

**ABSTRACT BOOK  
& PROCEEDINGS**



**4<sup>TH</sup> WPSA INTERNATIONAL (VIRTUAL)**

# **ONE HEALTH CONFERENCE**

**9-10 SEPTEMBER, 2021**



## VICE CHANCELLOR'S MESSAGE

I warmly welcome all participants to the 4<sup>th</sup> WPSA International (Virtual) One Health Conference on behalf of University of Veterinary and Animal Sciences (UVAS), Lahore, and the organizer of the Conference at the occasion of 4<sup>th</sup> WPSA International (Virtual) One Health Conference at University of Veterinary and Animal Sciences (UVAS), Lahore. One Health is a collaborative, multispectral, and trans disciplinary approach which working at the local, regional, national, and global level with the aim of achieving precise health outcomes that granting the interconnection between people, animals, plants, and their shared environment. One Health is a hail that acknowledges the health of people is closely connected to the health of animals and our shared environment. One Health is not new, but it has become more significant in recent years. This is because many factors have changed interactions between people, animals, plants, and our environment. Keeping in view the importance of one health, UVAS in collaboration with World Poultry Science Association (WPSA) is organizing Virtual Conference with main mandate of the conference for this year are latest development and research work in the field of one health including AMR / AMU, Zoonosis, Poultry Health & Welfare, Bacteriology, Biosafety & Biosecurity, Virology, Environmental factors contributing to one health, International trends, Human and One Health. By this conference UVAS and WPSA are providing a platform to bring together Academia, Researchers, Farmers, Professionals and Industrialists. With this platform, academia and researchers will be able to share their relevant research work and learn basics and advance approaches linked to one health, researchable problem and current challenges which will help the process of making new discoveries and then transforming them into products and services for the marketplace. It might be a one more step but with hard work and determination we will streamline our research efforts for the benefit of one health. As one of Pakistan's Public Universities, UVAS's main challenge is to remain competitive and relevant by offering high quality technical academic programs and research activities, focusing on healthy food production and economic development. New knowledge and findings cannot be generated without research and development. Pakistan has made substantial investment in research and development facilities. These efforts will undoubtedly generate lots of interesting results and new knowledge as either further investigation or commercial activities. Therefore, researchers must see this activity as the generator of relevant new knowledge and extend their research outcomes from laboratory experiments to the marketplace and towards commercialization. Maybe this doesn't appear significant in the short term but it may make a tremendous impact in the future.



**Prof. Dr. Nasim Ahmad SI**

Vice Chancellor

University of Veterinary and Animal Sciences, Lahore



## PRESIDENT'S MESSAGE

Dear Guests

On behalf of the Pakistan branch of World's Poultry Science Association, it is great honor for me that I am honored to welcome you in the 4th WPSA International one health conference (IOHC'21) at University of Veterinary and Animal Sciences, Lahore-Pakistan. We hope to you a very vibrant and successful conference. The conference will provide the pleasing advantage of innumerable introductions to set up new industrial and scientific linking, to discuss challenges in the area of one health, AMR, Alternative to antibiotic, biosecurity and biosafety and food security and consumer education to reinforce your group effort for coming new developments in the field of One Health.



Fast growing dairy and Poultry industry of Pakistan is responsible for the production of healthy milk, meat and eggs regarding food security and food insecurity keeping in mind the concepts of one health. Presently, Asian Pacific region is facing the challenges of different diseases in animals, AMR in human, environmental challenges and availability policies issues. So there is a dire need to highlights the predominant challenges and present development at international platform and make a strong strategy to future policy and open discussion which will play a big role to improve the feed quality in Animal and poultry business. I extend my especial thanks to the members of Pakistan branch of World's Poultry Science Association and to all members of scientific and other organizing committee for their special contribution to design and execution of this special event. The committees express its especial gratitude to sponsors for their valuable supports for symposium.

I congratulate to the administration of University of Veterinary & Animal Sciences Lahore – Pakistan, Prof. Dr. Masood Rabbani (Pro-VC UVAS-Lahore / Chairperson of Conference), Dr. Hanif Nazir – Chairperson of Scientific Committee, Dr Asim Mahmood Khan (Chief Organizer of Conference / President WPSA-PB-North), Mr. Sohail Ahmed Conference Treasure, Dr. Sohail Raza-Conference Secretry and Dr Nasir Mukhtar – Secretry General WPSA-Pakistan Branch / Organizer and all other team members to organize the 4th WPSA International One Health Conference'21.

Wishing you a very special, successful and pleasant event.

**Mian J. M. Javaid Rathore**  
President, Pakistan Branch of WPSA /  
CEO Jadeed group of Companies



## GENERAL SECRETARY'S MESSAGE

The Pakistan branch is a young branch and has developed to one of the most active branches of the World's Poultry Science Association, sharing knowledge with everyone, interested in poultry. Also in these bizarre COVID-19 times, with a disruption of the world's economy, making international travel and therefore many physical meetings impossible, the WPSA Pakistan branch has continued to organise meetings. Of course these virtual scientific meetings cannot replace in full the in-person meetings, as participants miss the interaction that accompanies face-to-face meetings. The 4<sup>th</sup> WPSA International One Health Symposium is the next challenge for the branch. One Health: Co-operation and communication covering all aspects of human, animal and environmental health care. Anti-microbial resistance, zoonosis, their prevention and control, poultry health in general and the importance of environmental factors are the themes to be presented and discussed.



As mentioned before, due to the current pandemic, many meetings had to be cancelled or postponed, also WPSA's major event, the World's Poultry Congress. The 26<sup>th</sup> World's Poultry Congress in Paris, France, originally planned for 2020, is now scheduled for 7-11 August 2022.

It is an enormous honour and privilege to have the opportunity to write this message and I wish you all a very fruitful One Health Conference, gaining new insights and refreshing the "old" knowledge.

Many thanks for organising and congratulations.

**Mr. Roel Mulder**  
Secretary-General WPSA





## PRO-VICE CHANCELLOR'S MESSAGE

On behalf of University of Veterinary and Animal Sciences (UVAS) & Pakistan Veterinary Medical Council (PVMC), I feel pleasure to welcome the participants of 4<sup>th</sup> WPSA International (Virtual) One Health Conference 2021. One Health is an approach to designing and implementing programmes, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes.

UVAS & PVMC is continuously working on tackling the challenges faced by the industry and farmers with the help of local and international researchers.

WPSA International (Virtual) One Health Conference 2021 will serve as a great platform for all national and international renowned researchers to share their thoughts, research and technologies under the umbrella of one health for the furtherance of sector and academia. I hope this conference will provide an enabling environment for the discussion on current issues of the Industry, exchange ideas and suggestions to explore new avenues in the field of one health in days to come.



**Prof. Dr. Masood Rabbani**  
Chairperson of the Conference  
Pro-Vice Chancellor, UVAS, Lahore  
President PVMC/ Hon. Sec. SPCA, Punjab



## SENIOR VICE PRESIDENT'S MESSAGE

A great welcome to everybody who are here for WPSA International One Health Conference. Thanks UVAS for hosting this and for that a very special thanks to Prof. Dr. Nasim Ahmad the Vice Chancellor. The conference gains more importance when Prof. Dr Masood Rabbani is the Chairperson with his lot of experience.



Thanks for Dr Nasir Mukhtar secretary general of WPSA Pakistan branch playing a key role along with different committees. A great responsibility lies on Organizing committee Dr Asim Mukhtar and his team. Conference secretary Dr. Sohail Raza efforts are confirming that we are sitting here. Leading the scientific committee I appreciate all members of the team who are great names in scientific development in poultry sector. Every since our president Mian Jan Mohammad Javaid took over the position the practical scientific momentum is gearing up particularly towards modern poultry production. Since poultry products are becoming major item for our people so the responsibility of safe food lies on us. One of the challenges while growing food for humans is Antimicrobial Resistance AMR. Giving antibiotics to chicken becomes potential risk of antibiotic resistance and due to that humane treatment response will be compromised. The umbrella of One health gives us lot of possibilities to work together and develop alternatives like if the bird gets its best comfort zone and protected well against viral diseases especially focus on bird immune system then bacterial infections will be far more less and we can move towards our target where other countries like Holland have done very well.

Enjoy the conference and lets move forward with different ways and methods going to be discussed here.

**Dr. Hanif Nazir Chaudhry**  
Chairperson of the Scientific Committee  
Senior Vice President WPSA-Pakistan



## ORGANIZING COMMITTEE

### **Patron-in-Chief**

**Mian J. M. Javaid Rathore**

President, WPSA-Pakistan Branch/  
CE Jadeed Group of Companies Pakistan

### **National Organizing Committee**

**Chairperson of the Conference**

**Prof. Dr. Masood Rabbani**

(Pro-VC UVAS-Lahore-Pakistan)

**Chairperson of the Scientific Committee**

**Dr. Hanif Nazeer**

(Senior Vice President WPSA-Pakistan)

**Editors of the Abstract Book**

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(UVAS Lahore-Pakistan)

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(UVAS Lahore-Pakistan)

**Dr. Muhammad Kashif Saleemi**

(UAF-Faisalabad-Pakistan)

**Dr. Nasir Mukhtar**

(Arid A. University Pakistan)

**Dr. Ayesha Riaz**

(Arid A. University Pakistan)

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**Dr. Asim Mehmood**

(President WPSA-PB-Northern /  
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### **Organizer:**

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(UAAR / SG WPSA-PB)

**Dr. Sohail Raza**

(Conference Secretary)

UVAS, Lahore-Pakistan

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(Senior Vice President WPSA-Northern)

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(SG-WPSA-PB-Northern / Director KK Chicks)

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(UVAS Lahore-Pakistan)

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**Dr. Muhammad Hassan Mushtaq**

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(UVAS Lahore-Pakistan)

**Dr. Muhammad Kashif Saleemi**

(UAF Faisalabad-Pakistan)

**Dr. Aayesha Riaz**

(UAAR Rawalpindi-Pakistan)

**Dr. Muhammad Farooq Tahir**

(Fleming Funds UK)



# Programme

Day-1 September 09, 2021

Note: All Times are in Pakistan Standard Time

10:00 AM	Recitation from Holy Quran
10:05 AM	Welcome Address: <b>Prof. Dr. Nasim Ahmad, S./</b> (Vice Chancellor UVAS, Lahore)
10:10 AM	Opening Address: <b>Mian J. M. Javaid Rathore</b> President WPSA – Pakistan Chapter
10:15 AM	<b>Dr. Roel Mulder</b> Secretary General WPSA (Global) – Netherland
10:30 AM	<b>Conference Introduction and Technical Sessions</b> <b>Prof. Dr. Masood Rabbani</b> (Pro-VC, UVAS Lahore / President PVMC/ Hon. Sec. SPCA, Punjab)
11:00 AM	<b>Implementing One Health Approach in Pakistan (Lesson learn)</b> <b>Dr. Jamil Ahmad Ansari</b> (Chief Field Epidemiology and Disease Surveillance Division - NIH Islamabad)
<b>1<sup>st</sup> Session</b> <b>Zoonosis &amp; Virology &amp; Bacteriology</b>	
<b>Research Chair: Prof. Dr. Muhammad Akram Muneer, RCVets-Pakistan</b> <b>Moderator: Dr. Muhammad Kashif Saleeemi</b> Associate Professor Pathology (UAF, Pakistan)	
11:30 AM	<b>COVID-19 in Pakistan</b> Prof. Dr. Tahir Yaqub , UVAS, Lahore
11:45 AM	<b>Tuberculosis Diagnosis: Current Practices in Pakistan</b> Dr. Nadia Mukhtar, UVAS, Lahore
12:00 PM	<b>Perspectives of Emerging Zoonoses –Challenges and Opportunities</b> Dr. Tariq Navid , NUMS, Islamabad
12:15 PM	<b>Rabies: A Perfect One Health Model and its future prospects in Pakistan</b> Dr. Muhammad Hassan Mushtaq, UVAS, Lahore
12:30 PM	<b>Role of Veterinarians in Preventing Zoonotic Diseases</b> Dr. Adnan Ashraf , UVAS, Lahore
12:45 PM	<b>In vitro Biological Control of Avian Pathogenic <i>Escherichia coli</i></b> Aleena Kokab, UVAS, Lahore-Pakistan
01:00 PM	Break ( Lunch, Prayer, etc.)





## 2<sup>nd</sup> Session – Poultry Health & Welfare

**Research Chair: Dr. Hanif Nazir Chaudhry**  
Moderator: Dr. Muhammad Saeed Imran, UVAS, Lahore

2:00 PM	<b>Mycotoxins: An Important Public Health Issue</b> Dr. Muhammad Kashif Saleemi, UAF
2:30 PM	<b>Identification and Molecular Characterization of Newcastle Disease virus Matrix Protein Gene.</b> Dr. Aayesha Riaz, PMAS-UAAR
2:45 PM	<b>Influence of chicory root powder and zinc sulfate on growth performance, meat quality and histo-morphology of muscles and bones in broilers</b> Dr. Saima Ashraf, UVAS, Lahore
3:00 PM	<b>Effects Of Copper Nanoparticles Supplementation On Growth Performance and Intestinal Morphology In Broilers Reared Under Cyclic Cold Stress</b> Dr. Saima Masood, UVAS, Lahore-Pakistan
3:15 PM	<b>In Ovo antiviral effect of flower extracts against Newcastle Disease Virus and Avian Influenza Virus</b> Dr. Fariha Altaaf, UVAS, Lahore
3:30 PM	<b>Impact of toxic effects of Mycotoxins on Animal and Human health - A Global Concern</b> Dr. Muhammad Imran, UAF
3:45 PM	<b>BACTERIOLOGICAL STUDY OF BROILER BREEDER HENS DURING EARLY, MID AND LATE PRODUCTION PERIOD WITH ARTIFICIAL INSEMINATION</b> Dr. Farhan Farooq, PMAS-UAAR

## 3<sup>rd</sup> Session - Antimicrobial Resistance (AMR)

**Research Chair: Dr. Khalid Naeem Khawaja**  
(One Health Consultant, Fleming Fund Project-Pakistan)  
Moderator: Dr. Muhammad Farooq Tahir (Fleming Fund, Pakistan)

5:00 PM	<b>One Health Concept and its link to Antimicrobial Resistance (AMR): The role of the profession of Veterinary Medicine</b> Dr Mo Salman (Colorado State University) USA
05:30 PM	<b>Antibiotic Footprint Analysis; A proposed framework for Pakistan</b> Dr Sam Orubu , Boston University, USA
06:00 PM	<b>Global Initiatives for Curtailing AMR</b> Maarten Van Dongen, AMR Insights Network, Netherlands
06:30 PM	<b>Occupational risk of antimicrobial resistance to livestock farmers and farming environment, recommendations for mitigation</b> Dr Sangeeta Rao, Colorado State University, USA



Day- 2 September 10, 2021

<b>4<sup>th</sup> Session</b> <b>Biosafety &amp; Biosecurity &amp; Human and One Health</b>	
<b>Research Chair: Dr. Asim Mahmood Khan</b> Forward Solutions, Animal Health Company/ Conference Chief Organizer / President WPSA-North zone <b>Moderator: Dr. Farhan Farooq</b> KK Chicks and Feeds, Rawalpindi/ General Secretary WPSA-North zone	
10:00 AM	<b>Biological Waste Management</b> Dr. Ali Ahmad Sheikh UVAS, Lahore
10:30 AM	<b>How to use antibiotics smartly with on-site PCR- A Case Study</b> Fu Choong Keat, Aviagen Inc., Huntsville, AL, USA/ GeneReach Biotechnology Corp., Taichung City, Taiwan
11:00 AM	<b>Post Cleaning and Disinfection Monitoring by using Real-Time PCR Test in Poultry House</b> Fu Choong Keat, Aviagen Inc., Huntsville, AL, USA/ GeneReach Biotechnology Corp., Taichung City, Taiwan
11:30 AM	<b>Decentralization of SARS-CoV-2 testing</b> Frank Chung Associate Marketing Director GeneReach Biotechnology Corporation, Taiwan
12:00 PM	<b>Zoonotic Diseases of Poultry and their Impact to Human Health</b> Prof. Dr. Hafez Mohamed Hafez, Freie University, Berlin, Germany
12:30 PM	<b>Pyrazinamide-Induced Hepatotoxicity Is Associated With Mitochondrial Injury</b> Muhammad Hasnat, UVAS, Lahore-Pakistan
01:00 PM	<b>Break (Luch,Prayer and etc.)</b>
<b>5<sup>th</sup> Session</b> <b>International Trends &amp; Environmental Factors Contributing to One Health</b>	
<b>Research Chair: Eng. Tariq Nazir Chaudhry,</b> Director NB Sons <b>Moderator: Dr. Zahra Zaman, Sec. Gen. WPSA - Woman Wing, Pakistan</b>	
2:00 PM	<b>Global Climate Change and One Health</b> Dr. Fariha Arooj, UVAS, Lahore
2:30 PM	<b>Therapeutic Outcomes Of Tuberculosis And Its Impact On Quality Of Life Of Tb Patients In Pakistan</b> Muhammad Khurram Waqas, UVAS, Lahore-Pakistan
<b>6<sup>th</sup> Session – Concluding Remarks</b>	
3:00 PM	<b>Dr. Hanif Nazir Chaudhry</b> Senior Vice President WPSA-Pakistan



## Biodegradation Of Zearalenone And Its Derivatives: A Novel Method To Mitigate Mycotoxins In Feed Stuff

Bilal Murtaza <sup>a,\*</sup>, Xiaoyu Li <sup>a,c</sup>, Liming Dong <sup>b</sup>, Muhammad Tariq Javed <sup>d</sup>, Le Xu <sup>a</sup>, Muhammad Kashif Saleemi <sup>d</sup>, Gen Li <sup>a</sup>, Bowen Jin <sup>a</sup>, Huijing Cui <sup>a</sup>, Yuyu Yuan <sup>a</sup>, Hui-jun Geng <sup>a</sup>, Lili Wang <sup>a,c</sup>, Yongping Xu <sup>a,c</sup>

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### Abstract

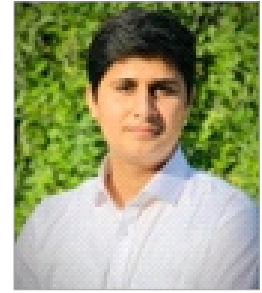
Mycotoxins are important one health issue now a days. Among these mycotoxins most important are aflatoxins, ochratoxins, fumonisins, zearalenone, T2-toxin etc. Zearalenone (ZEA) contamination of various foods and feeds is an important global problem. In some animals and humans, ZEA causes significant health issues in addition to massive economic losses, annually. Therefore, removal or degradation of the ZEA in foods and feeds is required to be done. The conventional physical and chemical methods have some serious issues including poor efficiency, decrease in nutritional value, palatability of feed, and use of costly equipment's. Therefore, the bio-degradation of ZEA by use of micro-organisms or their enzymes is much more advantageous and is close to nature and ecofriendly. Therefore, an effort is made to put forward the work done by different scientists on the biodegradation of ZEA by the use of fungi, yeast, bacteria and/or their enzymes to degrade the ZEA to non-toxic products.

**Key Words:** Keywords: Zearalenone (ZEA); bacteria; enzymes; biodegradation; detoxification



## Antimicrobial Resistance: Future Perspectives

Muhammad Kashif Javaid <sup>1\*</sup>, Muhammad Kashif Saleemi<sup>1</sup>, Aisha Khatoon<sup>1</sup>, Faqir Muhammad<sup>2</sup>, Masood Akhtar<sup>3</sup>, Muhammad Farooq<sup>4</sup>, Shafia Tehseen Gul<sup>1</sup>, Muhammad Imran<sup>1</sup>, Hafiz Muhammad Salman Khalid<sup>1</sup>, Haseeb Jawad<sup>1</sup>, Bilal Ahmad<sup>1</sup>, Ahad Fayyaz<sup>1</sup>, Qasim Saleem Raza<sup>1</sup>, Muhammad Waseem Tahir<sup>1</sup>



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<sup>3</sup>Faculty of Veterinary Sciences, Bahauddin Zakariya University, Multan Pakistan.

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### Abstract

Antimicrobial resistance (AMR) and antimicrobial usage (AMU) are global health threats in animal production units. The resistant genes of bacteria can be transferred from animals to humans through the food chain. Many bacterial species are now resistant to most antimicrobial agents and this resistance may vary between genera and species. The intrinsic resistance of gram-negative bacteria is generally high as compared to gram positive bacteria against many of antimicrobial agents. Poultry industry is the largest segment of livestock sector in terms of meat consumption in Pakistan. The overuse of antimicrobial agents without any prescription for prevention against various disease and as a growth promoter can lead toward the antimicrobial resistance (AMR). Antibiotic resistance can affect people and animals, making it one of the world's most urgent public health problems. The type I  $\beta$ -lactamase chromosomal mediated resistance is the most serious resistance problem now a days. Along with bacterial protein alteration and plasmid mediated  $\beta$ -lactamase also imposes serious clinical resistance challenges. Antibiotic resistant genes are now distributed among the environment and causes problem by distributing resistant genes to natural water, soil, sewage plants and clinical areas. To find the best alternative source to antibiotic, scientist are discovering novel substitutes like Egg yolk antibodies, nanoparticles, yeast extracts and other herbal products. The surveillance of the antimicrobial resistant bacteria relied on in-vitro susceptible method, but now have to collect the genetic information of the antibiotic resistant genes. We have to move toward molecular and genotypic detection of AMR genes to collect information and to move further accordingly. Along with, physician must have updated knowledge of commonly drug resistant genes and the appropriate use of antibiotic. The strict biosecurity, infection control and the development of novel vaccines will also play a major role in resistance control.

**Key Words:** Antimicrobial Resistance, Resistant genes, Bacteria, Antibiotics, Gene





## Cadmium Toxicity: Its Resulting Hazards For Animals And Human Health

Muhammad Waseem Tahir, Muhammad Kashif Saleemi\*, Faqir Muhammad<sup>1</sup>, Farzana Rizvi, Masood Akhtar<sup>2</sup>, Muhammad Zubair<sup>3</sup>, Muhammad Imran, Qasim Saleem Raza, Ahad Fayyaz, Hafiz Muhammad Salman Khalid, Iqra Zaheer



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### Abstract

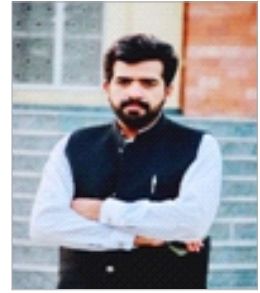
Those metals which are not essential and having mass density more than  $4.5\text{g/cm}^3$  are called heavy metal. Among these, cadmium (Cd) is one of the most toxic, non-essential and non-nutritive heavy metal. It ranked at 8<sup>th</sup> position among 20 hazardous substances. It found in water, air, soil, cigarette smoke, drainage and batteries. These metals remain in environment because our environment unable to degrade these metals. Use of inorganic and organic fertilizer, might be a source of Cd accumulation in plants. When poultry and animals are kept in those environments having high level of Cd and offered intoxicated water and feed, it affects the growth and accumulate into their bodies. Trace minerals including the Cd present in plants, fish, mutton, beef, poultry meat and mushrooms, from these commodities it entered into human body. Food plays a major role for the exposure of Cd; smoking increases the burden of Cd in human. Rice is a major source of cadmium (Cd) for human. It adversely affects to human life by damaging the musculoskeletal, cardiovascular and pulmonary system. Increased risk of cancer, bone fracture, hypertension and kidney dysfunction in human when they exposed 30-50 ug/day level of cadmium. It clearly showed that the renal toxicity was the first warning of cadmium toxicity. In Cd toxicity reactive oxygen species (ROS) and free radicals are produced, when there is over load of free radical, ROS generated which caused the carcinogenesis and chronic toxicity. Cd produced hydrogen peroxide, hydroxyl and hydrogen peroxide, as a result there is activation of transcription factors which are redox sensitive (AP-1, Nrf2 and F-kB) and change in gene expression related to ROS. Cadmium decreases in weight gain and relative organ weight, arrest the spermatogenesis, fatty liver and decrease the PCV, Hb and blood glutathione. Many investigations carried on culture, animals and human showed that the connection between cadmium and pancreatic cancer by damaging the epigenetic part cells, as a pathway collaborating with nucleic acids of cell. Risk of breast cancer increased by the increase in cadmium level. It also caused the skin cancer like melanoma through suppression of apoptotic mechanism and increase the cell growth from normal rate. Ascorbic acid, Vitamin E and selenium, Milk Thistle (MT), Silymarin, Metallothionein (MT) and low molecular weight protein are used as ameliorative agent.

**Key Words:** Cadmium, Toxicity, Silymarin, Milk Thistle, Selenium



## Essential Oil: An Alternative To Antibiotic Growth Promoter (Agp) In Poultry

Qasim Saleem Raza, Muhammad Kashif Saleemi\*, Faqir Muhammad<sup>1</sup>, Farzana Rizvi, Aisha Khatoon, Muhammad Imran, Shafia Tehseen Gul, Masood Akhtar<sup>2</sup>, Sheraz Ahmad Bhatti<sup>2</sup>, Muhammad Imran, Rao Zahid Abbas<sup>3</sup>, Ahad Fayyaz, Muhammad Waseem Tahir,



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### Abstract

There is increasing demand to reduce the number of antibiotics used as anti-bacteriostatic or anti-bactericidal drugs in poultry, demanding the use of ingenious alternatives to maintain chicken productivity and efficacy. Essential oils/EOs, offer a lot of potential and are often considered to be natural, free of harmful deposits and chemicals, and less dangerous. The literature lists several properties of volatile oils, including immunostimulatory, antiviral, digestive stimulant, antibacterial, antifungal, and antioxidant. Antibiotic growth promoters (AGP) are no longer required in animal diets, as per European Union Regulation no. 1831/2003/EC, which has resulted in the many health issues and financial losses. Prebiotics, probiotics, essential oils, and medicinal plants have thus become important AGP alternatives. Herbal essential oils have been shown to have beneficial impacts on broiler immune systems, as they promote lymphocyte activity, stimulate immunoglobulin synthesis, and increase IFN- $\gamma$ . It is found that a blend of *Oreganum aetheroleum* essential oils is more efficient than ciprofloxacin in treating *E. coli* in broiler chicks. Reduced symptoms, mortalities, postmortem lesions, improved cell mediated and humoral immune responses, and bacterial re-isolation were among the findings. cinnamon bark oil (CNO) @ 0.3 g/kg in the feed was more effective than administering antibiotic growth promoters for improving gut health, antioxidant status, blood cholesterol, and immunity, according to the findings of this study. When 100 or 200 mg of thyme and oregano (300, 500, and 700 mg/kg) were added to the feed, significant improvements in bird feed intake were observed. FCR was shown to increase by 12% when anise essential oil was added at a rate of 400 mg per kg. Thyme oil added @ 100 and 200 mg/kg improved the food conversion ratio. the influence of essential oils *Camellia sinensis* was studied on broilers for coccidiosis, and the findings were astounding, indicating that this oil have immunomodulatory properties in birds that protect them from avian coccidia. When a commercial combination of essential oils called CRINA® (Switzerland) was fed to boiler birds at a dose of 50 mg/kg, levels of trypsin, maltase, and amylase were found to be higher than in control birds.

**Key Words:** Essential Oils, Antibiotics, Alternatives, Herbal, Immunity



## Mycotoxins At Human Animal Interface: A Call For An Open One Health Debate

Hafiz Muhammad Salman Khalid, Muhammad Kashif Saleemi\*, Faqir Muhammad<sup>1</sup>, Farzana Rizvi, Aisha Khatoon, Muhammad Imran, Shafia Tehseen Gul, Masood Akhtar<sup>2</sup>, Sheraz Ahmad Bhatti<sup>2</sup>, Muhammad Imran, Qasim Saleem Raza, Ahad Fayyaz, Muhammad Waseem Tahir,



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### Abstract

Mycotoxins are secondary metabolites produced by different genera of filamentous fungi, *Penicillium*, *Aspergillus*, *Fusarium*, *Alternaria* and *Claviceps* that contaminate essential food items under favourable conditions all around the globe. There are currently over 500 mycotoxins reported, in which the most significant threat to human health and agriculture includes OTA, AFB1, TCTs (T2, HT-2, DON), ZEN, FB1. Numerous mycotoxins co-exposed, increasing the chance of adverse effects in human and animals. Mycotoxins have the potential to cause teratogenic, mutagenic, carcinogenic, immunosuppressive, and endocrine-disrupting effects both in animals and humans. Mycotoxins can enter in human and animals' circulatory system through absorption via gastrointestinal and respiratory route and cause toxicity. Livestock acquired Aflatoxin B1 (AFB1) through the consumption of contaminated feed which is then converted to a monohydroxy metabolite aflatoxin M1 (AFM1) in liver and excreted in animal's milk. Aflatoxins are considered as primary source of hepatic cancer along with hepatitis B virus due to prolonged exposure of aflatoxins. In humans, there is a substantial link between circulating AFB1-lysine adducts and gall bladder cancer (GBC). Cytochrome p450 is a hepatic enzyme responsible for carcinogenicity of AFs, attacking organism's DNA leading to mutations which further leads to liver cirrhosis and hepatic cancer. Co-exposure of AFs and FNs in human diets has been linked to human liver and esophageal cancer etiologies as Fumonisin B1 classified as Group 2B carcinogen in humans. During pregnancy, exposure of AFs and FNs may affect intrauterine fetal growth, neonatal jaundice, cerebral hemorrhages, and neural tube abnormalities. In livestock, FNs cause leukoencephalomalacia in horses, decreased feed intake, pulmonary edema in piglets, and reproductive disorders. Pre-harvest and post-harvest strategies to mitigate the mycotoxins represent the most efficient ways for the control of mycotoxins in food and feed. The development of fungal infection-resistant maize cultivars contributes to the production of mycotoxins-free maize. Public awareness program should be provided on adverse effects of mycotoxins so that people may be sure that the food they're eating is safe. This abstract highlights various types of mycotoxins and their harmful effects on animal species and humans while keeping the One-Health concept in mind.

**Key Words:** Aflatoxins (AFs), Fumonisin (FNs), Cancer, One Health



## Inappropriate Use Of Hand Sanitizer During The Covid-19 Outbreak Led To An Increase In Multiple Drugs Resistance; A Review

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### Abstract

The global risk of multi-resistant bacteria is increasing day by day in both patients and healthy individuals, especially in children and the elderly who use commercially available hand sanitizers, especially in under developing and poor countries during the COVID-19 epidemic. There is no drug or vaccine available to treat COVID-19 infections up till now. The World health organization recommended the easiest way to control the transmission of infection in humans is to use a hand sanitizer. However, overuse of hygiene equipment, hand sanitizer and antibiotics can cause bacteria to become resistant to commercially available antibiotics. Rising demand for competitive hand sanitizer products has reduced their supply. During the spread of COVID-19 in Pakistan, Dettol hand sanitizer disappeared from the market. Therefore, the increase in substandard hand sanitizer products on the market is a threat to human health and can lead to antibacterial resistance. Research showed that 80% of people are carriers of pathogenic bacteria after washing their hands with a commercially available hand sanitizer. Furthermore, poor quality hand sanitizer has other disadvantages such as hormonal disorders, itching, gray color skin, redness, poisoning, vomiting and drowsiness and in severe cases it can lead to insomnia and death. We emphasized the importance of using hand sanitizer appropriately rather than irrationally during the COVID-19 outbreak. According to sero-epidemic statistics, hand sanitizer contributes to antibiotic resistance worldwide. In the early stages of COVID-19 outbreaks, the dangers of using substandard alcoholic hand soaps are becoming more apparent in terms of potential human harm. The data could aid in the future in defeating and eliminating COVID-19 nightmares, as well as understanding multidrug resistant patterns in humans

**Key Words:** Hand sanitizer, Resistance, Demand, Quality, COVID-19





## Impact Of Toxic Effects Of Mycotoxins On Animal And Human Health-A Global Concern

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### Abstract

Mycotoxins are the natural contaminants of animals and human diets. These secondary metabolites are produced by different genera of fungi in susceptible crops under favorable conditions. Consumption of these crops leads to various adverse effects on humans and all animal species throughout the world. In addition to dietary sources, humans are also exposed to these mycotoxins in the workplace environment through contaminated dust. The present special issue aims to enlighten the perspectives about the animals and humans exposure to mycotoxins and their implications for the development of health issues. The important toxins are aflatoxins, ochratoxins, zearalenone, trichothecenes, and fumonisins. They severely affect the liver, kidney, immune system, and reproductive system and as a consequence, these toxins may cause liver carcinoma, renal dysfunction, immunosuppression and infertility in animals. In the case of compound stomach, rumen microbiota degrades these mycotoxins; therefore, they are more resistant to monogastric animals. The deleterious effects of mycotoxins in humans are hepatocellular carcinoma, Reye's syndrome, Balkan endemic nephropathy (BEN), immunosuppression, abdominal pain, neural tube defects, infertility and retarded growth in children. Meanwhile, we cannot exclude the impact of environmental and biological factors on the occurrence and predominance of mycotoxigenic fungi in stored agricultural commodities. The basic and efficient measure is to control the environment by manipulation of ecological factors. This will minimize the entrance of fungal-derived mycotoxins in the feed and food chain and ultimately curtail their adverse effects on animal and human health.

**Key Words:** Mycotoxins, fungi, crops, animals, humans, pathology



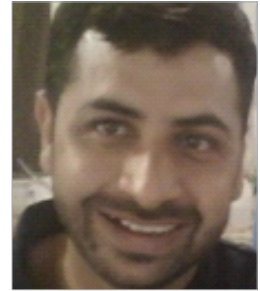
## Bacteriological Study of Broiler Breeder Hens During Early, Mid and Late Production Period with Artificial Insemination

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### Abstract

Poultry industry as per official record shows 13.66 million broiler parent stock (PS) in Pakistan and poultry meat contributes 34% of total meat consumption. Achieving standard body weight is the factor of success stories. Ultimate objective of PS farming is to maximum number of day-old-chicks via good hatchability and optimum fertility, to achieve the target we have to maintain fertility with a technique named Artificial Insemination (AI). The present study was designed to investigate the impact of female body weight category with and without artificial insemination on reproductive performance, hatchability traits and subsequent progeny performance of broiler breeder. Total of 3000 Ross-308 broiler breeder were maintained till 64 weeks of age at commercial breeding farm. All broiler breeder hens were reared then separated into two mating groups i.e., Artificial Insemination (AI) and Natural mating (NM) groups with 1500 hens (5 replicates with 300 hens in each replicate) in each. In late laying phase (45-60 weeks), chances of bacterial contamination particularly *E. coli*, *Mycoplasma* and *Salmonella* are most common. *E. coli* is the most common cause of contamination especially during AI, which results into sever health problems and economic losses in progeny. Mostly females were found positive during last laying phase (60 weeks) of breeder age. In overweight females of AI category, prevalence of *E.coli* found highest (86.7%) than in NM. Similarly *Mycoplasma* was found highest in overweight females (66.7%) than in NM groups, while infection was minimum in lower weight category. *Salmonella* infection observed minimum in early and mid-phase laying birds, but more cases were found in last laying period (60%) in over weight female. As the age of breeder flock increases the instruments used for AI were getting more and more exposed to pollutants, despite after cleaning and disinfection, may be some wear and tear in the instruments used for AI on floor is more prompt to get infection than in cage birds. Litter dust is the major contributory factor for causing more and more birds exposed to infection. Therefore, it is highly recommended that extra care should be taken while doing AI on floor to avoid bacterial contamination.

**Key Words:** Hatchability, fertility, artificial insemination, broiler breeder



## Association of Type-III Secretions with Multi Drug Resistant *Pseudomonas Aeruginosa* from Urinary Tract Infection

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### Abstract

*Pseudomonas aeruginosa* is the prominent causative agent of urinary tract infections (UTIs) resulting in a high mortality rate worldwide. It has the ability to produce toxins and type III secretions that inhibit polypeptide elongation than can lead to a septic shock and systemic infection. *Pseudomonas aeruginosa* is getting resistant to wide classes of antibiotics like Cephalosporin, extended-spectrum beta-lactamases, aminoglycosides and carbapenems due to versatile metabolic activity. The present study is conducted and main focus is to determine the resistance pattern and coexistence of type III secretion with MDR *Pseudomonas aeruginosa*. A Total of 200 Urine samples were collected from UTI patients from different hospitals and processed on *Pseudomonas* Cetrimide agar. Different biochemical test was carried out in order to identify *Pseudomonas aeruginosa* and molecular characterization is done by polymerase chain reaction. Antimicrobial susceptibility profiling done by performing the Kirby-Bauer disc diffusion technique by following the guidelines of Clinical and Laboratory Standards Institute. Molecular detection of Type III Secretions was done by using specific primers through a polymerase chain reaction under optimized condition. Total 72 (36%) isolates of *P. aeruginosa* was detected on basis of molecular identification PCR assay. Isolates of *P. aeruginosa* showed highest resistance towards ceftazidime (100%), ceftriaxone (100%), nalidixic acid (95%), piperacillin (85%), gentamicin (85%), aztreonam (85%), tobramycin (80%) and amikacin (80%), norfloxacin (70%), ciprofloxacin (60%) and Imipenem (70%). Gene specific PCR indicated 40 (56%) Isolates of *Pseudomonas aeruginosa* with prevalence of ExoS, 36(50%) ExoU, 32(44%) ExoY and 24(33%) ExoT. It is concluded that T3SS (exoS and exoU) associates more than 50% in infections occurred due to MDR *Pseudomonas aeruginosa*.

**Keywords:** *Pseudomonas aeruginosa*, Multidrug Resistance, Urinary Tract Infection, Type III secretions.



## Molecular Epidemiology Of Infectious Bronchitis (Ib) In Faisalabad Division And Immunopathogenesis Of Ib Variants In White Leghorn Layers.

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### Abstract

Infectious bronchitis virus (IBV) is an important poultry pathogen belonging to coronaviridae family causing various pathological disorders in poultry. In field conditions, IBV can evolve, resulting in a multitude of serotypes and strains of the infectious bronchitis (IB) virus. In the present study seroprevalence and molecular epidemiological of IB was studied. The data showed high seroprevalence of IBV circulating in the Faisalabad division. Molecular epidemiology indicated that variant strains of IBV are circulating in the study area. Various diagnostic procedures employed in this research were tailored for further IBV studies. In addition, experiments were also conducted on the virulence assessment of newly isolated IBVs in SPF embryonated eggs and white leghorn layers. A total of 2720 samples have been detected for IBV by the use of above-mentioned methods, 625 of which were confirmed IBV positive. Moreover, selected RT-PCR positive samples were inoculated in the specific pathogen free (SPF) embryonated chicken eggs through in ovo-inoculation. The pathogenicity assay revealed there was severe curling, dwarfism and hemorrhages reported in the embryonated pathogen free embryos. While the white leghorn layers birds revealed that in the mature birds due to IBV infection the egg production, egg quality, size, weight were severely affected as compared to the control group. The immunological parameters revealed that there was severe immunosuppression. In growing birds IBV severely affected the development of reproductive tract and oviduct was atrophied and no mature ova were developed and IBV severely affected the process of egg laying and no egg production was recorded. A total of 10 IBV isolates were subjected to phylogenetic analysis of partial S1 gene. The genome and phylogenetic study of the various Pak-IBV-isolates showed that owing to point mutations, selective evolutionary pressure, and recombination events, the IBV genome is constantly evolving. The introduction of strains available in Pakistan, into commercial vaccines production for poultry used in Pakistan is therefore extremely suitable.

**Key Words:** Infectious Bronchitis, Immuno pathogenesis, White leghorn layers, RT-PCR

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## Antimicrobial Evaluation Of Copper Nanoparticles Synthesized Through Green Synthesis Method Using Aqueous Leaf Extract Of *Azadirachta Indica* Linn.

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### Abstract

Antibacterial resistance is increasing day by day leading to therapeutic failure and increase in the cost of treatment. Change in drug delivery system to body may decrease resistance of bacteria against antibacterial agents. This project is designed to evaluate antimicrobial activity of copper nanoparticle (CuNPs) against *Escherichia coli* and *Staphylococcus aureus*.

Copper Nanoparticles were prepared through green synthesis method using aqueous leaf extract of Neem (*Azadirachta indica*). Characterization of nanoparticles was done using UV-spectroscopy and Fourier transform infrared (FTIR) spectroscopy. Scanning electron microscope (SEM) was used to determine the size of copper nanoparticles. Antibacterial effect of nanoparticles was evaluated using well diffusion method against field strains of *Escherichia coli*, and *Staphylococcus aureus*. UV-spectroscopy exhibited resonance absorption peak at 570nm, which is a convenient region of the spectrum, FTIR spectroscopy showed peaks at 1630 and 3400cm<sup>-1</sup> which confirms the presence of copper nanoparticles. The size of copper nanoparticles was ranging from 39-62 nm with average size 49.44 nm. Inhibitory zones were measured and compared with the guidelines of CLSI. Data was expressed as means±SD. P value ≤ 0.05 considered as significant. The diameter of zones of inhibition on plates exposed with nanoparticles and crude extract of Neem was (20.96±1.06), (11.38±1.59) respectively. It is concluded that nanoparticles has produced significant antimicrobial effect against *E.coli* and *S.aureus*. The Copper nanoparticle produced by aqueous leaf extract of Neem could be an alternative choice for treatment of diseases causing by *Escherichia coli* and *Staphylococcus aureus*.

**Key Words:** Copper nanoparticles, Neem extract, antibacterial resistance, green synthesis



## In Ovo Antiviral Effect Of Flower Extracts Against Newcastle Disease Virus And Avian Influenza Virus

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### Abstract

Among other industries, poultry industry is an expeditious industry in Pakistan. Due to less biosecurity measures, the industry is under threat of some highly infectious agents such as Avian Influenza virus (H9N2) and Newcastle disease virus (NDV) which affect economy at large scale. Both these agents have been responsible of many outbreaks in poultry in past years. To control the disease rate in poultry sector novel antiviral drugs are the salient factors to bring a control against these viral infections. The current therapeutic measures are required to be upgraded by identifying novel antiviral drugs from natural resources to combat against viral infections. The present study was escorted on ethanolic extracts of seven different flowers to examine their antiviral effect against New castle disease virus (NDV) and Avian Influenza (H9N2) in ovo by using chicken embryonated egg inoculation. The spot agglutination and heamagglutination tests showed inhibitory effects of *Rosa damascena* Miller, *Achillea millefolium*, *Woodfordia fruticosa* Kurtz and *Bombax ceiba* L. against NDV as no agglutination observed. On the other hand, the extracts of *Taxacum officinale* Weber, *Hyssopus officinalis* L. and *Chrysanthemum cinerifolium* (Trevis.) Vis. showed positive results for both spot agglutination and heamagglutination assay against NDV. Spot agglutination and heamagglutination assay exhibit inhibitory effect of all the flowers extracts against H9N2. The bioactive components such as alkaloids, ethers, terpenoids, etc. of each flower were analyzed through Gas chromatography mass spectrometry (GC-MS). The current results elucidates that ethanolic extracts of these flowers possess strong antiviral activity because of their active ingredients. These ingredients should be isolated, commercialized and can be used for therapeutic purpose against viral infections.

**Key Words:** Antiviral, Hemagglutination, Bioactive, GC-MS



## Antimicrobial effect of plant extracts against multi drug resistance *Escherichia coli*

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### Abstract

In recent years, antibiotic resistance is one of the considerable threat to treat diseases. *Escherichia coli* is a multidrug resistance (MDR) pathogen due to its resistance against multiple antibiotics. *Escherichia coli* is destructive pathogen among other pathogens that cause human illness by transmitting from food chain system contamination. The present research was overseeing to elucidate antibacterial effect of some flowers against MDR *Escherichia coli*. The elevated trend of antimicrobial resistance needs alternatives to treat diseases against MDR pathogens. The natural component of flower extracts are alkaloids, oils, polysaccharides serve to cure diseases and play a significant role in health wing. Ethanolic extracts of seven different flowers are *Achillea millefolium*, *Bombax ceiba*, *Chrysanthemum cinerarifolium*, *Hyssopus officinalis*, *Rosa damascena* Miller, *Taraxacum officinale* Weber and *Woodfordia fruticosa* were used against multi drug resistant (MDR) *E. coli*, by performing spot test and minimum inhibitory concentrations (MIC) test. The results explained all the seven extracts have significant antibacterial activity against MDR *Escherichia coli* and control. The MIC of *Rosa damascena* Miller, *Bombax ceiba* was 3.125 mg/ml and *Taraxacum officinale* Weber was 12.5 mg/ml for MDR *E. coli*. Similarly, *Achillea millefolium*, *Hyssopus officinalis*, *Chrysanthemum cinerarifolium* MIC value was 25 mg/ml and 12.5 mg/ml for *Woodfordia fruticosa* Kurtz. The current research showed that these flowers having strong and significant antibacterial activity and therefore can be used as prospective antimicrobial agent against various resistant bacterial pathogens.

**Key Words:** Antimicrobial activity, E.coli, Plant extract, Multi drug resistance



## Microbial And Quality Control Analysis Of Milk Samples From Lahore District

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### Abstract

Pakistan is 4<sup>th</sup> highest milk producing country in the world but malnutrition is a recognized health problem in Pakistan and plays a substantial role in the country's poor nutrition status as according to UNICEF nearly 50% of children in Pakistan are chronically malnourished and about 11% are acutely malnourished. The present study was conducted to assess the overall situation of milk quality in Lahore district on microbial and different quality assurance parameters including Total Viable Count (TVC), Coliform count, chemical adulterations, Beta lactams and Tetracyclines residues and AFM1 concentrations against market milk, household, UHT and Pasteurized categories. Milk samples were collected from all ten towns of Lahore district in four categories including raw, household, UHT and Pasteurized. Total Viable Count (TVC), Coliform counts were done by using spread plate methods on nutrient and MacConkey's agar plates. Chemical adulterations were investigated by using UVAS Milk Adulteration Testing (MAT) Kit for detection of 12 most common chemical milk adulterants. Beta Lactams and Tetracycline residues were analyzed by using "Beta Lactams and Tetracyclines Combo Rapid Test Strip" (Shenzhen Lvshiyuan Biotechnology Co. Ltd, Shenzhen, China). The quantitative estimation of Aflatoxin M1 level in the milk sample was done using "Solid phase competitive ELISA kit" (Helica Bio Systems, California, USA) against all four categories. The microbial analysis including TVC and Coliform count in loose market and household milk were far across the food safety standards admissible range and constitute a hazard to public health. The chemical adulterations were investigated across all the categories with sugar cane and urea are most common chemical adulterant found in all these categories. The high index of Beta Lactams and Tetracyclines residues in milk were reported in pasteurized category while high prevalence of aflatoxin M1 contamination was detected in UHT category among all of four sample categories. The findings of the study raise serious questions on the despairing situation of all types of milk which are supplied and marketed in all ten towns of Lahore district which not only gratify safe food standards but also a major health risk to public health.

**Key Words:** Milk quality, antibiotics, aflatoxins, adulteration



## In Vitro Biological Control Of Avian Pathogenic Escherichia Coli

Aleena Kokab\*, Ali Ahmad Sheikh, Masood Rabbani, Muhammad Ilyas Riaz, Qurat ul Ain, Kiran Imtiaz, Rida Haroon Durrani  
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### Abstract

Avian pathogenic *E. coli* (APEC) is causing colibacillosis in poultry and is responsible for major economic losses around the World because of less production, treatment expenses, carcass dismissal and high mortality. To prevent APEC all measures including antibiotics had limited success So, this all has stimulated the concern for the search of different antimicrobial agents to control bacterial infections. The purpose of the study was to isolate and, *in vitro*, evaluate effectiveness of lytic phages against antibiotic resistant avian pathogenic *Escherichia coli*. *Escherichia coli* was isolated from liver/heart/lungs of dead poultry birds showing typical lesions of colibacillosis as well as intestines of apparently healthy birds. After biochemical confirmation, the isolates were further confirmed by PCR targeting Universal Stress Protein (*uspA*) gene specific to *Escherichia coli*. Moreover, pathogenic and non-pathogenic *Escherichia coli* isolates were differentiated on the basis of their ability to bind Congo red dye. Antibiotic resistance profile was determined using Kirby-Bauer disk diffusion method. Bacteriophages isolated from sewage water were tested for their lytic activity against pathogenic and non-pathogenic *Escherichia coli*. Stability of phages at different temperatures and pH was also determined. Further, reduction in bacterial number due to bacteriophages was determined by measuring optical density (OD) at 600nm. Five no. of phages were isolated from sewage water showing clear plaques of different size. Phages were highly lytic against pathogenic isolates while there was no lytic activity against non-pathogenic isolates. Phages showed wide range of pH and temperature stability. Among all 5 phages, Maximum lytic activity observed was for 12 hours by phage S5. While phage S1 and S4 both suppressed bacterial growth for 6 hours, phage S2 suppressed for 4 hours and S3 suppressed for 8 hours. When compared with bacterial control it was observed that even after 24 hours the OD value remained low in phage treated flask. Results revealed the effectiveness of bacteriophages against antibiotic resistant *E.coli* and proved that bacteriophages can be used as promising alternatives to antibiotics for reducing *E.coli* infection in poultry.

**Key Words:** bacteriophage, E.coli, biological control, poultry





## Emerging Public Health Issues Concerned With Microbiologists I.E. Covid-19

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### Abstract

The public health system addresses emerging infectious diseases, antimicrobial resistance issues, and bioterrorism. Coronavirus is an emerging public health problem threatening the lives of over 2.4 million people around the world. The COVID-19 pandemic has led to massive health, social, and economic challenges on a widespread ranking. Due to the need for certified remedies or vaccines to prevent and treat this infection, its timely dissemination has devastated public healthcare systems worldwide. Modern knowledge of rising microbial threats includes the SARS and new influenza variants involving humans, the re-emergence of contagious disease issues. The contribution of clinical microbiologists is the marking of bacterial, viral, fungal, and parasitic agents which cause human disease which contributes to diagnostic and therapeutic measures for the clinical surveillance of patients and impeding the transmission of contagious diseases in the world. The number of recognized originating contagious infections has promptly grown since the 1940s, and in the earlier twenty-first century, various techniques which are PCR along with census and culture policies are altering clinical microbiology. Microbiology laboratories are the first lines of defense for the detection of outbreaks of infection. These are the first opportunities to discover these dangers and should contribute to the design of documenting policies and dissemination of this evidence. Non-remedial public health considerations can give modest and cost-effective strategies to reduce the transmission and effect of acute respiratory infections in pandemic and non-pandemic scenarios. A detailed policy that includes surveillance, diagnostics, clinical treatment, research, and development of vaccines and drugs, is timely chosen to defeat the fighting against COVID-19 and further widespread illness.

**Key Words:** Public Health, Antimicrobial resistance, Microbiologists, Pandemic



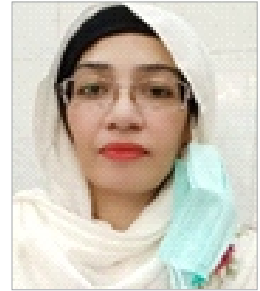
## Study of Histological Expression of Intestinal Mucosal Health in Rock Pigeon in Response to the Dietary Intervention of Mannan Oligosaccharide

Sahar Ijaz<sup>\*1</sup>, Hafsa Zaneb<sup>1</sup>, Saima Masood<sup>1</sup>, Muhammad Shahbaz Yousaf<sup>2</sup>, Saima Ashraf<sup>1</sup> and Mirza Muhammad Usman<sup>1</sup>

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### Abstract

Intestinal health of a food animal is of extreme significance for the animal's and for its consumer's health. The histology of the gut translates gut health. The Rock Pigeon (*Columba livia domestica*) is a bird thriving in our environment and this makes its intestine a worth studying subject. With the history of its meat usage in traditional medicine and as a delicacy, this bird could be an alternative meat source to make up for the increasing demand of animal protein. We recorded the dimensions of selected mucosal components in the small intestine of the Rock Pigeon and compared based on the feed given to different groups. To evaluate the gut health through mucosal dimensional histological data from the Rock Pigeon's small intestine both with and without the dietary intervention. Forty maternally isolated chicks were divided into four groups. Group A was fed the corn based basal diet (CBBD) while the groups B, C and D were fed CBBD with 0.1, 0.2 and 0.5% MOS respectively. At the end of the trial, the birds were sacrificed and samples from the small intestine were processed for the histological study of Villus height, Villus width, Crypt depth, Villus surface area, Mucosal absorptive surface area, Villus height to crypt depth ratio and thickness of lamina propria. The data were analyzed through one way ANOVA and Duncan's multiple range test.  $P < 0.5$  was considered significant.

The dimensions of the selected mucosal components were the greatest in the birds fed the CBBD only. The results signify that the rock pigeon's intestinal mucosa has shown a good growth pattern in terms of enhanced dimensions when CBBD was fed while the dietary intervention of MOS failed to encourage any enhancement in the dimensions of the selected mucosal components. This calls for digging down deep into the rock pigeon's intestinal histology as well as the effect of MOS on it.

**Key Words:** Rock Pigeon, Small intestine, mucosal histology

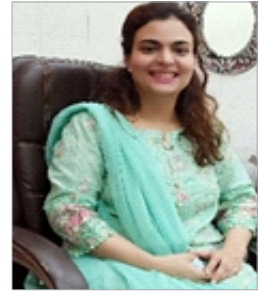


## Influence of Chicory Root Powder and Zinc Sulfate on Growth Performance, Meat Quality and Histomorphology Of Muscles and Bones in Broilers

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### Abstract

Development of antibiotic resistance in human and animals is a serious concern and one health approach is required to address this issue. Use of growth promoting feed supplements is a promising alternative strategy to reduce the use of antibiotic growth promoters in broiler production. Dietary supplements include prebiotics, phytochemical feed additives and trace minerals etc. which aim to promote performance and meat yield in broilers without harming the environment and consumer health. The study was planned to evaluate the efficacy of a phytochemical feed additive chicory root powder (CRP) (2% and 4%) and 60mg of zinc sulfate ( $ZnSO_4$ ) supplementation either alone or in combination on performance, organ development, tibial anatomy, meat quality parameters including pH and water holding capacity and histomorphology of muscles in broilers. Total of 150 day-old chicks were divided in 6 groups (5 replicates/pen) and raised under standard managemental condition for 35 days. The control group (CONT) received basal diet (BD) whereas group-2 received BD+2%CRP, group-3 received BD+4%CRP, group-4 received BD+ $ZnSO_4$  60mg/kg of diet, group-5 received BD+2%CRP+60mg $ZnSO_4$ , group-6 received BD+4%CRP+60mg $ZnSO_4$ . The performance was calculated on weekly basis, whereas, for other parameters 2 birds/replicate were sampled at 35<sup>th</sup> day and processed for gross and histological morphometric measurements. During 5<sup>th</sup> week, growth performance, muscle fascicle and fiber diameter, water holding capacity of breast and thigh muscles and relative weight of intestine was better ( $P<0.05$ ) in the group-6 receiving 4%CRP+60mg of  $ZnSO_4$  supplementation when compared with the other groups. Body weight was also higher ( $P<0.05$ ) in all the supplemented groups however carcass weight did not differ when compared with the control group. Supplementation of 2% and 4%CRP alone or in combination with 60mg of  $ZnSO_4$  improved ( $P<0.05$ ) the bone length and medullary canal diameter of tibia when compared with the control group. In conclusion, supplementation of 4%CRP+60mg of  $ZnSO_4$  proved to be a superior combination for improving the growth performance, muscular water holding capacity and tibial characteristics in broilers.

**Key Words:** Inulin, feed conversion ratio, muscular morphometry, poultry



## Effect Of Different Levels Of Dietary Vitamin D3 On Egg Quality, Hatchability And Chick Quality In Layer Breeders

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### Abstract

The current study was conducted to determine the effect of different levels of dietary vitamin D<sub>3</sub> on egg quality, hatchability and chick quality in layer breeders. Layer breeder flock, at age of 81 weeks, was selected for this study. A total of 704 birds (640 females and 64 males) of 81 weeks of age were kept under optimum management condition in an environment control colony cage poultry house. Birds were distributed in to 4 equal groups (treatments) with 16 replicates and each replicate with 44 birds (females 40, males 4). Four different levels of vitamin D<sub>3</sub> were given 2500, 3000 (control), 3500 and 4000 IU/kg in layer breeder's feed. Data of weekly male and female body weight, feed intake and egg production were evaluated by simple arithmetic means. Hatching eggs were collected to evaluate egg quality features, hatchability and chick quality parameters at 4<sup>th</sup> and 6<sup>th</sup> week of trial. Data were analyzed by using complete randomized design (CRD) and means were compared using Tukey's test. The results showed that body weights and egg productions were significant ( $p < 0.05$ ) improved with vitamin D and feed intake was nonsignificant ( $p > 0.05$ ) at different levels of vitamin D<sub>3</sub> in the diet. The egg quality characteristics like egg shape index, albumen index, yolk index, egg specific gravity, Haugh unit, shell to egg shell weight percentage, shell thickness and shell breaking strength were significantly ( $p < 0.05$ ) improved with the increase of vitamin D in layer breeders diet. Hatchability and chick quality parameters were improved significantly ( $p < 0.05$ ) by reducing the embryonic mortalities as a result of higher level of dietary vitamin D<sub>3</sub>. The effects of different levels of dietary vitamin D<sub>3</sub> on serum calcium and phosphorus levels were significant ( $p < 0.05$ ) and nonsignificant ( $p > 0.05$ ) on serum vitamin D<sub>3</sub> level. Chicken welfare in older layer birds can be improved by the increasing the dietary vitamin D<sub>3</sub> level.

**Key Words:** Vitamin D3, Egg quality, Hatchability and Chick quality



## Longitudinal Study Of Experimental Induction Of Aa Amyloidosis In Mice Seeded With Homologous And Heterologous Aa Fibrils

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### Abstract

To investigate pathogenesis and kinetics of experimentally induced murine AA amyloidosis seeded with homologous (murine) and heterologous (bovine) AA fibrils. Experimental AA amyloidosis was induced by administration of inflammatory stimulus and preformed AA fibrils to a total of 111 female C57/Black mice. In this longitudinal study, heterologous (bovine) as well as homologous (murine) AA fibrils were injected intraperitoneally to mice in various combinations. Re-stimulation was done at 120 or 300 days post first inoculation. To analyze the intensity of amyloid depositions in mice organs, immunohistochemical techniques and image J software were used. Assessment of cytokines level in sera was done using a Mouse Th1/Th2/Th17 Cytokine CBA Kit. Incidence and severity of AA amyloidosis were quite low in mice inoculated with heterologous bovine AA fibrils than homologous murine one. Homologous AA fibrils administration at first and second inoculation caused maximum amount of amyloid depositions and severe systemic form of amyloidosis. Increase in the level of pro-inflammatory cytokine IL-6 was observed after first inoculation, while second inoculation caused a further increase in the level of anti-inflammatory cytokine IL-10. AA amyloidosis can be induced by heterologous as well as homologous AA fibrils. Severity of AA amyloidosis induced with homologous AA fibrils is higher compared to heterologous AA fibrils.

**Key Words:** Amyloidosis fibrils Cytokine Heterologous Homologous





## Effect Of Hormone Manipulation On Hatch Sex Ratio In Birds

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### Abstract

Birds may have the ability to manipulate sex ratio i.e., the ratio of male to female chicks hatched after incubation. In birds, the female is heterozygous, so it is considered that this trait is under maternal control. The factors that are mainly considered to be involved in sex ratio manipulation are the female's social, environmental, and body condition. One possible condition related to maternal body condition is the steroid hormones that are circulating in the breeding females that will help in the allocation of sex chromosomes. However, the concentration of hormones changes with social and environmental responses. Studies showed that significantly more females were hatched from the female birds having more concentration of estrogen hormones in plasma and vice versa with the females having more concentration of testosterone hormones implanted. In addition to the effect of hormone concentration on the hatching ratio, it also helps determine the hormone status of breeding females during egg production and the allocation of hormones to eggs. the eggs receiving high levels of androgen, more male chicks will hatch than females. The better way to test this explicit is by manipulation of sex hormones in the breeding female and its effect on the sex of hatching chicks.

**Key Words:** Hatch ratio, Hormones, Female body condition



## Effect Of Butyrate Supplementation On Live Performance And Gut Health In Broilers

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### Abstract

The study was planned to evaluate the influence of different levels of butyrate on growth performance. Carcass traits, intestinal health along with immune response against Newcastle diseases were also studied. Two hundred, day-old Ross-308 broiler chicks were procured from a local commercial hatchery and randomly divided into four treatment group. Each group having fifty chicks was further divided into five replicates of ten chicks each. A basal diet (CP:20 % and ME: 2950 kcal/kg) was supplemented with 0 (C), 100(B-100), 200 (B-200) or 400 (B-400) ppm of calcium butyrate. Blood samples were collected on days 10, 21 and 35<sup>th</sup> for antibody titer against Newcastle disease. Carcass characteristics and intestinal health were determined on days 21 and 35. Data were analyzed with GLM procedure of SAS using CRD and means were tested using Tukey's test. Supplementation of calcium butyrate improved weight gain and FCR. No significant difference ( $P>0.05$ ) in feed intake was observed among dietary treatments. The pH value and length of small intestine was increased by addition of 100 ppm of butyrate in diet. Butyrate supplementation increased antibody titer against Newcastle disease. Nutrient digestibility increased linearly with increasing butyrate level. Dressing percentage, breast meat, thigh meat and giblet organs (liver, heart and gizzard) were not affected by dietary treatments. It was concluded that inclusion of butyrate increased nutrient digestibility, length of small intestine and weight gain in broiler birds.

**Key Words:** Broiler, Butyrate, Feed efficiency



## Effects Of Copper Nanoparticles Supplementation On Growth Performance And Intestinal Morphology In Broilers Reared Under Cyclic Cold Stress

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### Abstract

The international poultry industry has greatly expanded due to rise in need for chicken meat and eggs. Birds may suffer from variety of environmental stresses such as cold stress which affects the animal health and welfare. Moreover, cold stress is a major barrier in the expansion of poultry industry in cold regions. Copper nanoparticles (Cu-NP) have been used previously in broiler diet and have shown positive results for promoting the performance in broilers, but their efficacy during the cold stress in broilers is not reported. This study was designed to determine the ameliorative effects of Cu-NPs supplementation on growth efficacy, weight gain and intestinal morphology in broilers raised under cyclic cold stress conditions. Day-old chicks (n=400) in five groups were reared under normal conditions until 21<sup>st</sup> day. Birds received either basal diet (BD) i.e. Control group or BD supplemented with Cu-NP (5, 10 and 15mg/kg of feed). From 22<sup>nd</sup> to 35<sup>th</sup> day, the cold stress (CS) group and supplemented groups (CS+5mg, CS+10mg and CS+15mg) were exposed to 13 C°±2C° temperature treatment for 8 hours. Growth performance was calculated on weekly basis whereas for intestinal architecture 2 birds per group were slaughtered at the end of the trial. Results indicated that birds in the CS group had reduced (P<0.05) growth performance accompanied with lowered (P<0.05) body weight gain (BWG), reduced (P<0.05) small intestinal villus surface area and decreased (P<0.05) villus height to crypt depth ratio (VH:CD) when compared to the control group. Dietary inclusion of CuNP (15mg/kg) improved the growth performance, BWG, VSA and goblet cell count in jejunum and ileum when compared to the CS group. In conclusion, dietary CuNP aided in improving the growth performance and intestinal microarchitecture in broilers during CS.

**Key Words:** Key Words: Copper, nanoparticles, intestinal morphometry, broiler, goblet cells, mucin, stress



## Evaluation Of Hepatoprotective Potential of Cinnamon (Cinnamomum Cassia) Powder in Ccl4 Induced Liver Toxicity in Rodents

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### Abstract

The liver is a pivotal organ that has a crucial part in metabolism. Oxidative stress is initiated by metabolic conversion of a xenobiotic to reactive oxygen species (ROS) which sequentially impair the cellular macromolecules. Impairment in liver function contributes to the various pathological conditions that involve hepatitis, cirrhosis, fibrosis, and hepatocellular carcinoma. Provision of Cinnamon may have hepatoprotective effect and may correct the oxidative stress in hepatotoxic rats. The aim of the study was to evaluate the hepatoprotective potential of cinnamon (Cinnamomum cassia) powder in CCl<sub>4</sub> induced liver toxicity in on male Wister rats. The study was conducted on 24 male Wistar Albino rats. They were randomly divided into 4 groups each containing 6 rats. One control group (G1) was serve as negative control comprising of healthy rats which were served with refined olive oil at a dose of 0.1ml/100g BW. The second control group (G2) served as a positive control in which hepatotoxicity was induced by injecting CCl<sub>4</sub> at a dose of 0.1ml/100g B.W in refined Olive oil. Whereas treatment groups (G3) and (G4) were treated with Cinnamomum Cassia powder at a dose of 300 mg/kg BW and 500 mg/kg BW per os. Significant change in weight of rats throughout the duration ( $p < 0.001$ ) was found in experimental groups. In comparison to control, treatment groups showed significant changes in ALT, AST values of blood ( $p < 0.05$ ). The TPC, ABTS and DPPH also showed high free radical scavenging activity. The non-significant change in the treatment groups as compared to control group ( $p > 0.05$ ) showed that liver damage was not occurred at severe levels. Histopathological evaluation revealed the significant increase in liver central vein damage in control positive as compare to other groups which indicate the protective effect of Cinnamomum Cassia extract against CCl<sub>4</sub> damage in rats. These results suggest that the 500mg of cinnamon powder was very beneficial for producing defensive mechanism in body to avoid the chemo toxins based liver disorders.

**Key Words:** Cinnamon, Liver, Toxicity



## Perspectives of Emerging Zoonoses – Challenges and Opportunities

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### Abstract

Zoonoses are infectious diseases that are linked with human and animals. During the last few decades, human-animal linkages and close associations have increased the threats of the zoonotic diseases up-to several times. The increasing demands of animal-based edible proteins have resulted in a higher rate of human-animal interaction. Moreover, human, animal and environmental factors have increased the threat of vector-borne and food-borne illnesses globally. In the present study, we have focused on vector-borne and food-borne diseases that are transmissible between human and animal species. We have highlighted a few opportunities through which we can reduce the chances of emerging zoonotic illnesses in developing countries such as Pakistan.

**Key Words:** Emerging Infection, Human-Animal Interface, One Health, Zoonoses





## Role of Antimicrobial Resistance In Spread Of Zoonotic Diseases

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### Abstract

Antibiotic development was considered as the most important advancement in modern science. But the prolonged and overuse of antibiotic raised antimicrobial resistance, a significant threat to animal and human health. The resistant bacteria can be passed through affected animals to human through food chain, or by direct and indirect contact. The resistant genes are mostly found on gene cassettes, plasmids and transposons of various bacterial strains. The antimicrobial resistance against zoonotic pathogens (*E. coli*, *Salmonella*, *Enterococcus* and *Campylobacter* species) were assessed. Different bacteria's including brucella, leptospira, and Borrelia are the major zoonotic disease, causing high morbidity and even mortality. These bacteria's have now been resistant to a number of antibiotics. The trend of resistance may vary from specie to specie. The comparative analysis of whole genome (human and animal strain) revealed different types of antimicrobial resistance genomes. These findings revealed the importance of One Health concept to find the association of resistance genes and zoonotic infectious pathogens. The resistance genes were mostly found in pigs than cattle and broilers. The resistant infectious agents challenged and compromised the animal care, and also complicated the food animal production by posing serious zoonotic risks. To control the AMR and zoonotic infection, we need to implement serious health plans for the use of antibiotics in food animal. We need to develop best alternatives to antibiotics that can be improved managerial practices, use of vaccines, probiotics, use of IgY and nanoparticles. Need to control the spread of resistance gene, and have to develop various collaborations among farm, veterinarian, medical, and public health communities.

**Key Words:** Antibiotics, Resistance, AMR, Genes



## Novel Techniques For Control Of Tick And Tick-Borne Diseases

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### Abstract

Ticks are ravaging blood-sucking ectoparasite of veterinary and public health significance. Numerous deadly diseases vectored by ticks viz; babesiosis, theileriosis, anaplasmosis, Kyasanur forest disease (RFD), tick-borne encephalitis, Lyme's disease, possowan fever, and allergic reactions. Cattle, cynosure of the developing livestock industry, are under assaults of tick greediness and about 80% of the world cattle population is infested with ticks. To control ticks, there are several conventional methods viz: manual removal of ticks, use of dips, acaricidal treatment, and use of disinfectants. These methods, however, cannot prove to be as helpful as they were. A neoteric and eco-friendly method of control is transgenesis of tick symbiotes residing in the tick's gut. The crux is to manipulate the symbiotes genetically to impede the transmission of pathogens. Tick-associated rickettsia isolated from tick gut is modified genetically with cecropin A (an antimicrobial peptide) to form a stable pathogen. A few stable insect germlines have been developed using transposons. Aedes, Anopheles, and Culex mosquitoes have been altered genetically and successful results were seen in the case of Plasmodium species and Dengue virus. Inoculation of ticks with modified rickettsia will aid in creating a hurdle in the transmission cycle of pathogens carried by ticks. One of the main limitations in acquiring transgenic ticks/ vectors are their survival in natural habitat followed by two hurdles that are the lack of a transgene(s) that effectively reduce pathogen load, and the inadequacy of transposons as gene-drive mechanism(s). At present, a lot of work needs to be done before releasing the transgenic vectors free in natural habitat. In a long run, this study will anticipate a better and permanent strategy for the control of ticks and tick-borne diseases in humans as well as animals.

**Key Words:** Keywords: Tick-borne diseases, Transgenesis, control of ticks



## Combined Effect Of Prebiotics & Iron Fortificants On Various Types Of White Blood Cells In Iron Deficient Female Sprague Dawley Rats

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### Abstract

Iron deficiency is one of the biggest public health problems worldwide. Despite focusing on this menace for decades, this problem is still on rise and continues to affect millions across the globe. The current study was designed to determine the combined effect of prebiotics & iron fortificants on various types of White blood cells among Iron deficient female Sprague Dawley rats. For the present study, n = 126 female Sprague Dawley rats aged 6 to 8 weeks were obtained from the National Institute of Health, Islamabad. Two prebiotics namely Inulin and Galacto-oligosaccharides and two iron salts including Ferrous sulphate and Sodium Iron EDTA were used in varying dosages to prepare various types of feed to be fed to rats. Initially, anemia was induced among rats by feeding them with carbon tetrachloride which is an iron binder. After that, rats were orally fed with fortified feed daily for a period of three months. Blood samples of overnight fasted rats were collected at 0, 30<sup>th</sup>, 60<sup>th</sup> and 90<sup>th</sup> day of the trials. Five different types of white blood cells including Neutrophils, Lymphocytes, Basophils, Monocytes and Eosinophils were determined using the standard protocols. The results of the study showed that iron fortificants and prebiotics did not improve any of the white blood cells. The current study indicated that white blood cells are not impacted by consumption of iron fortificants and/or prebiotics.

**Key Words:** Prebiotics, Iron Fortificants, White Blood Cells, Public Health



## Genome Editing Based Modern Techniques For Mosquito Control

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### Abstract

Mosquito control strategies include chemical control, source reduction, environmental control, biological control, personal protection, and use of traps. But the present techniques are ineffective, offering a continuously global threat demanding advanced genetic tools to control mosquito-transmitted diseases. Genome editing techniques like RNA interference (RNAi), zinc finger nucleases (ZFN), transcription activator-like effector nucleases (TALEN), clustered regulatory interspaced palindromic repeats (CRISPR), and associated protein (Cas 9), and immune-related gene modification with the development of antiviral immunity. RNAi uses double-stranded RNA (dsRNA), and small interfering RNA/short interfering technique (siRNA), single stranded hairpin micro-RNA (miRNA), and short hairpin RNAs (shRNA) to halt the protein synthesis through post-transcriptional mRNA silencing. RNAi has knocked down many lethal genes, and identified essential genes like *IAP1*, *Ubi-p63E* and *CG11700* genes along with-it DNA binding proteins *bss* and *CG1545*. But this tool is laborious, limited to RNA based gene silencing with high-off target effects and there might be an immune response stimulation by the introduced RNA. The most recently used tool CRISPR: a gold standard to knocks out the genes on DNA level with no off-target effects. CRISPR has knocked down many genes like *AGAP005958*, *AGAP011377*, and *AGAP007280* (*female fertility genes*). It causes the permanent disruption of gene resulting in robust signal, lowers the risk of immune modulation with a flexible time frame for assay. By employing CRISPR researchers can impede protein synthesis, mating, and consequently control of mosquito and mosquito borne pathogens.

**Keywords:** Mosquitoes, control techniques, gene-editing, CRISPR



## Occurance Of Esbl Producing Klebsiella Pneumoniae From Raw Meat Samples

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### Abstract

Meat is among one of the most perishable foods and its composition favors the growth of pathogenic and spoilage causing bacteria. The presence of *Klebsiella pneumoniae* is increasing in meat and its products day by day causing serious health concerns. *Klebsiella pneumoniae* can cause bacteremia, meningitis, pneumonia and also have the ability to resist several antibiotic drugs. The objective of present study was isolation, identification and molecular detection of *Klebsiella pneumoniae* followed by its antimicrobial susceptibility and detection of antibiotic resistance genes from raw meat samples. Total 100 fresh and frozen meat samples were collected from supermarkets and butcher shops. Samples were collected from chicken and mutton equally. Isolation of *Klebsiella pneumoniae* was done on MacConkey. Identification was performed using cultural characteristics and biochemical characters and confirmation was done by polymerase chain reaction. Kirby bauer method was employed for detection of antibiotic susceptibility while double disk synergy test (DDST) for ESBL detection. Extended spectrum beta lactamase genes like *bla*<sub>TEM</sub>, *bla*<sub>CTX-M</sub>, *bla*<sub>KPC</sub> and *bla*<sub>OXA</sub> were detected by PCR. Multidrug resistant isolates (n = 30) were processed for congo red test for analysis of biofilm forming characteristic for *Klebsiella pneumoniae*. Out of total 100 meat samples, 35 *Klebsiella pneumoniae* were detected. Highest percentage of isolates was detected from fresh chicken samples (28 isolates). 30 isolates were calculated to be multidrug resistant isolates. 100% resistance was calculated for amikacin/ clavulanic acid, ceftriaxone and colistin followed by ticracillin (97.14%) and gentamicin and aztreonam (94.29%) while ceftazidime was calculated to be most susceptible antibiotic that showed (37.14%). In ESBL genes detection highest prevalence was calculated for *bla*<sub>CTX-M</sub> that was 33.33%, followed by *bla*<sub>TEM</sub> as 26.66% while in carbapenemase genes detection prevalence of *bla*<sub>OXA</sub> was calculated to be 06.66% and in colistin resistance genes detection prevalence of *mcr1* gene was calculated as 23.33%. 40% (n = 12) isolates were marked positive for congo red test, displaying the biofilm forming characteristic. Prevalence of MDR *Klebsiella pneumoniae* in raw meat samples has been a matter of concern and threat to public health. This research lefts major benefits to food officials to consider this issue as a matter of priority and to adopt some precautionary measures to prevent microbial contamination.

**Key Words:** MDR, meat, contamination, resistance





## Comparative effect of natural and synthetic canthanxanthin and apo-ester carotenoids on quality of bio fortified egg

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### Abstract

This study has been designed to develop carotenoids bio fortified eggs as a functional product to attenuate current diseases particular diabetes retinopathy. For this purpose, the layer hen egg was developed through feed fortification and incorporation of natural and synthetic canthanxanthin and apo-ester feeding different levels such as 40, 80, 120 mg/kg of feed and 25, 50, 75 mg/kg of feed respectively for 20-weeks. The eggs were evaluated for physiochemical characteristics and score egg data was statistically analyzed. Our results show that synthetic canthanxanthin significantly affect the shape Index (%), color and yolk height and diameter of biofortified egg while natural canthanxanthin intake significantly affects the specific gravity, albumin height, color and yolk diameter of egg. Synthetic apo-ester intake only changed significantly the color and yolk diameter while the natural apo-ester intake significantly changed egg height, color and yolk diameter. When they are used in combination of canthaxanthin and apo-ester, synthetic forms significantly affect shell thickness, color and yolk diameter as compared to natural combination that only significantly changed the color and yolk height. The results show that significant color change indicates the successful incorporation of carotenoids into yolk which can be functional on human consumption.

**Key Words:** carotenoids, biofortification, designer egg, anti-oxidation, metabolic diseases



## In Covid 19 Era, The Role Of Food Safety In One Health Concept

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### Abstract

Our society is facing huge challenge to feed for healthy life for the growing human population in the time of limited natural resources and preserving the environment. In this context, one health approach is the only possible solution to address sustainable food production and environmental stewardship ensuring the humans, animals, and the environment interlink age. One health approach can be applied primary for food safety though interdisciplinary. In this talk, it will be discuss how food safety can health in safeguarding the health and how academics, producers, consumers, and government can meet one Health challenge. The need for incorporating One Health education into curriculum for scientific, engineering, and humanities programs to build capacity in One Health competencies with the goal of established networks that will work toward improving public health, food safety, and sustainable agriculture by establishing new perspectives on interactions among plants, animals, and humans and recognizing the threat of disasters and trans boundary diseases to food security.

**Key Words:** Food Safety, health, food production, animal, environment



## Decentralization Of Sars-Cov-2 Testing

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### Abstract

SARS-CoV-2 has been responsible for more than 196 million cases with more than 4 million death cases reported worldwide. In the beginning of SARS-CoV-2 outbreak, the PCR testing capacity was allocated only in the medical center and the capacity increased slowly and was not affordable to provide diagnosis in time especially at the peak of pandemics. In order to increasing the capacity and the efficiency of SARS- CoV-2 PCR testing, a diagnostic network including not only medical center but also regional hospital was established with PCR system with minimal training requirement. The concept of decentralized SARS-CoV-2 PCR testing benefits the application of fast on-site boarder control, quarantine, which reduce the time for diagnosis and the risk of sample transportation. As the evolution of SARS-CoV-2 virus, we can expect the demands of SARS-CoV-2 testing will not decrease in the near future and decentralized SARS-CoV-2 testing can help us establish the power of diagnostic network, mitigate the transmission and control the outbreak.

**Key Words:** SARS-CoV-2, PCR, Testing



## How To Use Antibiotics Smartly With On-Site Pcr-Case Studies

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### Abstract

Mycoplasmosis is common around the world which causes down-grade of meat quality and results in economic losses in broiler industry. People rely on antibiotics for treatment but reduction of antibiotics is now an important issue. Two case studies showed how to use antibiotics smartly with on-site PCR. In the first case, *M. gallisepticum* was detected at the day of age, although Tilmicosin was treated, insufficient dosage did not solve the problem and *M. gallisepticum* was detected until Day 28 even several drugs were treated continuously. In the other case, *M. gallisepticum* and *M. synoviae* were detected at the day of age. Sufficient Doxycycline was treated immediately and Mycoplasmosis turned negative at Day 7 until harvesting. Using on-site PCR detection system to check the presence of *M. gallisepticum* and *M. synoviae* on DOCs and confirm the treatment efficiency is a good strategy for next-generation Mycoplasmosis control.

**Key Words:** Mycoplasmosis, PCR, Control



## Post Cleaning And Disinfection Monitoring By Using Real-Time Pcr Test In Poultry House.

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### Abstract

Pathogens like *Mycoplasma gallisepticum*, *Mycoplasma synoviae* as well as *Salmonella spp.* are known to survive in the environment. When such pathogens caused a disease outbreak in the flock, we usually treated the sick animal according to the clinical sign and perform cleaning and disinfection (C&D) in parallel to mitigate the stress from the environment. We can check whether the subsequent clinical outcome recovered the flock, however, we usually overlooked the evaluation of environment C&D. If the C&D procedure is not sufficient, the residual pathogen will cause infection again once the flock is under stress. In this case, a good practice to evaluate the procedure of C&D is the primary way to control the disease. A proper C&D procedure includes physical and chemical removal of organic materials (i.e., manure, feed, blood, and carcasses) and the use of disinfectants to inactivate viruses and bacteria from the poultry houses, farm equipment and surroundings. Bacterial culture and plating on agar are commonly used to monitor the efficacy of C&D. However, it is time-consuming and difficult for some pathogens like *Mycoplasma*. However, speeding up the evaluation and more sensitive detection are needed in the modern poultry industry. Polymerase Chain Reaction (PCR) is a good tool to evaluate the efficacy of C&D by detecting the residual nucleic acids of pathogens in more sensitive and specific way. A sample-to-answer on-site PCR analyzer is suitable to facilitate C&D evaluation with proper training to the farm technician. Not only bacteria/mycoplasma but also other viruses can be monitored by PCR analyzer to strengthen the biosecurity practice in the farm. This study will review the strategies for C&D efficacy evaluation and the practices to control Mycoplasmosis and Salmonella with a sample-to-answer on-site PCR analyzer.

**Key Words:** *Mycoplasma gallisepticum*, *Mycoplasma synoviae*, *Salmonella*





## Analyzing The Relationship Between Different Doses Of Arginine With Endocrine Hormones And Their Subsequential Impact On Broiler Growth

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### Abstract

Amino acids (A.A) play an essential role in attaining optimal broiler growth performance. Therefore, it is imperative to add the indispensable A.As with ideal ratios in poultry feeds to obtain maximal growth outcomes. The objective of this study was to evaluate the ideal A.A ratio of arginine and Lysine in relation with its impact on immune response, secretion of endocrine hormones and their subsequential role on growth performance in broiler birds. A total number of 612 day-old broiler chicks were reared for 35 days at Paroka Research Center, Agriculture University, Faisalabad. Birds were randomly divided into 6 treatment groups. Each group contained 6 replications with 17 birds in each. Treatments had 0.95 (1.19/1.25, 1.12/1.18, 1.05/1.1), 1 (1.25/1.25, 1.18/1.18, 1.1/1.1), 1.05 (1.31/1.25, 1.24/1.18, 1.17/1.1), 1.10 (1.38/1.25, 1.30/1.18, 1.23/1.1), 1.15 (1.44/1.25, 1.36/1.18, 1.28/1.1) and 1.20 (1.50/1.25, 1.42/1.18, 1.34/1.1) arginine with lysine ratio for starter, grower and finisher feed respectively. Data for feed intake (FI) and body weight (BW) were collected at day 7, 21 and 35 to analyze the feed conversion ratio (FCR) and BWG. One bird from each replicate of every treatment group was slaughtered on day 35 to collect organ and serum samples. The results showed a significant ( $p < 0.05$ ) effect of arginine on growth hormone, Insulin like growth factor-1, T3, T4 and insulin secretion however, the ratio of 1.10 proved to be the best one for the maximal secretion of these hormones. In starter and grower phases, 1.10 and 1.15 ratio showed better results for BWG and FCR too, however, FI was affected non-significantly ( $p > 0.05$ ) during these phases. Treatments had no remarkable effect on relative organs weight (liver, gizzard and heart) and immune organs (thymus, bursa and spleen) in broilers. Concluding that 1.10 ratio of arginine supplementation have better endocrine secretions with their positive impact on broiler growth.

**Key Words:** Arginine, Endocrine hormones, Feed supplementations



## Utilization Of Detoxified Castor Seed Meal As Protein Source In Broilers

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### Abstract

The study was designed to check the efficacy of various detoxification process and utilization of castor seed meal as protein sources in broiler diet. The trial lasted for 35 days. The adaptation period ranged from day 1 to 11<sup>th</sup>. On 12<sup>th</sup> day, broiler birds (n=40), were divided into five experimental groups (A-E) with three replicates having four birds each replicate. The corn-soy based reference diet (ME = 3000 Kcal/kg; CP = 20 %) was formulated and fed to group A. Group (B to E) composed of 80% of reference-diet and 20% castor seed meals. Castor seed meals was prepared at local oil extraction plant and detoxified through various physical treatments *i.e.* Soaking (6 hours), Autoclaving (1 hour; 15 Psi), Soaking + Autoclaving (6 hours + 1 hour; 15 psi, respectively). Diet B contained raw (untreated), C contained autoclaved, D contained soaked, and E contained soaked + autoclaved castor seed meals, respectively. Results of study revealed that performance of birds in terms of weight gain and feed conversion was negatively impaired with inclusion of castor seed meal in diet. Among the detoxified castor seed meals, highest weight gain and best feed conversion was observed in the birds fed autoclaved and autoclaved + soaked castor seed meal. The hypertrophy of immune organs including thymus, bursa and spleen was observed in the birds fed raw castor seed meal, while the effect was eliminated in the birds fed processed castor seed meal. It was inferred that the inclusion of castor seed meal can negatively impair the performance. The processed castor seed meal can be considered and studied further for optimization of inclusion level in broiler diet.

**Key Words:** Castor seed meal, detoxification, broiler, diet



## Effect Of Prebiotic And Selenium-Nanoparticles Alone Or In Combination On Ameliorating Higher Stocking Density Stress On Growth Performance And Stress Indicators In Broilers

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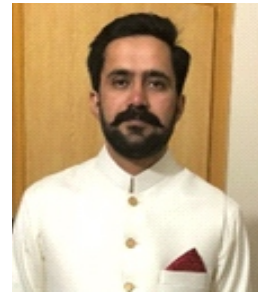
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### Abstract

Stocking density in broiler production is perceived as a topic of major importance; however, no consensus has been reached on what density would allow for good welfare as well as economic benefits to producers. Current study was carried out to investigate the effects of mannan-oligosaccharide (MOS) and selenium-nanoparticle (SeNP) alone or in combination in broiler reared under higher stocking density (HSD) on growth performance and serum stress indicators. The 392 day-old chicks were randomly divided in seven groups with eight replicates (n=7) as NSD (basal diet (B-D)+ normal stocking density: 10 bird/m<sup>2</sup>), HSD ( basal diet+ higher stocking density: 16bird/m<sup>2</sup>), Se-HSD (B-D + Se-0.15mg/kg), MOS-HSD (B-D + MOS-05gm/kg), Se-MOS-HSD (B-D + Se-0.15 mg/kg + 05gm/kg of MOS), SeNP-HSD (B-D + SeNP 0.15mg/kg) and SeNP-MOS-HSD (B-D + 0.15 SeNP + 05gm/kg of MOS). Each group consisted of eight replicates (n=7). Growth performance was measure on weekly basis whereas for serum analysis, two birds from each replicate were sampled on 21<sup>st</sup> and 42<sup>nd</sup> day. During 3<sup>rd</sup> to 6<sup>th</sup> week body weight of birds was lower ( $p < 0.05$ ) in all HSD groups than NSD group. The weekly body weight gain was poorer in 3<sup>rd</sup> week for all groups compared to NSD group. However, during 5<sup>th</sup> and 6<sup>th</sup> week body weight gain was lowest ( $p < 0.05$ ) in HSD group compared to NSD group, whereas in Se-MOS-HSD, SeNP-HSD, SeNP-MOS-HSD body weight gain was improved and comparable to NSD group. During 6<sup>th</sup> week, birds in HSD group had poor FCR ( $p < 0.05$ ) when compared with NSD group whereas SeNP-HSD, SeNP-MOS-HSD was presented with better FCR ( $p < 0.05$ ) when compared to HSD group. Regarding stress indicators, our results revealed that at 21<sup>st</sup> day, level of corticosterone and cholesterol was higher ( $p < 0.05$ ) in HSD group than NSD group whereas these levels were reduced in all HSD-supplemented groups with lowest corticosterone values reported for SeNP-MOS-HSD group. At 42nd day, level of corticosterone was not significant amongst experimental groups but cholesterol level was significantly higher ( $p < 0.05$ ) in HSD group, whereas cholesterol level was reduced ( $p < 0.05$ ) in all HSD-supplemented groups when compared to HSD group but was comparable with NSD group. Based on results, we concluded that higher stocking density is a stressful situation for bird which can negatively influence growth performance and major stress indicators in birds. Supplementation of SeNP+MOS partially ameliorated stress of HSD by improving FCR and body weight and reducing cholesterol level.

**Key Words:** Stocking density, Stress, Cholesterol, FCR



## Antibiotic Growth Promoter Driven Antibiotic Resistance Genes Prevalence In *Lactobacillus* Spp And Its Possible Sharing With *Klebsiella* Spp

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### Abstract

Antimicrobial drugs are being used for bacterial disease prevention and as growth promoters in the dairy and poultry industry. Resistance against these antimicrobials is increasing gradually. Increasing incidence of resistance has been attributed to selective pressure, different microbial characters, societal and technological developments. *Lactobacillus* normally resides as intestinal microbiota, acts as a reservoir for microbial resistance genes as well as involves in the dissemination of these resistance genes to other bacteria. Acquiring and possible transfer of AR genes from poultry to human. This particular study was designed to determine the role of *Lactobacillus* in the transfer of antibiotic resistance (AR) genes to *Shigella*. Samples were taken from the colon (large intestine) of commercial broiler chicken and indigenous poultry breeds. DNA was isolated from *Lactobacillus* and *Shigella* and amplified using PCR. qRT-PCR was used to analyze the gene expression level of AR genes *tet* (M), *erm* (B) AND *sul* (2)) in *Lactobacillus* and *Shigella*. The expression level of antibiotic resistance genes were higher in broiler chicken as compared to indigenous. The bacterial genera of normal microbiota *Lactobacillus* were found to have antibiotic resistance genes, which was a source of antibiotic resistance genes transfer. The use of antibiotic growth promoters in broiler chicken may serve as a source of resistance development, which may trigger and transfer antibiotic resistance genes. While in indigenous poultry to which no growth promoters were given, low expression of AR genes prevalence was determined.

**Key Words:** Antibiotic resistance, Indigenous poultry, *Lactobacillus*, *Shigella*.



## Biological Waste Management In Labs

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### Abstract

Laboratories dealing with microorganism produce laboratory waste comprising of hazardous and infectious wastes. According to the Environmental Protection agency, infectious waste is categorized into seven different categories; isolation waste, stock cultures of infectious agents/organisms, blood & blood products, pathological waste, laboratory sharps, contaminated animal carcasses & animal bedding and miscellaneous waste including wastes from hematological analyzers, chemistry analyzers, ELISA plate washers, etc. The waste is considered infectious if it contains pathogen with sufficient virulence and quantity so that exposure to the waste by a person or animal could result in an infectious disease. In major objective of the waste management is to maximize safety and minimize environmental impact. The tiers applied for safety during waste management includes; segregation, packaging, labeling, collection, collection storage and transport. While the tiers to reduce the environmental impact during waste management includes; pollution prevention, reduction of waste production, reuse, treatment, reclamation and disposal (incineration, landfill, etc). WHO has assigned different color codes for laboratory wastes for easy and quick identification of the laboratory waste. Red colored bag is for highly infectious waste, yellow colored bag is for infectious, anatomical and pathological waste, yellow colored box is for laboratory sharps, brown colored bag is for pharmaceutical waste, for radioactive waste, silver color and for general waste black color is designated. It is important that different professional involved in life-sciences laboratories must have adequate knowledge, attitudes and skills for proper waste management to avoid their impact on human health and the environment.

**Key Words:** Waste Management, Bioogical Laboratories, Biorisk Management





## Perspectives of One Health Approach Towards Global Climate Change

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### Abstract

One health- a comprehensive, multidisciplinary approach encompassing the human health, animal health and the environment has gained attention in the last few decades. However practically speaking, the diversified domains it covers need individual attention with multidisciplinary focus on each component as a separate entity. Among them, environment has the most contributing role but unfortunately often over-looked while studying human or animal health. Environmental issues have been arising around the globe at an alarming rate and culminating in the biggest challenge of the century as 15,000 people die annually due to climate change. Many people question how are One Health and climate change inter-related? The simple answer lies in the fact that we need a healthy environment to live in. The past few decades have seen its implications in the form of flash floods, extreme droughts, smog episodes, heat waves, disturbed precipitation patterns, increased spread of water-borne and vector-borne diseases and many more. These outcomes are not only affecting human or animal health but affecting the agricultural yields as well. As a result, food security is emerging as another challenge. Among the many components, one of the prime contributors towards climate change is the livestock sector which at the same time is the most vulnerable one too. My current project focuses on emissions estimates from intensive livestock farms and monitoring the animal health through various ambient parameters. Livestock farms are a significant contributor of methane, a potent greenhouse gas, but at the same time also face health issues due to environmental pollution. By adopting One Health approach we may be able to find sustainable solutions for a healthy environment since the challenges we face today can only be effectively met through an integrated, multisectoral approach.

**Key Words:** One Health, Climate Change, Environment



## Poultry Zoonotic Diseases and Concept of One Health

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### Abstract

Zoonotic diseases are characterized as diseases transmitted by natural means between humans and vertebrate animals. A list of zoonotic diseases including Avian tuberculosis, Salmonellosis, Ornithosis, Avian influenza, Cryptosporidiosis, and Campylobacteriosis that are transmitted from poultry to human beings. These diseases are mainly caused by pathogens like viruses, fungi, parasites, and bacteria and carried by free-range animals. Direct and indirect contact between humans and animals are responsible for the transmission of these pathogens. The presence of poultry zoonotic diseases is observed around the world including in developing, underdeveloped and developed countries that affect the economy of the countries and public health. In viral diseases, avian influenza outbreaks exert enormous economic losses in terms of loss of poultry and poultry products. The foodborne zoonotic diseases of bacterial origin are about 90% of all intestinal infection cases in human beings and species of *Salmonella* and *Campylobacter* bacteria are mainly involved. In poultry meat and eggs, the presence of *Salmonella* species is commonly observed @ 5.6% and 1%, respectively. These diseases produce their impact in terms of (a) damaging the safety and quality products (b) higher production cost (c) decreased production (d) lower quality products (e) compromised biosafety (f) poor hygiene (g) infections to handlers (h) low labor availability (i) shortage of safe food for human beings. These factors exert serious effects on public health along with decreased availability of animal-source protein. The efforts including training of staff, government agencies involvement, public awareness, more research and funding along with the implementation of effective policies should be adopted to control and prevent such infections.

**Key Words:** Poultry, zoonosis, one health, biosafety, economic



## Rabies: A Perfect 'One Health Model' and Its Future Prospects In Pakistan

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### Abstract

Rabies exists as two distinct epidemiological forms (i) Urban rabies, in which the domestic dog is the principal reservoir and (ii) Sylvatic rabies, where the principal reservoir can be any one of a number of wildlife species. Urban dog rabies presents the greatest risk to human health. Unfortunately Pakistan is among countries with highest cases of rabies. Under WHO program “Zero by 30” a pilot project - 'Rabies Free Karachi' started in October 2017. Mass Dog Vaccination(MDV) of at least 70% of dogs in Ibrahim Hyderi town of Karachi was carried out to produce-herd immunity against rabies. To reduce dog population the recommended strategy known as Capture, Neuter, Vaccinate and Release (CNVR) for Animal Birth Control (ABC) or Dog Population Management (DPM) through spaying/neutering was part of the campaign. Afterwards, with collaboration of “Indus Hospital Karachi” and “University of Veterinary and Animal Sciences” – pilot scale project was carried out in Lahore to train relevant human resource during July, 2018. Volunteer students of DVM degree program participated. Firstly indoor training was given by experts to understand the dog behavior, dog catching techniques, vaccination and data recording. Afterwards in-house-outdoor practical training was given to participants. Consent form was filled by each participant. Rabies vaccination status of participants was asked and only those were allowed to handle the stray dogs who were vaccinated. A survey was conducted to select the sites for stray dog vaccination and consent of local community was obtained to conduct activities in their areas. Several teams were formed, in each team duties were assigned for holding vaccine box, marking, data recording, dog catching (using control pole and dog catching net), helpers and vaccinators. Two areas were vaccinated with more than 80% coverage. Data was uploaded to GARC. This was a first pilot project in Punjab Province and laid foundation of Dog Birth Control policy 2021. Currently government is advocating 'no killing of dogs' and emphasize to adopt alternate approached like CNVR.

**Key Words:** Rabies, One Health, Control



**COVID-19 pandemic, a high speed journey. Where are we now?**

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**Abstract**

SARS-CoV-2 belongs to family Coronaviridae and subfamily Coronavirinae causing severe illness of respiratory system. The infection has been spread throughout the world and become a threat to public health at global level. Overall, 219 million confirmed cases of COVID-19 have been reported worldwide and 4.55 million deaths. In Pakistan, the first case of Covid-19 was reported on February 26, 2020 from Karachi. Afterwards, strictest SOP's were designed to follow to stop the emergence of COVID-19 in country. The first wave of COVID-19 was emerged from March-April 2020, when positive and confirmed cases were reported. The wave caught its peak in mid-June and ended in July 2020. Overall, the first wave was in low death rate and passes rapidly and cases were falling from July to onward. Then, the second wave started from October-November, was at peak in mid-December 2020. Consequently, the second wave was low in intensity due to low no. of confirmed cases as well as deaths. After that, in mid-March 2021 the third wave was declared. During third wave, highest no. of confirmed and positive cases was reported and highest death rate was recorded. The third wave was elevated than previous two waves. These COVID-19 waves left a drastic effect on economy by affecting large scale industries in Pakistan. Now a day, COVID testing is being conducting through quantitative polymerase chain reaction (qPCR). Currently, vaccine campaign is the promising strategy to control the spread of COVID-19. The vaccine status is monitored on the daily basis according to first dose administration and completed vaccine dose. By following SOP's and vaccine administration the disease is still circulating and we are in need to develop some other strategies such as public awareness against COVID by social media, extension messages, and speed up drive through vaccine campaign.

**Key words;** Covid-19, Pakistan, vaccination



## Pyrazinamide-Induced Hepatotoxicity Is Associated With Mitochondrial Injury

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### Abstract

Tuberculosis is still a major challenge for the health care system in developing countries like Pakistan. It can be treated by a number of antibiotics including pyrazinamide, isoniazid, rifampin, streptomycin, and ethambutol. Pyrazinamide reduces the time duration required for the treatment of TB. Its therapeutic effect also leaves some toxicological effects like hepatotoxicity. The study was designed to investigate the role of mitochondrial pathogenesis in pyrazinamide-induced liver injury. Human liver cancer HepG2 cell line and female Wistar rats were used for in vitro and in vivo studies. In vitro studies on HepG2 cell line showed that pyrazinamide could induce apoptosis, mitochondrial depolarization, ROS production and mitochondrial fragmentation. Mitochondrial fragmentation is associated with an imbalance in mitochondrial dynamics. Images from immunofluorescence and PCR results showed that pyrazinamide could increase mitochondrial fission and decrease the mitochondrial fusion that could lead to mitochondrial fragmentation. In vivo studies on female Wistar rats showed the apoptosis in liver tissues exposed to pyrazinamide. Rat liver tissues treated with pyrazinamide showed an increase in reactive oxygen species level i.e. MDA, GSH, Catalase, and SOD. PCR results showed an increase in mRNA expression of mitochondrial fission protein. Mitochondrial fission was associated with the release of apoptotic marker into the cytoplasm that led to the activation of caspase-3. MitoQ, a mitochondrial oxidative stress scavenger, protected the hepatocytes from pyrazinamide induced mitochondrial injury. Taken together, our results showed that mitochondrial injury was the main cause of pyrazinamide-induced hepatotoxicity. Protecting mitochondria from pathogenesis could be a main target in the alleviation of pyrazinamide-induced hepatotoxicity.

**Key Words:** Pyrazinamide, mitochondria, hepatotoxicity

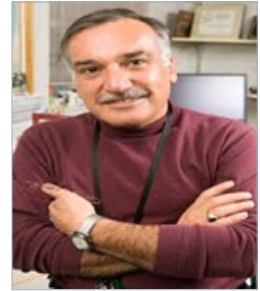




## One Health Concept and its link to Antimicrobial Resistance (AMR): The role of the profession of Veterinary Medicine

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### Abstract

One Health Concept (OHC) has been applied in several adverse health events locally and globally as well. The OHC, however, has also been abused in its application. History of the OHC and its previous label One Medicine provide evidence of their impact in public health arena and animal health as well. Currently AMR is considered a serious global health security that needs attention from all involved professions and public health decision makers as well. The profession of veterinary medicine (PVM) can play a major role in linking approaches through OHC to potential practical strategies for handling the global AMR public health crises.

**Key Words:** One Health, Veterinary Medicine, One Medicine



## Occupational risk of antimicrobial resistance to livestock farmers and farming environment, recommendations for mitigation

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### Abstract

Antimicrobial resistance (AMR) is an escalating global health concern for animals and humans. Antimicrobial use (AMU) in animal production systems has long been suspected to be a cause of the emergence and dissemination of AMR. Farm worker and animal health and productivity are crucial to national and global food security. Livestock and poultry operations represent working environment with a high risk for zoonotic pathogen exposures. People working or living on a farm, farm visitors, service providers, and veterinarians are the most at-risk for contracting pathogens including the ones with AMR. The choice of antimicrobials among veterinarians may vary depending on their experience and availability for various conditions. Although the connections between human, animal, and environmental health (One Health) are apparent in farm settings, we must understand how the farmers perceive AMU in animals and AMR among foodborne pathogens, especially in light of regulations towards restricted AMU implemented in some countries. We need to understand the AMR risks not only through food production and processing chain, but also the risks through exposures of farmers to their working environments.

**Key words:** Antimicrobial resistance, Antimicrobial use, One Health



## Identification And Molecular Characterization Of Newcastle Disease Virus Matrix Protein Gene.

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### Abstract

Newcastle disease Virus (NDV) an important member of the paramyxoviruses, is a highly infectious virus of birds that causes substantial economic losses to the poultry industry worldwide. NDV genome encodes six immunogenic proteins including Fusion, Haemagglutinin, Nucleocapsid, phosphoprotein protein, large polymerase protein and Matrix (M) protein. Out of these matrix protein is the smallest protein showing multifunctional role, including intra-cellular transport and viral assembly. Identification and Molecular characterization of NDV matrix protein gene from local NDV isolates. In the present study, trachea, liver, caecal-tonsils and proventriculus samples were collected from the NDV suspected birds from poultry farms in the vicinity of Rawalpindi and Islamabad. The Haemagglutination test and RT-PCR were employed to detect NDV in tissue homogenates of all the samples. Our results have shown that out of 72 samples, 50 samples (69%) were found positive. The sequences of the positive PCR products were analyzed and phylogenetic analyses were performed. The results revealed minor genetic variation among the sequences and major resemblance with strains of NDV found throughout the world. The genetic variations were not significant enough to cause difference in protein structure, but might be a reason for vaccine failure. Considering the important function of M protein, to constitute a bridge between nucleocapsid and virus envelop, M protein gene can be a potential candidate for DNA vaccines.

**Key Words:** Newcastle disease virus, Matrix protein, RT-PCR, Molecular characterization

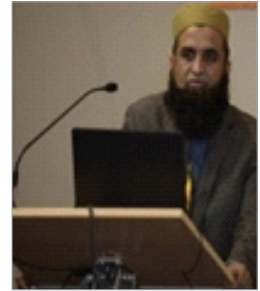


## Therapeutic Outcomes Of Tuberculosis And Its Impact On Quality Of Life Of Tb Patients In Pakistan

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### Abstract

The aim of this study is to find out gaps present in the treatment of tuberculosis in Pakistan and factors which are responsible for the failure of treatment. Total 385 patients were included in this study but at the time of screening, 10 patients were excluded because their treatment outcomes were not clear. Those 375 patients who received their treatment from 1<sup>st</sup> January 2019 to 31<sup>st</sup> January 2019 were followed retrospectively until their treatments were completed. A p-value <0.05 was considered significant during this study. The mean age of the patients was  $36.03 \pm 15.398$  years. Out of these 375 patients, 308 (82.1%) were successfully treated, 44 (11.8%) were failed to be cured after the completion of 5<sup>th</sup> month of treatment, 18 (4.8%) left their treatment incomplete and they remained absent for more than 60 days and 5 (1.3%) were died of tuberculosis. Out of 375 patients, 192 (51.2%) were males and 183 (48.8%) were females. Most patients were from the age group of 21-40 years i.e. 140 (37.3%) and weight group of 50-59kg i.e. 126 (33.6%). People should be educated about tuberculosis, financial support should be provided to the poor patients so that they can make their diet good, smokers should be guided to quit smoking, healthcare professional supervised treatment should be provided to avoid adherence issues and Xpert RIF/MTB assay should be done for every patient for diagnosis instead of smear test because the former is accurate and informs any resistance present.

**Key Words:** Tuberculosis, Therapeutic outcomes of tuberculosis, Tuberculosis in Pakistan, Treatment outcomes of tuberculosis, Tuberculosis in Pakistan



## Effect Of Prebiotic And Selenium-Nanoparticles Alone Or In Combination On Ameliorating Higher Stocking Density Stress On Absolute And Relative Organ Weights, And Meat Quality In Broiler Chickens

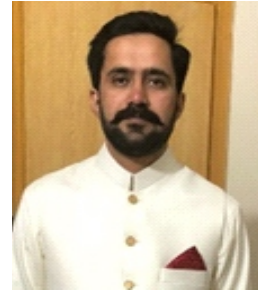
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### Abstract

Broiler chicken welfare is under increasing scrutiny due to welfare concerns regarding growth rate and stocking density. Current study was carried out to investigate the effect of mannan-oligosaccharide (MOS) and selenium-nanoparticle (SeNP) alone or in combination in broiler reared under higher stocking density (HSD) on absolute and relative visceral organ weights and certain meat quality parameters. The 392 day-old chicks Ross-308 were randomly divided in seven groups with eight replicates ( $n=7$ ) as NSD (basal diet (B-D)+ normal stocking density: 10 bird/m<sup>2</sup>), HSD (basal diet+ higher stocking density: 16bird/m<sup>2</sup>), Se-HSD (B-D + Se-0.15mg/kg), MOS-HSD (B-D + MOS-05gm/kg), Se-MOS-HSD (B-D + Se-0.15 mg/kg + 05gm/kg of MOS), SeNP-HSD (B-D + SeNP 0.15mg/kg) and SeNP-MOS-HSD (B-D + 0.15 SeNP + 05gm/kg of MOS). Each group consisted of eight replicates ( $n=7$ ). On 21<sup>st</sup> and 42<sup>nd</sup> day, two birds from each replicate were slaughtered for measuring absolute and relative organ weights and sampled breast muscle for pH at 0-hour (0-H) and 24-hours (24-H) post slaughter and drip loss percentage. At 21<sup>st</sup> day, absolute weights of liver, small intestine (filled and empty), large intestine (filled and empty) and absolute length of small intestine were lowest ( $p < 0.05$ ) in HSD group and highest ( $p < 0.05$ ) in NSD group, whereas for Se-MOS-HSD and SeNP-MOS-HSD it was comparable with NSD group. At 42<sup>nd</sup> day, absolute weights of liver, Bursa of Fabricius, spleen and small intestine (empty) were lowest ( $P < 0.05$ ) in HSD group. Liver weight was highest ( $p < 0.05$ ) in SeNP-HSD group; Bursa of Fabricius weight was highest ( $p < 0.05$ ) in SeNP-MOS+HSD group. Spleen weight was highest ( $p < 0.05$ ) in Se-MOS-HSD, SeNP-HSD, SeNP-MOS-HSD and NSD-control group. While relative organ weight, at both 21st day and 42nd day, did not vary significantly ( $P > 0.05$ ) for all investigated visceral organs amongst experimental groups. At 21<sup>st</sup> day, there was no significantly difference ( $P < 0.05$ ) in pH-0H, pH-24H and water holding capacity of breast meat. At 42<sup>nd</sup> day pH-i was lower ( $P < 0.05$ ) in all HSD groups than NSD group, while pH-u was lower ( $P < 0.05$ ) in HSD group than NSD group and it was comparable in all HSD-supplemented groups with NSD-control group. Water holding capacity was highest with low drip loss % ( $P < 0.05$ ) in NSD and SeNP-MOS+HSD groups, lowest ( $P < 0.05$ ) in HSD and MOS-HSD. Based on results, we concluded that higher stocking density is a stressful situation for bird which can negatively influence absolute organ weight and meat quality. Supplementations of Se-MOS and SeNP-MOS in higher stocking density partially mitigated HSD effects in aforementioned parameters. In current experimental condition SeNP-MOS performed better than all other supplementations.

**Key Words:** meat pH, MOS, Stocking Density, Selenium





## Role of Veterinarians in preventing zoonotic diseases

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### Abstract

Domestic and wildlife animals act as a reservoir for different pathogens of zoonotic diseases. The control of zoonotic diseases involves much more role of risk mitigation strategies along with therapeutic measures. However, veterinarians have no direct role in the human health system. The zoonotic potential of pathogens including MRSA, vaccinia virus, dermatophytes, *Escherichia coli* O157:H7 *Mycobacterium* and *Campylobacter* is increasing. Veterinarians are usually in a better position to identify situation-specific risk factors from animals. Globalization of the world has led to an increase in the transport of livestock. The inadequate screening of the animals' export has increased the incidence of communicable diseases. The increased deforestation destroys the habitat of the wildlife animals including bats which has pushed the animals to be in closer contact with humans. A person's ability of pet ownership or raising farm animals should be based on the quantification of the risk factors involved. An immunocompromised person is more likely to contract the disease. Therefore, veterinarians should be involved in the decisions making related to international trade, ecotourism, food safety, risk assessment, pet ownership and disease diagnosis. As zoonotic diseases affect both humans and animals, veterinarians and physicians should work in harmony. The contribution from both veterinarians and physicians can help to control zoonotic diseases effectively.

**Key words:** Zoonotic Diseases, Veterinarian, One Health



## Zoonotic diseases of poultry and their impact to human health

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Currently several factors and problems are influence the poultry production worldwide. These include strong global competition, continuous changes of consumer perceptions with regard to food safety, animal welfare and environmental protection. Poultry shares a number of infectious diseases with humans, and most of the zoonotic diseases in poultry have additional reservoirs in other mammals than humans which complicating their control.

Three groups of zoonoses that humans can acquire from poultry:

The **first group** includes **food borne diseases**, mainly caused by *Salmonella* serovars and *Campylobacter spp.*, which are the most common causes of human food borne bacterial diseases linked to poultry. In addition, the development of antibiotic resistant bacteria will also be a continuous public health hazard

**The second group** comprises diseases that are **transmitted by direct contact** between birds and humans. Such as Avian Influenza, Newcastle Disease. Chlamydiosis. Furthermore, Erysipelas has an exceptional position and it mainly infects people working in slaughter houses via skin injuries. Furthermore, Avian tuberculosis transmission from poultry to humans seems to be very rare.

**The third group** comprises diseases **transmitted by insects**, especially ticks from mammals and birds, including poultry, to humans such as West Nile Virus and Eastern and Western Equine Encephalitis. In the future, the global cooperation and trade will force the governments in several countries to harmonize the existing different legislations related to trade, animal disease control, animal nutrition as well as the licensing of drugs and vaccines for veterinary use.

Finally, the consumer expectations for high standards quality and safety of poultry products will strongly influence the production methods. This means that farmers, veterinarians, stockholders and all other partners involved in the production chain will have to share more responsibilities and that cooperation should be intensified.



### Seroprevalence and zoonotic potential of *Toxoplasma gondii* in Camels in Cholistan desert area of Bahawalpur, Pakistan.

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#### Abstract

*Toxoplasma gondii* infection is widespread in humans and other animals around the world and is of zoonotic importance. People who work closely with animals are at greater risk of contracting *Toxoplasma gondii* infection. Present study was accomplished to determine the seroprevalence of *Toxoplasma gondii* in camels and its risk of transmission to humans in Cholistan desert area of Bahawalpur, Pakistan. Serum samples from camels (n=226) and humans (n=113 camel owners and n=113 people having no contact with camels) were collected and analyzed for anti-toxoplasma antibodies by using Latex Agglutination Test (LAT). Overall 9.73% camels were seropositive for anti-toxoplasma antibodies. In the month of April camels had the high prevalence of 11.5% (9 out of 78). The highest prevalence (12%) was detected in camels in the 11 year or above age group. The prevalence of *Toxoplasma gondii* was high in the third trimester of pregnancy (27.2%). Overall 27(12%) humans were seropositive for anti-toxoplasma antibodies. The highest seropositivity was observed in camel owners (15.92%) and the lowest seropositivity (7.96%) was observed in the people having no contact with camels. It was concluded that *Toxoplasma gondii* is prevalent in camels of Cholistan desert area Bahawalpur and it has risk of transmission to their owners.



## Tuberculosis Diagnosis: Current Practices in Pakistan

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### Abstract

Tuberculosis (TB) is globally the second most common cause of death from infectious diseases, killing almost 2 million people annually. TB is highly epidemic in Pakistan. Pakistan, with an estimated 510,000 new TB cases emerging each year and approximately 15000 developing drug resistant TB cases every year, is ranked fifth among B high-burden countries worldwide and it accounts for 61% of the TB burden in the WHO Eastern Mediterranean Region. The country is also estimated to have the fourth highest prevalence of multidrug-resistant TB (MDR-TB) globally. Key reasons for emergence of drug resistance form of TB include: delays in diagnosis, unsupervised, inappropriate and inadequate drug regimens, poor follow-up and lack of a social support programme for high-risk populations. Early and effective treatment is crucial to prevent the emergence of drug-resistance strains. This demands the availability of fast and reliable point-of-care (POC) diagnostic methods for effective case management. Commonly used methods to screen and diagnose TB are clinical, immunological, microscopy, radiography, and bacterial culture. In addition, recent advances in molecular diagnostic methods including MTBDRplus, loop-mediated isothermal amplification (LAMP), line probe assay (LPA), GeneXpert, and whole genome sequencing (WGS) have been employed to diagnose and characterize TB. These methods can simultaneously identify *Mycobacterium tuberculosis* (MTB) and mutation(s) associated with routinely used anti-TB drugs. The National TB Control Programme, under Ministry of National Health Services, Regulation and Coordination is primarily responsible for collaboration for development of uniform policies and strategies, facilitating the donor liaison at national and international levels, and Global Fund grant management. Along with the public sector, private sector and civil society and community-based organization, are playing a vital role in case detection and management of TB, in the country.



4<sup>th</sup> WPSA INTERNATIONAL (VIRTUAL)  
**ONE HEALTH CONFERENCE**  
9 - 10 SEPTEMBER, 2021  
**PROCEEDINGS**





## DAY 1 (09 September, 2021)

The two days 4<sup>th</sup> WPSA International (Virtual) One Health Conference started off as a success and emblem of mutual efforts of World Poultry Science Association (WPSA), Pakistan Veterinary Medical Council and University of Veterinary & Animal Sciences, Lahore. The event involved international and national renowned scientists, researchers, faculty members and experts from different fields of one health and mandate of this conference was to set up new industrial and scientific linking, to discuss challenges in the area of one health, AMR, Alternative to antibiotic, biosecurity and biosafety and food security and consumer education to reinforce your group effort for coming new developments in the field of one health.

The training formally starts with the welcome address of **Prof. Dr. Nasim Ahmad SI** (Vice Chancellor, UVAS) in which he enlightened the concept of one health and its significance in recent years. He also spoke about one health which is a collaborative, multispectral, and trans disciplinary approach which working at the local, regional, national, and global level with the aim of achieving precise health outcomes that granting the interconnection between people, animals, plants, and their shared environment. He also acknowledges the role of World Poultry Science Association, PVMC and organizing team for organizing this wonderful event for the professional betterment and capacity building of sector's stakeholders.

After the welcome address, opening address was delivered by **Mian J. M. Javaid Rathore** President WPSA – Pakistan Chapter in which he talked about the role of WPSA in uplifting of sectors potential and the challenges in the light of diseases in animals, AMR in human, environmental challenges and availability policies issues.

**Dr. Roel Mulder** Secretary General WPSA (Global) – Netherland appreciates Pakistan branch of WPSA for organizing this event in tough times of COVID-19 and shared his thoughts on one health which involves co-operation and communication covering all aspects of human, animal and environmental health care. He also talked about poultry health, anti-microbial resistance, zoonosis, their prevention and their control through effective and sustainable strategies.

**Prof. Dr. Masood Rabbani** (Pro-VC, UVAS Lahore / President PVMC/ Hon. Sec. SPCA, Punjab) Chairperson of the Conference shared his view on one health approach to designing and implementing programmes, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes. He delivered introductory lecture on conference theme and mandate and talked about different technical sessions of conference presenting in next two days.

**Dr. Hanif Nazir Chaudhry** Chairperson of the Scientific Committee/Senior Vice President WPSA-Pakistan welcomed all the participants and acknowledges UVAS for hosting this event and briefed the participants about the role of WPSA in assisting farmers, academia, research for combatting challenges in poultry sector and shared success stories from different countries in the poultry industry and how we can excel our potential by adopting their models for the betterment of farmers and sector.

**Dr. Jamil Ahmad Ansari** (Chief Field Epidemiology and Disease Surveillance Division - NIH Islamabad) delivered a comprehensive lecture on learnt lessons during implanting one health approach in Pakistan. He highlighted the role of epidemiology and disease surveillance for getting true picture of diseases for devising eradication and control plans in the light of true surveillance data.



## 1<sup>st</sup> Session - (Zoonosis & Virology & Bacteriology)

The first technical session was chaired by Prof. Dr. Muhammad Akram Muneer (RCVets-Pakistan) and moderated by Dr. Muhammad Kashif Saleemi (Associate Professor UAF-Pakistan). The first talk was delivered by Miss. Fariha Altaf (UVAS) on the behalf of Prof. Dr. Tahir Yaqub (UVAS) on the subject of COVID-19 in Pakistan. She talked about pathogen introduction, disease transmission pattern and shared recent stats of COVID-19 cases, deaths, recoveries and vaccination in Pakistan.

Dr. Nadia Mukhtar (UVAS, Lahore) presented a very interesting topic of public health entitled Tuberculosis Diagnosis: Current Practices in Pakistan. In her presentation she talked about high epidemic status of Tuberculosis in Pakistan and presented disease reporting data from passing years with different diagnostic facilities available in the country. After it Dr. Tariq Navid (NUMS, Islamabad) delivered talk on prespectives of emerging zoonoses –challenges and opportunities in which he talked about increased threat of zoonoses due to close interaction between animals and humans in the recent times. He also talked about human, animal and environmental contributing factors in order to increase the threat of vector-borne and food-borne illnesses globally. Dr. Muhammad Hassan Mushtaq (UVAS, Lahore) talked on Rabies: A Perfect One Health Model and its future prospects in Pakistan and shared latest data about rabies cases and different control strategies including capture, neuter, vaccination and release for animal birth control and dog population management. He also acknowledges the role of Indus Hospital Karachi for their collaboration with UVAS for training and capacity building of UVAS volunteer team on rabies control in Pakistan.

Dr. Adnan Ashraf , UVAS, Lahore presentation topic was Role of Veterinarians in Preventing Zoonotic Diseases in which he explains the important role of veterinarian on devising risk mitigation strategies along with therapeutic measures for the control of zoonotic diseases. He also talked about common zoonotic infections and their possible risk factors and their control measures in working practices. After it Miss Aleena Kokab (UVAS, Lahore) presented In vitro Biological Control of Avian Pathogenic *Escherichia coli* in which she talked about comprehensively about the use of bacteriophages and their potential to combat different poultry infections especially *Escherichia coli* as alternative source of antimicrobial drugs with their possible advantages over therapeutic drugs.

In the last a Q/A session was arranged to address the questions of participants from the topics of this session before end of the session.

## 2<sup>nd</sup> Session - Poultry Health & Welfare

Second session was resumed after lunch break and chaired by Dr. Hanif Nazir Chaudhry (Senior Vice President WPSA-Pakistan) and moderated by Dr. Muhammad Saeed Imran (UVAS, Lahore). The first presenter was Dr. Muhammad Kashif Saleemi (UAF) and his topic was Mycotoxins: An Important Public Health Issue in which he explained about different genera of filamentous fungi, *Penicillium*, *Aspergillus*, *Fusarium*, *Alternaria* and *Claviceps* that contaminate essential food items under favourable conditions all around the globe and how their toxins caused serious infections in humans and animals. Dr. Aayesha Riaz (PMAS-UAAR) presented Identification and Molecular Characterization of Newcastle Disease virus Matrix Protein Gene and explains NDV genome 's six immunogenic proteins including Fusion, Haemagglutinin, Nucleocapsid, Phospho protein, large polymerase protein and Matrix (M) protein and their role in disease development in poultry and their significance for disease diagnostics and confirmation.



Dr. Saima Ashraf (UVAS, Lahore) talk was on Influence of Chicory Root Powder And Zinc Sulfate On Growth Performance, Meat Quality And Histo-Morphology of Muscles And Bones In Broilers in which she explained role of zinc sulfate ( $ZnSO_4$ ) supplementation on performance, organ development, tibial anatomy, meat quality parameters including pH and water holding capacity and histomorphology of muscles in broilers. Dr. Saima Masood (UVAS, Lahore) presented Effects of Copper Nanoparticles Supplementation on Growth Performance And Intestinal Morphology In Broilers Reared Under Cyclic Cold Stress and briefed about ameliorative effects of Cu-NPs supplementation on growth efficacy, weight gain and intestinal morphology in broilers raised under cyclic cold stress conditions. After it, Miss Fariha Altaf (UVAS, Lahore) talked on In Ovo Antiviral Effect of Flower Extracts Against Newcastle Disease Virus and Avian Influenza Virus and shared her study results of different medicinal plants extract as therapeutic remedy in control of NDV and AI which are the causative agents of very important poultry viral diseases.

Dr. Muhammad Imran (UAF) presentation topic was Impact of Toxic Effects of Mycotoxins on Animal and Human Health- A Global Concern and he highlighted the role of mycotoxins potential in causing teratogenic, mutagenic, carcinogenic, immunosuppressive, and endocrine-disrupting effects both in animals and humans. The last presenter of second session was Dr. Farhan Farooq (PMAS-UAAR) and his topic was Bacteriological Study of Broiler Breeder Hens During Early, Mid And Late Production Period With Artificial Insemination and he talked about impact of female body weight category with and without artificial insemination on reproductive performance, hatchability traits and subsequent progeny performance of broiler breeder.

In the last a Q/A session was arranged to address the questions of participants from the topics of this session before end of the session.

### 3<sup>rd</sup> Session - Antimicrobial Resistance (AMR)

Third session resumed after tea break chaired by Dr. Khalid Naeem Khawaja (One Health Consultant, Fleming Fund Project-Pakistan) and moderated by Dr. Muhammad Farooq Tahir (Fleming Fund, Pakistan). The first presenter of this session was Dr Mo Salman (Colorado State University, USA) and his topic was One Health Concept And Its Link To Antimicrobial Resistance (AMR): The Role of The Profession of Veterinary Medicine in which he talked about history of the One Health Concept (OHC) and its previous label one medicine provide evidence of their impact in public health arena and animal health as well. He highlighted the importance of profession of veterinary medicine (PVM) how it can play a major role in linking approaches through OHC to potential practical strategies for handling the global AMR public health crises. The second presentation was delivered by Dr Sam Orubu (Boston University, USA) and his topic was Antibiotic Footprint Analysis; A Proposed Framework For Pakistan in which he provided details about antibiotic resistance and how it impacts globally and what action or policies Pakistan should follow to combat this challenge.

Maarten Van Dongen (AMR Insights Network, Netherlands) topic was Global Initiatives for Curtailing AMR and he briefed the participants about AMR concept and global efforts, challenges and how these challenges can be overcome by interlinking all three elements of one health. The last topic for this session was delivered by Dr Sangeeta Rao (Colorado State University, USA) and her topic was Occupational Risk of Antimicrobial Resistance to Livestock Farmers and Farming Environment, Recommendations for Mitigation in which she educate the audience about connections between human, animal, and environmental health (One Health) are apparent in farm settings and we must understand how the farmers perceive AMU in animals and AMR among foodborne pathogens, especially in light of regulations towards restricted AMU implemented in some countries.

In the last a Q/A session was arranged to address the questions of participants from the topics of this session before end of the session.



**DAY 2 (10 September, 2021)****4<sup>th</sup> Session - Biosafety & Biosecurity & Human and One Health**

Day 2 started with a full swing and 4<sup>th</sup> session of conference was chaired by Dr. Asim Mahmood Khan (Forward Solutions, Animal Health Company/ Conference Chief Organizer /President WPSA-North zone) and moderator of this session was Dr. Farhan Farooq (KK Chicks and Feeds, Rawalpindi/ General Secretary WPSA-North zone). First presenter was Dr. Ali Ahmad Sheikh (UVAS, Lahore) and his topic was Biological Waste Management. He talked about biological waste management concept, biosafety practices and safety tiers during waste management includes; segregation, packaging, labeling, collection, collection storage and transport. After this second lecture was delivered by Fu Choong Keat (Aviagen Inc., Huntsville, AL, USA/ Gene Reach Biotechnology Corp. Taichung City, Taiwan) on topic of How to use antibiotics smartly with on-site PCR- A Case Study. He shared results of two case studies which showed how to use antibiotics smartly with on-site PCR and concludes about PCR detection system efficiency to check the presence of *M. gallisepticum* and *M. synoviae* on DOCs and suggests treatment efficiency is a good strategy for next-generation Mycoplasmosis control. Next presenter was also delivered by Fu Choong Keat (Aviagen Inc., Huntsville, AL, USA/ Gene Reach Biotechnology Corp. Taichung City, Taiwan) and this time he talked on Post Cleaning and Disinfection Monitoring by using Real-Time PCR Test in Poultry House. In this presentation he discussed on-site PCR analyzer is suitable to facilitate C&D evaluation with proper training to the farm technician not only bacteria/mycoplasma but also other viruses can be monitored by PCR analyzer to strengthen the biosecurity practice in the farm.

Fourth presentation topic was Decentralization of SARS-CoV-2 testing and presented by Frank Chung (Associate Marketing Director, Gene Reach Biotechnology Corporation, Taiwan) and presenter discussed about the concept of decentralized SARS-CoV-2 PCR testing which can benefits the application of fast on-site boarder control, quarantine which will reduce the time for diagnosis and the risk of sample transportation. Next presentation topic was Zoonotic Diseases of Poultry and their Impact to Human Health delivered by Prof. Dr. Hafez Mohamed Hafez (Freie University, Berlin, Germany) and he spoke about three groups of zoonoses that humans can acquire from poultry and concluding that farmers, veterinarians, stockholders and all other partners involved in the production chain will have to share more responsibilities and that cooperation should be intensified. Before lunch last presentation was delivered by Muhammad Hasnat (UVAS, Lahore) and his talk was on Pyrazinamide-Induced Hepatotoxicity Is Associated with Mitochondrial Injury in which he discussed role of mitochondrial pathogenesis in pyrazinamide-induced liver injury and . protecting mitochondria from pathogenesis could be a main target in the alleviation of pyrazinamide-induced hepatotoxicity.

In the last a Q/A session was arranged to address the questions of participants from the topics of this session before session closure.





## 5<sup>th</sup> Session - International Trends & Environmental Factors Contributing to One Health

This session was chaired by Eng. Tariq Nazir Chaudhry (Director NB Sons) and moderated by Dr. Zahra Zaman (Sec. Gen. WPSA- Woman Wing, Pakistan). The first topic was Global Climate Change and One Health delivered by Dr. Fariha Arooj (UVAS, Lahore). She discussed that environment has the most contributing role but unfortunately often over-looked while studying human or animal health. As a result, food security is emerging as another challenge and among the many components, one of the prime contributors towards climate change is the livestock sector which at the same time is the most vulnerable one too. She suggested that by adopting one health approach we may be able to find sustainable solutions for a healthy environment since the challenges we face today can only be effectively met through an integrated, multisectoral approach.

After it the next presenter was Muhammad Khurram Waqas, (UVAS, Lahore) his talk was on Therapeutic Outcomes of Tuberculosis and Its Impact on Quality of Life of TB Patients in Pakistan. He discussed in detail on the gaps present in the treatment of tuberculosis in Pakistan and factors which are responsible for the failure of treatment. He suggested that people should be educated about tuberculosis, financial support should be provided to the poor patients so that they can make their diet good, smokers should be guided to quit smoking, healthcare professional supervised treatment should be provided to avoid adherence issues and Xpert RIF/MTB assay should be done for every patient for diagnosis instead of smear test because the former is accurate and informs any resistance present.

In the last a Q/A session was arranged to address the questions of participants from the topics of this session before end of the session.

## 6<sup>th</sup> Session – Concluding Remarks

Before breaking off, a closing ceremony was held. The conference was ended by remarks and experiences shared by the different participants about this multidisciplinary event. On the behalf of organizing team **Dr. Hanif Nazir Chaudhry** (Senior Vice President WPSA-Pakistan) paid his vote of thanks to invaluable support of World Poultry Science Association (WPSA) and University of Veterinary and Animal Sciences (UVAS), Lahore for arranging such a great event and showed his full support and encouragement to UVAS for organizing such events in the future time.





4<sup>th</sup> WPSA INTERNATIONAL (VIRTUAL)  
**ONE HEALTH CONFERENCE**  
9 - 10 SEPTEMBER, 2021



Group Photo with Vice Chancellor at Inaugural Ceremony



Participants



Prof. Dr. Nasim Ahmad SI, Prof. Dr. Masood Rabbani



**Editors of the Abstract Book**

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World's Poultry Science Association-Pakistan Branch &  
Pakistan Veterinary Medical Council (PVMC)**

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