

4th

ONE HEALTH

INTERNATIONAL CONFERENCE

Edited By:

Muhammad Fiaz Qamar
Ishtiaq Ahmed
Syed Ehtisham-Ul-Haque
Amar Nasir
Muhammad Arshad
Muhammad Farooq
Abdur Rahman Ansari
Shaista Abbas
Ahmad Yar Qamar
Komal Khan



**HEALTH
FOR ALL
24-25th
NOV 2022**



The Chancellor's Message, UVAS, Lahore

This is a splendid privilege and opportunity for me to welcome you all to the “4th One Health International Conference 2022 (OHIC). One Health is a collaborative approach that enterprises focus on individuals’ every day life globally, with the goal of achieving optimal health and well-being of people, animals, and their environment. Now-a-days, reducing and ultimately eliminating health inequalities, have become an important policy objective in many countries as no one should be left without the resources needed to be healthy.



Likewise, our vision is ‘A World cohesive against infectious diseases’. Infectious disease remains one of the world’s greatest threats to human and animal life, the environment, local communities and economies. We want to enable you to use your local knowledge and relationships to prompt disease detection and early response.

Addressing the problems threatening health of humans, animals and the environment and removing the obstacles in this area, is a complex and challenging task. International collaboration has become an essential part of the comprehensive strategies that are adopted in this context. To be effective and sustainable, interventions for this purpose should be through collaboration across different policy and program sectors at the international level. Research evidence and experiences of practitioners can increase awareness of the major opportunities that exist to protect public health through policies aimed at preventing and controlling pathogens at the level of animal populations and at the interface between humans, animals, and their surrounding environment.

Therefore, a clear need for countries to have the capability and capacity to maintain an effective alert and response system to detect and quickly react to outbreaks of international concern, and to share information about such outbreaks rapidly with responsibility. Some critical questions call for answers within this framework. What kinds of inter-sectoral collaboration, and to what ends? What success conditions and enablers are needed to realize the potential of inter-sectoral collaboration? How can effective and responsive collaboration address complex social problems and contribute to reducing health inequalities? To find answers of such type of questions, I hope this scientific meeting (OHIC) will be benefiting you and constructive for a better and more equitable “One health” concept.

Thanks.

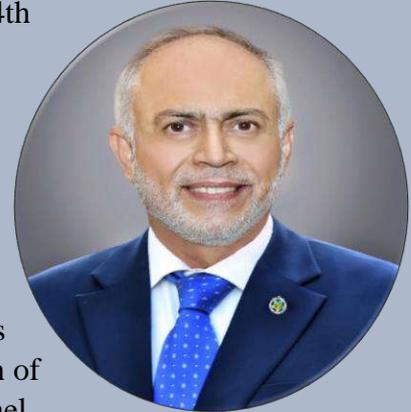
The Chancellor, UVAS, Lahore (Pakistan), November 24th and 25th, 2022

Muhammad Baligh Ur Rehman

(4th One Health International Conference)

The Vice Chancellor's Message, UVAS, Lahore

It is indeed a great pleasure to say a few words regarding the 4th International Conference on One Health organised by College of Veterinary and Animal Sciences (sub-campus UVAS), Jhang in November 2022. Let me welcome all of you and thank you for taking part in the conference. This conference is not only designed to improve the knowledge among health professionals, but more importantly to exchange information and discover new solutions to the health issues. After few years of lockdown due to corona virus (COVID-19) pandemic, inception of this conference is an excellent opportunity for face-to-face interaction of participants and I am seeing it as some light at the end of the tunnel.



I think it will provide a leading interdisciplinary platform for researchers, practitioners, and educators to present and discuss the most recent innovations, trends, concerns and policy as well as practical challenges encountered and solutions adopted in the field of One-Health. I also hope that there will be collaboration and open dialogue between participants to improve research, education, healthcare, and policy outcomes. Participants will deliver their latest research in many of the areas and hope that we will share and discuss our research findings. This will not only highlight the importance of one health, but also the weaknesses of the health care systems. I encourage the practitioners to work together to achieve better health outcomes by establishing a unique network using this conference as a platform.

This is one of the premier conferences on one health and it is hoped that the participants will take full advantage of making new networks to do better research and address the challenges of the new era. I am sure all of you will enjoy the variety of speakers in the conference and will take back a wealth of information. It is my earnest wish that you make the best use of the conference to enjoy and meet people from different cultures as well. Let me also thank the organising committee for all the hard work in getting the conference organised.

Have a good time. Thank You.

The Vice Chancellor, UVAS, Lahore (Pakistan), November 24th and 25th, 2022

Professor Dr. Nasim Ahmed

Patron in Chief (4th One Health International Conference)

The Patron/Principal's Message, CVAS, Jhang

On behalf of the Committee of the 4th International Conference on One Health 2022 (OHIC 2022), I would like to extend a warm welcome to all the distinguished guests, keynote speakers, and participants to this 2-days international conference (24-25 November, 2022). I take this opportunity to thank everyone for making time to participate in this congregation. Previously, the conferences were virtual for few years, not allowing for real human interface and connectivity, and enjoying the warmth and hospitality of the host nations. Now that we have become used to becoming virtual humans, let's not forget the importance of face-to-face interaction.



OHIC 2022 is the oncoming event of the successful conference series focusing on One Health. The scientific program focuses on current advances in the research, production and use of Medical Science with particular focus on its role in controlling diseases affecting both human and animals' health. The conference's goals are to provide a scientific forum for all international prestige scholars around the world and enable the interactive exchange of state-of-the-art knowledge. This meeting will focus on evidence-based benefits proven in clinical trials and scientific experiments for creating a platform for knowledge sharing and collaboration, and above all, finding solutions to major health challenges of the world to achieve better health outcomes by establishing a unique health network.

The conference will bring together leading academic scientists, researchers and scholars in the domain of interest from around the world. This will provide tremendous opportunity for networking with researchers from various countries and sharing research work in an increasingly critical and congested one health arena. The synergism achieved will advance health care for the 21st century. If properly policy implemented, it will help protect and save untold millions of lives in our present and future generations.

For making real effort to connect all of us through this conference, I must thank the conveners and their hard-working teams for their tremendous work in putting together an inspiring international conference and getting people across the globe to meet and share their knowledge and invaluable experiences. My gratitude to our UVAS and CVAS family, for making sure that the conference is on track.

I wish all the very best.

The Principal, CVAS, Jhang (Pakistan), November 24th and 25th, 2022

Professor Dr. Muhammad Fiaz Qamar

Patron/Chief Organizer (4th One Health International Conference)



Abstract Book 4th International One Health Conference 2022

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PROGRAMME SCHEDULE, 4th-ONE HEALTH INTERNATIONAL CONFERENCE

Inaugural Session:24-11-2022, 9:00-9:30 am

Venue: Conference Hall, First floor, Academic Block, CVAS, Jhang

Events of the One Health International Conference (OHIC)		Time	
Registration, sitting of participants and sign-in call for online guests		8:00-9:00 am	
Inauguration and formal welcome of guests		9:00-9:30 am	
<u>Session-I: Physical session (9:30 am – 12:00am, 24-Nov-2022)</u>			
Session Chair: Dr. Muhammad Farrukh Tahir, HOD Biochemistry, University of Jhang			
Co-Chair: Dr. Tariq Hussain, Associate Professor, Pharmacology and Toxicology, CVAS, Jhang			
Moderator: Muhammad Usman Siddique, Lecturer Microbiology			
	Speaker	Topic	Time
1.	Aqsa Mumtaz/ Mazhar Abbas Department of Basic Sciences, University of Veterinary and Animal Sciences, Lahore (Jhang Campus). mazhar.abbas@uvas.edu.pk	Exposure of lead contaminated environment-an unusual cause of hepatotoxicity	09:30-9:50 am
2.	Syed Ehtisham-ul-Haque Department of Pathobiology, University of Veterinary and Animal Sciences, Lahore (Jhang Campus). ehtishamsyed@uvas.edu.pk	Evaluation of in-vitro efficacy of cranberry extract against uropathogenic bacteria isolated from dogs	9:50-10:10 am
3.	Shanza Khan Department of Pathobiology, University of Veterinary and Animal Sciences, Lahore (Jhang Campus). 2020-mphil-2183@uvas.edu.pk	Characterization of immunogenicity, duration of protection, and safety studies in bovines immunized with <i>Pasteurella multocida</i> B:2 Eolane oil adjuvant vaccine	10:10-10:30 am

4.	Muhammad Riaz Department of Allied Health Sciences, University of Sargodha, Sargodha-Pakistan. riazmlt786@gmail.com	Detection and identification of drug resistant MTB strains through PCR-RFLP	10:30-10:50 am
5.	Bilal Aslam (Guest Speaker) Department of Microbiology, Government College University Faisalabad, GCUF. drbilalaslaml@gcuf.edu.pk	Distribution and genetic diversity of multi-drug-resistant <i>Klebsiella pneumoniae</i> at the human-animal-environment interface in Pakistan	10:50-11:10 am
6.	Farhan Ahmad Atif Associate Professor, Medicine Section, Department of Clinical Sciences, University of Veterinary and Animal Sciences, Lahore (Jhang Campus). farhan.atif@uvas.edu.pk	Molecular epidemiology and chemotherapy of <i>Anaplasma platys</i> infection in domestic and stray dogs in Jhang district, Pakistan	11:10-11:30 am
7.	Abdul Subhan/ Aman Ullah Khan Section of Microbiology, Department of Pathobiology, University of Veterinary and Animal Sciences, Lahore (Jhang Campus). amanullah.khan@uvas.edu.pk	Immunogenicity ELISA to assess immunity induced by <i>Pasteurella multocida</i> B:2 Eolane oil adjuvanted vaccines in large animals	11:30-11:50 am
Conclusion of session I			11:50 am-12:00 pm
Break			12:00-1:00 pm
<u>Session-II: Physical Session (1:00 pm-3:10 pm, 24-Nov-2022)</u>			
Session Chair: Prof. Dr. Syed Ehtisham-ul-Haque, Chairman, Pathobiology, CVAS, Jhang			
Co-Chair: Dr. Abid Hussain Shahzad, Associate Professor, Theriogenology, CVAS, Jhang			
Moderator: Dr. Muhammad Kashif, Assistant Professor, Medicine			
8.	Zulqarnain Baloch, (Guest Speaker) Faculty of Life Science and Technology, Yunnan Provincial Center for Molecular Medicine, Kunming University of Science and Technology, Kunming, China. znbalooch@yahoo.com	One health is critical to deal with zoonotic health threats	1:00-1:20pm
9.	Aqeela Kanwal Department of Pathobiology, University of Veterinary and Animal Sciences, Lahore (Jhang Campus) kanwalaqeela@gmail.com	Isolation, identification and molecular characterization of methicillin resistant <i>Staphylococcus aureus</i> isolated from bovine milk samples	1:20-1:40pm
10.	Amjad Islam Aqib Department of Medicine, CUVAS, Bahawalpur, Pakistan. amjadislamaqib@cuvas.edu.pk	Role of non-conventional antibacterial candidates against emerging pathogens	1:40-2:00 pm

11.	Afshan Muneer, Department of Zoology, CUVAS, Bahawalpur, Pakistan. afshanchudhary9@gmail.com	Exploring nutraceuticals of Moringa oliefera leave extracts (MOE) through oxidative stress, impact on body growth, public acceptability, and synergism with antibiotics	2:00-2:20 pm
12.	Ammar Tahir Department of Clinical Sciences, University of Veterinary and Animal Sciences, Lahore (Jhang Campus). ammartts123@gmail.com	Vaccines against Lyme Borreliosis: A one health paradigm	2:20-2:40 pm
13.	Hina Ishaq Department of Microbiology, CVAS, Jhang AminaPervaiz759@gmail.com	Surveillance of vaccine preventable diseases (VPDs) at DHQ (District Headquarter Hospital) Jhang	2:40-3:00 pm
Conclusion Session II			3:00-3:10 pm
<u>Session-III: Role of Veterinarian in One-health; Zoonotic diseases and One-health</u> <u>(Online session) 9:30 am-1:00 pm</u>			
Session Chair: Prof. Dr. Anas Sarwar Qureshi, Pro Vice Chancellor, UAF			
Co-Chair: Dr. Amar Nasir, Associate Professor, Medicine, CVAS, Jhang			
Moderator: Dr. Mubarak Mahmood, Assistant Professor, Animal Nutrition			
14.	Abrar Hussain (Guest Speaker) Department of Pathobiology, College of Veterinary Medicine, University of Illinois Urbana Champaign. abrah2@illinois.edu	An epidemiological survey regarding ticks and tick-borne diseases among livestock owners in Punjab, Pakistan: A one health context	9:30-9:50 am
15.	Beytullah KENAR (Guest Speaker) Afyon Kocatepe University, Department of Pathology, Afyon karahisar, Türkiye. beytullahkenar03@gmail.com	The role of veterinarians in one health and zoonosis	9:50-10:10 am
16.	Halil Selçuk BİRİCİK (Guest Speaker) Department of Laborant and Veterinary Health, Şuhut Vocational School, Afyonkarahisar, Turkey. hsbiricik1@gmail.com	Let animals breathe easier in fire	10:10-10:30 am
17.	Muhammad Imran Arshad (Guest Speaker) Associate Professor/US-NAS One Health fellow IOM, UAF.	One health paradigm in control of zoonotic pandemics and its core competencies	10:30-10:50 am ONLINE
18.	Youssef Attia Department of Agriculture, Faculty of Environmental Sciences, King Abdulaziz University, Saudi Arabia. yaattia@kau.edu.sa	Knowledge gained from animal nutrition in the era of COVID-19	10:50-11:10 am ONLINE

19.	Sabir Hussain Department of Infectious Diseases and Public Health, Jockey Club College of Veterinary Medicine and Life Sciences, City University of Hong Kong, Kowloon, Hong Kong SAR, China. sahussain8-c@my.cityu.edu.hk	First serological evidence of Q fever in large ruminants with one health perspective in Punjab, Pakistan	11:10 -11:30 am ONLINE
20.	Mian Muhammad Awais One Health Research Lab., Department of Pathobiology, Faculty of Veterinary Sciences, Bahauddin Zakariya University, Multan, Pakistan.	Copro-ELISA based prevalence and risk determinants of giardiasis in cattle and sheep populations raised by socio-economically deprived urban nomadic communities located in and around Multan, Punjab-Pakistan	11:30-11:50 pm ONLINE
21.	Rimsha Khan Advanced Diagnostic Laboratory, Punjab Aids Control Program Lahore Pakistan. rimshakhanbaloach@gmail.com	Origin, environmental transfer, health effects of COVID-19 disease	11:50-12:10 pm ONLINE
22.	Noor Fatima Department of Research, Innovation & Commercialization, Fatima Jinnah Medical University, Lahore. noorfatima051101@gmail.com	Antimicrobial resistance in Pakistan- A Call to Arms	12:10-12:30 pm ONLINE
23.	Saima Masood Department of Anatomy & Histology, UVAS, Lahore Saima.masood@uvas.edu.pk	Dietary symbiotic and cinnamon essential oil improves growth performance and small intestine histomorphometry in Japanese quails	12:30-12:50 pm ONLINE
Conclusion of session III			12:50-1:00 pm
<u>Session-IV Drug resistance; Emerging infectious diseases (Online session) 1:00 pm-4:50 pm</u>			
Session Chair: Prof. Dr. Muhammad Hidayat Rasool, Professor of Microbiology/Registrar, GCU Faisalabad, drmhrasool@gcuf.edu.pk Co-Chair: Dr. Farhan Ahmad Atif, Associate Professor, Medicine Moderator: Dr. Muhammad Adnan Saeed, Lecturer Microbiology			
24.	Hafez Mohamed Hafez (Guest Speaker) Former Head of the Institute of Poultry Diseases, free University Berlin, Germany. Hafez.Mohamed@fu-berlin.de	Public health issues related to poultry and poultry products	1:00-1:50 pm ONLINE
25.	Awad A. Shehata (Guest Speaker)	The use of phytogetic substances against secret killers in	1:50-2:20 pm

	Research and Development Section, PerNaturam GmbH, An der Trift 8, 56290 Godenroth, Germany. awad.shehata@pernaturam.de	poultry: Challenges and possibilities for overcoming breakdowns	ONLINE
26.	Muhammad Usman Qamar Department of Microbiology, Faculty of Life Sciences, Government College University Faisalabad. musmanqamar@gcuf.edu.pk	The presence of antibiotic-resistant bacteria, antibiotic resistance genes, and antibiotic residue in food-producing animals - One Health food safety concern	2:20-2:40 pm ONLINE
27.	Kaneez Fizza Department of Microbiology, Faculty of Life Sciences, GCUF. Department of Nuclear Institute of Agriculture Biology, Faisalabad. musmanqamar@gcuf.edu.pk	Detection Of antimicrobial residues of quinolones and nitrofurantoin metabolites in fish and chicken samples - One health food concern	2:40-3:00 pm ONLINE
28.	Aatika Department of Microbiology, Faculty of Life Sciences, GCUF. Department of Nuclear Institute of Agriculture Biology, Faisalabad. musmanqamar@gcuf.edu.pk	Detection of antimicrobial residues of tetracycline and chloramphenicol in bovine milk and beef samples- One health food concern	3:00-3:20 pm ONLINE
29.	Dr. Muhammad Suleman Institute of Microbiology, University of Veterinary and Animal Sciences, Lahore, Pakistan. muhammad.suleman@uvas.edu.pk	Saving precious lives from COVID-19 using a prognostic CAL model to predict disease severity and mortality	3:20-3:40 pm ONLINE
30.	Ms. Izza Awan University Diagnostic Laboratory, Institute of Microbiology, University of Veterinary and Animal Sciences, Lahore, Pakistan. izzaawan0323@gmail.com	Serological status of PPR and its associated risk factors in small ruminants of district Chakwal (Bharpur Village), Pakistan	3:40-4:00 pm ONLINE
31.	Shehla Gul Bokhari Pet Centre, University of Veterinary & Animal Sciences, Lahore. shehla.gul@uvas.edu.pk	Ultrasonographic and laboratory assessments of the liver and spleen in parasitized carrier horses	4:00-4:20 pm ONLINE
32.	Dr. Tasleem Kausar, Department of Zoology, Government Sadiq College Women University, Bahawalpur. tasleem.kausar@gscwu.edu.pk	Molecular characterization of CYP17A1 Gene & CYP19A1 gene polymorphisms for polycystic ovarian syndrome (PCOS) in local female population of Bahawalpur	4:20-4:40 pm ONLINE

Session-V Experimental Research (Online session) 1:00 pm-3:50pm**Session Chair: Prof. Dr. Muhammad Tariq Javed, Dean, FVS, UAF****Co-Chair: Dr. Muhammad Arshad, Associate Professor, Biochemistry, CVAS, Jhang****Moderator: Dr. Muhammad Zahid Farooq, Lecturer, Animal Sciences, CVAS, Jhang**

33.	Zahid Majeed Department of Biotechnology, Faculty of Science, The University of Azad Jammu and Kashmir, Chehla Campus, Pakistan. zahid.majeed@ajku.edu.pk	Process optimization, antioxidant, antibacterial, drug adjuvant properties of bioactive keratin microparticles derived from porcupine (<i>Hystrixindica</i>) quills	1:00-1:20 pm ONLINE
34.	Shehla Gul Bokhari Pet Centre, University of Veterinary & Animal Sciences, Lahore. shehla.gul@uvas.edu.pk	Comparative efficacy of topical amitraz and <i>AzadirachtaIndica</i> (Neem) against Demodecosis in dogs	1:20-1:40 pm ONLINE
35.	Iram Liaqat Government College University, Department of Zoology, Microbiology Lab, Lahore, Pakistan. dr.iramliqat@gcu.edu.pk ;	Gelatin extraction from fish scales using microbial biofilms	1:40-2:00 pm ONLINE
36.	Muhammad Nasir BHAYA Afyon Kocatepe University Faculty of Veterinary Medicine Department of Pathology, ANS Campus, Afyon karahisar, TURKEY. dr.muhammadnasir399@gmail.com	The evaluation of protective role of ursolic acid against chemotherapy-induced nephrotoxicity in rats with apoptotic and anti-apoptotic markers.	2:00-2:20 pm ONLINE
37.	Muhammad Naeem Department of Food Science and Human Nutrition, University of Veterinary and Animals Sciences (UVAS), Lahore, Pakistan. m.naeem@uvas.edu.pk	Prolonged dietary intake of titanium dioxide nanoparticles and its health impact on intestine inflammation in experimental chicken	2:20-2:40 pm ONLINE
38.	Shahoodah Anwar College of Earth and Environmental Sciences, University of the Punjab, Lahore, Pakistan. shahanwar884@hotmail.com	Estimation of wastewater flows using census data and option analysis for the treatment	2:40-3:00 pm ONLINE
39.	Awais Masud, Livestock and Dairy Development Department, Govt. of Punjab, Pakistan Awaismasud2015@gmail.com	Seroprevalence and hematological investigation of bovine brucellosis among the dairy farms in the Thal desert	3:00-3:20 pm ONLINE

40.	Ziasma Haneef Khan, Department of Psychology, University of Karachi ziasmak@uok.edu.pk	The human factor: Moral and social responsibility in control of zoonotic disease in Pakistan	3:20-3:40 pm ONLINE
41.	Ambar Imtiaz, Department of Anatomy & Histology, Faculty of Bio-Sciences, UVAS, Lahore. 2020-mphil-1846@uvas.edu.pk	Effect of transcutaneous electrical nerve stimulation (TENS) and topical lavender oil therapies on the nociceptive and microarchitectural response of osteoarthritic stifle joint"	3:40-4:00 pm ONLINE
Conclusion of session V			4:00-4:10 pm
Day-2			Time
Session-I: Hybrid Session (8:00 am – 10:00am, 25-Nov-2022)			
Session Chair: Prof. Dr. Shahana Urooj Kazmi, Vice Chancellor, Women University Swabi, vc@wus.edu.pk			
Co-Chair: Prof. Dr. Iahtasham Khan, Chairman, Clinical Sciences, CVAS, Jhang			
Moderator: Dr. Muhammad Kamran Rafique, Lecturer, Pathology			
	Speaker	Topic	Time
42.	Xin Zhao, (Guest Speaker) Professor, Professor, Dept. of Animal Science Macdonald Campus, McGill University, Canada. xin.zhao@mcgill.ca	A one-health perspective on <i>S. aureus</i> induced mastitis in dairy cows	8:00-8:40 am ONLINE
43.	George Lee Cornell University, USA, ghl42@cornell.edu	Impact of Outdoor Air Pollution on the Health of School-aged Children in Tanzania; A Case Study in Moshi municipality	8:40-8:55 am ONLINE
44.	Mamoon Rashid, (Guest Speaker) Florida Department of Agriculture and Consumer Services	One health-The global approach	8:55-9:20 am
45.	Muhammad Tahir Meraj, Department of Pathobiology, University of Veterinary and Animal Sciences, Lahore (Jhang Campus). tahirmairaj7@gmail.com	Slaughtered stock surveillance of zoonotic diseases prevalence in small and large ruminants in district Jhang-Pakistan	9:20-9:35 am
46.	Amina Pervaiz Department of Microbiology, CVAS, Jhang AminaPervaiz759@gmail.com	Residual veterinary antibiotics from food of animal origin: A potential health hazard	9:35-9:50 am
Conclusion of session I			9:50-9:55 am
Concluding Session in Auditorium CVAS Jhang			9:55-1:00 pm

For more information please contact:

Dr. Ishtiaq Ahmed, Associate Professor/Convener Scientific Committee, ishtiaqahmed@uvas.edu.pk, Cell-0300-7306928



The role of veterinarians in one health and zoonosis

Muhammad Nasir BHAYA¹, Beytullah KENAR^{2*}

¹Afyon Kocatepe University, Department of Pathology, Afyonkarahisar, Türkiye.

²Afyon Kocatepe University, Department of Microbiology, Afyonkarahisar, Türkiye.

*Corresponding author: Beytullah KENAR, beytullahkenar03@gmail.com

Abstract: The concept of one health encourages communication and collaboration between all the health professionals, who are working for the betterment of humans, animals and environment. There is a need of collaborative work of veterinarians, physicians, dentists, and others for the success of one health concept. The rise in the development of zoonotic diseases during the last few decades has provoked new interest in the One Health concept. The following implications of these diseases on human and animal's health, as well as the economic consequences, have increased international and national health organizations to overcome health problems. The remarkable appearance and spread of zoonotic illnesses, pollution of food, water, and soil, bioterrorist activities are among the most prominent concerns placing strain on world health today.

Veterinarians have critical roles in improving public health, response to zoonotic disease transmission, protecting food and water quality, and fostering wildlife and ecosystem health. The Veterinary profession is the only profession to work with both humans and animals. They are well aware of the threats of zoonotic diseases and can play important role for the detection and prevention of these diseases. The veterinarians get training zoonosis, public health and comparative medicine. The Veterinarians are the best choice for the recognition and control of zoonotic diseases. The veterinarians can play a better role in the epidemiology of zoonotic diseases because they have direct contact with animals.

Veterinarians can play important role in the one health concept. The future is collaboration of veterinarians with all other health professionals to make this concept complete because it is clear that all together, we are stronger to fight against all the problems.

Keywords: One health, Zoonosis, Veterinarian, public health



The evaluation of protective role of ursolic acid against chemotherapy-induced nephrotoxicity in rats with apoptotic and anti-apoptotic markers.

Muhammad Nasir BHAYA^{1}, Hikmet KELES¹*

¹Afyon Kocatepe University Faculty of Veterinary Medicine Department of Pathology 03030, ANS Campus Afyonkarahisar-TURKEY

***Corresponding author:** Muhammad Nasir Bhaya, dr.muhammadnasir399@gmail.com

Abstract: The clinical use of chemotherapeutic agents in the treatment of neoplasms was started in the late 1950s and was thought to be the best treatment. Later the side effects of the drug itself and its metabolites were reported in different organs, especially in the kidneys. Ursolic acid is a pentacyclic triterpenoid carboxylic acid found in natural fruits and has nephroprotective, hepatoprotective, cardioprotective, and neuroprotective effects.

To evaluate the protective effect of ursolic acid against chemotherapy-induced nephrotoxicity in experimental rats.

In this experiment, 28 rats were divided into four equal groups as control, Cyclophosphamide (CP), CP+ Ursolic acid100, and CP+ Ursolic acid200. The dose of CP was 150 mg/kg and two different doses of ursolic acid 100 mg/kg and 200 mg/kg were used in two groups.

Tubular degeneration, luminal casts, tubular cystic dilatation, hemorrhages, mononuclear cells infiltration in cortical and medullary areas, periglomerular inflammation, and glomerular hypercellularity in CP-treated group were found during histopathological examination. A significant improvement in the pathological lesions was seen in the groups that received doses of ursolic acid, especially the CP+ Ursolic acid200 group. Specific immunopositivity of 8-hydroxy-2-deoxyguanosine (8-OHdG), [hypoxia-inducible factor-1](#) alpha (HIF-1 α), inducible nitric oxide synthase (iNOS), and less specific immunopositivity of B-cell lymphoma-2 (BCL-2) was recorded in kidneys of CP-treated group. The ursolic acid groups revealed less immunopositivity of 8-OHdG, BCL-2, and iNOS but specific immunopositivity of Bcl-2.

The results of histopathological evaluation, apoptotic and anti-apoptotic markers supporting the protective effect of ursolic acid against chemotherapy-induced nephrotoxicity in the experimental study of rats.

Keywords: Chemotherapy, Ursolic acid, Histopathology, Immunohistochemistry



LET ANIMALS BREATHE EASIER IN FIRE

Halil Selçuk BİRİCİK^{1*} Farah IJAZ² İbrahim DURMUŞ¹ Selcen Süheyla ERGÜN¹

¹Department of Laborant and Veterinary Health, Şuhut Vocational School, Afyonkarahisar, Turkey

²College of Veterinary and Animal Sciences, Jhang, Pqkistan

*Corresponding author: Halil Selçuk BİRİCİK, hsbiricik1@gmail.com

Abstract: Sivil Düşün is a European Union programmer supporting active citizens and civil society organizations throughout Turkey. It offers unique mechanism that easily and quickly enables civic actors to secure support for specific needs and desired outcomes. This study is supported by this programmer. Fire Brigade teams make the first response in forest and house fires. Like other disasters, firefighters give priority to human rescue activities in case of fires, and animal rescue activities are overlooked. The target group of this study was the firefighters working in the cities of Aegean region in Turkey. The main activity was to encourage firefighters to use Oxygen masks for animals, unconscious due to smoke or having breathing difficulties in fires. These masks should be available in all Fire Brigades facilities. In recent years, animal owners have suffered greatly in fires and other disasters in our country. Last year, especially as a result of the forest fires, many large and small animal barns were burned and animals such as cows and sheep perished. High temperatures, toxic effects of smoke, and oxygen depletion can therefore cause mortality or impairment of animals' life. With the widespread use of Oxygen masks in fire, it will make a positive contribution to animal welfare and survival at the regional level. With awareness activities, seminars and events under this project, animal rescue capacity of firefighters will increase. Current study will also contribute to animal rescue strategies in case of fires and other emergencies.

Keywords: *Sivil Düşün, EU Programmer, animal, fire*



Determination of Antibiotic Sensitivity by Isolation and Identification of *Aeromonas salmonicida* Fish from Afyonkarahisar, Antalya and Eskişehir

*Dr. Fatma Yıldırım¹, Prof. Dr. Beytullah Kenar¹**

¹*Afyon Kocatepe University, Department of Microbiology, Afyonkarahisar, Türkiye*

***Corresponding author:** *Prof. Dr. Beytullah Kenar¹*, beytullahkenar03@gmail.com

Abstract: In this study, it was aimed to determine the various antibiotics susceptibility of different fish species by isolation and identification of *Aeromonas salmonicida*.

For this purpose, a total of 100 samples of different fish species were collected from the provinces of the Central West Anatolian Region (Afyonkarahisar), the Mediterranean Region (Antalya) and the Marmara Region (Eskişehir) between 2020-2021. The fish sampling are as follows: 21 Sea bass, 8 Sea bream, 49 Salmon trout, 1 Whiting, 1 Grey mullet, 1 Poor cod, 1 red mullet, 1 garfish, 1 Round herring, 1 pike fish, 1 carp, 1 lidaki, 1 scallop, 2 Yellowfin, 7 Granios, 1 Salmon, 1 Horse mackerel, 1 Anchovy.

Tryptic soy broth, Trypticase soy agar, Blood agar, MacConkey agar, Eosin Methylene Blue agar, CLED agar. First, they were planted in TSB for enrichment and incubated for 24-48 hours at 25°C. They were then inoculated on the above mentioned media. After incubation, the macroscopic and microscopic morphologies of the growing colonies were evaluated. Gram stain, motility examination, oxidase (Oxidase Test Kit) and lambda catalase (Catalase Test Kit) were applied to suspicious colonies.

The automated VITEK® 2 Compact (bioMérieux) system in Afyon Kocatepe University, Faculty of Veterinary Medicine, Diagnosis and Analysis Laboratory was used for the identification and confirmation of the isolates obtained.

Gram staining properties, microscopic morphologies, catalase and oxidase test results of the isolated colonies were taken. *A. salmonicida* could not be identified from the sampled fish. Apart from the agent sought in the sampled fish species, *Aeromonas hydrophila*, *Aeromonas caviae*, *Aeromonas sobria*, *Photobacterium damsela*, *Escherichia coli*, *Vibrio parahaemolyticus*, *Serratia liquefaciens*, *Sphingomonas paucimobilis*, *Bordetella hinzii* and *Pseudomonas fluorescens* were detected. In this study *A. salmonicida* could not be identified but different types of bacteria were identified.



Keywords: Fish, *A. salmonicida*, Antibiotics, VITEK® 2



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Knowledge gained from Animal Nutrition in the Era of COVID-19

Youssef Attia^{1,2*}, Shehata AA^{3,4}, Muhammad Zahid Farooq⁵ and Shereen Basiouni⁶

¹Department of Agriculture, Faculty of Environmental Sciences, King Abdulaziz University, P.O Box: 80208, Jeddah 21589, Saudi Arabia; YAA

²Animal and Poultry Production Department, Faculty of Agriculture, Damanshour University, Damanshour 22516, Egypt.

³Birds and Rabbit Medicine Department, Faculty of Veterinary Medicine, University of Sadat City, Sadat City, Egypt.

⁴Research and Development Section, PerNaturam GmbH, Gödenroth, Germany

⁵Department of Animal Sciences College of Veterinary and Animal Sciences, Jhang, Pakistan

⁶Clinical Pathology Department, Faculty of Veterinary Medicine, Benha University, Benha, Egypt.

⁷Institute of Molecular Physiology, Johannes-Gutenberg University, 55128, Mainz, Germany

Corresponding author: Prof. Dr. Youssef Attia: yaattia@kau.edu.sa

Abstract: One health approach after Coronavirus disease-19 (COVID-19), induced by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), is currently worldwide accepted. Remarkable negative impacts of the pandemic have already been observed on humans, animals, civilization, environments, and the ecosystem at the national, global, and local levels. In addition, various sectors involved in the food production chain, particularly the livestock sector have been negatively impacted affected. A sharp reduction in the production of eggs, milk, meat, etc. as a consequence of the pandemic across the globe has already been well documented. Because of the movement restriction locally and at the international level, as part of the COVID-19 control strategy, business related to the supply of raw materials, feed additives, essential supplements, and medicines, for livestock farmers and farm outcomes, animal services, farmworkers has dramatically affected animal nutrition, and thus animal immunity and health. In this review, we have highlighted the major knowledge gained in animal nutrition of COVID-19 such as the role of vitamins, minerals, phytochemicals, amino acids, and omega-3.



Keywords: COVID-19, one health concept, livestock production, animal nutrition economic loss, supply chain.



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Prediction of hematological and biochemical markers of SARS-CoV-2 infected ICU patients of Chattogram, Bangladesh

¹Eftekhar Ahmed Rana, ^{*2}ASM Golam Kibria

¹Department of Microbiology and Veterinary Public Health; ²Department of Anatomy and Histology, Faculty of Veterinary Medicine, Chattogram Veterinary and Animal Sciences University (CVASU), Bangladesh

***Corresponding author:** eaftekhar@cvasu.ac.bd

Abstract: Global pandemic the Coronavirus Disease 2019 (COVID-19) has recently emerged as a public health emergency with a wide range of clinical features among patients. But there is limited data on the risk variables and their predictive value for COVID-19 mortality in the ICU. However, there are involvement of numbers of biomarkers in viral replication along with cellular and organ damage in human body. This study revealed the variation of biochemical and hematological parameters of ICU admitted COVID-19 patients to predict mortality rate from 234 blood samples of ICU admitted COVID-19 patients in Chattogram general hospital from July to August 2021 through a crosssectional study. The value of different biochemical and hematological parameters along with patients' demographic information was recorded and analyzed in STATA-13. Here, a total of 156 (66.67%) death were recorded where male (70.83%, n=85) was higher than female (62.28%, n= 71) and more than 50 years age category (76.03%) was in higher risk group. Higher death rate (77.78%) was recorded with increased WBC contents as three folds more in male (32329) and two folds more in female (19526.47) where the reference value was 11000 number. Higher death rate was also calculated in higher level of s-creatinine (70.31%), CRP (67.39%) and d-dimer (70.75%) than the normal level in blood. In the death patients, the measurement of oxygen pressure in arterial blood was calculated lower than the normal value in both sex (49.35 mmHg in male and 52.35 mmHg in female). In male CRP was recorded higher than female in both death and survive COVID-19 patients. These biochemical and hematological analysis of ICU admitted COVID-19 patients can be used as marker to predict the outcome and the physician can modified their treatment procedure to overcome the health risks of ICU patients.

Keywords: biochemical, Chattogram, COVID-19, hematological, ICU, mortality.



Serological Survey of CCPP and its associated risk factors in small ruminants of Bhurpur village, District Chakwal, Punjab.

Amna Sattar^{*1}, *Muhammad Suleman*¹, *Iqra Liaqat*¹, *Izza*¹, *Muhammad Atta Ul Zia*², *Sunbal Sarfraz*², *Saba Ashraf*², *Muhammad Haroon Muzaffar*², and *Angus JD Campbell*³

¹*University Diagnostic Laboratory, Institute of Microbiology, University of Veterinary and Animal Sciences, Lahore, Pakistan.*

²*ACIAR Project LPS-2018-105: Enhancing small ruminant production to benefit farming families in Sindh and Punjab, Pakistan.*

³*Nossal Institute for Global Health, Melbourne School of Population and Global Health, University of Melbourne, Australia.*

*Correspondence: Amna Sattar, amnamalick007@gmail.com

Abstract: Contagious caprine pleuropneumonia (CCPP), caused by bacterium *Mycoplasma capricolum* subspecies *capripneumoniae* (Mccp), is a classic transboundary disease of small ruminants, causing 60-80% mortality and 80-100% morbidity.

This study was aimed to quantify the IgG levels against CCPP and to determine the association between potential risk factors.

A serological survey was conducted between December 2019 and November 2020 in Bhurpur village, District Chakwal, Pakistan. A total of 300 serum were randomly collected and analyzed by commercial ELISA kit for the detection of antibodies for Mccp from sheep (65) and goats (235) of different age and sex. Numbers of seropositive animals at different times (Dec, Feb, Aug, Nov) of the year were compared with the *Chi Square* test, using an alpha level of 0.05 for all analyses.

We found seroprevalence to be significantly greater in sheep (36.4%) than goats (14%; $p < 0.05$) and higher in adults (23%) than young animals (13%, respectively; $p = 0.03$). The proportion of seropositive animals increased from December (11%) through February (17%) and to August (38%), and then decrease occurred in November (15%). The prevalence of CCPP was statistically similar in males and females.

This small, preliminary study suggests that CCPP is a common disease in a typical small-scale village farming scenario in Punjab. Further studies are needed to identify where and how to more effectively address this disease and its effects in Pakistan.



This work was part of the project LS-2018-105 funded by the Australian Centre for International Agricultural Research (ACIAR).

Keywords: Contagious, Disease, Prevalence, Transboundary, Transmission.





One Health is critical to deal with Zoonotic Health Threats

Nafeesa Yasmeen¹, Bilal Aslam², Zulqarnain Baloch^{3,*}

¹National Risk Assessment Laboratory for Antimicrobial Resistance of Animal Original Bacteria, South China Agricultural University, Guangzhou, China.

²Department of Microbiology, Government College University, Faisalabad, Pakistan.

³Faculty of Life Science and Technology, Kunming University of Science and Technology, Kunming, China.

*Corresponding authors: Zulqarnain Baloch, znbalooch@yahoo.com

Abstract: The persistent rise of zoonotic diseases in the world has significantly affected both animal and human health. According to estimates, almost 75% of zoonotic diseases are commonly transmitted between animals and humans or indirectly through different vectors. Different factors such as urbanization, globalization, growing population, and close interaction among humans and animals are playing a key role in the emergence or reemergence of zoonotic diseases. "One Health" is a collaborative effort of different sectors as a joint team to acquire optimal human, animal, and associated environmental health. The "One Health" concept has already been adopted in developed regions of the world. Unfortunately, it is still not extensively embraced in developing including Pakistan. Where animal, human, and their associated environmental health has been badly affected due to a lack of will and sufficient resources. There is an urgent need to explore the prevalence of the most common zoonotic diseases in Pakistan and highlights the significance of "One Health" in managing this mince. Keep in mind, the current situation, multi-interdisciplinary research efforts are needed to avoid the emergence or reemergence of zoonotic diseases while also promoting a healthier One World.

Keywords: Zoonotic diseases; Pakistan; One Health; Animal, Human.



Isolation, Identification and molecular characterization of methicillin resistant *Staphylococcus aureus* isolated from bovine milk samples

Aqeela Kanwal*¹, Usman Waheed¹, Muhammad Adnan Saeed¹, Syed Ehtisham Ul Haque¹,
Abdur Rehman Sial¹, Jean Paul Gonzalez²

¹University of Veterinary & Animal Sciences, Lahore Jhang-campus, Pakistan;

²Medical centre, Georgetown University

***Corresponding author:** kanwalaqeela@gmail.com

Abstract: Livestock associated methicillin resistant *Staphylococcus aureus* (LA-MRSA), is an emergent zoonotic problem in globally. The incidence of LA-MRSA in the milk of infected animals is increasing day by day. The studies on MRSA in Pakistan are scarce. To fill this knowledge gap, present study was planned with the focus on antimicrobial resistant genes existence in the isolated MRSA from milk. Total 125 milk samples were collected from bovines (Cow and buffalo mix milk) present in the area of study and surf field mastitis test was performed to get mastitis milk samples which were found 70(56%) in numbers and then *S. aureus* was isolated on selective media Staph110 agar media. Phenotypic confirmation of the isolated bacteria was confirmed by relevant means of gram's staining and biochemical tests. Methicillin resistant *S. aureus* and sensitive *S. aureus* were identified by AST by applying methicillin and oxacillin discs. Identification of resistant genes against methicillin antibiotic was carried out by PCR using *mecA* gene specific primers and *pvl* gene specific primers. Present study confirmed the existence of 50% LA-MRSA (among total 60 positive *S. aureus* 30 were MRSA) in the mastitic milk of bovines and 80% *mecA* (24/30) and 50% *pvl* genes (15/30) were found responsible for their resistance against methicillin antibiotics. *Pvl* gene was not reported in LA-MRSA previously in Pakistan. During this study high rate of LA-MRSA was found in mastitis milk. Further studies on finding of candidate genes conferring the resistance against other antibiotics is the call for further studies in the field of food borne pathogens.

Keywords: MRSA, Mastitis, bovine, Pakistan



Serological study of FMD virus (serotypes A, O, Asia-1) and its associated risk factors in small ruminants of district Chakwal (Bharpur Village), Pakistan

*Iqra Liaquat^{*1}, Muhammad Suleman¹, Amna Sattar¹, Izza¹, Muhammad Atta Ul Zia², Sunbal Sarfraz², Saba Ashraf², Muhammad Haroon Muzaffar², Angus JD Campbell³*

¹*University Diagnostic Laboratory, Institute of Microbiology, University of Veterinary and Animal Sciences, Lahore, Pakistan.*

²*ACIAR Project LPS-2018-105: Enhancing small ruminant production to benefit farming families in Sindh and Punjab, Pakistan.*

³*Nossal Institute for Global Health, Melbourne School of Population and Global Health, University of Melbourne, Australia.*

*Correspondence: Iqra Liaquat, iqrالياق41@gmail.com

Abstract: Foot-and-mouth disease (FMD) is a highly contagious viral disease that affects multiple species of domestic and wild cloven-hoofed animals, and causes massive economic losses due to morbidity, mortality and trade restrictions.

The purpose of this study was to determine the status of FMD outbreak and risk factors associated with the occurrence of the disease.

A serological survey was conducted in Bharpur village, Chakwal, between December 2019 and November 2020 to look for antibodies against FMD virus.

A total of 337 serum samples (Goat: 247; Sheep: 90) were tested. FMD seroprevalence was 23.4%. Seropositivity within herds ranged from 10 to 33%. We found serotype O (13%) as the most prevalent, followed by serotype A (7%) and Asia1 (1%). FMD seroprevalence was higher in goats (25.1%) than in sheep (18.8%). Females had higher seroprevalence (24.1%) than males (16.6%). Adult animals (>12 months) appeared to have of being seropositive than young animals. Animals that were grazed on common areas outside the farm, where presumably there was greater contact with livestock from other households, had twice the odds of being seropositive than animals managed at home (OR= 2.04, 95% CI= 1.15 - 3.59). The proportion of seropositive animals decreased from December and February (26.6%) to August (17.5%) before increasing in November (23.9%).



Our research has shown that FMD is prevalent in sheep and goats in a typical village farming setting in Punjab. This work shows that further research and policy are required to address the impact of FMD on small ruminants, their role in transmission and disease in large ruminants.

This work was part of the project LS-2018-105 funded by the Australian Centre for International Agricultural Research (ACIAR).

Keywords: Foot-and-mouth disease, seroprevalence, Small ruminants, Outbreak, transboundary disease





Serological status of PPR and its associated risk factors in small ruminants of district Chakwal (Bharpur Village), Pakistan

*Izza¹, Muhammad Suleman*¹, Iqra Liaqat¹, Amna Sattar¹, Muhammad Atta Ul Zia², Sunbal Sarfraz², Saba Ashraf², Muhammad Haroon Muzaffar², Haroon Akbar³, Angus JD Campbell⁴*

¹*University Diagnostic Laboratory, Institute of Microbiology, University of Veterinary and Animal Sciences, Lahore, Pakistan.*

²*ACIAR Project LPS-2018-105: Enhancing small ruminant production to benefit farming families in Sindh and Punjab, Pakistan.*

³*Department of Parasitology, University of Veterinary and Animal Sciences, Lahore, Pakistan.*

⁴*Nossal Institute for Global Health, Melbourne School of Population and Global Health, University of Melbourne, Australia.*

*Correspondence: Muhammad Suleman, muhammad.suleman@uvas.edu.pk

Abstract: *Peste des petits ruminants (PPR)* is a highly contagious disease that affects small domestic and wild ruminants, posing a threat to global food security as well as the long-term viability of farmer livelihoods across Asia, the Middle East, and Africa.

The purpose of this study was to estimate seroprevalence and risk factors to understand the disease epidemiology and control.

The present study was conducted as a case study of PPR serostatus from December 2019 to November 2020 in district Chakwal (Bharpur village) Punjab, Pakistan. A total of 300 serum samples were taken from (233 goats and 67 sheep) from one village in the district, Commercial competitive ELISA kit was used to detect the presence of antibodies.

Overall, 62% of samples were seropositive. There were no significant differences in the proportions of seropositive between goats (64.37%) and sheep (55.22%), female (62.36%) and male (61.9%), or four seasonal sampling time points (64.28%, 65.47%, 62.82%, and 57.31%). Significantly more adult animals (69.34%) were seropositive than young ones (48.51%). The proportion of PPR positive was significantly greater in large (65.93%) than in medium (64.55%) and small herds (41.02%). There were no differences in proportion of seropositive in animals largely fed at home or extensively grazed.

Results of the present study indicated that PPR is currently circulating widely in the (Bharpur Village), and still is a leading cause of disease outbreaks and higher fatalities in small ruminants.



This work was part of the project LS-2018-105 funded by the Australian Centre for International Agricultural Research (ACIAR).

Keywords: Goats, PPR, risk factors, sheep, seroprevalence



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16s rRNA based characterization of ESBL enteric bacteria originated from poultry wet market in district Jhang

Muhammad Adnan Saeed*¹, Shan Ali¹, Muhammad Ramzan¹, Syed Ehtisham-ul-Haque¹, Usman Waheed¹, Muhammad Fiaz Qamar¹

¹Department of Pathobiology, University of Veterinary and Animal Sciences, Lahore (Jhang Campus), Pakistan.

*Corresponding author: adnan.saeed@uvas.edu.pk

Abstract: Extended spectrum beta lactamases (ESBL) are enzymes are responsible for structural degradation of certain beta-lactam antibiotics. Mostly plasmid mediated genes encode ESBL and spread horizontally among bacteria. The present study was designed to evaluate the diversity and prevalence of ESBL producing enteric bacteria in poultry wet market in district Jhang. Fifty samples of cecal specimens were collected via loop ligation method from different sellers in wet market. Specimens were sequentially cultured in buffered peptone water, Rappaport Vassiliadis (RV) broth supplemented with cefotaxime (4mg/litre) and MacConkey agar. Colony morphology, staining character and biochemical tests (catalase, oxidase, indole, methyl red, voges Proskauer and citrate utilization) were used for presumptive identification. DDST (double disk synergy test) was used to confirm ESBL character. Polymerase Chain reaction (PCR) was performed to amplify 16srRNA gene by using universal primers set (fD₁: AGAGTTTGATCCTGGCTCAG; rP₂: ACGGCTACCTTGTTACGACTT). Selected PCR products were sequenced and analyzed via NCBI BLAST tools The sequence data was submitted to NCBI platform with accession numbers OP744530, OP744528, OP744534, OP744581 and OP74542. The overall prevalence of ESBL isolates was found to be 54% (28/50). Diverse ESBL species were obtained including 54% *E. coli*, 21% *klebsiella pneumoniae*, 14% *Enterobacter cloacae*, 7% *Salmonella enterica subsp. enterica* and 4% *Pseudomonas aeruginosa*. Resistance to cefotaxime and co-amoxiclav was found to be 66% (33/50) and 76% (38/50), respectively. The present study demonstrated high incidence and diverse nature of ESBL producing enteric bacteria originated in poultry birds slaughtered at wet market in study area. Wet markets are an important reservoir of resistant microbes and can be used to monitor the spread of resistant microbes.

Keywords: ESBL, 16srRNA, Enterobacteriaceae, Antimicrobial resistance, poultry



Surveillance of Vaccine Preventable diseases (VPDs) at DHQ (District Headquarter Hospital) Jhang

Hina Ishaq*¹, Arooj Fatima¹, Aman Ullah Khan¹, Muhammad Adnan Saeed¹, Dr Tahir Munir², Syed Ehtisham-ul-Haque¹

¹Section of Microbiology, Department of Pathobiology, University of Veterinary and Animal Sciences, Lahore (Jhang Campus), Pakistan.

²Clinical diagnostic lab, district headquarter (DHQ) hospital, Jhang.

*Corresponding author: Hina Ishaq, hishaq987@gmail.com

Abstract: In children, vaccination is an effective and safe method for controlling multiple infectious diseases. Vaccine preventable diseases (VPDs) are those diseases for which vaccines are available. This study was aimed at surveillance of selected VPDs including polio, rubella, measles, diphtheria and neonatal tetanus (NNT) from individuals presented at district headquarter (DHQ) hospital Jhang. For this study, clinical samples including stool sample for polio, blood for rubella, serum for measles, oropharyngeal swab for diphtheria and recorded data of physical examination for NNT were collected and stored at DHQ Jhang for further processing. Polymerase chain reaction (PCR), ELISA, culturing and reported clinical symptoms (lock jaw, opisthotonos, risus Sardonicus) were used for the diagnosis of polio, Measles & Rubella, diphtheria and NNT, respectively. The findings of the study revealed the highest prevalence of NNT, 0.03 % (6/205) followed by measles, 0.01% (32/2760), diphtheria, 0.004% (1/232), rubella, 0.001% (4/2760). All subjects tested for polio were found negative. Neonatal tetanus is an overlooked disease which has emerged in district Jhang as highlighted by present study. Although national immunization program is being implemented yet there is dire need enhance public awareness and expanding the scope of on-ground vaccination coverage especially in district Jhang.

Keywords: VPDs, surveillance, Jhang, Neonatal infections.



Immunogenicity ELISA to assess immunity induced by *Pasteurella multocida* B:2 Eolane oil adjuvanted vaccines in large animals

Abdul Subhan¹, Aman Ullah Khan*¹, Syed Ehtisham-ul-Haque¹, Muhammad Fiaz Qamar², Muhammad Adnan Saeed¹, Tyyba Arshad¹, Muhammad Usman¹, Izza³

¹Section of Microbiology, Department of Pathobiology, University of Veterinary and Animal Sciences, Lahore (Sub Campus Jhang)

²Section of Parasitology, Department of Pathobiology, University of Veterinary and Animal Sciences, Lahore (Sub Campus Jhang)

³Institute of Microbiology, University of Veterinary and Animal Sciences, Lahore.

*Corresponding author: Aman Ullah Khan, amanullah.khan@uvas.edu.pk

Abstract: Haemorrhagic Septicaemia (HS), a contagious, highly fatal, and economically important bacterial disease of bovines caused by *Pasteurella multocida* (*P. multocida*) serotype B:2 in Pakistan. Due to acute and seasonal nature of disease, immunization through Oil-based HS vaccines can limit disease transmission in endemic areas. Agglutination and indirect Hemagglutination assays have been used to assess immune response but ELISA is considered more sensitive and specific.

The purpose of this study was to assess immunogenicity of HS vaccines based on three different (2 locally made) oil adjuvants using novel Eolane from Total Special Fluids, Total Energies, France Eolane-170 (E170), Eolane-150 (E150) and a commercially available Montanide ISA-50 V2 (M50) through in-house prepared iELISA.

Immunogenicity study was conducted on calves (n= 24) including cow calves and buffalo calves (n= 12 each). A total of three animal groups were made (8 calves per group) including 4 buffalo calves and 4 cattle calves in each. Groups of experimental calves were named as A, B and C each group was vaccinated with E170, E150 and M50 respectively and serum samples were collected at days 0, 42, 90, 180 and 360. In-house prepared indirect ELISA kit with purified recombinant outer membrane H protein (rOmpH) from *P. multocida* B:2 as the coating antigen was used.

iELISA demonstrated exceptional sensitivity and specificity. Serum antibody titers ranging from 1.366268447 log₁₀ to 1.697716093 log₁₀ were observed. Buffalo calves showed significantly high titer as compare to cattle calves. Eolane 170 Eolane 150 and M-ISA50 shown



positive titer while Eolane 150 shown consistent rich titer as compare to Montanide ISA-50 and Eolane 170 and proved the best vaccine by iELISA.

It is concluded that the novel Eolane® based vaccines (E170 & E150) were found safe and immunogenic. E-150 adjuvanted vaccine has the potential to generate comparable immunity and safety at par with M-50, having the advantage of being cost-effective too.

Punjab Agricultural Research Board (PARB), Lahore, Pakistan Project ref. 629

Keywords: Bovines, Eolane adjuvant, Hemorrhagic Septicemia, iELISA, Vaccines





Use of Treated Domestic Wastewater as Irrigation Water to Combat Water Scarcity and to Optimize Rice Crop Growth

Safdar Ali Mirza¹, Tahira Aslam*¹, Aneeba Rashid², M Arshad Javed²

¹Botany Department GC University, Lahore

² Department of Plant Breeding and Genetics, Faculty of Agriculture, PU Lahore

*Corresponding author: Tahira Aslam, tahirashehram381@gmail.com

Abstract: Water scarcity has become important environmental concern in many countries worldwide. Water pollution endangers people's health through water-borne illnesses. In developing countries, 80 to 90% wastewater is released directly into surface water bodies without complete treatment. Domestic wastewater irrigation is becoming an important component of more integrated and sustainable water resource management, especially in water-stressed regions. Around 200 million farmers worldwide use wastewater to irrigate more than 20 million hectares. The reuse of treated wastewater for agricultural irrigation would aid in the reduction of freshwater scarcity. Keeping the aforementioned situation in mind, the current study was conducted to determine the biodegradation and heavy metal tolerance limits of the isolated bacterial strain in domestic wastewater samples, as well as the influence of untreated and treated domestic wastewater on rice seedlings. This research provided an overview of the development of treated and raw domestic wastewater in the field of agricultural water resources, with an emphasis on rice cultivar germination. This work also identified that municipal wastewater effluents need to be treated before being used for irrigation, which will help reduce the disease risk associated with wastewater reuse, as well as a number of technological, social, environmental, and health issues that require special attention and further research. The use of treated home wastewater in agriculture has immense potential, but it must be managed in the context of local, regional and global water and sanitation management systems.

Keywords: wastewater; bacterial strain; biodegradation; irrigation; treatment.



DETECTION OF ANTIMICROBIAL RESIDUES OF QUINOLONES AND NITROFURANMETABOLITES IN FISH AND CHICKEN SAMPLES - ONE HEALTH FOOD CONCERN

Kaneez Fizza¹, Ismail Chughtai², Muhammad Zeeshan Nawaz¹, Gull Naz¹, Muhammad Usman Qamar¹

¹ *Department of Microbiology, Faculty of Life Sciences, Government College University Faisalabad*

² *Department of Nuclear Institute of Agriculture Biology, Faisalabad*

***Corresponding author:** musmanqamar@gcuf.edu.pk

Abstract: Antimicrobial resistance is serious concern globally mainly in developing countries like Pakistan. One of the important factors is the excessive use of antibiotics in livestock. Different types of antibiotics including quinolones and nitrofurans metabolites are being used in livestock to increase their production. Therefore, the present study evaluated the quinolones and nitrofurans metabolites residues in the Chicken and Fish samples. A total of 40 chicken and 40 fish samples were collected from five different areas of the Faisalabad metropolitan, including butcher markets and fish mart from five different colonies. 50-100g of chicken samples and fish samples were collected using sterile techniques. The samples were transported to the microbiology lab at 4-6 °C. The 1g of chicken and fish samples were used for antibiotics residues detection of quinolones and nitrofurans metabolites using commercially available enzyme linked immunosorbent assay (ELISA) kit. Overall the results illustrated that out of 40 chicken samples six chicken samples were positive for quinolones at concentrations 140ppb, 106ppb and 130ppb and fish samples were found positive with concentration 110ppb. While the two chicken samples were found positive for SEM with concentrations 1.600ppb and 1.000ppb and 4 fish samples were found positive with concentrations at 1.600, 1.600, 3.000 and 1.800ppb. This study concluded high prevalence of antimicrobial residue in the food samples.

Keywords: Antimicrobial Residue, Fish, Chicken



Molecular Characterization of *CYP17A1* Gene & *CYP19A1* Gene Polymorphisms for Polycystic Ovarian Syndrome (PCOS) in Local Female Population of Bahawalpur

Tasleem Kausar*¹, Nadia Noureen¹, Rubina Shakil¹, Shumaila Javed¹, Sana Abdulsattar¹, Mah Noor Samrah¹, Umme Abiha¹, and Fareeha Shahid¹,

¹Department of Zoology, Government Sadiq College Women University, Bahawalpur

*Corresponding author: Dr. Tasleem Kausar, tasleem.kausar@gscwu.edu.pk

Abstract: Polycystic Ovarian Syndrome (PCOS) is a multifactorial endocrine condition that leads to hyperandrogenism, menstrual irregularities, and numerous cysts which eventually result in infertility. Multiple genes are known to be associated with PCOS, but no studies were reported on the genetic causes of PCOS in the local population of Bahawalpur. Our study aimed to investigate the genetic association of SNP rs2414096 in the *CYP19A1* gene and *CYP17A1* polymorphism (rs743572) c.-34T/c with PCOS in the local female population of Bahawalpur. For this case-control association study, 100 patients with PCOS and 50 healthy individuals as controls were identified and enrolled. A questionnaire based on demographic characteristics like age, weight, height, BMI, Ferriman–Gallwey (FG) score, family history, and menstrual irregularity, was designed and filled by all case and control subjects at the time of sampling. Blood samples of all the participants were drawn and DNA was extracted. The tetra ARMS-PCR (Amplification Refractory Mutation System-Polymerase Chain Reaction) technique was used to analyze the association of *CYP19A1* and *CYP17A1* gene mutations with the phenotype. A p-value of less than 0.05 was considered to be significant. There was a significant association between hirsutism, body mass index (BMI), weight, acne, and menstrual irregularity with PCOS. The genotypic distribution for *CYP17A1* (Homozygous wild type TT, Heterozygous TC, Homozygous mutant CC) showed that the wild type frequency is significantly higher in both PCOS (68%) and control (70%) females, with an odd ratio of 1.068 (CI 0.57-1.98). The genotypic distribution for *CYP19A1* (Homozygous wild type GG, Heterozygous GA, Homozygous mutant AA) revealed a high frequency of wild type in patients (67%) and in the control group (86%) with an odd ratio of 2.625 (CI 1.117-6.167). The results showed no difference in the genotypic distribution of both *CYP17A1*, and *CYP19A1* alleles between patients and controls. This suggested that *CYP17A1*



(rs743572) and *CYP19A1* (rs2414096) polymorphisms are not significantly associated with PCOS in the Bahawalpur population. Some other genetic variations are responsible for PCOS in the local female population

Keywords: *CYP17A1*; *CYP19A1*; Ferriman–Gallwey; Hirsutism; Menstrual irregularity; Polycystic Ovarian Syndrome





The presence of antibiotic-resistant bacteria, antibiotic resistance genes, and antibiotic residue in food-producing animals - One Health food safety concern

Muhammad Usman Qamar*¹, Atika¹, Muhammad Ismael Chughtai², Zeeshan Taj¹, Muhammad Shafique¹, Uzma Maqbool²

¹Department of Microbiology, Faculty of Life Sciences, Government College University Faisalabad.

²Department of Food and Nutrition, National Institute for Agriculture and Biology, Faisalabad

*Corresponding author: Muhammad Usman Qamar, musmanqamar@gcuf.edu.pk

Abstract: In Pakistan, the demand for meat and milk has increased, leading to the intensification of farming practices and the use of antibiotics, particularly tetracyclines. Antimicrobial-resistant bacteria that cause serious food-borne illnesses can also be found in contaminated food. Therefore, the purpose of this study was to identify the pathogens, genes, and antimicrobial residue present in raw milk and meat samples. 40 samples each of raw milk and beef were taken by aseptic method from various parts of the Faisalabad metropolis. On blood, MacConkey, and UTI chrome agar, the samples were cultured. Utilizing the VITEK 2 compact system, the isolates' identification and minimal inhibitory concentration were determined. Antimicrobial-resistant genes for ESBL, MRSA, and carbapenem-resistant bacteria were identified using molecular techniques. An ELISA kit was used to determine the amount of tetracycline residue in each sample. 64 polymicrobial bacteria were identified in 40 beef samples, with *E. coli* (29; 45.3%) and *K. pneumoniae* (11; 17.1%) predominating. 73 polymicrobial bacteria were identified in 40 milk samples, with the majority being 22 (36.6%) *E. coli* (22; 30%), 12 (20%) *K. pneumoniae* (12; 16.4%), and *S. aureus* (10; 13.6%). In beef isolates, 28 (43.7%) tet gene, 19 (29.6%) blaCTX-M, 14 (21.8%) blaNDM-1, and 26 (35.6%) tet gene, 19 (26%) blaTEM and blaCTX-M, and 3 (4%) blaNDM-1 were found, while 22 (55%) of each beef and milk sample increased the tetracycline residue MRL limits (100ppb). The increased prevalence of MDR bacteria and the presence of tetracycline residue seriously endanger the health of consumers.

Keywords: Antimicrobial resistance, Antimicrobial resistant genes, Antimicrobial residue, food samples, bacteria



Seroprevalence of brucellosis and associated risk factors, in small and large ruminants, in district Multan and Khanewal, of Punjab Pakistan.

Mahrukh¹, Najam Zafar¹, Iahtasham Khan^{1}, Muhammad Farooq¹, Ali Zohaib⁴, Riaz Hussain⁴*

¹University of Veterinary and Animal Sciences Lahore Sub-campus Jhang.

⁴Faculty of Veterinary Sciences, Islamia University Bahawalpure, Pakistan

***Correspondence:** Prof. Dr. Iahtasham Khan, iahtasham.khan@uvas.edu.pk

Abstract: Brucellosis is a zoonotic disease. It is detrimental to both the animals and humans and affects badly the nation's economic growth. In this study, conducted to find out the seroprevalence of brucellosis and its associated risk factors in small and large ruminants in two districts (Multan and Khanewal) of Punjab, 400 samples were collected, including the serum, and milk samples. Milk samples were preferably collected from pregnant and lactating animals, and from others serum samples were collected. The study animals were sheep, goat, cattle and buffaloes. A total of 50 samples were taken from the goats, 50 from sheeps, 50 from buffaloes and 50 from the cows, so these 200 samples were collected from Multan region and likewise from Khanewal region and tested for prevalence among the animals. RBPT (Rose Bengal Plate Test), MRT (Milk Ring Test), and ELISA (Enzyme Linked Immunosorbent Assay) were performed. As a result of MRT, higher prevalence was found in cattle i.e. 15%, as compared to buffaloes i.e. 13%, and a very low prevalence was found in sheep and goat, 4% and 5% respectively. Through ELISA, a higher prevalence was observed i.e. 18% in buffaloes, 15% in cattle, 14% in the goats and 4% in sheep. For quicker diagnosis of Brucellosis serological test is preferred, although ELISA is the most sensitive test. Prevalence of the disease also depends upon the climate, pregnancy, lactation status, age, specie, area, reproduction problem history and body condition score etc. Retention of fetal membrane and abortion in the 3rd trimester of pregnancy were determined significant risk factors for brucellosis transmission. Animals with BCS (body condition score) less than 3 are more prevalent to this disease. Vaccination, screening and culling of the animals are possible choices to reduce endemicity of the disease. This study reveals that brucellosis is prevalent in Khanewal area.

Key words: Seroprevalence, Brucellosis, Small Ruminants, Large Ruminants



Seroprevalence and Risk Factors of Brucellosis among Animals Visiting CVAS Teaching Hospital, Jhang Pakistan

Muhammad Najam Zafar¹, Iahtasham Khan², Muhammad Farooq³, Mahrugh⁴, Muhammad Ali Assad⁵ and Ali Zohair Khizer⁶

¹ University of Veterinary and Animal Sciences Lahore, Sub-Campus Jhang.

*Correspondence: Iahtasham Khan, iahtasham.khan@uvas.edu.pk

Abstract: Brucellosis is zoonotic disease of animals and endemic in Pakistan. Brucellosis causes effect on livestock industry and cause major economic damage to livestock farmers. Due to political and socio-economic issues of developing countries, it is very tough to apply control measures for Brucellosis as that of no compensation and test and slaughter policy. Brucellosis is prevalent in domestic animals worldwide like in buffaloes, cattle (*B. abortus*), in goat and sheep (*B. melitensis*), in sheep (*B. ovis*), in dogs (*B. canis*). In the view of this study is the seroprevalence of Brucellosis in goats, sheep, buffaloes, cattle, and dogs in CVAS teaching hospital, Jhang was conducted. Risk factor based seroprevalence of Brucella was conducted in this study in outdoor clinic at College of Veterinary and Animal Sciences, Jhang Campus. In this study 317 serum samples were collected and screened. The screening test was performed with Rose Bengal Plate test (RBPT). In this study, buffaloes prevalence was 6.1% and in cattles prevalence of Brucella disease was 15.2%. In other animals like sheep, goats, dogs no sample was tested positive in this research area. Cumulative seroprevalence of Brucellosis is 4.1% in this study area. In this study most of the animals were seen positive of 2nd and 3rd lactation as reinforcing risk factors. But the animals of 2nd lactation number are more positive than 3rd lactation number of animals. Most of animals are positive having the history of abortion in animals in last trimester. According to this study the Brucellosis infection is prevalent in Jhang area and it is highly suggestible to take steps for its prevention and control to safeguard its transmission in humans.

Key words: Seroprevalence, Brucellosis, Abortion, Cattle, Buffalo



HEALTH MAINTENANCE OF TEDDY GOAT AGAINST HEAVY METAL RESIDUES IN NATURAL ENVIRONMENT

Muhammad Sajid*¹, Muhammad Irfan Anwar¹, Tanveer Aslam¹, Muhammad Kamran¹, Irfan Anwar¹

¹College of Veterinary and Animal Sciences, Jhang-Pakistan,

*Corresponding author: Muhammad Sajid, muhammad.sajid@uvas.edu.pk

Abstract: Heavy metal residues are becoming significant issue in food items in developing countries due to mismanagement of industrial wastes. Hazardous effects of Pb have been studied in animals and human all over the world. Contaminated water and forage are the major sources of heavy metal accumulation in animals and are excreted in milk and meat. Pakistan possessed larger population of animals and hence there is need to investigate the heavy metal residues specially in food animals. The effects of two heavy metals were observed on health of adult goats as teddy goat is a major source of mutton in Pakistan. The samples were collected from a clean area and were compared with sewerage drain area. The serum was analyzed for level of heavy metal residues along with liver and kidney functions. The mean values of Pb were significantly higher ($P < 0.05$) in contaminated area but the blood parameters were showing normal range. The serum ALT, AST and urea levels were also within the normal range in both areas which showed the tolerance of teddy goat against heavy metal residues. This research also reveals that teddy goat might be a useful animal for production of mutton as a safe food.

Keywords: teddy goat, mutton, heavy metal, liver, kidney



ESTIMATION OF WASTE WATER FLOWS USING CENSUS DATA AND OPTION ANALYSIS FOR THE TREATMENT

Shahoodah Anwar*¹, Irfan Ahmed Shaikh¹, Naqi Iqbal²

¹College of Earth and Environmental Sciences, University of the Punjab, Lahore, Pakistan

²Ravi Urban Development Authority, Lahore, Pakistan

*Corresponding author: Shahoodah Anwar, enr.shahoodah@gmail.com

Abstract: This paper aimed to estimate the water consumption according to the population of each district of the Punjab and consequently the wastewater production in each district of the Punjab Pakistan. Furthermore, the comparative analysis of pros and cons of the conventional wastewater treatment technologies has been conducted. The population of the district Punjab has been increased from the 73 million to 110 million persons from 1998 to 2017 according to census data reported by Pakistan Bureau of Statistics. The 50% increase in population considering 1998 census data as reference value indicate that the water demand, consumption and water reservoir capacity also effected comparatively. As water consumption trend is being changed and water consumption is high, the volume of wastewater flow has also been increased. For each district water consumption is taken as per technical standard of the Public Health Engineering Department Punjab. The total water consumption calculated for the Punjab district is 4246.2 MGD and wastewater production as 3397.14 MGD inclusive of non-domestic water demand and other losses as well. Punjab district have both rural and urban areas. Proposing a suitable treatment option for urban and rural areas of the Punjab is dependent on cost, availability of area, skilled labor, and energy consumption and site conditions. Using the comparative analysis of the treatment technologies that are classified as non-mechanized e.g. ponds, semi mechanical and mechanical treatment options is used for proposing the suitable treatment technology for the rural and urban areas of the Punjab.

Keywords: Million Gallons per day (MGD), Water consumption, wastewater production



Process Optimization, Antioxidant, Antibacterial, Drug Adjuvant Properties of Bioactive Keratin Microparticles Derived from Porcupine (*Hystrix indica*) Quills

Zahid Majeed*¹, Hoor ul Aain², Basharat Ahmad³

¹Department of Biotechnology, Faculty of Science, The University of Azad Jammu and Kashmir, Chehla Campus, Muzaffarabad 13100, Pakistan.

²Department of Zoology, Faculty of Science, The University of Azad Jammu and Kashmir, Chehla Campus, Muzaffarabad 13100, Pakistan

***Correspondence:** Zahid Majeed, zahid.majeed@ajku.edu.pk

Abstract: Keratin is structural protein, used vastly in the field of medicine to develop drug carrier.

This research is focused on process optimization, antioxidant, antibacterial, drug adjuvant studies of synthesized bioactive keratin microparticles obtained lipid and keratin extracted from Porcupine (*Hystrix indica*) quills.

Bioactive keratin microparticles obtained after coating with lipids extracted also from porcupine quills. The extraction parameters for keratin were optimized using response surface methodology, and the size of the keratin micro particles was measured microscopically and characterized using infrared spectroscopy.

Results showed the keratin yield of 27.36 to 42.25% was achieved and its microparticle size ranged from 60.65 to 118.87 μm . Response surface optimization of parameters revealed mercaptoethanol and urea as the key factors influencing the yield and particle size of the keratin microparticles. Infrared spectroscopy confirmed the lipid layering of the keratin microparticles. The ABTS assay explained the antioxidant activity having value of 29.83% for keratin microparticles. The activity of the keratin microparticles after coating with the lipid increased upto 55% against *E. coli* and *S. aureus* as compared to lipid alone. The lipid loaded erythromycin as drug carried on the surface of keratin microparticles increased the activity against gram positive (*S. aureus*) and gram negative bacteria (*E. coli*).

From this work, it is concluded that the keratin microparticles can be successfully prepared and used as the drug loading support. The lipid coated keratin microparticles were activated



successfully using lipid obtained from the quills of porcupine. The drug efficacy after loading on lipid coated keratin called bioactive acted as best drug adjuvant due to inhibition against *S. aureus* and *E. coli* pathogens.

Keywords: Keratin microparticles, lipids, antioxidant, antibacterial, adjuvant





EFFECT OF TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION (TENS) AND TOPICAL LAVENDER OIL THERAPIES ON THE NOCICEPTIVE AND MICROARCHITECTURAL RESPONSE OF OSTEOARTHRITIC STIFLE JOINT

Hafiza Ambar Imtiaz¹, Sahar Ijaz¹, Hafsa Zaneb¹, Saima Ashraf¹, Mirza Muhammad Usman¹
Abdul Rehman²

¹Department of Anatomy & Histology, Faculty of Bio-Sciences, University of Veterinary and Animal Sciences, Lahore.

²Department of Epidemiology and Public Health, Faculty of Veterinary Science, University of Veterinary and Animal Sciences, Lahore.

*Corresponding author: Hafiza Ambar Imtiaz, 2020-mphil-1846@uvas.edu.pk

Abstract: The experiment was carried out at the Department of Anatomy and Histology, University of Veterinary and Animal Sciences, Lahore. 18 male rabbits, aged eight months to one year, were used in this experiment. The rabbits were fed food and water ad libitum. The total sample size of Stifle joints was 36 (n=36). They were divided into six groups such that A1 (Sham stifle joints), A2 (OA or positive control stifle joints), B1 (Tcont or negative control with TENS), B2 (TENS or OA joints with TENS), C1 (Lcont or negative control with Lavender Oil massage), C2 (LOA or OA joints with Lavender Oil massage). Animals whose stifle joints were to be made into Sham and OA models (A1, A2, B2 and C2) were given 1% solution of carrageenan (10mg diluted in 1ml normal saline). Intra articular injection of 0.1 ml of this solution was given in the stifle joint to make the OA model and normal saline was given in the joints of A1 group. The animals were evaluated through Bristol Rabbit Pain Scale (BRPS) for level of pain and Digital Vernier Calipers for diameter of stifle joint before and after the treatment. For TENS therapy, we used 1.5 inch electrodes on medial and lateral side of stifle joint after shaving with 4-6 Hz frequency and for Oil massage therapy, we used 3% concentration of Lavender Oil prepared in sweet almond oil (3 drops of essential oil in 97 drops of sweet almond oil) for 10 minutes, 5 days per week for two consecutive weeks. The diameters of stifle joints of the animals were measured with vernier calipers five times a week and level of pain was scored on BRPS thrice a week by two observers blind to the experiment. These data were used to assess the changes in joint inflammation. At the end of the experiment, the animals were slaughtered to harvest their stifle joints. The joint tissue samples were processed



for histological slide formation through Haematoxylin and Eosin (H & E) staining protocols. Paraffin embedding technique was used for light microscopic observation of tissue samples. Tissue sections were observed using a bright field microscope (LABOMED® USA) which is connected through a camera and computer for Histomorphometry. The thickness of Articular Cartilage, Subchondral bone, Intimal lining of Synovial Membrane, and Width of Joint Space and number of Chondrocytes were assessed for Histomorphometric parameters. A statistical package of social sciences (SPSS Inc. Version 20.0) was used to analyze the data. Analysis of Variance Two way ANOVA was applied to analyze readings of BRPS and Vernier Calipers. One way ANOVA was used for Histomorphometric parameters. The pain score was found significantly higher ($p < 0.05$) in A (OA) as compared to B (TENS) and C (LO) groups. The inflammation score was found significantly higher ($p < 0.05$) in the OA groups (A2, B2 and C2) than non-OA (A1, B1 and C1) groups. The number of Chondrocytes was found significant ($p < 0.05$) in B2 (TENS) followed by C2 (LOA) and A2 (OA). The thickness of articular cartilage was found significant higher ($p < 0.05$) more in A1 (Sham) group followed by C1 (Lcont) and B1 (Tcont). In treatment groups, it was found lower ($p < 0.05$) in group B2 (TENS) as compared to C2 (LOA). The thickness of subchondral bone was found higher ($p < 0.05$) in A1 (Sham) followed by C1 (Lcont) and B1 (Tcont). In treatment groups it was found lower ($p < 0.05$) in C2 (LOA) as compared to B2 (TENS). The thickness of the intimal lining of the synovial membrane was found significantly higher ($p < 0.05$) in C2 (LOA) and A2 (OA) followed by B2 (TENS). The width of joint space was found significantly higher ($p < 0.05$) in A1 (Sham) followed by B1 (Tcont) and C1 (Lcont). In the treatment groups, group C2 (LOA) was found higher ($p \leq 0.05$) narrowing of joint space as compared to A2 (OA) and B2 (TENS). Our Conclusion is that the Transcutaneous Electrical Nerve Stimulation (TENS) as a non-invasive therapy improves the degree of pain score, decreases the level of inflammation and prevents progression of structural damage in an OA joint more than the Lavender Oil massage.

Keywords: TENS, Lavender oil, Male rabbits, Osteoarthritis, Stifle Joints, Carrageenan



ASSESSMENT OF KNOWLEDGE ATTITUDE AND PRACTICES TOWARDS ANTIMICROBIAL RESISTANCE (AMR) AMONG THE LIVESTOCK WORKERS IN DISTRICT LAYYAH.

Muhammad Ali Assad¹, Najam Zafar¹, Ali Zohair Khize¹, Iahtasham Khan¹ Amman ullah Khan¹, Tariq Abbas², Muhammad Farooq¹*

¹ College of Veterinary and Animal Sciences, Jhang; University of Veterinary and Animal Sciences Lahore

² Department of Epidemiology and Public Health, Cholistan University of Veterinary and Animal Sciences, Bahawalpur.

***Correspondence:** muhammad.farooq@uvas.edu.pk

Abstract: Antimicrobial resistance develops when infection-causing organisms find ways to resist medications. Although resistance is a biological phenomenon that occurs naturally, it is heightened and expedited by a number of variables, including drug abuse, inadequate infection control procedures, international trade.

This study was done to understand the knowledge, attitude and practices regarding the issue of (AMR) in the district of Layyah.

We collected data as performing the Convenience sampling from the district of layyah to find out the basic level of knowledge of a community regarding the AMR.

A total of 161 participants took part in the survey. 54 percent of the respondents have basic level of education matric or under matric. About 97% of the respondents claim that antibiotics are used to treat bacterial infection. And about 57% used antibiotics to treat flue, a viral disease. About half of the participants were unaware towards the word Antimicrobial resistance. Social media and medical books remained the key contributor towards knowledge regarding AMR. About every second participants have no idea about the mechanism of spread of AMR. Almost every 9 out of 10 participants demonstrating the lack of seminar or workshops by any Govt or Non-Govt organizations to educate people about AMR. This survey highlights gaps regarding knowledge, attitude and practices to mitigate the risk of AMR and stresses the need of educating the people to hamper the spread of AMR.

Keywords: Antimicrobial Resistance; Livestock workers; Layyah; Antibiotics



Molecular epidemiology and chemotherapy of *Anaplasma platys* infection in domestic and stray dogs in Jhang district, Pakistan

Laraib Khan¹, Farhan Ahmad Atif*¹, Muhammad Fiaz Qamar², Muhammad Kashif¹

¹Medicine Section, Department of Clinical Sciences, College of Veterinary and Animal Sciences, Jhang, Sub-campus of University of Veterinary and Animal Sciences, Lahore, Pakistan.

²Department of Pathobiology, College of Veterinary and Animal Sciences, Jhang, Sub-campus of University of Veterinary and Animal Sciences, Lahore, Pakistan.

*Corresponding author: Farhan Ahmad Atif, farhan.atif@uvas.edu.pk

Abstract: *Anaplasma platys* is a tick-borne pathogen that affects canines, livestock and humans worldwide. The study was planned to determine prevalence, distribution, associated risk factors and chemotherapy of *A. platys* in dogs. A total of 384 cephalic blood samples were collected from domestic (n=256) and stray dogs (n=128) using multistage sampling technique belonging to different breeds, age and gender for the detection of *A. platys* infection using PCR from Jhang district. For chemotherapeutic clinical trial, selected dogs were divided into five groups comprising five dogs each except control. The animals of Group 1 (n=5) received Vibramycine (Doxycycline) @ 10mg/kg, PO (21 days). The dogs of Group 2 (n=5) were given Encure 10% (Enrofloxacin) 2.5mg/kg, IM, (21 days). The Group 3 (n=5) was given Vibramycine (Doxycycline) @ 10mg/kg, PO (21 days) and Deltasole (Prednisolon) (1-3 mg/body weight PO for 21 days). Group 4 (n=5) was given Encure 10% (Enrofloxacin) 2.5mg/kg, IM, (21 days) and Deltasole (Prednisolon) 1-3 mg/body weight PO for 21 days. The overall prevalence of *A. platys* was 10.16%. Whereas, prevalence was higher in domestic (7.42%) compared to stray dogs (15.62%). Final logistic regression analysis revealed that area (OR=3.78), breed (OR=4.09), age (OR=2.62) and tick infestation (OR=3.4) were the significant ($p<0.05$) risk factors associated with molecular prevalence of *A. platys* in dogs. The results of the treatment trials revealed 40%, 80%, 100% and 80% recovery rate for Group I, Group II, Group III and Group IV; respectively. It can be concluded that area, breed, age and tick infestation were the major risk factors and doxycycline along with prednisolon had the highest recovery rate for canine anaplasmosis. The study would aid in prevention and control of canine anaplasmosis with public health implications.

Keywords: Canine anaplasmosis; *Anaplasma platys*; Epidemiology, Chemotherapy; Control.



AMELIORATIVE EFFECTS OF *MORINGA OLEIFERA* AGAINST TOXICO-PATHOLOGICAL CHANGES INDUCED BY THIAMETHOXAM TOXICITY IN BROILER BIRDS

Aziz ur Rehman^{*1}, Syed Muhammad Adeel Arshad¹, Ishtiaq Ahmed¹, Muhammad Kamran Rafique¹

¹Department of Pathobiology, University of Veterinary and Animal Sciences, Lahore Sub-campus, Jhang

***Correspondence:** Aziz ur Rehman, aziz.rehman@uvas.edu.pk

Abstract: Insecticides and pesticides are widely employed to kill insects and eliminate vector-borne illnesses in agriculture and animal husbandry. Thiamethoxam (TMX) is a second-generation neonicotinoid with particular anti-insect nervous system action.

The purpose of this study is to evaluate the TMX toxicity along with the ameliorative effects of *Moringa oleifera* (MOR) in broiler birds.

A total (n=50) day old chicks (DOC) divided into (n=5) equal groups were chosen. Sub-lethal doses of TMX 50 mg/kg and 100 mg/kg body weight were administered to them. DOC in groups C and D were given MOR 10gm/kg b.w.t to check ameliorative effects against TMX toxicity. Whereas one group served as control (group-E). Body weight relative organ weight, Lymphoproliferative response against avian tuberculin, hematobiochemical studies and gross and histopathology parameters were investigated.

Results of this experimental study revealed that the administration of TMX in poultry birds adversely affected hematological profiles such as erythrocyte indices and leukocyte indices. Biochemical profile like creatinine decreased significantly. After administration of avian tuberculin, as a result of the lymphoproliferative response of this antigen cell-mediated immunity was developed. The relative weight of the liver was significantly reduced. In TMX-treated groups, liver showed congestion in sinusoidal spaces, cytoplasmic vacuolation degenerative hepatocytes were formed. Cellular infiltrations of the mononuclear cell were also present. Whereas in kidney tubular lysis, congestion in glomeruli, and the presence of pyknotic and karyorrhetic alterations were observed. The brain showed no microscopic alterations.

So, it was concluded that the detrimental effects of TMX can be ameliorated by MOR.

Keywords: Biochemical Profile, Hematological profile, Microscopic alterations, *Moringa oleifera*, Thiamethoxam



Copro-ELISA based prevalence and risk determinants of giardiasis in cattle and sheep populations raised by socio-economically deprived urban nomadic communities located in and around Multan, Punjab-Pakistan

Mian Muhammad Awais*¹, Hafiz Ihsan-ul-Haq¹, Masood Akhtar¹, Muhammad Irfan Anwar¹, Abdul Sammad Ali Khan Shirwany¹, Abdul Razzaq² and Sibtain Ahmad³

¹One Health Research Lab., Department of Pathobiology, Faculty of Veterinary Sciences, Bahauddin Zakariya University, Multan, Pakistan

²Animal Sciences Division, Pakistan Agricultural Research Council, Islamabad, Pakistan

³Livestock and dairy Development department, Directorate of Multan Division, Multan, Pakistan

*Corresponding Author: Mian Muhammad Awais, drawaisuaf@gmail.com

Abstract: This study reports the copro-prevalence of giardiasis in sheep and cattle populations of urban nomadic communities of Multan-Pakistan. For this purpose, a total of 184 faecal samples were collected from cattle (n=92) and sheep (n=92) raised by the nomads. All samples were analyzed by using species-specific ELISA kits for the detection of copro-antigens of *Giardia duodenalis*. Results showed that the overall prevalence of giardiasis was 21.20% whereas, in sheep and cattle, the prevalence rates were 19.18% and 23.91%, respectively. Age, clinico-physical status and drinking water source showed significant association ($P < 0.05$) with giardiasis in both sheep and cattle. Breed, history of gastrointestinal problems and routine vaccination were also significant ($P < 0.05$) risk factors in sheep but not in cattle. Deworming history had a significant association ($P > 0.05$) with giardiasis in cattle but not in sheep. Conversely, sex, herd size, location, farmer's educational status, feeding pattern, physiological status, contact with wildlife and *Giardia* susceptible animals and hygienic condition of housing facility showed no significant association ($P > 0.05$) with giardiasis. In conclusion, the cattle and sheep kept by the nomadic communities are infected with giardiasis and may pose a significant threat of veterinary and public health concerns by the transmission of *Giardia* infection in susceptible animal and human populations.

Keywords: Copro-prevalence, Giardiasis, Ruminants, Nomadic communities, Multan-Pakistan



Impact of Outdoor Air Pollution on the Health of School-aged Children in Tanzania; A Case Study in Moshi municipality

Kelvin M Musa¹, Rebecca Gordon², George Lee², Bhoke Daniel¹, Nsiya Nyaimaga¹

¹*Kilimanjaro Christian Medical University College*

²*Cornell University*

***Corresponding author:** Kelvin M Musa,

Abstract: Outdoor air pollution is becoming a significant problem globally. Over four million deaths are attributed to outdoor air pollution globally each year. In 2019, 4% of all deaths in Tanzania were related to outdoor air pollution. Children are most affected by outdoor air pollution because of their immature immune and respiratory systems. In Moshi municipality, outdoor air pollution is primarily caused by the use of fossil fuels for transportation, industrial and agricultural activities, and burning of municipal and household waste. This case study examined the impact of outdoor air pollution on child health. In conclusion, major policy issues contributing greatly to the problem of outdoor air pollution were identified and proposed new policies to address the problem. This study was conducted in Kilimanjaro, Tanzania from June to July, 2022.

We performed an intensive literature review and conducted interviews with different stakeholders. Stakeholders involved were the health environmental officers, headmistresses, environmental researchers, ward officers and pediatricians. We critically analyzed the policy issues contributing to outdoor air pollution and proposed new policy recommendations.

The problems of improper collection and burning of waste, lack of industry and vehicle emission standards, lack of air quality monitoring, high cost of sustainable fuels and inadequate awareness were highlighted as the contributors to the problem. Various stakeholders and their level of influence in mitigating the problem were identified. The most influential stakeholders are the National Environmental Management Council (NEMC) and the least influential but the most important are the school-aged children. Policy such as limiting individual waste burning, installation of air quality monitors, establishing and enforcing industry and vehicle emission standards, community outreach to increase awareness, and subsidizing the costs of sustainable fuels are recommended to combat the problem.



The problem of outdoor air pollution is increasing globally in each year and its impact to children health is often ignored. Individual waste burning is occurring in our community and the cost of more sustainable fuels is high and not affordable to most people. The recommended policy options from this case study can be employed in other developing countries to minimize the outdoor air pollution globally.

Key words; outdoor air pollution, school-aged children, health





COMPARATIVE EFFICACY OF TOPICAL AMITRAZ AND AZADIRACHTA INDICA (NEEM) AGAINST DEMODECOSIS IN DOGS

Muhammad Faisal Shabbir¹, Shehla Gul Bokhari^{1*}, Rashid Hussain¹ and Hassan Mushtaq²

¹*Pet Centre, University of Veterinary and Animal Sciences, Lahore*

²*Dept of Epidemiology and Public Health, University of Veterinary and Animal Sciences, Lahore*

***Corresponding author:** Shehla Gul Bokhari, shehla.gul@uvas.edu.pk

Abstract: Generalized canine demodecosis accounts for high case-loads during the summer months in Pakistan. Whilst impaired immunity is considered the major predisposing factor, the disease manifests as erythema, alopecia, edema, seborrhea, pyoderma and pruritus. In this study, the efficacy of the recommended drug Amitraz, was compared to that of a locally available herbal drug, Azadirachta indica (Neem), against generalized canine demodecosis. 20 demodecosis positive dogs, as confirmed through skin scrape examinations, were selected for this study and divided into two equal groups (n=10): Group A dogs were treated with 1.25% Amitraz solution whole body spray, while Group B dogs received treatment using 25% Azadirachta indica solution whole body spray, on Days 0, 7, 14, 21, 28 and 35, respectively. Before each application, follow-up skin scrapes were examined to assess the efficacy of the two drugs. By the end of the 35-day trial period, 70% of the Group B dogs treated with Neem, had recovered from the mite infestation, whilst only 40% of the Group A dogs treated with Amitraz showed promising results. Conclusively, Azadirachta indica (Neem) solution in the concentration of 25% can act as a cheap locally available herbal remedy with greater medical benefits for generalized demodecosis in dogs, as compared with the imported medicine, Amitraz, which is rather, associated with potential adverse effects.

Keywords: Demodecosis, Amitraz, Azadirachta Indica, Neem, pyoderma



Public and animal health concerns as a driver for Dog Population Management

Muhammad Waseem Nazar¹, Muhammad Kashif¹, Amar Nasir¹, Aziz ur Rehman¹, Ans Nadeem¹, Muhammad Haider Jabbar¹, Muhammad Asad Fayyaz Khan¹

¹Department of clinical sciences, College of Veterinary and Animal Sciences University of Veterinary and Animal Sciences (Jhang Campus) Lahore, Pakistan.

*Corresponding Author: Muhammad Kashif, muhammad.kashif@uvas.edu.pk

Abstract: In order to improve human and animal health and welfare as well as environmentally sustainable management, the One Health concept addresses health concerns at the point where animals, people, and the environment come together. The idea emphasizes cooperation, communication, and coordination between sectors and promotes a holistic view. It is in line with the horizontal strategy, which integrates various disease control measures by making the greatest use of the resources at hand (i.e. doing more with less). At the global, regional, national, and local levels, priorities must be clearly stated, and any disease management strategy should include collaboration with the appropriate stakeholders. The One Health idea is all-encompassing and should consider several aspects of a condition, engaging a variety of professionals. In order to effectively control zoonotic illnesses and dog populations, strategies must address social issues, clearly take into account the current situation, and make sure that any actions taken either have no effect or improve the environment. Communication between sectors and resource allocation will both be enhanced through monitoring and evaluation using outcome-based indicators that are pertinent to both human and animal health and welfare. When developing plans, national and local players must coordinate their efforts and establish priorities. In general, intergovernmental groups promote good practice and consolidated experiences and promote the One Health concept.

Keywords: Dog Population Management, Health risk, Environment, Management



Role of non-conventional antibacterial candidates against emerging pathogens

Amjad Islam Aqib^{*1}, Mehreen Noor², Afshan Muneer³, Tasleem Kausar⁴, Sana Zia⁴

¹Department of Medicine, Cholistan University of Veterinary and Animal Sciences, Bahawalpur-63100, Pakistan

²Faculty of biosciences, Cholistan University of Veterinary and Animal Sciences, Bahawalpur-63100, Pakistan

³Department of Zoology, Cholistan University of Veterinary and Animal Sciences, Bahawalpur-63100, Pakistan

⁴Department of Zoology, Government Sadiq Women University, Bahawalpur-63100, Pakistan

***Corresponding author:** Amjad Islam Aqib, amjadislamaqib@cuvas.edu.pk

Abstract: Antimicrobial resistance is a global issue that has given rise to the re-emergence of pathogens. Novel strains of pathogens are arising e.g vancomycin-resistant *S. aureus* and vancomycin-intermediate *S. aureus*. Beta-lactamase-producing bacteria are also another threat to the treatment protocols. Antibiotics' efficacy needs to be potentiated or it needs to be replaced with non-conventional strategies. Prebiotics, probiotics, phytochemicals, peptides, and nanoparticles are better options. They have different modes of action than to that antibiotics and differences also exist among them too. However, mechanisms of action are yet to be understood and extensive research is required for this. On the other hand, factors affecting the activity of these non-conventional antibacterial agents are required to be explored. Size, shape, mode of preparation, and application method are salient factors to be considered while summarizing their activity. Combination therapy consisting of antibiotics with non-antibiotic sources has been found another wise approach. Thus, a comprehensive series of studies are required to develop effective products to culminate antimicrobial resistance.

Keywords: Antibiotics, resistance, prebiotics, probiotics, nanoparticles, mechanisms, factors



Environmental Change as Determinants of Polycystic Ovarian Syndrome

Mahreen Fatima*¹, Sana Zia², Afshan Muneer³, Amjad Islam Aqib⁴

¹Faculty of Biosciences, Cholistan University of Veterinary and Animal Sciences Bahawalpur, Pakistan

²Government Sadiq College Women University Bahawalpur, Pakistan

³Department of Zoology, Cholistan University of Veterinary and Animal Sciences Bahawalpur, Pakistan

⁴Department of Medicine, Cholistan University of Veterinary and Animal Sciences Bahawalpur, Pakistan

*Corresponding author: Mahreen Fatima, noormahreen63100@gmail.com

Abstract: Polycystic Ovarian Syndrome (PCOS) is a condition that affects the reproductive status due to the high level of androgen hormone. Increased androgen level cause disturbance in menstrual cycles that hinder the growth of follicles. Environmental pollutants, diet and nutrition, socioeconomic level, and location are among the environmental factors that may be involved in the etiology, prevalence, and modulation of polycystic ovarian syndrome (PCOS). There is some evidence that environmental toxins alter reproductive health, but research on how these chemicals may affect the development of PCOS is lacking. Although research has indicated that specific dietary supplements and weight loss lessen PCOS symptoms in obese women, further research is needed to examine different approaches to weight management, as well as nutritional aspects that may have a role in preventing or alleviating the development of PCOS. Finally, the limited scope of comparable international studies on PCOS needs to be addressed, because global patterns of PCOS are potentially valuable indicators of cultural, environmental, and genetic factors that may contribute to excess risk in certain regions of the world. The objective of this review article is to evaluate the relationship of environmental toxins with polycystic Ovarian Syndrome in the -local population.

Keywords: PCOS, Environmental toxins, Diet, Hormonal Disturbance



Ultrasonographic and Laboratory Assessments of the Liver and Spleen in Parasitized Carrier Horses

Muhammad Zeeshan Abbas¹, Shehla Gul Bokhari*¹, Asim Khalid Mahmood¹, Saima Masood², Muhammad Kashaf Khan¹ and Muhammad Bilal³

¹Pet Centre, University of Veterinary & Animal Sciences, Lahore

²Dept of Anatomy and Histology, University of Veterinary & Animal Sciences, Lahore

³Dept of Statistics, University of Veterinary and Animal Sciences, Lahore, Pakistan

*Corresponding author: Shehla Gul Bokhari, shehla.gul@uvas.edu.pk

Abstract: Hemoparasites (Babesia, Theileria, Trypanosoma and Leishmania), are highly prevalent among horses in Pakistan, and cause significant acute and chronic diseases. Most horses recovering from acute episodes enter into a chronic carrier state, either with significant replaces or without significant clinical manifestations, except for anemia, performance shortfalls, or changes in spleen and liver function. This study, thus, investigated the carrier status in 05 previously parasitized horses, allocated under Group B; for comparison, 05 healthy horses, allocated under Group A, were taken as Control. Blood parasite status was confirmed primarily, using blood smear microscopy, followed by a complete blood count (CBC), liver function tests and liver and spleen ultrasound examinations, respectively, thereafter. Group B horses under study depicted persistent low-grade parasitemia caused by a higher prevalence of Babesia and Theileria, and rare occurrence of Leishmania. Carrier horses manifested signs of bone marrow suppression due to chronic parasitic disease (as evidenced through low normal granulocyte numbers $P<0.05$; low normal Packed Cell Volume, PCV; high Red Cell Distribution Width, RDW, $P<0.05$); furthermore, high Total Protein, TP, along with monocytosis was suggestive of chronic inflammation, while the persistence of infection/ toxins was also evidenced by a low-normal platelet count along with a high Mean Platelet Volume, MPV, $P<0.05$). Liver echogenicity and echotexture showed only slight non-significant differences between the two groups, however, one horse affected with Leishmaniasis showed sonographic evidence of chronic hepatitis, which also correlated well with the clinical picture. Spleen volume, although slightly less than normal values, showed strong correlations with blood volume ($R^2=0.87$) and hematocrit, HCT ($R^2=0.85$). Conclusively, carrier status in



previously parasitized horses is largely masked through a sound immune system; however, hepatic disease may be detected in horses which succumb to latent, chronic/ relapsing infections after an initial hemoparasitemia.

Keywords: Ultrasonography, parasitized, hemo-parasites, Liver echogenicity, echotexture





Gain-of-Function Research Serial Passage Method and Jumping of Virus over Species Barrier

Inam Ul Haq^{1*}, Muhammad Bakhsh¹, Abdul Rauf¹

¹ University of Veterinary and Animal Sciences Lahore, CVAS Jhang, Pakistan

***Corresponding author:** Inam Ul Haq, inamulhaqm143@gmail.com

Abstract: Gain-of-function (GoF) is a process in which a virus gets several passages that enhances its biological function, immunogenic properties, pathogenicity, and also host tropism. It created an alarming situation for the first time in Influenza Epidemic in 1977-78. It was probably the first viral epidemic caused by a virus created as a result of gain-of-function research through serial passages in the laboratory. This topic again emerged in 2011, when a strain of H5N1 Bird Flu that was transmissible to mammals via aerosol was created by serial passages in ferrets. It was followed by the creation of a chimeric virus by the combination of H5N1 and H1N1 genes via genetic engineering passing it through serial passages in ferrets with the ability to cause a deadly pandemic. SARS-CoV-2 which has caused the recent pandemic has a quality “the furin cleavage site” that distinguishes it from other strains of SARS-CoV and gives a severe clue for its gain-of-function as the previous evidence from the Influenza virus showed that they gained the furin cleavage site through serial passages method. If other SARS-CoV strains gain this furin cleavage site by passage method then it will confirm the gain of function by SARS-CoV-2 through the serial passage.

Keywords: Epidemic; Influenza; SARS-CoV; Virus



Prevalence of Lumpy skin disease in Muzaffargarh district, Pakistan and its consequences

Aiman Rehman*¹, Haseeb Asif¹, Arfa Tehreem¹, Syed Ehtisham-ul-Haque¹, Aman Ullah Khan¹, Adnan Saeed¹, Jaweria Riaz²

¹Section of Microbiology, Department of Pathobiology, University of Veterinary and Animal Sciences, Lahore (Jhang Campus)

²Disease Diagnostic Laboratory, Muzaffargarh, Livestock and Dairy Development Department, Lahore, Pakistan

*Corresponding author: Aiman Rehman, aimanrehman28@gmail.com

Abstract: Lumpy skin disease is a highly contagious domestic disease of cattle caused by the infection of one of the poxviruses LSV (lumpy skin virus). LSD has recently spread within Asia and posing a threat to Pakistan. Incubation period of LSD is 28 days and infected cattle develop clinical signs as early as 6-9 days. We have taken data from CVH Muzaffargarh in which we found 747 cases of LSDV, 226 samples were taken by vesicles and oral swab and 11 samples were sent to Lahore for testing they perform PCR, out of which 5 samples gave positive results and 6 were negative with 45.5% prevalence. Almost 209135 vaccines uploaded on 9211 system on 30-06-2022 in south Punjab. Results suggest that it heavily impacts animal health and welfare and leads to severe economic losses in effected farms. Unawareness may be one cause as most peoples are unaware of the disease and its spread. It is the main concern of one health. LSD should be controlled by strict regulations for animals, stamping out of infected animals and movement control awareness campaigns for control strategies. Infected animals should be separated from healthy animals these strategies may control the disease in the district. For the control LSD vaccination should be implemented for this purpose inoculation of Caprivac vaccine must be done.

Keywords: Lumpy skin disease virus; Poxvirus; mechanical transmission; Livestock rearing



Vaccines against Lyme Borreliosis: A one health paradigm

Ammar Tahir¹, Farhan Ahmad Atif*¹, Muhammad Kashif¹, Arfa Shahzad¹

¹Department of Clinical Sciences, College of Veterinary and Animal Sciences, Jhang, Pakistan

*Corresponding Author: Farhan Ahmad Atif, farhan.atif@uvas.edu.pk

Abstract: To safeguard human health and well-being, both illness prevention and ecological preservation are essential. An increasing global public health problem is diseases brought on by human interaction with domestic and wild animals. This concern will only rise as anthropogenic environmental changes continue. About 60% of all human infections are zoonotic, and about 75% of recently developing infectious illnesses that afflict people are diseases of animal origin. Lyme borreliosis has recently emerged from relative obscurity to become a significant public health issue. The same kind of tick (Ixodes) that transmits Lyme borreliosis' etiologic agents also acts as a vector for diseases that cause tick-borne encephalitis, babesiosis, various types of rickettsioses, and anaplasmoses. The development of classical vaccines with the goal of preventing infection in the host is driven by previously identified B. burgdorferi proteins, lipid immunogens, and live mutants. Bypassing direct vaccination of the human host, new methods of controlling Lyme disease were created as a result of the discovery of the first vaccine's mode of action. Therefore, new preventative theories focus on tick proteins that mediate feeding and disease transmission as well as proteins generated by B. burgdorferi during tick transit. Tick immunity is a growing topic of study because it might reveal mechanistic processes that can be subject to disruption. The development of immunization programs against Lyme disease might be aided by studies that illuminate the mammalian immune mechanisms activated during tick-transmitted B. burgdorferi infection.

Keywords: Lyme Disease, Zoonosis, Vaccine, One Health, Tick-Borne Diseases



Achieving Sustainable Improvements in Livestock Production and Food Safety Using a "One Health" Approach in Low-Resource Areas- A review

Muhammad Zahid Farooq^{1,2}, Tanveer Hussain⁵, Muhammad Fiaz Qamar³, Syed Ehtisham-ul-Haque³, Arbab Sikandar⁴, Muhammad Adil⁴, Muhammad Kamran Afzal⁵

¹Department of Animal Sciences, University of Veterinary and Animal Sciences (Jhang Campus), Lahore 54000, Pakistan

²College of Animal Sciences and Technology, Huazhong Agricultural University, Wuhan, 430070 Hubei, China

³Department of Pathobiology, College of Veterinary and Animal Sciences, Jhang 34200, Pakistan.

⁴Department of Basic Sciences, College of Veterinary and Animal Sciences, Jhang 34200, Pakistan

⁵Department of Molecular biology, Virtual University Lahore 54000, Pakistan.

***Corresponding author:** Muhammad Zahid Farooq, zahid.farooq@uvas.edu.pk

Abstract: Over the past few decades, both production and consumption of livestock products around the world have expanded significantly. Meanwhile, worries about the spread of infectious diseases to humans and other animals through livestock products are rising. There are trade-offs between livestock for nutrition (L4N), foodborne diseases (FBD), and nutritional illnesses (NCDs), and livestock productivity and food safety are intimately intertwined. Challenges in animal food production, such as those related to climate change, shifting consumer preferences, animal welfare, the use of antibiotics, and sustainable animal production systems, have been addressed by interventions at various scales. Within the context of the many Sustainable Development Goals, "One Health" can be a strategy for improving the living conditions of livestock-dependent populations. By emphasizing the importance of animal health to human health and well-being and expanding on the conceptual framework of One Health, in 2016, in Busia county, western Kenya, using a standardized questionnaire as a framework for organized interviews, researchers spoke with 70 farmers, 49 agroveter staff, and 28 veterinary animal healthcare workers or veterinary surgeons. The bulk of antimicrobials were obtained off-label, through the purchase of products through agroveterinary stores,



wherein over half of the employees lacked the qualifications required by law to provide advice on or sell veterinary antimicrobials.

Keywords: Livestock Production, one health, food safety, SDGs, climate change





HEALTH STATUS OF LARGE RUMINANTS AS SOURCE OF BEEF IN PAKISTAN; USE OF HEMORRHAGIC SEPTICEMIA VACCINE FOR PREVENTION

Tanveer Aslam¹, Muhammad Sajid¹, Aziz-ur-Rehman¹, Iahasham Khan¹, Syed Ehtisham-ul-Haque¹, Muhammad Irfan Anwar¹

¹College of Veterinary and Animal Sciences, Jhang.

*Corresponding author: Tanveer Aslam, tanveeraslam500@gmail.com

Abstract: Hemorrhagic septicemia is caused by *Pasteurella multocida* and is thought to be the most fatal disease in large ruminants. It is thought that the effective vaccination might be the only preventive measure in incident areas before the start of outbreaks. This study was conducted to investigate the effect of an Eolane based vaccine which would be economic but more effective than the already available vaccines. A total of 24 cattle and buffalo calves with age of one year were reared under standard conditions of management and feeding. The experimental animals were administered oil-based vaccine at day 0 and day 90. The animals were observed for clinical signs after each vaccination. Blood and serum samples were collected on day 0, 42, 90, 180 and 270. The samples were subjected to hematology and serum urea, creatinine, ALT, AST, ALP, total protein, glucose and cholesterol. This work was helpful to establish the clinical changes in vaccinated cattle and buffalo calves and provide information for vaccine safety. The mean value of all parameters was tested by student's T-test at 95% confidence level. It was concluded that the vaccines triggered the immune cells but liver and kidney function tests were comparable with control group. Our study showed that the Eolane adjuvant-based vaccine (E150) produced highest antibody titers as compared to E170 and Montanide 50. The hematological and serological parameters also showed no hazardous effect on health of bovines for E 150 and hence it might be safe for animals.

Keywords: vaccine, hemorrhagic septicemia, hematology, serology



Role of Camel Meat in Food Safety and Food Security: One Health Prospective

Muhammad Hussain Ghazali^{*1}, *Fareena Khan*², *Muhammad Tashfeen Dilawar*³, and *Muhammad Bakhsh*⁴

¹ *Department of Meat Science and Technology, Faculty of Animal Production and Technology, the University of Veterinary and Animal Sciences, Lahore – Pakistan.*

² *Department of Soil Sciences, Faculty of Agriculture Sciences and Technology, Bahauddin Zakariya University, Multan – Pakistan.*

³ *Department of Horticulture, Faculty of Agriculture Sciences and Technology, Bahauddin Zakariya University, Multan – Pakistan.*

⁴ *Department of Animal Sciences, College of Veterinary and Animal Sciences, Jhang- Pakistan.*

***Corresponding author:** Muhammad Hussain Ghazali, muhammadhussainghazali@gmail.com

Abstract: The health and welfare of humans are interlinked with domestic animals and vital wildlife which is a healthy and intact ecosystem. This concept forms ‘One Health. The hurdles in achieving the objectives of ‘One Health’ concept is quite complicated. The origin of most infectious diseases in humans is animals. As the human population is tremendously increasing day by day, the demand for meat and meat products is rising and is becoming one of the main challenges to food security. Conventional food systems including bush meat and backyard farming propose the risk of transmission of disease from wild animals. Intensive farming enhances the effect of the disease due to the increased density, high immunodeficiency, and live transport of farmed animals. However, existing regulatory frameworks such as the “One Health” context emphasize improving farms’ biosecurity and disaster preparedness, and we show the need to better align stakeholders’ incentives. Camel meat is an exceptional source of protein and as well as has many medicinal benefits for human health and well-being. Camel meat demand is increasing for health purposes. It can yield carcasses that have low (↓) fat content than beef and high content of water. It has a significantly high (↑) quantity of Polyunsaturated Fatty Acids (PUFA) than beef. We can utilize camel meat for remedial purposes in the treatment of certain issues like jaundice, long bone pain, arthritis, diabetes,



spleen infections, and liver diseases. It may offer a solution to sustainably secure the food supply. Moreover, there is a dire need to discover dedicated sources concerning farm animals' wellness and food safety parameters.

Keywords: Biosecurity; Camel Meat; Food Safety; Infectious Diseases; Wild Animals





***Sarcoptes scabiei* in Canine and Humans: A one Health Concern**

Arfa Shahzad¹, Muhammad Kashif¹, Amar Nasir¹, Mazzhar Abbas², Ammar Tahir¹

¹Department of Clinical Sciences, College of Veterinary and Animal Sciences, Jhang, Pakistan

²Department of Basic Sciences, College of Veterinary and Animal Sciences, Jhang, Pakistan

***Corresponding author:** Muhammad Kashif, muhammad.kashif@uvas.edu.pk

Abstract: Many dermatological conditions affect both humans and animals. One of them is the *Sarcoptes scabiei*. These mites can be transmitted from animals to humans through close contact and cause self-limiting very uncomfortable pruritic papules on arms and other areas of the body like the anterior chest and upper thighs. Other signs include excoriations, hyperkeratosis, and hypotrichosis. We report a 24-year-old female veterinarian intern from Bahawalpur Pakistan who developed the same skin lesions. Upon taking the history, it was revealed that a female intern took skin scrapping from the ears of a 7 weeks old German Shephard puppy without wearing any gloves. Even after the dog was diagnosed with *S. scabies*, the intern didn't take notice of her safety. Later on, the intern developed lesions like pruritic papular eruption on the back, trunk, and thighs after 4 days of exposure to the respective puppy. Mites were recovered from the skin scrapping of the patient. The patient was treated with Scabion Forte (Crotamiton + Sulphur) lotion and was asymptomatic after 15 days of treatment. This case shows a linkage between animal, and human health and the environment, and an alliance that may allow the worsening of zoonotic diseases origin, as the One Health concept emphasizes. It is, therefore, crucial to increase scrutiny on vectors of diseases and to find collective, multiscale, and thwartwise for possible quality health of humans and animals.

Keywords: Canines, Environment, Humans, One Health, Sarcopties, Zoonosis



Optimization of state-of-the-art flow cytometry assays for the quantification of CD8⁺ and CD4⁺ T cells in poultry

Muhammad Suleman^{1*}, Khadija Naseer¹, Namrah Ishtiaq¹, Muhammad Ramiz¹, Muhammad Zubair Shabbir² and Arfan Ahmad¹

¹University Diagnostic Laboratory, Institute of Microbiology, University of Veterinary and Animal Sciences, Lahore, Pakistan

²Quality Operations Laboratory, ²Institute of Microbiology, University of Veterinary and Animal Sciences, Lahore, Pakistan

*Corresponding author: Muhammad Suleman, muhammad.suleman@uvas.edu.pk

Abstract: Multi-parameter flow cytometry (FCM) has been used internationally but not being established in veterinary research in Pakistan. FCM can identify various avian leukocyte subsets, namely CD8⁺, CD4⁺, T cells, B cells macrophages, monocytes and natural killer cells. With convenient and proven flow cytometry, cellular immune responses can be evaluated and improved after infection or vaccination in birds. Advances and standardization of chicken T-cell function assay methods will aid in the analysis of immune defense mechanisms and the development of new vaccines and therapeutics against various avian diseases.

We collected blood in different volume (2ml & 3ml) from control group of poultry (broiler), PBMCs were separated using ficoll density gradient method and cells were counted and stained the 0.5×10^6 cells using different concentrations (1 μ g, 2.5 μ g and 5 μ g) of CD8-FITC and CD4-PE monoclonal antibodies and then performed flow cytometry acquired (10,000 events) using FACS AttuneX NxT cytometer. Initial gating included gate for debris exclusion, gate for excluding duplets and including only singlets, the population was then gated for isotype control to minimize background staining and after that gates were set for quantifying CD8⁺ and CD4⁺ cells.

Our results showed that 3ml blood is optimum to separate the PBMCs and 2.5 μ g of CD8-FITC and CD4-PE monoclonal antibodies is found optimum for staining T cells. The %age of positive cells using 1 μ g, 2.5 μ g and 5 μ g of CD4-PE is 4.819% 17.071% and 17.27% respectively. The %age of positive cells using 1 μ g, 2.5 μ g and 5 μ g of CD8-FITC is 3.46%, 6.69% and 8.38% respectively.



It is concluded that the optimization of flow cytometric assays for *in-vitro* quantification of poultry immune cells (CD8+, CD4+ T cells) may contribute in the development of more effective T cells-based vaccines against various diseases for the poultry industry in future.

Keywords: Poultry, CD4+ & CD8+ T cells, flow cytometry, immunization, avian disease





Prevalence and Mitigation Strategies of *Campylobacter* and *Salmonella* in Broilers

Abdul Rauf^{1}, Muhammad Bakhsh¹, Inam Ul Haq¹, Muhammad Irfan²*

¹ *University of Veterinary and Animal Sciences Lahore, CVAS Jhang, Pakistan*

² *Department of Epidemiology and Public Health, University of Agriculture, Faisalabad, Pakistan*

***Corresponding author:** Abdul Rauf, arauf8815@gmail.com

Abstract: High prevalence of *Campylobacter* and *Salmonella* species has been reported in poultry from brooding age (first week chicks) to adult birds (7th week birds) in recent years imposing a public health threat by producing resistant strains against antibiotics and disinfectants and reducing shelf life of poultry meat. European food safety authority (EFSA) has reported 50%-80% of human campylobacteriosis emerging from poultry sources. A number of 500 *Campylobacter* cells can contribute to enteric illness in humans. Major reservoirs of *Campylobacter* species are fecal content, drinking water and carcass. Detection of *Campylobacter* species during processing, defeathering and slaughtering is reported more than 50% of all microbes. Species of *Salmonella* and *Campylobacter* are reported to be little sensitive to peracetic acids in chilling of poultry meat after processing but cross contamination before chilling limits this methodology. *Campylobacter* species have shown no reduction in colony forming units when poultry meat is subjected to vacuum packaging. Transient state of *Campylobacter* species limits culture testing control after modified packaging. In short and in fact, no intervention is successful in mitigating the *Salmonella* and *Campylobacter* species from poultry meat currently. Use of bacteriolytic and macrophages have reduced bacterial load of *Salmonella* and *Campylobacter* species in poultry birds and processing plants. It is key requirement to limit and mitigate *Salmonella* and *Campylobacter* species in poultry to reduce human enteric illness and enhance shelf life of chicken meat. Most suitable strategy for this purpose is utilization of bacteriophages and bacteriolytic that demands a huge research area for practical application.

Keywords: *Campylobacter*; *Salmonella*; Peracetic acid; Poultry; Macrophages; Bacteriolytic



Detection and identification of drug resistant *MTB* strains through PCR-RFLP

Muhammad Riaz¹

¹Department of Allied Health Sciences, University of Sargodha, Sargodha-Pakistan

*Corresponding author: Muhammad Riaz, riazmlt786@gmail.com

Abstract: Tuberculosis (TB) is a chronic infectious disease mainly affecting the adult population worldwide. The current study was conducted to determine the *Mycobacterium tuberculosis* drug resistance through PCR-RFLP. The study population consists of suspected of drug resistance (120) cases and random sputum samples (221) from patients. PCR-RFLP was used to evaluate the variation in the genes of drug resistant strains against isoniazid, ethambutol, streptomycin and ofloxacin. PCR analysis confirmed 91.5% cases infected with *M. tuberculosis* complex. The drug resistance was found in 8.2% cases from random samples and 73.3% from suspected drug resistance cases. Single drug resistance was found in 56.1% of the isolates, with two drugs in 33.3% and to more than two drugs in 10.6% of the isolates. Only 6.5% of the cases were found resistant to ofloxacin along with isoniazid, ethambutol and streptomycin. Isoniazid resistance was found in 61% cases, 50.4% to ethambutol and 43.1% cases to streptomycin. The study concluded that mutations in TB cases resistant to anti-TB drugs can be rapidly detected through PCR-RFLP that may be used as a rapid tool in timely diagnosing the drug resistant TB cases.

Keywords: Tuberculosis, drug resistance, isoniazid, streptomycin, ofloxacin



Impacts of Lumpy skin disease on economy and environment

Ans Nadeem¹, Amar Nasir¹, Farhan Ahmad Atif¹, Aziz Ur Rehman², Aftab Hussain¹, Muhammad Haider Jabbar¹

¹Department of Clinical Sciences, College of Veterinary and Animal Sciences, University of Veterinary and Animal Sciences, (Jhang campus), Pakistan

²Department of Pathobiology, College of Veterinary and Animal Sciences, University of Veterinary and Animal Sciences, (Jhang campus), Pakistan

*Corresponding author: Ans Nadeem, ansnadeem89f@gmail.com

Abstract: Livestock contributes a major portion to the GDP of most agricultural countries. Likewise, its contribution to Pakistan's GDP is 14%. Out of all infections, viral ones are the most significant because they cause severe illness and great economic loss. Lumpy skin disease is an emerging and re-emerging viral disease of Bovine, caused by the Lumpy skin disease virus. It causes considerable economic losses due to emaciation, infertility, mastitis, loss of production, and mortality. The scars left on the hide of animals made them non-saleable, which caused losses to farmers and the leather industry. The animals become starved, milk production is reduced due to stress, and great chance of udder infection, which causes direct and indirect losses due to the high cost of treatment. Mortality may reach up to 50%.

In outbreak situations farmers throw away their dead animals on the sides of the road, viruses present in dead animals pose threats to human and animal lives as well as the environment. These animals were treated with high doses of antibiotics, which are released into the environment and cause antimicrobial resistance in humans by entering the food chain. These dead animals become sources of smell, which disturbs pedestrians, and sources of other infections.

A large-scale vaccination campaign should be carried out by the governments to control and reduce the risk of future outbreaks. Proper dumping places should be provided by the local authorities for the dead animals. Campaigns to educate the public about One health So, they show responsibility regarding dumping their dead animals.

Keywords: Economic loss, LSD outbreak, Mortality, Vaccination, Environmental Impact



A management perspective: intra-mammary ozone therapy for contagious mastitis

Muhammad Asad Fayyaz Khan¹, Amar Nasir¹, Ans Nadeem¹, Aftab Hussain¹, Muhammad Waseem Nazar¹, Sami Ullah¹

¹Department of Clinical Sciences, College of Veterinary and Animal Sciences, University of Veterinary and Animal Sciences, (Jhang campus), Pakistan

Corresponding author: Muhammad Asad Fayyaz Khan, asadfayaz1234@gmail.com

Abstract: This research evaluates the efficacy of intra-mammary ozone treatment during the dry period and at the period of calving in avoiding mastitis.

The cows were separated into four groups of five each. At the beginning of the dry period, Group 1 was treated for 5 seconds with ozone-containing preparation via the intra-mammary route; Group 2 was administered ozone into all four udder quarters for 5 seconds at the parturition time; Group 3 was treated with a preparation of amoxicillin infusion at the start of the dry period; and Group 4 was treated using only teat sealant at the start of the dry period.

There was no substantial change among the SCC levels at the start of the dry period and at the parturition time in group 4. Comparing the SCC at the start of the dry period and at the time of calving, it was found that the SCC values decreased in group 3. According to the incidence of microbiological isolation in milk at the time of calving, clinical mastitis was observed in all cows of group 2 but two of the cows in Group 1 at parturition.

Intra-mammary ozone treatment provided no prevention of mastitis in the dry season or at parturition in herds; furthermore, it increased the incidence of mastitis in the lactational period.

Keywords: Ozone Treatment, Mastitis, Dry cow therapy, Somatic cell count, Intra-mammary infection



TOXOCARIASIS: An Emerging Parasitic Zoonosis

Taimoor Nasrullah¹, Amar Nasir¹, Muhammad Kashif¹, Farhan Ahmad Atif¹, Ans Nadeem¹, Aftab Hussain¹

¹Department of Clinical Sciences, College of Veterinary and Animal Sciences, Jhang

***Corresponding author:** Taimoor Nasrullah, taimoornasrullah0@gmail.com

Abstract: Infection caused by a parasitic roundworm that inhabits the intestines of cats, dogs, and foxes. Eggs shed in animal feces contaminate the surrounding soil. Infected eggs may be swallowed, hatch, and release larvae that move to the brain, liver, eye, heart, lungs, or muscle after penetrating the intestines.

Toxocariasis as monitoring, prevention, and treatment get minimal attention, this parasitic illness has been identified as one of five that are ignored. In a research study, a modest number of clinical physicians claimed to have a passing understanding of toxocariasis, but when given a list of symptoms, only half accurately identified the condition. Low-income and minority people are more susceptible to exposure. Playgrounds and schoolyards may increase young children's exposure to hazards.

Physicians do little research, despite 15-30% of Pakistanis are infected with the parasite. There is currently no government funding available for toxocariasis research. About 30 percent of dogs and 25 percent of cats are infected with the parasite *Toxocara*, which may lead to impaired learning and mental disorders. The rate is higher among outdoor pets and stray animals.

Raise the level of toxocariasis awareness among parents and pet owners. promote the immunization and deworming treatments administered by veterinarians. • Educate clinical doctors about the diagnosis and treatment of childhood toxocariasis.

Toxocariasis is a fully treatable parasitic illness if pet owners are properly educated on pet waste management and pet health care. Current therapeutic techniques would avoid any long-term health impacts in the case of exposure. Although it is known that larvae may move throughout the human body, nothing is known about the health consequences. This ubiquitous common parasite requires further care to avoid any adverse health effects.

Keywords: Toxocariasis, parasitic infection, emerging issue, zoonotic parasites, neglected issue



THE BASIC AND BEYOND OF PAPILOMAVIRUS

Muhammad Mujeeb Abid^{*1}, Aziz ur Rehman¹, Muhammad Kamran Rafique¹, Ishtiaq Ahmed¹,
Muhammad Naeem Abbas¹

¹Department of Pathobiology, College of Veterinary and Animal Sciences, Jhang

*Corresponding author: Muhammad Mujeeb Abid, mmujeebaid@gmail.com

Abstract: Papillomavirus (PV) is a crucial causing agent of malignant and benign tumors both in humans and animals. Human papillomavirus (HPV) belongs to the family papillomaviridae known as the oldest viral family. Human papillomatosis is characterized by tumor growth of the oral and genital mucosal membranes. HPV proliferates in epithelial cells of the skin and causes cancerous growth. WHO documented that HPV type 17 and HPV type 18 are oncogenic agents and 20-25% of human malignancies cause by HPV. Bovine papillomaviruses (BPV) are a small group of double-stranded Deoxyribonucleic acid. Bovine papillomaviruses are oncogenic and epitheliotropic in nature. Bovine papillomaviruses are small non-enveloped dsDNA that have 13 genomes that are fully characterized until now. BPV replicates in upper stratified cells of the epithelial membrane. BPV induces tumors and cancerous growth in epithelial cells. The growth of Bovine papillomaviruses may be exophytic and endophytic. Many exploratory studies showed that ironically change in molecular detection of Papillomavirus through degenerative polymerase chain reaction primers. Specifically, the division of nucleotide sequence of the L1 gene proved helpful in the identification of a new classification of papillomaviruses. The last 50 years of research studies on papillomaviruses showed that BPVs and HPVs have an association in many ways. Now modern molecular detection in which RT-PCR, gene sequencing, and screening tools show less association between BPVs and HPVs in structure, pathogenesis, and gene sequence. It also transmits through frictional epithelial contact with animal or blood transfusion and contaminated dairy fomites or fixtures. Usually, the diagnosis of Bovine papillomavirus is through gene amplification of PCR and ELISA techniques.

Keywords: Bovine Papilloma Virus, Tumour, Transmission, Diagnosis



Measures for sustainable food supply through livestock products in perspective of malnutrition and climate change

Abdur Rahman^{*1}, Akhtar Rasool Asif¹, Zaman Zahid¹

¹Department of Animal Sciences, University of Veterinary and Animal Sciences, Jhang Campus.

*Corresponding Author: Abdur Rehman, abdurrehman@uvas.edu.pk

Abstract: Since emergence of concept of revolutionary modernization, the climate is changing badly, affecting the life in many ways. Development aims to facilitate human beings on this planet. Along-with this development various hazardous effects have been arising due to many factors like utilization of agricultural and forest land for construction of buildings, industries and houses which disturbs the normal ecosystem leading to environmental pollution along-with less available land for staple food crops. Animals, the best and complimentary part of human nutrition as ideal protein source, also need to be fed some part of these staple foods, which puts pressure on supply of these food items and negatively impacts the human dietary requirements and animal production as well. This phenomenon stresses on the need to explore the alternative feed resources to dilute the pressure on the supply of food items. Various non-conventional feed resources can be investigated and explored for their inclusion in animals feed to get optimum production with less cost of production. Moreover, along-with modernization in other fields, many latest value addition techniques are needed to be adopted in the production of livestock and poultry products to improve shelf life of products, their quality, formation of multiple products from single raw product, trend to reshape packaging strategies, biofortification, and production of designer products etc. These practices may bring revolution in livestock sector in combating challenges of food shortage and may result in sustainable supply of food to the individuals of this universe.

Keywords: Food security, Livestock, Climate change, Animal products



Characterization of immunogenicity, duration of protection, and safety studies in bovines immunized with *Pasteurella multocida* B:2 Eolane oil adjuvant vaccine

*Prof. Syed Ehtisham-ul-Haque¹, Shanza Khan^{*1}, Muhammad Adnan Saeed¹, Muhammad Sajid¹ Maleeha Fatima¹*

¹*University of Veterinary and Animal Sciences, Sub-campus, Jhang:*

***Correspondence:** Shanza Khan, 2020-mphil-2183@uvas.edu.pk

Abstract: Hemorrhagic septicemia (HS) is a fatal infectious disease affecting cattle and buffalo caused by *Pasteurella multocida* B:2 and E:2. HS outbreaks lead to numerous deaths, and severe economic loss, Control through vaccination is the only method that can be used effectively.

To determine the efficacy of Eolane based HS vaccine and its immunogenic effect in buffalo calves and safety study in lactating bovines.

Alum (adjuvant) precipitated vaccines induce immunity for 3-4 months; whereas oil (adjuvant) based vaccines induce immunity for a year. We studied immunological response and safety of locally produced HS oil-based vaccines Montanide ISA-50 V2 (M50), Eolane-170 (E170), and Eolane-150 (E150) in buffalo calves and also saw the effect of the Eolane-150 vaccine on milk production in lactating buffaloes. The antigen suspension in vaccines was adjusted to a concentration of 2mg/ml for bacterin (killed bacterial vaccine). In the end, antigen suspension was mixed 1:1 with mineral oils.

To check immune response Indirect Haem-Agglutination (IHA) test was conducted on serum samples of buffalo calves (n=12); three groups of buffalo calves each group (n=4) buffalo calves were vaccinated with three different HS oil-based vaccines E150 and E170, and M50. IHA indicated that immune response in buffalo calves was higher (GMT=13) on the 90th-day post-vaccination with HS vaccine adjuvanted with Eolane-150 in buffalo calves while, Daily milk records of 06 lactating bovines were noted for 10 days before vaccination and 90 days after vaccination. There was no milk drop due to vaccine stress or any other vaccinal side



effects. Vaccines were easy to inject with no side effects, no swelling at the injection site, and longer protection.

Eolane oil adjuvanted vaccines (Eolane-150, Eolane-170) in buffalo calves can provoke immune response but Eolane-150 adjuvanted HS vaccine excelled with the highest immune titer and long-lived humoral immunity against B:2 *P. multocida* infection.

Keywords: HS vaccine, buffalo calves, Oil adjuvants, Immunogenicity, Lactating bovines.





Evaluation of *in-vitro* Efficacy of Cranberry Extract Against Uropathogenic Bacteria Isolated from Dogs

Syed Ehtisham-ul-Haqu*¹, Awais Saleem¹, Muhammad Adnan Saeed³, Mazhar Abbas⁴

¹Section of Microbiology, Department of Pathobiology, University of Veterinary and Animal Sciences, Lahore (Jhang Campus)

²Section of Biochemistry, Department of Biochemistry, University of Veterinary and Animal Sciences, Lahore (Jhang Campus)

*Corresponding author: Syed Ehtisham-ul-Haque, ehtishamsyed@uvas.edu.pk

Urinary tract infection is the most emerging disease worldwide in dogs. The main causative uropathogen is *Escherichia coli*. For its treatment other ways have been introduced to diminish the problems of antibiotic resistance and recurrence. Cranberry extract can be used as an alternative herbal treatment without any side effects and risk of antibiotic resistance. This study was conducted in Lahore and a total $n=100$ urine samples were collected from Lahore. Leukocyte esterase test and microscopy was done to observe pus cells and the positive samples were inoculated on media for incubation. Further identification of cultures was performed by biochemical tests and microscopy. *In vitro* efficacy of cranberry extract was determined by the Kirby-Bauer disc diffusion method. In our study, UTIs were more prevalent in females of dogs (23%) and less in males, 6% in dogs. Prevalence of *E. coli* in dogs was highest followed by *P. mirabilis* and *K. pneumoniae*. In our study cranberry extract also showed antimicrobial activity against antibiotic-resistant isolates of *K. pneumoniae*. These findings showed that cranberry extract possesses potent phytochemical activity against antibiotic-resistant uropathogens isolated from urine specimens of dogs in Lahore, Pakistan and hold great promise as an antimicrobial agent.

Key words: Urinary tract infections, phytochemical, cranberry extract, isolates, uropathogens



Development of Innovative organoids to study virulence trends of avian influenza viruses in poultry and wild birds

Hafiz Muhammad Usman¹, Waleed Akram¹, Aman Ullah Khan¹, Adnan Saeed¹, Syed Ehtisham-ul-Haque¹, Muhammad Fiaz Qamar¹, Usman Waheed¹

¹Department of Pathobiology, University of Veterinary and Animal Sciences, Lahore (Jhang Campus)

*Corresponding author: Hafiz Muhammad Usman, usman.siddiq@uvas.edu.pk

Abstract: The viruses and other microorganisms are getting stronger with mutations in their structures and virulence; therefore, we need more advanced, quicker and reliable research methodologies and resources. In case of influenza viruses, the emergence of new strains is the consistent threat to poultry health. Therefore, it is a dire need to tackle such challenges on real time basis.

The development of animal models and cell culture lines in virology has advanced the research capabilities of modern science in terms of disease diagnostics and vaccines development. Moreover, these models helped us to understand the host-pathogen interaction. However, these animal model or immortal cell lines do not represent the true sense of virus interaction in a natural host, there are some limitations of these cell lines system. On the other hand, the modern techniques and methodology of using organoids for culturing influenza viruses of poultry and wild birds will revolutionize the understanding of structural and functional complexity of infected and normal cells. By using organoids for characterizing avian influenza viruses will help us to highlight the virulence of different strains of viruses in vast field challenges. Organoids are simplified form of an organ. They can better mimic the pathologies of an organ. Use of organotypic cultures will help us to understand the morbidity pattern of avian viruses in different age groups of poultry birds. Moreover, this advancement will help us to study antiviral testing and culture the viruses which are not easily grow on immortal cell lines.

Key words: Organoids, influenza viruses, virulence, animal model, poultry and wild birds



Effects of microplastics on human, animal, and environmental health from a One Health perspective

Abdur Rahman Ansari*¹, Muhammad Fiaz Qamar¹, Muhammad Arshad¹

¹University of Veterinary and Animal Sciences, Lahore, Sub-campus, CVAS, Jhang.

*Corresponding author: Abdur Rahman Ansari, arahman@uvas.edu.pk

Abstract Plastics have been widely used in a variety of industries since the 1950s because of their cost-effectiveness, adaptability, lightness, strength, and durability. Plastic materials break down into little pieces when they decompose. Microplastics are defined as plastic particles that are less than 5 mm in size. Because of the pervasive environmental pollution with microplastics, both people and other biota are exposed. While the majority of studies exaggerate the direct toxicity of microplastics, it is important to take into account the particle quantities, properties, and exposure settings employed in these assays. Furthermore, microplastics degrade the health of aquatic animals and contaminate the oceans. Similarly, data from lab rats and mice point to a serious adverse impact of microplastics on human health. The experimental evidence is still incomplete and contentious due to the wide range of plastic kinds, particle sizes, doses, models, and means of delivery. Microplastic pollution of the environment is a widespread issue brought on by the widespread usage and manufacture of plastics. These particles are continuously inhaled and consumed by humans. The accompanying health risks warrant careful consideration and serious assessment. The One Health method offers a fresh viewpoint that focuses on the confluence of various fields, specifically animal, human, and environmental health. A One Health approach to microplastics addresses consequences beyond toxicological effects. The acquired data points to a significant knowledge gap that requires more study to understand the direct and indirect effects of microplastics on One Health under environmentally relevant conditions.

Keywords: microplastics; toxicity; one health



The Human Factor: Moral and Social Responsibility in control of zoonotic disease in Pakistan

*Dr Ziasma Haneef Khan*¹, Mahwish Haider¹*

¹Department of Psychology, University of Karachi

***Corresponding author:** Dr Ziasma Haneef Khan, ziasmak@uok.edu.pk

Abstract: This article draws attention to an integral unit in the one health model. The recent flood in Pakistan has affected over 33 million people, where 81 districts have been declared as calamity hit, 5.5 million areas of croplands are affected and 1.1 million livestock lost which is the main source of income for many people. Furthermore, the health infrastructure is also damaged with rapid assessments indicating some 1543 health facilities and their contents destroyed. We can also see that Pakistan has to fight the ongoing challenge in the rise of zoonotic diseases. Although the Government of Pakistan is extensively and persistently engaged in educating, policy making and controlling the spread of zoonotic diseases but an integral human component of moral obligation has been immensely ignored. Hence this article addresses a serious neglected solution that if focussed on may help in implementing the government innovative steps and strategies to prevent and control zoonotic diseases. The greatest challenge in successful implementation of these programs is the human part of the moral and social responsibility to do so which is confounded by clash between self-interest, monetary gains and welfare of animals and humans. Therefore, this paper explores and highlights the importance of creating moral and ethical responsibility for all stakeholders engaged in livestock in order to follow the directions for control and prevention of zoonotic disease.

Keywords: stakeholders, moral responsibility, clear governance, autonomy



Significance of biowaste valorization from one-health perspective

Ayesha Afzal^{*1}, Muhammad Adil¹, Amina Pervaiz¹, Ayat Fatima¹, Ayesha Shareef¹

¹University of Veterinary & Animal Sciences, Lahore, Jhang campus, Jhang-35200, Pakistan.

*Corresponding author: Ayesha Afzal, ayashaafzal20001@gmail.com

Abstract: Anthropogenic activities may lead to extensive biowaste production and its release into the environment with potential ecotoxic effects. Biowaste generated from medical activities, biomedical discharge from hospitals, health care units and other medical sectors has been implicated in the spread of several diseases such as typhoid, cholera and hepatitis. Improper disposal of hospital waste and medical activities can directly affect the environment, humans and animals, hence disrupting the balance of one-health. Valorization is an important process of waste management for the synthesis of low-cost and valuable products through recycling, biorefining and associated innovative techniques. Apart from the manufacturing of useful, bio-based-products, the reprocessing of biowaste also helps in reducing the likelihood of environmental contamination.

Critically-required technological transition, consumer awareness and lack of legislative measures are the major constraints of biowaste valorization in underdeveloped and developing countries. This article describes the current status and future consideration of biowaste valorization from one-health standpoint.

Keywords: Biowaste, medical waste, valorization, recycling, one-health



COMPARATIVE PREVALENCE OF COLISTIN RESISTANT *E.coli* IN ASIAN POULTRY

Sheeba Gulzar¹, Muhammad Adnan Saeed¹

¹Section of Microbiology, University of Veterinary and Animal Sciences, Lahore (Jhang Campus), Pakistan.

*Corresponding author: Sheeba Gulzar, 2019-amj-018@uvas.edu.pk

Abstract: Antimicrobial resistance has become an intercontinental problem for livestock and public health. Irrational uses of antibiotics in poultry have promoted the emergence of multidrug-resistant organisms (MDRO) and elicit threats to human health & livestock. Colistin, a last-line antibiotic of prime importance in veterinary and human medicine, is prescribed to treat enteric infections caused by different strains of *E.coli* in multiple veterinary species including poultry. *E.coli* cause Colibacillosis, fatal septicemia, subacute peritonitis, cellulitis and so on... Colistin has effective treatment against E.Coli and other bacteria of the Enterobacteriaceae family. Treatment by maximum dose(5.09mg/kg) of Colistin results in an almost 1000-fold reduction in the total population of *E.coli*. Presently, there is a high prevalence of *E. coli* and their resistance rate against colistin in poultry. In the meta-analysis of 12 studies in the Asian region including China, Nepal, Pakistan, and India. The pooled prevalence of *E. coli* was 11.6%, 31.6%, 18.95%, and 28.6% respectively. Consequently, antimicrobials in raising livestock. Plasmid Transferred Mobilized Colistin Resistance (*mcr-1*) gene is the most reported to confer resistance to colistin in *E.coli*. *E.coli* isolates containing *mcr-1* has higher resistance rates as compared to *E.coli* *mcr-1* negative. In poultry food, especially chicken & broilers *E. coli* precede worldwide concern about the horizontal transfer of resistant genes *mcr-1*. Ultimately colistin residues in Environment become hazardous for other species. The outcome shows a Colistin resistance in *E.coli* varied during 2017 -2022 massively in Asian Region. One Health Authorities should provide a valuable reference & more effective policies that can be formulated and implemented to minimize accelerating Colistin Resistance potential in Enterobacteriaceae.

Keywords: Colistin Resistant E.Coli, prevalence, poultry, Asia



Antimicrobial resistance reducing potential of antibiofilm agents

Arooj Fatima¹, Hina Isha¹, Muhammad Adil¹, Muhammad Adnan Saeed¹

¹University of Veterinary & Animal Sciences, Lahore, Jhang Campus, Jhang -35200, Pakistan.

*Corresponding author: Arooj Fatima, aroojf01122@gmail.com

Abstract: Biofilm has drawn substantial interest in various sectors such as public health, medicine and pharmaceutical industry. It is consortium of microbial cells made of polymer matrix and causes a worldwide health challenge on account of its antimicrobial resistance property which may leads to high morbidity and high mortality with subsequent detrimental impact on health economy. Recent intensification of research develops new antibiofilm therapies, antibiofilm medical devices and diagnostic tools help in combating pathogenic biofilms and will provide fast, inexpensive, potent and safe weapon to combat pathogenic biofilm. For overcoming its resistant property or reduce the antimicrobial resistance the available drug can be repurposed to eradicate the pathogen ease the antimicrobial burden. Introducing nanoparticles in biomaterials or as drug delivery mode can be the solutions to reduce antimicrobial resistance. Bioinformatics can also be used for analyzing and predicting antimicrobial resistance emanating from biofilm .Small molecules like 5-fluorouracil and synthetic molecule like terrain targets quorum sensing .C-di-GMP can be used for Antibiofilm strategies .Novel molecules like SYG-180-2-2 has the ability to reduce bacterial adhesion and Polysaccharide intercellular adhesion in methicillin –resistant *Staphylococcus Aureus* can be used as potential antimicrobial agents. On the other hand, Cap analysis gene expression. (CAGE) is effective against biofilm causing micro-organisms pave the way to combat biofilm associated antimicrobial resistance. CRISPR-CAS (gene editing technology) and photodynamic therapy are the future therapeutic options to treat the infections caused by multidrug resistant, extremely drug resistant and total drug resistant strains.

Keywords: antibiofilm agents, microbial biofilms, antimicrobial resistance.



Potential impact of climate change on one-health

Ayat Fatima Malik^{*1}, Muhammad Adil¹, Ayesha Afzal¹, Amina Pervaiz¹

¹University of Veterinary and Animal Sciences, Lahore, Jhang campus, Pakistan

***Corresponding author:** Ayat Fatima Malik, 2020-amj-002@uvas.edu.pk

Abstract: Climate change is a complex phenomenon that gives rise to several issues such as air pollution, greenhouse gases, floods, extreme temperatures, wildfires. The most frequent consequences of climate change are melting of glaciers, rising sea levels, heat waves and storms. Anthropogenic activities including deforestation, global warming, and other ecotoxic agro-industrial processes are considered as the leading causes of climate change. Climate change increases the production of pathogenic parasites and vectors which cause several food, water and vector-borne diseases in animals and humans such as dengue fever, malaria and pollen allergy. Besides, it also affects the life of aquatic organisms, through water contamination, floods, drought and consequent habitat destruction. Collaborative efforts involving human and veterinary health-care providers, environmental experts and policy makers are requisite to circumvent the detrimental impact of climate change on humans, plants, animals, microorganism and environment. Besides, afforestation, biodiversity conservation, reduced consumption of coal-based fuels, introduction and use of alternative bioenergy sources and biorefining of waste material are recommended as the long-term mitigation strategies.

Keywords: Climate change, one-health, humans, animals, environment

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Residual veterinary antibiotics from food of animal origin: A potential health hazard

*Amina Pervaiz*¹, Ayesha Afzal¹, Ayat Fatima¹, Ayesha Shareef¹, Muhammad Adil¹*

¹University of Veterinary and Animal Sciences, Lahore, Jhang campus, Pakistan

***Corresponding author:** Amina Pervaiz, aminaPervaiz759@gmail.com

Abstract: Antibiotics are extensively used in veterinary medicine to treat infections, promote growth rate and improve feed efficiency as well as the productivity of animals. Nevertheless, this imprudent usage of antibiotic in animals causes the release of antibiotic residues in animal products including milk, meat and manure. Antibiotics are also used in livestock as feed additives in order to maintain animal health, however, there is an increasing attempt to stop the use as the discharge of antibiotic residues in animal products, soil and ground water has caused global concern. In general, great attention from a public health aspect is needed as the indiscriminate use of antibiotics causing acute toxicity has carcinogenic and teratogenic effects. Antimicrobial resistance is a rapidly prevailing issue as these antibiotic residues transfer the resistant bacteria to humans making the existing pathogens as more harmful. Because of these undesirable effects, it is important to regulate the rational use of antibiotics in food animals and monitor the dosage given to animals. Moreover, there is a need to degrade the antibiotics during composting by means of anaerobic digestion and lagooning of animal waste.

Keywords: Residual veterinary antibiotics, food animals, antimicrobial resistance

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Risk of parasite transmission through seafood; A one-health perspective

*Ayesha Shareef*¹, Amina pervaiz¹, Ayesha Afzal¹, Ayat Fatima¹, Muhammad Adil¹*

¹University of Veterinary and Animal Sciences, lahore , Jhang Campus , Pakistan

***Corresponding author:** Ayesha Shareef, ayeshashareef435@gmail.com

Abstract: Seafood is highly nutritious and rich in macronutrients, micronutrients and bioactive constituents and therefore has a great potential as sustainable resources in term of both consumption and production of a desirable food. Being easily digestible and tender, it is suitable for the consumption of all ages. The vital nourishing elements present in seafood include vitamins (A, D, E and B12), minerals (Ca, Mg, P, Zn, I, K) and high-quality proteins. More than 3 billion people in the world rely on wild caught and farm seafood as significant source of animal protein. Cray fish, lobster, tuna, crabs, mollusks, shrimps and prawns are popular seafood items. Most common pathogens that can be found in seafood and subsequently transmitted to humans are Vibrio, Salmonella, Listeria, Shigella, Staphylococcus, Clostridium and Escherichia coli. The potential risk of parasite transmission should be considered when raw, undercooked or marinated sea foods are consumed. This risk can be eliminated either by cooking or freezing the seafood before consumption. The most important considerations in safe handling of seafood at home are cleanliness of hands, preparation area, and utensils. Moreover, the mixing of raw and cooked seafoods should be avoided. The demand for more nutritious and healthy food, with a low negative environmental footprint, is progressively growing. Therefore, appropriate measures are critically needed to provide safe, hygienic and high-quality seafood for minimizing the risk of parasite transmission along-with fulfilling the dietary requirement of the public.

Keywords: Seafood, Health risk, Pathogen, Food safety, Consumer information, One health



Antimicrobial Resistance in Pakistan- A Call to Arms

¹Zoya Almas, ¹Noor Fatima, ²Munazza Iqbal, ¹Azra Mahmud

¹Department of Research, Innovation & Commercialization, Fatima Jinnah Medical University, Lahore.

²Department of Pathology, Fatima Jinnah Medical University, Lahore.

*Corresponding author: Noor Fatima, nurfatyma123@gmail.com

Abstract: Antimicrobial Resistance (AMR) occurs when injudicious use of anti-infective agents culminates in bacteria, viruses, fungi, and parasites evolving genetically over time to become resistant to antimicrobial drugs, rendering infections difficult to treat with an increased risk of spread of disease, severe illness, and high mortality. AMR continues to become a menace in Pakistan, and is largely responsible for the rise in healthcare costs and mortality rates. To combat this problem globally, WHO launched the Global Antimicrobial Resistance and Use Surveillance System (GLASS) in 2015 to continue filling knowledge gaps and to inform strategies at all levels. An antimicrobial stewardship Programme (ASP) is now mandatory in many countries which has greatly helped in tackling AMR. However, this is sadly lacking in many developing countries including Pakistan.

Further research is required into the specific conditions that govern the selection and dissemination of resistant bacteria. International travel and trade in animals and food increase the risks of antimicrobial resistance world-wide as well as misuse of anti-infective agents in health care and over the counter prescribing practices. The cost of AMR is massive; in addition to death and disability, prolonged illness results in longer hospital stays, the need for more expensive medicines and financial challenges for those impacted. Without effective antimicrobials, the success of modern medicine in treating infections, including during major surgery and cancer chemotherapy, is doomed to failure. The time to act is now!

Keywords: Antimicrobial, infections, antibiotics, plasmids, antimicrobial resistance.



Exploring nutraceuticals of *Moringa oliefera* leave extracts (MOE) through oxidative stress, impact on body growth, public acceptability, and synergism with antibiotics

¹Qandeel Ashraf, ¹Hamid Majeed, ^{2*}Amjad Islam Aqib, ¹Kashif Akram, ³Muhammad Farrukh Nisar, ³Muhammad Rafiq, ⁴Muhammad Usman, ⁵Afshan Muneer, ⁵Maheen Murtaza, ⁵Saba Batool

¹Department of Food Science, Cholistan University of Veterinary and Animal Sciences Bahawalpur, Pakistan, 63100

^{2*}Department of Medicine, Cholistan University of Veterinary and Animal Sciences Bahawalpur, Pakistan, 63100

³Department of Biochemistry, Cholistan University of Veterinary and Animal Sciences Bahawalpur, Pakistan, 63100

⁴Department of Anatomy and Histology, Cholistan University of Veterinary and Animal Sciences Bahawalpur, Pakistan, 63100

⁵Department of Zoology, Cholistan University of Veterinary and Animal Sciences Bahawalpur, Pakistan, 63100

*Corresponding author: Amjad Islam Aqib, amjadislamaqib@cuvas.edu.pk

Abstract: Plant-based products are indeed a reliable substitute for traditional anti-inflammatory treatments because of increased burden of food borne diseases. Plants extracts are commonly used to inhibit the growth of microbes, increase shelf-life, and to provide extra-functional characteristics to the food. *Moringa*, in particular, can be a good source of some essential micronutrients, lacking in cereal-based diets.

Moringa Oliefera leaves extract (MOE) was characterized using high performance liquid chromatography, whereas oxidative potential was determined through series of standard tests. An *in vivo* trial was conducted for growth trial and histological studies. Histomorphometry of kidney was performed by measuring renal cortex thickness and renal corpuscle density (RC/mm²) in 25 microscopic fields for each group at 40X. Resistant strains of *Escherichia coli* (*E. coli*), *Staphylococcus aureus*, and *klebsiella pneumoniae*) were cultured and were tested for



synergy between MOE and routinely used antibiotics (oxytetracycline), (gentamicin), (ampicillin), (enrofloxacin) groups using well diffusion assay. A single blind trial was carried out for the acceptability of MOE's decoction among people.

Moringa feed significantly increased mice growth rate and weight gain. The study found significant higher values of all parameters except glomerular diameter sinusoid width. Antibacterial activity of *Moringa* extract showed highest zones of inhibitions against *klebsiella pneumoniae* followed by *E. coli* and *S. aureus*. Decoction trial showed highest odd ratio for the acceptability of 100% *Moringa* preparation.

This study reports the significant antibacterial and antioxidant properties of *Moringa* leaf extract, which shows its potential as future nutraceutical product.

Keywords: *Moringa*, Antibiotics, Histological, Phytochemical, Oxidative stress



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One Health paradigm in control of zoonotic pandemics and its core competencies

Dr. Muhammad Imran Arshad*¹

¹Institute of Microbiology, University of Agriculture, Faisalabad, Pakistan.

***Corresponding author:** Dr. Muhammad Imran Arshad, drimranarshad@yahoo.com

Abstract: The “One Health” is a global initiative and a multi-disciplinary approach to address and solve the inter-connected health of humans, animals, and the environment. An estimated 60-70% of emerging infectious diseases (EIDs) of public health importance are linked to animals and such transmission is controlled by host, agent and environmental factors. Potentially infectious diseases such as highly pathogenic influenza (HPAI) viruses, MERS-CoV, SARS-CoV-2 (COVID-19), Ebola and Zika viruses have pandemic distribution crossing the borders. The One Health approach is an integrated strategic framework for reducing the risks of emerging and re-emerging infectious diseases and transboundary zoonotic diseases at the Animal-Human-Ecosystem pyramid.

In Pakistan, Ministry of National Health Services, Regulation & Coordination (NHSR & C) notified 32 prioritized diseases among those seven diseases were considered as high-risk diseases. The recent alarming monkeypox virus public health emergency declared by the WHO also posed global public health threat and need for enhancing its event-based surveillance. The One Health approach is plausibly needed to circumvent the alarming infectious, zoonotic (MERS-CoV, Brucellosis, Q-Fever, Rabies, wildlife diseases), vector-borne (Dengue, CCHF, Encephalitis arboviruses), multi-drug resistant pathogens (food animals and companion animals), non-communicable, nutritional and adulterated-food diseases (e.g. pesticides toxicity in agriculture, fungal toxins, water contamination, drug residues). The One Health core competencies can help in public health safety, advocacy and capacity building. Hence, the sensitization, training and recognition of One Health approach for professionals are required to control trans-boundary zoonotic diseases as per quadripartite model of WHO-FAO-WOAH-UN.

Keywords: Zoonotic pandemic, SARS-CoV-2, MERS-CoV, monkeypox



One health approach to combat antimicrobial resistance issues

Zain Ul Abadeen*¹, Muhammad Tariq Javed², Syed Muhammad Faizan², Aziz Ur Rehman³

¹Section of Pathobiology, Riphah College of Veterinary Sciences (RCVetS), Riphah International University-Lahore Campus, 54000 Lahore, Pakistan.

²Department of Pathology, University of Agriculture, 38040 Faisalabad, Pakistan.

³Department of Pathobiology, College of Veterinary and Animal Sciences, Jhang, Pakistan.

*Corresponding author: Zain Ul Abadeen, drzain47@gmail.com

Abstract: Antimicrobial resistance (AMR) is considered when bacteria, viruses, fungi and parasites are no longer respond to drugs used that make infections difficult to treat resulting in a more severe form of disease and ultimately death. AMR is rated as an alarming threat for global health and development. World health organization (WHO) has nominated AMR as one of the important global public health threats affecting humans and animals. Due to overuse and misuse of several antimicrobials leading to the development of drug-resistant pathogens. Several activities including less availability of clean water, improper sanitation and lack of infection prevention encourage the spread of pathogens which are resistant to several antimicrobial treatments. One health is a collaborative approach that develops a link between humans, animals, and their environment to improve public health. AMR issues heavily effect the global economy in terms of prolonged treatments, non-treatable diseases and ultimately death of the humans and their productive animals. In recent times, one health approach can be effectively used to limit the effects of AMR on public health by adopting certain strategies including (a) development of nation-wide action plans (b) regulations regarding the usage of antibiotics in food animals (c) improvement in public awareness and (d) use of advanced techniques like genomic sequencing and metagenomics etc for quick and better understating of AMR issues.

Keywords: Antimicrobial resistance, one health, economy, public health, food animals.



Prevalence and Antimicrobial Resistance in Campylobacter and Salmonella: A Public Health Concern

*Inam Ul Haq^{*1}, Muhammad Bakhsh¹, Zulqarnain Baqir², Abdul Rauf¹*

¹ *University of Veterinary and Animal Sciences Lahore, CVAS Jhang, Pakistan.*

² *International Graduate Program, Faculty of Veterinary Sciences, Chulalongkorn University, Bangkok, Thailand.*

***Corresponding author:** Inam Ul Haq, inamulhaqm143@gmail.com

Abstract: Campylobacter and salmonella species are the leading causes of gastroenteritis in humans and mostly are acquired through the food chain, especially through chicken meat that is not properly cooked. The emergence of antimicrobial resistance in these pathogens is a serious public health concern. Samples of these pathogens studied were resistant to at least one antibiotic. Some strains have also shown multiple drug resistance (MDR). Resistance was observed against ampicillin, nalidixic acid, ciprofloxacin, gentamycin, tetracycline, chloramphenicol, and trimethoprim in these pathogens with reported zoonosis. The Meta-Analysis showed that tetO, Class 1 Integrons, blaOXA-61, and cmeB were the most common antimicrobial resistance genes in human isolates and tetO, Class 1 Integrons, blaOXA-61, and cmeB in food-producing animals. This close relationship in the antimicrobial resistance genes of isolates from humans and animals is evidence of the spread of this resistance due to human livestock interaction. In different regions of the globe, multiple drug-resistance strains have caused outbreaks and produced serious risks to human health. Planned surveillance and monitoring system is working for the control and observation of this public health issue. Studies on the use of strain-specific phages against these MDR strains of these pathogens are under study and may prove helpful in the future.

Keywords: Antimicrobial; Meat; Pathogen; Prevalence; Resistance



Consequences of Using Antibiotics as Growth Promoters in Poultry and Their Alternatives in Future

*Abdul Rauf^{*1}, Muhammad Bakhsh¹, Inam Ul Haq¹*

¹ *University of Veterinary and Animal Sciences Lahore, CVAS Jhang, Pakistan.*

***Corresponding author:** Abdul Rauf, arauf8815@gmail.com

Abstract: Antibiotic growth promoter is any antimicrobial substance that aids in feed conversion ratio in poultry industry either by disrupting pathogenic bacteria in intestines or producing cytokines that produce energy shift towards the growth of animal and strengthening immune system. Food and Drug Administration (FDA) has strictly condemned the use of antibiotics that are absorbable from intestine of birds or being used in human therapeutics like fluoroquinolones and cephalosporins. Though FDA instructions are being followed in different countries including Europe yet use of certain antibiotics as growth promoters is professional practice but it should be discouraged as it is irrational and showing residues in poultry meat producing antimicrobial resistant strains in humans. Poultry meat has been reported to be abused irrationally with residues of antibiotics like colistin, bacitracin and tetracyclines that are being used as growth promoters. Poultry industry is expected to dominate pork industry by 2025 and such an injudicious and irrational use of antimicrobials as growth promoters sets a primary hurdle in dominance of poultry industry. Use of organic acids, probiotics and ionophore coccidiostats is believed to be safe when utilized as an alternate to antibiotics. Organic farming of poultry is emerging trend and proving quite safe from any health hazard through research. Thus, it is high time to limit the unnecessary use of antimicrobials in poultry feed and encourage organic farming and use of probiotics for the sake of food safety and security of common public.

Keywords: Antibiotics; Probiotics; Coccidiostats; Poultry; Ionophore



In-vivo Immune Response of Oil adjuvanted Hemorrhagic Septicemia Vaccines in Cattle Calves

Maleeha Fatima¹, Syed Ehtisham-ul-Haque*¹, Muhammad Adnan Saeed¹, Abdur Rahman², Usman Waheed¹

¹Section of Microbiology, Department of Pathobiology, University of Veterinary and Animal Sciences, Lahore (CVAS, Jhang Campus)

²Section of Animal Nutrition, University of Veterinary and Animal Sciences, Lahore (CVAS, Jhang Campus),

*Corresponding author: Prof. Dr. Syed Ehtisham-ul-Haque, ehtishamsyed@uvas.edu.pk

Abstract: *Pasteurella multocida* serotype B:2 causes fatal clinical infection called “Hemorrhagic Septicemia (HS)” in bovines. Immunization of susceptible animals in endemic regions is the only effective approach to control disease instances. HS epidemics result in a significant number of fatalities as well as huge economic damage. Vaccination against HS that is oil based is an efficient strategy for controlling outbreaks in regions where the disease is prevalent. The purpose of this study was to evaluate the efficacy of two newly prepared HS vaccines using different mineral oil adjuvants marketed as Total Special Fluids, Total Energies, France, namely Eolane-150 (E-150) and Eolane-170 (E-170), and to compare these vaccines to an already existing Montanide ISA-50 V2 (M-50) adjuvanted vaccine. In order to conduct the in-vivo immunogenicity, a total of 12 cattle calves were used. Animals were partitioned into 3 groups and each one had four young calves. The experimental groups of cattle calves were given the names A, B, and C. Vaccines were administered by a deep intramuscular route at a dosage rate of 2 ml per animal on day 1 and on the 90th day as E-170 in group A, E-150 in group B and M-50 in group C. At 0, 42, 84, 126 and 168 days after vaccination, serum samples from each of the groups were tested through an Indirect Hemagglutination test (IHA), and the geometric mean titer (GMT) was determined. E-150 performed very well with a protective antibody GMT of more than 16 in cattle calves. The immunity that the E-150 vaccination elicited was on par with that which was generated by the M-50 vaccine. Regarding any of the vaccinations that were given, there was not a single instance of an adverse response, either locally or systemically. It is concluded that *the Pasteurella multocida B:2* Eolane-150 adjuvanted vaccine has the potential to generate comparable immunity and safety at par with M-50, in addition to having the benefit of being cost-effective.



Keywords: Hemorrhagic septicemia vaccine, Oil adjuvants, Immunogenicity, calves



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Origin, Environmental Transfer, Health Effects of COVID-19 Disease

Rimsha Khan^{1,2}, Hasnain Javed*¹

1. Advanced Diagnostic Laboratory, Punjab Aids Control Program Lahore Pakistan

2. University of Veterinary and Animal Sciences Lahore Pakistan

*Corresponding author: Hasnain Javed, hasnain_javed@hotmail.com

Abstract: Severe acute respiratory corona virus 2 (SARS-CoV-2) is involved in causing corona virus disease (COVID-19). This virus was first found in Wuhan, China on 31 December, 2019. This virus spread was very rapid globally and it resulted the COVID-19 pandemic. World Health Organization declared this pandemic significant health emergency. COVID-19 is highly infectious and contagious disease. This virus transmits through close contact with the infected. The origin and transmission of this virus was suspected from animals to humans and environmental factors. Genetic analysis of 100 SARS-CoV-2 samples was done followed by phylogenetic analysis to find out its origin. Transmission of COVID-19 through air and wastewater as environmental transmission modes by environmental surveillance study was done.

The genetic analysis of corona virus suggested that bats, snakes and Malay pangolins can be intermediate hosts of this virus due to close phylogenetic relation. High sequence homology was present between severe acute respiratory syndrome like (SARS-like) bat virus and SARS-CoV-2. So, bats can be possible primary reservoir of SARS-CoV-2. Transmission of this virus occur through close contact from person to person and environmental modes of transmission i.e. air droplets, food, waste water, fecal. Due to high sequence homology of SARS-CoV-2 and (SARS-like) bat virus isolated from bats, its origin is considered zoonotic. This virus can continuously circulate in population because of its mode of transmissions which are person to person and environmental. COVID-19 testing, social distancing, quarantine should be encouraged.

Keywords: SARS-CoV-2, Environmental surveillance, Origin, Phylogenetic study, Transmission modes



Slaughtered Stock Surveillance of Zoonotic Diseases Prevalence in Small and Large Ruminants in District Jhang-Pakistan

Muhammad Tahir Meraj¹, Muhammad Kamran Rafique^{1}, Ishtiaq Ahmed, Aziz ur Rehman, Syed Ehtisham-ul-Haque², Muhammad Saadullah¹.*

¹Section of Pathology, Department of Pathobiology, University of Veterinary and Animal Sciences (Sub-Campus UVAS) Jhang 35200, Punjab, Pakistan.

²Section of Microbiology, Department of Pathobiology, University of Veterinary and Animal Sciences (Sub-Campus UVAS) Jhang 35200, Punjab, Pakistan.

***Corresponding author:** Muhammad Kamran Rafique, kamran.rafique@uvas.edu.pk

Abstract: Zoonotic diseases are well known for affecting the life quality of the host animals and their farmers. Butchers slaughter healthy along with sub clinically sick animals and expose the contaminated tissues (e.g., blood and organs etc.) to the environment. The current study was carried out in four local government slaughter houses to assess the prevalence of zoonotic diseases in the slaughtered small ruminants and large ruminants in district Jhang. All four visited slaughterhouses had low levels of hygiene, oversight and infrastructure.

Regular visits to the slaughterhouses were carried out between the years 2017 and 2022. The brief history and serum samples were collected from obviously healthy animals exhibiting the clinical signs of underlying disease. The tissue samples were collected on gross examination basis showing lesions (e.g., lungs, liver, intestines etc.) in the slaughtered animals for histopathology.

Based on history, clinical signs, gross lesions, and histopathological evidence, Tuberculosis, Paratuberculosis and echinococcosis were found as highly prevalent zoonotic diseases ($p < 0.05$) in the small and large ruminants of Jhang. The % prevalence of these diseases was 3.71%, 1.92% and 21.47%, respectively in small ruminants, and 4.58%, 2.35%, and 52.9% respectively in large ruminants.

The study findings suggest that TB, PTB, and Echinococcosis are prevalent in Jhang & provide definite evidence of transmission of zoonotic pathogens from slaughtered animals to community with concurrent public health consequences.

Keywords: Slaughterhouse, Surveillance, Zoonosis



Toxoplasmosis; Public Health Significance

Alishwa Rubab¹, Mehak Yousaf¹, Kainat Zahra^{*1}

¹Department of Pathobiology, University of Veterinary and Animal Sciences, sub-campus Jhang.

***Corresponding author:** Kainat Zahra, kainatzahra1212@gmail.com

Abstract: Toxoplasmosis is a worldwide disease, caused by intracellular parasite *Toxoplasma gondii*. It affects about one third of worldwide population. *T. gondii* is susceptible to environmental change i.e. behavior and population density of hosts. This disease has highly impact in immune-compromised people and in infants as congenital infection. It is a zoonotic disease with a wide range of clinical syndrome in humans. *Toxoplasma gondii* mainly infected the humans through viable tissue cysts in uncooked meat or through oocyst by ingesting contaminated food or water. The tissue cyst induced infections are less severe than oocyst-acquired infections. Still a large no of humans is infected by contaminations of a municipal water reservoir. Cats are the primary host of the parasite as they excrete oocysts in their feces in the environment and can affect other animals and humans. It may be severe in immune-compromised patients. Toxoplasmosis in pregnant women can cause miscarriage still birth or may lead to the congenital infections in unborn child. Studies show the prevalence of diversity of *T. gondii* in goats in the past decade. *T. gondii* in milk is a source of infection in humans. *T. gondii* isolates in domestic goats usually associated with wildlife. *T. gondii* can also cause eye disease lead to damage to the retina and even blindness. It can be controlled by proper hygiene, properly cooked food and by using clean water. Pregnant women should avoid cats.

Keywords: Congenital infection, Immuno-compromised, Oocyst-induced, Still birth, Toxoplasmosis, Zoonosis.



DETECTION OF ANTIMICROBIAL RESIDUES OF TETRACYCLINE AND CHLORAMPHENICOL IN BOVINE MILK AND BEEF SAMPLES- ONE HEALTH FOOD CONCERN

*Aatika¹, Ismail Chughtai², Muhammad Shafique¹, Zeeshan Taj, Muhammad Usman Qamar*¹*

¹ Department of Microbiology, Faculty of Life Sciences, Government College University Faisalabad

² Department of Nuclear Institute of Agriculture Biology, Faisalabad

***Corresponding author:** Muhammad Usman Qamar, musmanqaamar@gcuf.edu.pk \

Abstract: Antimicrobial resistance is a serious concern globally mainly in developing countries like Pakistan. One of the important factors is the excessive use of antibiotics in livestock. Nowadays, different types of antibiotics including tetracycline and chloramphenicol are being used in livestock to increase their production. Therefore, the present study evaluated the chloramphenicol and tetracycline residues in the beef and milk samples. Methods: A total of 40 beef and 40 milk samples were collected from five different areas of the Faisalabad metropolitan, including milk shops and butcher markets from five different colonies. 50-100 grams of beef samples and 50ml of milk samples were collected using sterile techniques. The samples were transported to the microbiology lab at 4-6c. The 3 g of beef sample were used for antibiotics residue detection of tetracycline and chloramphenicol while 15ul milk sample was used for antibiotics residue detection of chloramphenicol and tetracycline by commercially available enzyme-linked immunosorbent assay (ELISA) kit. Results: Overall the results illustrated that out of 40 milk samples, five milk samples showed a tetracycline residue value more than the maximum residue limit ranging from 100-180 ppb, and beef samples showed, six samples showed that the MRL value ranged from 110-188 ppb. The chloramphenicol residue in milk samples had a maximum limit ranging from 0.22-0.68 ppb while in the beef samples, the highest values ranged from 0.15-0.195 ppb. Conclusion: This study concluded that the residue of both antibiotics is present in the food samples. This study called for immediate actions to control and monitor the antimicrobial usage in food-producing animals.

Keywords: Antimicrobial Residues, Beef, Milk



Molecular epidemiology and control of Lyme borreliosis: A one health paradigm

Ammar Tahir,¹ Farhan Ahmad Atif¹, Muhammad Kashif¹, Arfa Shahzad¹

¹Department of Clinical Sciences, College of Veterinary and Animal Sciences, Jhang, Pakistan

*Corresponding author: Farhan Ahmad Atif, farhan.atif@uvas.edu.pk

Abstract: An increasing global public health problem is diseases brought on by human interaction with domestic and wild animals. This concern will only rise as anthropogenic environmental changes continue. Lyme borreliosis is an emerging tick-borne zoonotic disease. It is caused by a spirochete, *Borrelia burgdorferi*. Three-host tick species *Ixodes scapularis* in mid-Atlantic, *I. ricinus* in Europe and *I. persulcatus* in Asia are the main vectors for *Borrelia* spp. Since only ticks can transfer the bacteria that causes Lyme disease to people, the geographic distribution and quantity of tick species that can do so dictate the risk of contracting the illness. Neurological symptoms include depression, behavioral abnormalities, dysphagia, head tilt, and encephalitis can be detected in animals in addition to intermittent lameness, laminitis, low-grade fever, swollen joints, painful muscles, and anterior uveitis. Dermatologic, neurological, and rheumatologic symptoms are among the clinical characteristics of human infection. Vaccines, host-targeted insecticides, environmental modification, and biological control are among the prevention strategies that are possible for Lyme disease. Tick immunity is a growing topic of study because it might reveal mechanistic processes that can be subject to disruption. The development of immunization programs against Lyme disease might be aided by studies that illuminate the mammalian immune mechanisms activated during tick-transmitted *B. burgdorferi* infection. An integrated human-veterinary risk analysis-based structure can be used as one health approach against Lyme borreliosis.

Keywords: Lyme Borreliosis, Zoonosis, One Health, Tick born disease, Epidemiology



Assessing the Therapeutic Potential of Black Seed Oil Post Atrazine Toxicity in Female Reproductive System of Rats

Qamar Shahzad Ahmed¹, Anas Sarwar Qureshi*¹, Adeel Sarfraz²

¹ University of Agriculture, Faisalabad

² The Islamia University of Bahawalpur

*Corresponding author: Anas Sarwar Qureshi, anas-sarwar@uaf.edu.pk

Abstract: Black seed oil (BSO) has a pharmacological active ingredient thymoquinone which possesses antioxidant and immunomodulatory properties. The following study was aimed to assess the therapeutic potential of BSO in atrazine (ATR) mediated toxicity to the female reproductive organs. For this purpose, 24 adult female Wistar rats were divided into 4 groups; (A) Control, (B) ATR treated @300 mg/kg/bw, (C) ATR + BSO treated @300 mg/kg/bw + @5ml/kg/bw/day and (D) BSO treated @5ml/kg/bw/day respectively for 15 days. At the end of trial, blood was analyzed, ovaries, oviduct and uterus were collected and measured for weight in (mg) and dimensions (width, length, and diameter) (mm). For microscopic evaluation, tissues were fixed, processed, stained with hematoxylin and eosin (H&E) and photomicrographs were analyzed with Image J® software. The results indicated that BSO treatment showed an obvious improvement in RBCs, Hb, HCT and MCV values alone (6.592±0.583, 12.400±0.559, 42.667±0.728, 65.300±0.690) and in combination against ATR induced toxicity (5.350±0.383, 11.100±0.405, 27.683±0.571, 51.250±0.706) which were otherwise significantly lowered (P<0.05) (2.650±0.302, 5.033±0.242, 13.067±0.367, 50.100±0.502) due to atrazine treatment. The results also indicated that BSO also act as cushion in preventing the gross structural atrophy of length, width, diameter and weight in ovaries, oviduct and uterus caused by ATR treatment group (5.067±0.216, 5.017±0.248, 10.067±0.463, 70.920±3.880), (24.050±1.558, 2.128±0.217, 4.267±0.463, 162.57±3.45) and (12.717±1.522, 5.017±0.264, 93.967±2.428) as results were comparable with that of control (5.268±0.214, 5.117±0.232, 10.200±0.498, 72.670±3.480), (23.583±1.182, 2.222±0.259, 4.517±0.527, 166.48±3.34) and (13.250±1.361, 4.800±0.346, 9.617±0.662, 95.183±2.140) respectively. The results also showed ATR results in significant (P<0.05) decrease in the mean thickness of oviduct, uterine wall, and number of follicles in ovaries while reverse happened after treatment with BSO alone. The results of BSO+ATR group (536.0±28.4, 596.48±7.07 and 48.16±7.931)



for morphometry of oviduct, uterine wall, and number of follicles in ovaries were comparable with that of control (600.39 ± 21.03 , 721.95 ± 18.54 and 51.003 ± 8.041) respectively indicating the counter effect of BSO against atrazine toxicity. The findings of this study suggest that atrazine could be endocrine disruptor and may cause infertility in females which can be significantly altered/lowered after treatment with black seed oil.

Keywords: ATR, BSO, Ovary, Uterus, Oviduct, Follicles





Effect of Black Seed (*Nigella Sativa*) Oil on Atrazine Induced Histological Changes in the Testes of Albino Rats

Mushtaq Hussain¹, Anas Sarwar Qureshi^{1*}, Abdur Rahman Ansari²

¹ University of Agriculture, Faisalabad.

² University of Veterinary and Animal Sciences, Sub-campus, Jhang.

*Corresponding author: Anas Sarwar Qureshi, anas-sarwar@uaf.edu.pk

Abstract: Atrazine is a commonly used herbicide with toxic effects. Several drugs are used to reduce the toxic effects of atrazine and atrazine-induced male reproductive infertility. These drugs have certain health hazards. Alternatively, some herbs with medicinal properties may help to reduce the herbicide toxicity. The purpose of this study was to evaluate the therapeutic potential of black seed oil against atrazine prompted histological alterations in the testes of albino rats. Total 24 male rats aged 7-8 weeks with an average weight (170 ± 20 g) were used in this study. Rats were separated into 4 groups: Group A with basal diet, Group B with basal diet and atrazine (300mg/kg/day), Group C with basal diet and black seed oil (5ml/kg/day) and Group D with basal diet, atrazine (300mg/kg/day) and black seed oil (5ml/kg/day) for period of 15 days. At the end of trial, animals were slaughtered, and blood were collected in EDTA vacutainer for complete blood count (CBC). There was significant increase ($P\leq 0.05$) in blood parameters in the group treated with black seed oil however MCHC was significantly ($P\leq 0.05$) reduced as compared to control and atrazine treated group. Blood parameters significantly decreased in atrazine treated group however MCHC were enhanced. The Atrazine + black seed oil co-supplemented group indicated improvement in blood parameters as compared to the atrazine treated group. The organs of male reproductive system (testes) were carefully collected from each animal to record the weight, dimensions (width, length) and appearance (color and shape). Macroscopic appearance shows that that weight, length, width of testes was significant ($P\leq 0.05$) higher of group treated with black seed oil as compared to control and atrazine treated group. Co-supplemented group with atrazine + black seed oil showed improvement in weight, length and width from atrazine treated group. Finally, tissues were processed, stained with H&E and analyzed by IMAGE J@ software to check histological parameters of testes including diameter of seminiferous tubules and thickness of germinal layer. Histological studies showed that there was significant ($P\geq 0.05$) increase in diameter of seminiferous tubule and thickness



of germinal layer in group treated with black seed oil as compared to control and atrazine treated group. The Atrazine + black seed oil co-supplemented group showed improvement in thickness of germinal layer and diameter of seminiferous tubules as compared to atrazine treated group. Data were analyzed through ANOVA by using variables. It may be concluded that black seed oil may have therapeutic potential against atrazine induced histological changes in testes of rats.

Keywords: ATR, BSO, Testes, Uterus, Oviduct, Follicles





Effect of Black Seed (*Nigella Sativa*) Oil on Glyphosate Induced Toxicity in the Female Reproductive System of Rat

Faiqa Muqaddas¹, Anas Sarwar Qureshi^{1*}, Shakeela Parveen², Sarmad Rehan¹, Shah Nawaz¹,

¹ University of Agriculture, Faisalabad.

² Department of Zoology, Wildlife and Fisheries, University of Agriculture Faisalabad

*Corresponding author: Anas Sarwar Qureshi, anas-sarwar@uaf.edu.pk

Abstract: Glyphosate (GLY) as a weed killer demonstrate toxicity to animals as well humans. The aim of this study was to investigate the therapeutic effects of black seed oil (BSO) against the glyphosate mediated toxicity in female reproductive organ of rats. For this purpose, 24 adult female Wistar rats were divided into 4 groups; Control, GLY treated @600mg/kg/bw, BSO @5ml/kg/bw/day and GLY + BSO @600mg/kg/bw + @5ml/kg/bw respectively for 15 days. At the end of the trial, fresh blood from all groups was collected and analyzed. Further, samples of ovary, oviduct and uterus were collected and measured for weight in (mg) and dimensions (length, width, and diameter) in (mm). For microscopic evaluation, tissues were fixed, processed, stained with hematoxylin and eosin (H&E) and analyzed by image J® software. Blood analysis of BSO group positively showed improvement in RBCs, HB and HCT values (6.14 ± 0.48), (11.81 ± 0.608) and (37.73 ± 4.84) and in combination against GLY induced toxicity (4.96 ± 0.51), (10.68 ± 0.48) and (28.65 ± 1.48) which were significantly decreased ($P < 0.05$) due to GLY treatment. The results also indicated that BSO prevents the gross structural atrophy in reproductive organs caused by GLY treatment as results were compared to control group. The results also showed GLY significantly ($P < 0.05$) decreases the mean thickness of uterine wall, oviduct and number of follicles in ovaries while BSO showed reverse results. The results of GLY+BSO group for morphometry of uterine wall (Total thickness 446.7 ± 72.4), (Myometrium 240.63 ± 23.39), (endometrium 233.32 ± 21.48), oviduct (Total layer 480.8 ± 53.5), (mucosal 251.18 ± 11.73), (muscularis 207.95 ± 21.84) and for number follicles in ovary (primary 13.55 ± 3.69), (secondary 16.05 ± 3.02), (tertiary 40.50 ± 5.44) were comparable with that of control (16.05 ± 4.46), (18.55 ± 2.91) and (42.50 ± 6.86) respectively, indicating the counter effect of BSO against GLY toxicity. The findings of the study suggest that black seed



oil supplementation could be a great hallmark in countering the toxic effects in female reproductive organs induced by glyphosate.

Keywords: BSO, GLY, Uterine walls





Effect of Black Seed Oil on Histological Changes Induced by Atrazine in Gastrointestinal Tract of Rat

Asifa Rehman¹, Anas Sarwar Qureshi^{1*}, Hammad Ahmad Khan², Sarmad Rehan¹, Shah Nawaz¹, Adeel Sarfraz³, Abdur Rahman Ansari⁴, Muhammad Usman¹

¹ University of Agriculture, Faisalabad

² Department of Zoology, Wildlife and Fisheries, University of Agriculture Faisalabad

³ The Islamia University of Bahawalpur

⁴ University of Veterinary and Animal Sciences, Sub-campus, Jhang

***Corresponding author:** Anas Sarwar Qureshi, anas-sarwar@uaf.edu.pk

Abstract: The current study was investigated the therapeutic potential of black seed oil (BSO) against atrazine (ATR) induced toxicity in gastrointestinal (GIT) tract. For this purpose, 24 Wistar rats were divided into Control, ATR treated @300 mg/kg/b.w., BSO treated@5ml/kg/bw/day and ATR @300 mg/kg/b.w. + BSO@5ml/kg/bw/day treated groups. At the end of 15 days trial, blood was collected and analyzed, stomach, liver and small intestine were collected and measured for weight in (g) and dimensions (width, length, and diameter) (mm). For microscopic evaluation, tissues were fixed, processed, stained with hematoxylin and eosin (H&E) and photomicrograph were analyzed with Image J® software. Blood analysis showed that BSO results in considerable improvement in RBCs, Hb, HCT and MCV values alone (6.59 ±0.58, 12.40±0.55, 42.66±0.72 and 65.30±0.69) and in combination against ATR induced toxicity which were otherwise significantly (P<0.05) lowered (2.65±0.30, 5.03±0.24, 13.06±0.36 and 50.10 ± 0.50) due to ATR treatment. The results also indicated that BSO also act as cushion in preventing the gross structural atrophy in gastrointestinal tract (stomach, liver, and small intestine) caused by ATR treatment group, as results were comparable with that of control. The results also showed ATR results in significant (P<0.05) decrease in the mean thickness of stomach layers (mucosa 26.48±2.36, serosa 11.90 ±1.32, liver hepatocyte 16.19±1.14, and central vein 429.6 ±37.7) and intestine (villus height 31.95±5.24, crypt depth 19.96±1.26) while reverse happened after treatment with BSO alone. The results of BSO+ATR group while measuring the thickness of stomach layers (mucosa 41.52±2.11, serosa15.11±1.74), liver hepatocyte 20.15 ±2.77, central vein 501.8±18.0) and intestine (villus



height 34.46 ± 2.04 , crypt depth 28.77 ± 4.99) were comparable with that of control stomach layers (mucosa 50.03 ± 3.48 , serosa 15.90 ± 2.20), liver hepatocyte 27.86 ± 2.21 and central vein 436.3 ± 38.9) and intestine (villus height 37.60 ± 2.31 , crypt depth 28.65 ± 4.58) indicating the counter effect of BSO against atrazine toxicity. The findings of this study the black seed oil supplementation could be a great hallmark in countering the toxic effect on gastrointestinal tract induced by atrazine.

Keywords: ATR, BSO, CBC, GIT





BOVINE OCULAR SQUAMOUS CELL CARCINOMA

Ali Asadullah*¹, Dr. Farah Ijaz¹

¹University of Veterinary and Animal Sciences, Lahore Pakistan (Jhang Campus)

*Corresponding author: Ali Asadullah, aliasadullah092@gmail.com

Abstract: Bovine Ocular Squamous Cell Carcinoma (OSCC) is a cancerous growth of epithelial origin, including cornea, limbus, third-eyelid, and Conjunctiva. Being one of the leading causes of Enucleation in bovines, OSCC is the most reported Neoplastic Bovine Disease in Asia. According to the research studies, Ocular Squamous Cell Carcinoma in cattle is of great significance epidemiologically and economically due to its high prevalence.

The main object of this report is to epidemiologically inspect 11 cases of Bovine Ocular Squamous Cell Carcinoma reported in *Bubalus bubalis*.

For the identification of the Papilloma Virus and Herpes Virus, Polymerase Chain Reaction (PCR) was done. This epidemiological investigation was completed exclusively in Ocular Squamous Cell Carcinoma cases reported in Jhang, District of Pakistan. The investigation is based on a ready-made classification system for Bovine OSSC.

The PCR did not detect bovine Papilloma Virus and Herpes Virus in the selected cases. On Histological examination, it was made clear that there is no deep penetration of neoplastic tissue into the fascial muscles of the cow. Seven out of 11 reported cases of bovine OSCC were low-pigmented eyes.

Results show that the high prevalence of Bovine OSCC in Asia is due to various etiological factors, including Environmental, Phenotypic, and Genotypic factors causing neoplasia in the eyes. High exposure to Ultraviolet rays is the leading etiological factor.

Keywords: Bovine Ocular Squamous Cell Carcinoma, Susceptibility, Distribution and Frequency, Etiological Factors, Pathogenesis, Epidemiology



One Health, a new paradigm for multi-sectoral prevention of health threats.

Jean-Paul Gonzalez¹, Usman Waheed²

¹School of Medicine, Georgetown University, USA

²Department of Pathobiology, CVAS, Jhang campus, University of Veterinary and Animal Sciences, Lahore

***Corresponding author:** Usman Waheed, usman.waheed@uvas.edu.pk

Abstract: Human, animal, and plant populations all share ecosystems in each place and time while they interact in symbiotic relationships that range from commensalism to competition, from mutualism to parasitism and predation.

In view of these multiple and complex interactions, it is easy to understand that public health strategies, which aim to preserve or improve the well-being of populations, must consider in spatial and temporal ways these biotic sets of the animal and plant kingdoms as well as the abiotic components of the environments. This holistic vision of health is the concept of One Health which calls for a transdisciplinary approach to health issues to understand, solve and prevent them.

Several health issues such as the emergence of new pathologies, zoonoses, vector-borne diseases, antimicrobial resistance, food safety, contamination of environments by pollutants and other common health threats to people, animals, and plants are part of these complex systems that the 1H approach targets. The 1H concept is positioned as a paradigm shift that tends to displace the classic "observation - diagnosis - treatment" approach, to promote an approach based on prevention. Beyond infectious diseases, chronic, metabolic, and degenerative diseases are also part of this 1H framework while ultimately, 1H integrates the political and economic health sectors indispensable to a sustainable public health action.

Here we will present some exemplary viral diseases for One Health, and of interest to the Pakistan region, including emerging disease (Dengue fever), vector-borne zoonosis (Crimean hemorrhagic fever) and pandemic (Sars-Cov-2).

Keywords: One health, transdisciplinary, CCHF, Dengue, pandemic



Dietary synbiotic and cinnamon essential oil improves growth performance and small intestinal histomorphometry in Japanese quails.

Easha Tur Razia Munir¹, Saima Masood, Hafsa Zaneb¹, Imtiaz Rabbani², Saima Ashraf¹, Sehar Ijaz¹, Hafiz Faseeh ur Rehman¹, Mirza M Usman¹, Sabiqaa Masood³ and Khizar Hayat¹*

¹*Department of Anatomy and Histology, UVAS, Lahore, Pakistan*

²*Department of Physiology, UVAS, Lahore, Pakistan*

³*Department of Parasitology, Islamia University Bahawalpur, Pakistan*

***Corresponding author:** Saima Masood, saima.masood@uvas.edu.pk

Abstract: Antimicrobial resistance is an emerging problem. Alternatives to antibiotics as synbiotic and essential oil are being used in poultry diet.

A 35 days experiment with hundred day –old birds was conducted. Control group (T1) with basal diet, T2 (BD+CEO 200mg/kg of diet), T3 (BD+synbiotic 1g/kg of diet), and T4 (BD+CEO 200mg/kg of diet + synbiotic 1g/kg of diet). Twenty five birds per group with five replicates were taken. The quails were provided feed and water *ad libitum*. Performance was calculated on weekly basis and two birds from each replicate were slaughtered for histological processing. Body weight gain, feed intake and feed conversion ratio of quails were calculated. Dietary inclusion of cinnamon essential oil improved the body weight gain of birds ($P < 0.05$). The feed intake and FCR ($P < 0.05$) were improved in T4 than other groups. Histomorphometry revealed that jejunal villus height in T3 was higher than other while ileal villus height was higher ($P < 0.05$) in T2 and T4 than other groups. Villus width of jejunum increased significantly ($P < 0.05$) in T4 and ileum villus width significantly ($P < 0.05$) increased in T3. Crypt depth of jejunum and ileum was significantly increased ($P < 0.05$) in synbiotic supplemented group than other groups. Synbiotic and CEO dietary inclusion will enhance the performance and villus architecture in quails.

Keywords: Cinnamon oil, Gut histomorphometry, Growth performance, Japanese quail, Synbiotic



Sero-Prevalence and Hematological Investigation of Bovine Brucellosis among Dairy Farms in the Thal Desert

Awais Masud^{1, 2*}, Muhammad Asad Ali², Muhammad Kaleem Ullah³, Syed Faizan Ali Shah³, and Muhammad Usama Ghaffar²

¹Livestock & Dairy Development Department, Government of the Punjab, Pakistan

²Institute of Microbiology, University of Veterinary & Animal Sciences, Lahore-54000, Pakistan

³Department of Clinical Medicine, University of Veterinary & Animal Sciences, Lahore-54000, Pakistan

***Corresponding author:** Dr. Awais Masud, awaismasud2015@gmail.com

Abstract: Brucellosis is a highly contagious, economically important and zoonotic bacterial disease worldwide. Members of the genus *Brucella* are responsible to cause a decrease in milk production, weak offspring, abortion, weight loss, infertility and death of infected animals in severe cases.

Current study investigated the seroprevalence and hematology of brucellosis among buffaloes and cattle of four different dairy farms located in the Thal desert of district Bhakkar (31.8621° N, 71.3824° E), Punjab, Pakistan.

Rose Bengal Plate Agglutination Test (RBPT), and Serum Agglutination Test (SAT), were implied to study the seroprevalence of brucellosis. A hematological analyzer (Mythic 18-vet) was used to determine the effect of *Brucella* infection on different blood parameters.

A total of 949 bovines (n=234 buffaloes; n=715 cattle) were tested. The overall seroprevalence of brucellosis was found to be 3.27 % and 32.26 % by RBPT and SAT, respectively. A higher prevalence of brucellosis was observed in buffaloes (66.67 %) than in cattle (10.53 %). Seropositive buffaloes and cattle revealed a significant decrease in Haemoglobin (Hb) and lymphocyte count. However, remarkably lower values of Packed Cell Volume (PCV), Total Erythrocyte Count (TEC), lymphocytes, and higher monocytes were observed in cattle only. Farm-wise comparison indicated a significantly higher prevalence in farm-B at tehsil Darya Khan followed by farm-A at Kaloor Kot, farm-C at tehsil Bhakkar, and farm-D at Mankera by RBPT. SAT revealed 37.4 % infection in farm-B at Darya Khan while animals from other farms were found negative.



It was concluded that brucellosis is more prevalent among buffaloes than cattle in dairy farms of the Thal desert. Animals positive for Brucellosis had anemia, leukopenia, pancytopenia, and monocytosis.

Keywords: Brucellosis, Dairy Farms, Hematological analysis, Rose Bengal Plate Agglutination Test, Serum Agglutination Test



Review & Recommendations of OHIC 2022:

80 Abstracts are published

- Infectious diseases and others etc. Brucella, Tick borne infections, Toxoplasma, SARS Cov-2. Waste water treatment, Pollutants effect on immunity, Moringa benefits for health.
- AMR. XDR Priority 1: CRITICAL pathogens including *Klebsiella pneumoniae* and other (Enterobacteriaceae, carbapenem-resistant, ESBL-producing). *Staphylococcus aureus*, methicillin-resistant. *Campylobacter* spp., fluoroquinolone-resistant, *Salmonellae*, fluoroquinolone-resistant.
- For, humans only left treatment option choice is Colistin and Tigecycline.

Remedies for controlling AMR:

- Development of clones expressing Bacteriophage lytic enzyme.
- Development of sequence specific antibiotics using RNA guided nucleases against Gram Negative Bacteria

Recommendations

- Must consider in spatial and temporal ways biotic sets of the animal and plant kingdoms as well as the abiotic components of the environments.
- The 1H concept is positioned as a paradigm shift that tends to displace the classic "observation - diagnosis - treatment" approach, to promote an approach based on prevention.
- Beyond infectious diseases, chronic, metabolic, and degenerative diseases should be also part of 1H framework while ultimately, 1H integrates the political and economic health sectors indispensable to a sustainable public health action. This calls for a transdisciplinary approach to health issues.

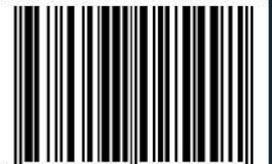
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