowski et al, 2012; Baker, Leggett et al, 2013; Tong, Zhu et al, 2013; Drexler, Geipel et al, 2013). Henipaviruses are widespread in South East Asia in Pteropus bats. In Sub Saharan Africa, Eidolon is a reservoir of henipaviruses as it has a high seroprevalence and its migration covers much of the continent. Eidolon is known to roost in close proximity with other fruit bat species in Ghana, in particular with Epomophorus gambianus, a species of interest as it is widely distributed in both rural and urban regions of the country. The aim of this study is to understand the maintainance of these viruses among populations of fruit bats. In doing so, 4 colonies with up to 400 km of distance between them, are being serosurveilled four times yearly. Epomophorus is present in all of them, co-roosting with either Eidolon or/and Rousettus aegyptiacus. Seroprevalence analysis is performed with a Luminex multiplexing assay, validated previously (Baker, 2012). Genetic connectedness of Epomophorus populations will be assessed with genetic analysis (Peel, Sargan et al, 2013); mtDNA and microsatellite markers have been selected from an Ilumina high-throughput sequencing platform (Castoe, Poole et al, 2012). Both the seroprevalence and gene flow analysis will help understand transmission dynamics and connectivity of Epomophorus across colonies and regions of Ghana.
Prevalence and antimicrobial profile of Campylobacter isolates from chicken meat during a 6-year survey

Economou V.1,2, Zisides N.1, Gousia P.1, Petsios S.1, Sakkas H.1, Soultos N.2, Papadopoulou C.1

1 Food-Water Microbiology Group, Department of Microbiology, Faculty of Medicine, School of Health Sciences, University of Ioannina, Ioannina, Greece. 2 Department of Hygiene and Technology of Foods of Animals Origin, Faculty of Veterinary Medicine, School of Health Sciences, Aristotle University of Thessaloniki, Thessaloniki, Greece.

Campylobacter spp. is one of the most common causes of enteritis in humans and also is implicated in extra-intestinal infections. The Campylobacter infection has been linked to the consumption of raw or undercooked poultry meat. The present study aimed to investigate the prevalence of Campylobacter spp. in the meat of free-range and conventional farming broilers and to assess the respective antimicrobial susceptibility of the isolates. Three hundred and sixty nine fresh chicken meat samples were collected from different farms at slaughter (60 from free-range poultry farms and 309 from conventional farms) in North-Western Greece, an area in which almost half of the broiler population in Greece is being bred. The detection of Campylobacter was performed using the enzyme linked fluorescent assay kit VIDAS CAM and the mini-VIDAS automated immunoassay analyzer (BioMérieux S.A., France), while for isolation CampyFood and Columbia blood agar plates were used. Susceptibility tests against 12 antimicrobials (amikacin, gentamicin, imipenem, cefamandole, cefotaxime, ceftoxitin, imipenem, erythromycin, ampicillin, amoxicillin – clavulanic acid, ciprofloxacin, tetracycline) were performed. Campylobacter spp. (C. jejuni, C.coli and C. lari) was isolated from 91 (29.4 %) of the free-range and from 106 (28.7 %) of the conventional farming chicken meat samples. The annual incidence of Campylobacter spp. among the free-range and conventional broilers was not statistically significant. However, a reducing trend was observed in the overall prevalence of Campylobacter spp. from 2005 to 2010. Variable resistance rates were observed towards the tested antimicrobials: erythromycin (76%), tetracyclines (71%), ampicillin (66%), ciprofloxacin (51%), cefamendole (41%) ceftoxitin (27%), amikacin (15%), and cefotaxime (5%). No differences were observed in the antimicrobial susceptibility of isolates from free-range and conventional farming samples. Contrary to the widespread belief of free-range poultry being more contaminated with pathogens compared to conventional farming poultry, in the present survey no such evidence was found for Campylobacter spp. The decreased incidence of Campylobacter spp. from 2005 to 2010 is most likely due to the increased biosecurity measures applied at farm level, Conclusively, the exhibition of marked resistances of the Campylobacter spp. isolates calls for advanced vigilance concerning the prudent use of antimicrobials in the food-producing animals.
Monitoring 137Cs activity in mosses at the city of Ioannina, north-western Greece, attributed to increased wood combustion for heating following the financial crisis.

K. G. Ioannides1, M. Alexandropoulou1, S. Petsios2, K. Stamoulis1, C. Papachristodoulou1, C. Papadopoulou2

1 Department of Physics, School of Sciences, University of Ioannina, 45110 Ioannina, Greece
2 Food-Water-Environmental Microbiology Group, Faculty of Medicine, School of Health Sciences.

137Cs activities in mosses collected at the city of Ioannina in north-western Greece were measured to monitor radioactivity released in air from the combustion of biomass fuels. Mosses are considered as excellent biomonitors of radioactive contamination from both natural and artificial sources. The ongoing financial crisis, which hit Greece after 2009, amongst other implications, has led the inhabitants of the Greek cities to abandon oil for domestic heating since its price rose 30% following over-taxation. Many consumers turned to cheaper wood, used in raw or in processed form due to lower tax. The combustion of wood has led to the deterioration of urban air quality during winter. Among the pollutants released in the atmosphere is the long-lived radioactive isotope 137Cs, which was a major component of the fallout from the Chernobyl accident in 1986, when it was introduced into the forest ecosystems of Europe. During a two winters period (2014 and 2015) samples of about 40 g dry weight of mosses were placed into cylindrical plastic containers and were measured using a broad energy range HPGe detector (Canberra BE3825) with a relative efficiency of 28%, and an energy resolution of 1.9 keV at 1.33 MeV. The activity concentration of 137Cs in mosses collected in the city-center of Ioannina ranged from 7 to 140 Bq/kg. The results evinced that the average activity concentration of 137Cs in mosses collected in the center of the city during 2014 was approximately three times greater than the corresponding concentration in mosses collected from the outskirts of the city. A less pronounced difference was observed in 2015. These differences are attributed to increased 137Cs air radioactivity concentrations during the winter months. The presence of 137Cs in the air indicates the presence of excess wood smoke particles which are been associated with a range of negative health effects including increased morbidity and mortality from pulmonary and cardiovascular diseases. Also, recently the International Agency for Research on Cancer (IARC) classified indoor emissions from household combustion of biomass fuel (mainly wood) as probably carcinogenic to humans.
The WVA/WMA would like to thank very much the A.M.A. insurance company for the great contribution to the organization of the One Health Conference and for the support of the Spanish health professionals.

A.M.A. is specialized in providing insurance services to health sector professionals (physicians, veterinarians, pharmacists).