



Poultry Science Conference

(PSC@IPEX2019)



Organized by:
Pakistan Poultry Association &
University of Veterinary & Animal Sciences,
Lahore-Pakistan

[ABSTRACT BOOK]

www.uvas.edu.pk

MESSAGE OF PROF. DR. TALAT NASEER PASHA

VICE CHANCELLOR



I warmly welcome all participants to the Poultry Science Conference (PSC@IPEX2019) on behalf of University of Veterinary and Animal Sciences (UVAS), Lahore, and the organizer of the Conference at the occasion of International Poultry Expo – 2019 during September 13 – 15, 2019 at Expo Center, Lahore. Commercial poultry in Pakistan was established in 1962. Poultry sector is one of the most vibrant segments of the livestock industry in Pakistan. The sector provides employment (direct/indirect) to over 1.5 million people. The current investment in Poultry Industry is Rs. 750.0 billions. Pakistan has become the 11th largest poultry producer in the world with the production of 1560 millions day old broilers annually. Poultry industry of Pakistan is making

tremendous contribution in bridging the gap between supply and demand of healthy animal protein of high biological value. Poultry today is not only a balancing force to keep a check on the prices of mutton and beef, but also serving as backbone of Agriculture. Keeping in view the importance of poultry industry, UVAS in collaboration with Pakistan Poultry Association (PPA) is organizing Poultry Science Conference. Main Themes of the conference for this year are Poultry Health; Farm Management & Nutrition and Processing, Value Addition & Food Safety. By this conference UVAS and PPA are providing a platform to bring together Academia, Researchers Poultry farmers, Poultry professionals and Industrialists. With this platform, academia and researchers will be able to share their relevant research work and learn from poultry farmers their 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 poultry sector. 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. Talat Naseer Pasha

Vice Chancellor

University of Veterinary and Animal Sciences, Lahore

MESSAGE OF DR. HANIF NAZIR CHAUDHRY

CONVENER



On behalf of Pakistan Poultry Association, I welcome all distinguished guests, researchers, key note speakers, oral presenter, farmers, students all other participants in Poultry Science Conference (PSC@IPEX2019). The conference is organized at the occasion of International Poultry Expo – 2019 with the aim to bridge academia and poultry industry and promote indigenous research. Pakistan poultry industry has a tremendous potential and is growing at exponential rate. New technologies are continuously being added to make it more profitable. The purpose of this conference is also to aware our young researchers and students about such advancement in the sector. This is also providing a platform to the students to interact with industry people who have setup their stalls in exhibition.

Bringing all poultry sectors together in one conference benefits all industry partners. The nature of the industry is changing at a fast pace and the impacts of the marketplace and government policy have become more supportive. As we continue this format and relationship, we look to strengthen our shared vision and goals to strengthen the industry as a whole.

Recognizing the need for the poultry industry to come together and represent our broad industry community, the Poultry Science Conference aims to benefit from increased exposure and attendance growth by hosting each commodity along with a unique trade show, education sessions, and an industry gala.

On behalf of the Conference team with special mention to VC UVAS, Chairman PPA, Chief organizer IPEX 2019 and members of the organizing committee I would like to thank all the sponsors, exhibitors, speakers and most of all the delegates that are here to attend the Conference.

Dr. Hanif Nazir Chaudhry

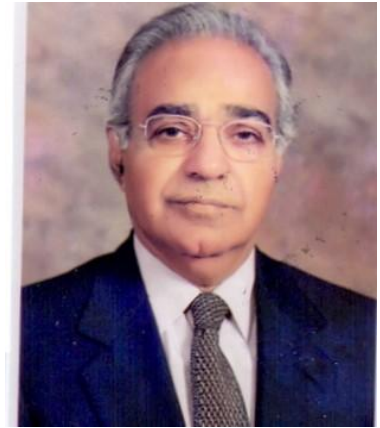
Convener

MESSAGE OF MR. KHALIL A. SATTAR

Chairman PPA

On behalf of Pakistan Poultry Association (PPA), I feel pleasure to welcome the participants of Poultry Science Conference and International Poultry Expo 2019. Indeed, PPA has always been extending full support to the Industry in past. This year also PPA has joined hands with University of Veterinary and Animal Sciences (UVAS) Lahore to provide a common platform for the students, academicians, researchers, poultry farmers, entrepreneurs; and businessmen engaged with Poultry Industry.

I hope this Conference and Expo together 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 Poultry Industry in days to come.



Dr. Khalil A. Sattar
Chairman, PPA

MESSAGE OF MR. GHULAM KHALIQ

Vice Chairman PPA (Southern Zone)

Being vice chairman (Southern zone) PPA, I feel honored to welcome the farmers, businessmen, students and researchers not only from Pakistan but also from abroad in PSC @ipex 2019. Pakistan poultry association (PPA) is continuously working on tackling the challenges faced by the industry and farmers with the help of local and international researchers. PSC @ipex 2019 is being arranged with the same objective. During this event, national and international manufacturers will also exhibit technologies for use in poultry industry. I hope this conference and exhibition will benefit all the components and allied sectors of poultry industry.



Ghulam Khaliq

Vice Chairman PPA (Southern Zone)

MESSAGE OF CH. MUHAMMAD NUSRAT TAHIR

Vice Chairman (Northern Zone)

Pakistan Poultry industry is providing the nation with two of the most economical protein sources like meat and eggs. These food items not only supply high quality and easily digestible protein rather serves as a source of all basic minerals, vitamins and amino acids. Provision of meat and eggs at the lowest possible price, keeping the quality in check, and maintaining a constant supply keeping in view the increase in population is among the major challenges for poultry farmers. These challenges along with continuous disease attacks and market fluctuations pose serious threats to profit margin and wellbeing of poultry farmers. Despite all these challenges, poultry industry managed to grow at the rate of 10-12% per annum with 700 billion turnovers per year. Scientists working in Research and Development



(R&D) of poultry industry always lead from the front to deal with challenges faced by the poultry industry. I am overwhelmed by the efforts of Pakistan Poultry Association and University of Veterinary and Animal Sciences, Lahore in organizing Poultry Science Conference (PSC@IPEX-2019). This conference will not only provide a platform for the development of academia-industry linkages but also help scientists to outsource their research findings to poultry farmers. The quality of research abstracts and response of scientists in this conference is very encouraging and I hope in the upcoming years, this conference will be the hub of scientific activities in South Asia. I am thankful to the organizer of organizing such a dynamic conference covering all the aspects of poultry production. I am also thankful to all the scientists who share with us their research findings and helps us to improve the efficiency of poultry production.

Ch. Muhammad Nusrat Tahir

Vice Chairman PPA (Northern Zone)

MESSAGE OF MR. KHALID SALEEM MALIK

Chief Organizer, IPEX-2019

Organizing the 21st International Poultry Expo under the auspices of Pakistan Poultry Association is really an honor for me. An event of this magnitude, started in 1998, involves a great deal of foresight, planning and conscientious efforts, and all former Chief Organizers have collectively brought IPEX to new heights.

I have been lucky for getting dedicated team members, who have committed themselves to the success of expo with their tireless efforts over the past several months. This exposition will be helpful and beneficial for all areas of poultry sector.

The Event also provides a forum to resolve issues relating provincial and federal governments. Since 1998, a number of dignitaries and federal ministers from the government of Pakistan and a number of ministers from the government of Punjab have graced the occasion with their presence. These dignitaries are always very kind to resolve the issues being faced by Pakistan Poultry industry. We are confident that with present government's support, our poultry sector will be able to resolve the other constraints hampering the growth of poultry sector.

Our main objectives include:

- ✚ To overcome the problem of stunted Growth and malnutrition by providing Chicken meat and Eggs to masses.
- ✚ Creating awareness among the Farmers & Veterinarians.
- ✚ Sharing recent development in different areas of poultry production in the world.
- ✚ Educating consumers & answering all their unasked questions.
- ✚ Developing closer interaction among different sectors of poultry industry.
- ✚ Creating awareness among the potential investors in poultry business.
- ✚ Developing trade relations with the outside world by providing them a platform.
- ✚ Finally, increasing per capita consumption of Chicken and Eggs.

I believe that the collective wisdom and unity is the key to resolve any issue in our lives. Participation of our members with such enthusiasm is really admiring, making this event possible. The farmers; veterinarians and rest of the poultry sector should be the best judges of how far we have gone in organizing this mega event.

I express my heartiest gratitude to the international participants, mainly Mr. Wouter Plomp (The honorable Ambassador from Kingdom of Netherlands to Pakistan) and all participants from around the world. I pray for the success of IPEX Pakistan. I would like to thank you to the devoted volunteers of Poultry Sector, who contributed their valuable time to make this event a great success.

Khalid Saleem Malik

Chief Organizer, IPEX 2019



ORGANIZING COMMITTEE OF THE CONFERENCE

Poultry Science Conference (PSC@IPEX2019)



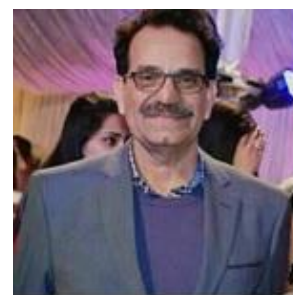
Meritorious Prof. Dr. Talat Naseer Pasha
(Patron In chief)



Prof. Dr. Masood Rabbani
(Patron)



Prof. Dr. Aftab Ahmad Anjum
(Convener)



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(Member)



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SCIENTIFIC PROGRAM (2019)

Day – 1: 13th September, 2019

1st Session of PSC@IPEX-2019

INFORMAL SESSION

9:45 – 9:47 am	Welcome and Recitation of Holy Quran	Dr. Ali Ahmad Sheikh
9:48 – 9:51 am	Introduction of Poultry Science Conference	Meritorious Prof. Dr. Talat Naseer Pasha , Worthy Vice Chancellor, UVAS
9:51 – 9:54 am	Remarks on Poultry Health (Theme – I of the Conference)	Dr. Mustafa Kamal
9:55 – 9:57 am	General guidelines about the conference	Dr. Hanif Nazir Ch

FORMAL SESSION

9:58 – 9:59 am	Formal Opening of the Poultry Science Conference	Khalid Saleem Malik , Chief Organizer, IPEX-2019
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Theme: Poultry Health

Moderator: Dr. Kashif Saleemi

Time	Topic	Presenter
10:00 am to 10:20 am	Improving Vaccines and Diagnostics for Avian Influenza Viruses affecting Poultry	Key Note Speaker: Dr. Munir Iqbal Head of Avian Influenza Group and Visiting Professor, Royal Veterinary College London The Pirbright Institute, Ash Road, Pirbright, Woking, GU24 0NF, UK
10:21 am to 10:31 am	A Highly Virulent Newcastle Disease Virus Strain Reported From An Outbreak in District Okara, Pakistan	Muhammad Saqlain Lecturer, Government College University, Faisalabad
10:32 am to 10:42 am	Prevalence and Co-Existence of Colistin Resistant and ESBL Producing <i>Escherichia coli</i> Isolated from Poultry From Pakistan	Sana Ilyas PhD (Scholar), Government College University, Faisalabad

10:43 am to 10:53 am	Biologic, Genotypic and Pathotypical Characterization of Newcastle Disease Viruses Isolated From Duck and Pigeon	Aziz Ul Rehman PhD (Scholar), Department of Microbiology, University of Veterinary and Animal Sciences, Lahore
10:54 am to 11:04 am	Evaluation of Avian Beta Defensin and Polyphosphazene as Adjuvants for Efficient <i>In-Ovo</i> Vaccination Against Fowl <i>Adenovirus</i> 8b in Chickens	Muhammad Suleman Research Officer, Western College of Veterinary Medicine, University of Saskatchewan, Saskatoon, SK, Canada
11:04 am to 11:14 am	Isolation and <i>in vitro</i> Characterization of Anti- <i>Salmonella</i> Enteritidis Probiotic Potential of Indigenous Lactobacilli from Poultry	Nadeem Murtaza PhD (Scholar), Department of Microbiology, UVAS, Lahore
11:15 am to 11:25 am	Molecular Epidemiology of Infectious Bronchitis and its Variant Types in Commercial Poultry: One year study	Ahad Fayyaz Research Associate/ PhD Fellow Department of Pathology, Faculty of Veterinary Science, University of Agriculture., Faisalabad
11:26 am to 11:36 am	Isolation, Identification, and Propagation of Fowl Adeno Virus Along with Genetic Sequencing	Iqra Zaheer Teaching Assistant, PhD (Scholar) Department of Pathology, University of Agriculture, Faisalabad
11:37 am to 11:47 am	Seroprevalence and Molecular Diagnosis of Avian Pneumoviruses Among Broiler Breeders in Rawalpindi Region	Mahnoor Raza Lab Officer Department of Biosciences, Comsats University, Islamabad
11:48 am to 12:18 pm	Infectious Bronchitis: One of the Leading Causes of Economic Losses	Key Note Speaker: Dr. Magali CHARLES Doctor Veterinarian Cobb Vantress
12:19 pm to 12:30 pm	Panel Discussion	

Day – 2: 14th September, 2019

2nd Session of PSC@IPEX-2019

INFORMAL SESSION

9:45 – 9:47 am	Welcome and Recitation of Holy Quran	Dr. Ali Ahmad Sheikh
9:47 – 9:54 am	Opening remarks on Farm Management and Nutrition (Theme – II of the Conference)	Dr. Abdul Karim Bhatti
9:55 – 9:59 am	General guidelines about the conference	Dr. Hanif Nazir Ch

FORMAL SESSION

Theme: Farm Management and Nutrition

Moderator: Dr. Nasir Mukhtar

Time	Topic	Presenter
10:00 am to 10:20 am	Organic Acids: Intestinal Health and Performance in Intensive Poultry Farming	Key Note Speaker: Dr. Ioannis Ch. Mavromatic Lebanon
10:21 am to 10:33 am	Performance Evaluation of Commercial Layers under Free Range, Semi-intensive and Intensive Rearing Systems	Shahid Mehmood Assistant Professor University of Veterinary and Animal Sciences, Lahore
10:34 am to 10:46 am	Assessing the Impact of Light Stimulation During Incubation on Hatching Traits and Post-hatch Performance of Broilers	Jibran Hussain Assistant Professor, Department of Poultry Production, University of Veterinary and Animal Sciences Lahore, Pakistan
10:47 am to 10:59 am	Production and Evaluation of Zinc Oxide Nanoparticles as Feed Additive in Broilers	Sajid Khan Tahir Lecturer, Department of Physiology, University of Veterinary and Animal Sciences Lahore

11:00 am to 11:12 am	Effect of Different Storage Conditions on the Physical Quality Traits of Leghorn and Naked Neck Chicken Eggs	Muhammad Usman PhD (Scholar), Department of Poultry Production, University of Veterinary and Animal Sciences, Lahore
11:13 am to 11:25 am	Investigation of Role of Natural Antioxidants on Liquid Semen Storage in Chicken	Umer Farooq Assistant Professor, Poultry Science UAF Sub Campus Toba Tek Singh
11:26 am to 11:38 am	Digital Connections in Poultry Industry, "a savior"	Afsheen Shafqat DVM Student, College of Veterinary & Animal Sciences, Jhang
11:39 am to 11:51 am	Applied Low Amino Acids Concept with Protease Enzyme in Poultry Nutrition	Nasir Mukhtar Assistant Professor-PMAS-Arid Agriculture University Rawalpindi-Pakistan
11:52 am to 12:12 pm	Impact of Ventilation on Performance of Broilers	Key Note Speaker: Dr. Andrew Bourne Cobb Vantress Inc., US
12:13 pm to 12:45 pm	Panel Discussion	

Day – 3:15th September, 2019

3rd Session of PSC@IPEX-2019

INFORMAL SESSION

1:45 – 1:47 pm	Welcome Note and Recitation of the Holy Quran	Dr. Ali Ahmad Sheikh
1:48 – 1:54 pm	Opening remarks on Processing, Value Addition and Food Safety (Theme – III of the Conference)	Prof. Dr. Masood Rabbani
1:55 – 1:59 am	General guidelines about the conference	Dr. Hanif Nazir Ch

FORMAL SESSION

Theme: Processing, Value Addition and Food Safety

Moderator: Engr. Tariq Nazir

Time	Topic	Presenter
02:00 pm to 02:20 pm	Transitioning to Antibiotic Free Production in the US: Current and Emerging Challenges	Key Note Speaker: Prof. Paul Ebner Professor of Animal Sciences, Department of Animal Sciences, Purdue University, USA
02:21 pm to 02:33 pm	Evaluation of Microbial Quality and Antibiotics in Poultry Meat and Feed	Hammad Ur Rehman Research Associate, Department of Microbiology, UVAS, Lahore
02:34 pm to 02:46 pm	Shelf Life Extension of Chilled Broiler Meat Using Lactic Acid and Oregano Essential Oil Under the Aerobic and Modified Atmosphere Packaging	Hafiz Anwaar ul Haq Department of Meat Science and Technology, University of Veterinary and Animal Sciences
02:47 pm to 02:59 pm	Do Genetic Strains of Broiler have an Impact on Meat Quality Characteristics, Reared Under Local Climatic Conditions in Pakistan?	Iftikhar Hussain Badar Lecturer, Department of Meat Science and Technology, University of Veterinary and Animal Sciences, Lahore
03:00 pm to 03:12 pm	Comparative Evaluation of Carcass	Muhammad Kashif Yar

	Characteristics, Cut-up and Boneless Yield of Four Exotic Broiler Strains Reared Under Local Climatic Conditions in Pakistan	PhD Scholar, University of Veterinary and Animal Sciences, Lahore, Pakistan
03:13 pm to 03:25 pm	Microbiological Profile and Qualitative Screening of Antimicrobial Drug Residues in Commercial Poultry Meat	Noreen Sarwar Assistant Professor, Department of Microbiology, UVAS, Lahore
03:26 pm to 03:38 pm	Losses Associated with Broiler Transportation Distance and Crating Densities During Summer Season in Pakistan	Faisal Hussain Lecturer, Department of Poultry Production, University of Veterinary and Animal Sciences, Lahore
03:39 pm to 03:59 pm	Broiler Chicken and Eggs are Best Protein and Safest Food	Key Note Speaker: Shahid Waheed General Manager (Production), Al-Meezan Feeds, Karachi
04:00 pm to 04:30 pm	Panel Discussion	

END OF FORMAL SESSIONS

4:31 – 4:32 pm Formal Closing of the Poultry Science Conference

Mr. Ch. Muhammad Nusrat Tahir,
Chairman, IPEX – 2019

Judges of Poultry Science Conference – 2019 (PSC@IPEX2019)

Prof. Dr. Khalid Naeem Khawaja (Comsats)

Prof. Dr. Athar Mahmud (UVAS)

Dr. Muhammad Athar (Hitech)

Prof. Dr. Munir Iqbal (DVM, MPhil, PhD)

Head of Avian Influenza Group and Visiting Professor, Royal Veterinary College London

Email: munir.iqbal@pirbright.ac.uk

Key Note Speaker:

Professor Munir Iqbal is head of the Avian Influenza Virus (AIV) group at The Pirbright Institute. Munir obtained Veterinary Medicine and MPhil degrees in Pakistan and a PhD in Biotechnology at Imperial College London in 1991. He worked as postdoctoral researcher at the University of Liverpool and the University of St Andrews, before joining the Pirbright Institute in 1996. Currently, he is leading a number of research projects aimed to define the impact of evolutionary molecular changes on AIV antigenicity, pathogenicity and cross-species transmission and the development of new vaccines and diagnostics for better control of avian respiratory viruses (including avian influenza, Newcastle, avian adenovirus, Avian metapneumoviruses...).
<https://www.pirbright.ac.uk/users/prof-munir-iqbal>



TITLE:

IMPROVING VACCINES AND DIAGNOSTICS FOR AVIAN INFLUENZA VIRUSES AFFECTING POULTRY

Abstract

Avian influenza viruses (AIV) pose an increasing threat to global poultry production and can also cause pandemics in human population due to zoonotic infections. Vaccination of poultry is a key element for the disease control in endemic countries, but vaccine effectiveness is persistently challenged by the emergence of antigenic variants. We used a combination of emerging molecular virology, immunology and vaccinology techniques to provide an enhanced understanding of the molecular determinants in the haemagglutinin (HA) proteins of H9 viruses that drive antigenic variability and vaccine failure. We identified amino acid substitutions essential for the ability of mutant viruses to escape immune pressure and alter antigenicity compared with the wild type H9N2 viruses. These results provide new molecular markers of antigenic changes in H9N2 viruses enabling development of vaccines eliciting broadly neutralising antibody response against antigenic variants. To efficiently deliver AIV vaccines through mass immunisation, we developed recombinant herpes virus of turkeys (HVT) and duck enteritis viruses (DEV) AIV vaccines; an approach based on CRISPR/Cas9 gene editing technology ensuring rapid HA antigen integration. Our antigen targeting vaccine (ATV) systems specifically target antigen to chickens' immune cells enhancing uptake and presentation of HA antigens eliciting rapid, strong and durable immunity in vaccinated chickens. In addition, our novel passive immunization approaches induce immediate protection, overcoming maternally derived antibodies and protecting immunocompromised birds. We have also developed lateral flow assays for the detection and differentiation of different subtypes of AIV infecting poultry. We are currently transferring these highly protective and cost-effective disease control tools and strategies from laboratory to the field for an effective management of AIV infections in poultry.

Dr. Muhammad Saqalein

Lecturer

Email: drsaqalein@hotmail.com & drsaqalein@gcuf.edu.pk

Dr. Muhammad Saqalein has been working as lecturer in Department of Microbiology, Government College University Faisalabad since September 03, 2012 to date. He did his D.V.M from University of Agriculture Faisalabad, in 2009 with Silver Medal in session 2004-2009, M.Phil Microbiology in 2012 from Institute of Microbiology UAF. His M. Phil research project was “Evaluation of *Cassia fistula* extracts for their Adjuvant activity in Hemorrhagic Septicemia (HS) Vaccine using Rabbit model” in which he formulated three different vaccines of HS adjuvanted with aqueous, methanolic and ethanolic extracts of *Cassia fistula* and compared efficacies with the routinely used oil-based vaccine in animal model. He has worked as Co-Plin (01) HEC funded project and participated in several national conferences, (06) workshops and organized various seminars as well. He has 18 publications in peer reviewed Journals. Moreover, Dr. Saqalein is committed to work hard and excel in his area of expertise that includes on research in fields of infection biology, molecular biology and probionomics.



TITLE:

A HIGHLY VIRULENT NEWCASTLE DISEASE VIRUS STRAIN REPORTED FROM AN OUTBREAK IN DISTRICT OKARA PAKISTAN

Abstract

Despite the use of live-attenuated vaccines for the control of ND, many outbreaks of the disease have occurred, recently. This is mostly due to emergence of new strains that possess divergent antigenic regions of virus. Therefore, present study was conducted for the pathotyping and genetic characterization of NDV isolated from a field outbreak from District Okara region of Punjab, Pakistan. Samples were collected and processed for virus isolation as per standard protocols. The 9 days old embryonated chicken eggs were used for virus cultivation followed by identification through haemagglutination test and confirmation by haemagglutination inhibition test using known hyperimmune serum. NDV was purified using sucrose gradient ultracentrifugation. Reverse Transcription Polymerase Chain Reaction (RT-PCR) was used for the amplification of F-gene followed by sequence analysis. SDS-PAGE was used for the characterization of viral proteins followed by in gel digestion and mass spectrometry of fusion protein. *In-vivo* pathogenicity was determined in day-old chicks by calculating Intracerebral Pathogenicity Index (ICPI). It was found that our strain (Okara/Pakistan/MH607122) revealed maximum similarity (99%) with UVAS/Pak/2015/MF437287, UVAS/Pak/2016/KX791187 and Tehran/Iran/MG871466. The existence of fusion protein with estimated mass of 58896.0 Da along with ICPI of 2 confirmed high virulent nature of this indigenous strain which caused heavy mortality in vaccinated flock. Thus it is the need of the time to characterize the prevalent indigenous strains of NDV in order to develop some novel vaccine strategies appropriate for such viruses.

Ms. Sana Ilyas

PhD Scholar, GCU, Faisalabad

Email: sanailyas42@gmail.com

I am a Ph.D. Scholar at the Department of Microbiology Government College University, Faisalabad, Pakistan. My PhD research work is on Prevalence and Molecular Characterization of Extended Spectrum β -Lactamase Producing *Escherichia coli* from Poultry and Environment. I have completed my work at National Veterinary Laboratory as this work was a pilot project to assess the rate of AMR in Pakistan by WHO.

I have completed my M. Phil in Microbiology from GCUF and my BS in Medical laboratory technology from Sheikh Zayed Medical College, Rahim Yar Khan. I have also worked as Medical Technologist at Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore for 1 year.



TITLE:

PREVALENCE AND CO-EXISTENCE OF COLISTIN RESISTANT AND ESBL PRODUCING *ESCHERICHIA COLI* ISOLATED FROM POULTRY FROM PAKISTAN

Abstract:

Emergence of colistin resistance and extended-spectrum- β -lactamase (ESBL) producing *Escherichia coli* is a serious threat to public health sector around the globe particularly in developing countries like Pakistan. ESBL producing bacteria display resistance against the β -lactam drugs except carbapenem. However, *mcr-1* is a novel plasmid-mediated gene conferring resistance to colistin which is considering a last resort to treat clinical infection caused by multidrug resistant pathogens. The aim of the study was to determine the prevalence of both *mcr-1* and ESBL producing *E. coli* in different settings. A total of 100 poultry cloacal swabs were collected from Faisalabad metropolitan during October 2018-April 2019. Samples were screened for ESBL and colistin producing *E. coli* using colistin (4 μ g/mL) containing MacConkey agar and cefotaxime (4mg/L) containing Chrome IDESBL agar. Further, isolates were confirmed using UTI Chromo Select agar and API 20E. Antibigram and phenotypic confirmation of ESBL was carried out as per CLSI 2018 guidelines. Molecular identification of *mcr-1* and ESBL genes (*bla*_{CTX-M}, *bla*_{TEM}, *bla*_{SHV}, *bla*_{OXA}) was performed using PCR. Of 100 poultry samples; 22 *E. coli* were positive for both *mcr-1* and ESBL. Among ESBL producing *E. coli*, 22 (100%) carried *bla*_{CTX-M} and 11 (50%) *bla*_{TEM}. *E. coli* from poultry displayed 100% resistance to β -lactam, β -lactam inhibitors and colistin while 63% to ciprofloxacin and 18% to meropenem. Occurrence of *mcr-1* and ESBL producing *E. coli* from poultry is a matter of great concern for both livestock and public health.

Dr. Aziz-ul-Rahman

PhD Scholar, Microbiology, UVAS, Lahore

Email: dralizangel@gmail.com

I am a PhD scholar in Department of Microbiology, UVAS, Lahore. Currently, I am working to elucidate the evolutionary dynamics of currently prevailing Newcastle disease viruses (NDVs) and its potential pathobiology in susceptible hosts. Specially, my research aim is to reveal the virus-host interaction by exploring up- and down-regulation of innate immune related genes in commercial chickens to NDVs infection of varying pathogenicity. Additionally, my research interest also includes the comparative genomic, phylogenomic and evolutionary analysis of infectious pathogens of animals such as Peste des petits ruminants virus (PPRV) and foot and mouth disease virus (FMDV).



TITLE:

BIOLOGIC, GENOTYPIC AND PATHOTYPICAL CHARACTERIZATION OF NEWCASTLE DISEASE VIRUSES ISOLATED FROM DUCK AND PIGEON

Abstract

Virulent Newcastle disease viruses (NDV), including their genetic variants cause Newcastle disease (ND), which is a major threat to poultry production because of severe economic losses. Considering the role of wild birds as natural reservoirs, the emergence of new variants of diverse genotypes is ascending over a period of time. Herein, two virulent NDVs were isolated from asymptomatic duck (*Anas carolinensis*) and a clinically suspected ND outbreak in a feral pigeon (*Columba livia*) flock. Biologic assessment revealed duck-originated NDV as velogenic (MDT = 49.2 to 50 hours, $EID_{50} = 10^{-6.51}$) while pigeon-originated isolate as mesogenic strain (MDT = 72 hours, $EID_{50} = 10^{-6.87}$). Followed the “rule of six” in an order of 3'-NP-P-M-F-HN-L-5', full-length genome sequence velogenic isolate comprised of 15,192 nts while mesogenic isolate had 15,189 nts with typical cleavage motif [112 RRQKR↓F 117] in fusion protein. The phylogenetic analysis clustered velogenic isolates within sub-genotype VIIi with a close relationship to isolates reported previously from backyard poultry and wild birds from different regions in Pakistan. On the other hand, mesogenic isolate clustered within genotype VI_m closely related to previously reported isolates from pigeons in China. Subsequently, the infectious potential of velogenic and mesogenic NDV strains was assessed in broiler chickens and pigeons, separately. Chicken were found to be more susceptible to velogenic strain with 100% morbidity and mortality within 6th dpi whereas pigeon had 86% morbidity and 67% mortality within 9th dpi. Similarly, upon exposure to mesogenic strain, chicken showed only morbidity (40%) while pigeon had 50% morbidity and 5% mortality within 10th dpi. The observed clinical signs, gross and histopathological lesions were typical of ND infection, except, no neurological symptoms were observed in chickens infected with velogenic NDV strain. Overall, virus shedding was detectable in chickens and pigeons infected with velogenic strain from 4th and 5th dpi onward, respectively. Contrary to this, it was detectable in chickens and pigeons infected with mesogenic strain from 6th and 7th dpi onwards, respectively. Thus, this study confirms the evolutionary nature of NDVs and their potential role in disease occurrence, necessitating continuous surveillance of migratory/aquatic fowls to better elucidate the infection, epidemiology and potential impacts on commercial poultry.

Dr. Muhammad Suleman

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Dr. Suleman is a veterinarian with passion of research to improve animal health; he is best graduate of UVAS winning two gold medals. He won multiple national and international scholarships. Dr. Suleman has over 15 years research and teaching experience in veterinary schools from France and Canada. He published over 20 international research papers with cumulative impact factor of 58.7 and won international research projects of over Rs.20M. Dr. Suleman has expertise in vaccine development and flow cytometry. His lab produced new reverse genetic vaccine against CBPP that won “Best Veterinary Vaccine Award 2019” at World vaccine conference in Washington, USA.



TITLE:

EVALUATION OF AVIAN BETA DEFENSIN AND POLYPHOSPHAZENE AS ADJUVANTS FOR EFFICIENT *IN-OVO* VACCINATION AGAINST FOWL ADENOVIRUS 8B IN CHICKENS

Abstract

Poultry industry worldwide needs better vaccination strategies against infectious diseases, particularly against fowl adenovirus 8b (FAdV), which is responsible for inclusion body hepatitis causing significant economic losses globally. Thus an effective vaccination strategy is needed. Using a combination of vaccine antigens with potent and safe immunostimulants (adjuvants) may have ability to enhance post-vaccination protective responses. One such well characterized effective adjuvant tested in multiple experimental veterinary vaccines is water soluble biodegradable Poly[di(sodium carboxylatoethylphenoxy)]phosphazene (PCEP). Moreover, host defense peptides have known effective adjuvant activity; particularly avian beta defensins (ABD) have great potential to be used as vaccine adjuvant in avian vaccines. We designed vaccination trails with formulations containing inactivated FAdV along with PCEP and ABD2as adjuvants to test their effectiveness following *in ovo* administration of these formulations. All vaccine combinations and control formulations were delivered *in-ovo* into the amniotic sac of 18-day old live embryos. Serum and spleen samples were collected from chicks at 1, 7 and 14 days post hatch. We found a long lasting robust induction of antibody response using a combination of FAdV and PCEP. We also found a significantly enhanced gene expression of INF-alpha, INF-gamma, IL-12(p40) and IL-6 associated with inclusion of PCEP as adjuvant in effective and safe vaccine formulations. These results indicate potential of PCEP as *in-ovo* adjuvant in order to induce a substantial balanced immune response in chickens. This is first ever report of PCEP and ABD as *in-ovo* adjuvants in poultry vaccines and will pave the way for development of robust *in-ovo* vaccine against FAdV and also other poultry diseases.

Dr. Nadeem Murtaza

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Dr. Nadeem Murtaza is a PhD student at the department of Microbiology UVAS, Lahore. He is serving in poultry industry since 2003 and currently working as veterinary officer in Livestock and Dairy Development Department since 2011. He did DVM and M.Phil Microbiology degree from University of Veterinary and Animal Sciences, Lahore. During his M.Phil Degree topic of his research is “Antibody Response of Buffaloes to inactivated Foot and Mouth Disease vaccine containing serotypes “O”, “A”, and “Asia-1”. He is working on probiotics for Poultry and Livestock.



TITLE:

ISOLATION AND *IN VITRO* CHARACTERIZATION OF ANTI-*SALMONELLA* ENTERITIDIS PROBIOTIC POTENTIAL OF INDIGENOUS LACTOBACILLI FROM POULTRY

Abstract

Aim of the present study was to isolate, identify and characterize new indigenous *Lactobacillus* strains with probiotic potential against *Salmonella enteritidis*. From 84 isolated lactobacilli of indigenous poultry origin, 15 isolates were pre-selected for *in vitro* characterization on the basis of their activity (6.33 ± 0.57 - 20.33 ± 1.15 mm) against *S. enteritidis* by well diffusion assay. All pre-selected isolates had variable tolerance to acidic pH (2, 3, and 4). All isolate also showed growth in MRS broth supplemented with 0.3%, 1% and 1.8% bile salts. Isolates had varying degree of auto-aggregation ($27.05 \pm 0.72\%$ - $65.87 \pm 3.12\%$) and co-aggregation with *S. enteritidis* ($6.33 \pm 0.11\%$ - $55.70 \pm 1.32\%$) within 2 hours. Safety profile of lactobacilli indicated that IKP23, IKP 111, IKP 333 had no acquired antibiotic resistance. IKP 23, IKP 111 and IKP 333 were selected as potential probiotics on the basis of probiotic prerequisites and identified as *L. fermentum*, *L. fermentum* and *L. salivarius*, respectively by sequencing their partial 16S rRNA gene or 16S-23S intergenic spacer region. IKP 23, IKP 111 and IKP 333 inhibited *S. enteritidis* (81, 99.3 and 93%, respectively) in co-culture experiments. This study insinuates that IKP 23, IKP 111 and IKP 333 have favorable probiotic potential and may be used for *in vivo* studies for the development of probiotics against *S. enteritidis*.

Dr. Ahad Fayyaz

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Ahad Fayyaz is currently working as a research associate and also doing Ph.D. in the Department of Pathology, Faculty of Veterinary Science, University of Agriculture, Faisalabad. He assisted in several M.Phil and Ph.Ds during his career and also working on fungus isolation and quantification through advanced techniques. He is also involved in the teaching and major field of specialization is the poultry and mycotoxins. Now his Ph.D is based on molecular epidemiology and pathobiology of Infectious Bronchitis. He is currently operating the Toxicological Lab in his department. He has completed two projects related to mycotoxins and control through different binders.



TITLE:

MOLECULAR EPIDEMIOLOGY OF INFECTIOUS BRONCHITIS AND ITS VARIANT TYPES IN COMMERCIAL POULTRY: ONE YEAR STUDY

Abstract

A study was designed for the molecular detection and sero-prevalence of Infectious bronchitis (IB) from different commercial poultry farms in Faisalabad division and adjoining areas. Samples were collected at different age groups, from different seasons, and different type of birds. In first phase molecular studies were done and for this purpose a total of 860 samples were collected from different layer, broiler and breeder farms of different age groups and different breeds and from these 210 samples came out positive through Reverse transcriptase polymerase chain reaction (RT-PCR). A further serotyping was performed by targeting the S1 gene to check the status of classical and variant strains present in the area. Serotyping of selected samples revealed that the Pakistani strains were 100% identical to variant strains of KM594225 Morocco, MF322810 Iran, MH427492 China, MG913343 Brazil, KJ57726 India. Phylogenetic relationship also revealed that it matches Indian, Chinese and Pakistani strains from a range of 84-96%. Another round of serological detection was done in which 346 samples were tested for IB and from these 148 (43%) samples came out positive. Indirect hemagglutination of M-41 and 4/91 was also performed in which 133 (38%) and 58 (17%) samples came out positive from 346 samples, respectively. The results concluded that there is strong evidence of presence of IB for the year 2017-2018 and there is emergence and rise in the disease outbreaks.

Dr. Iqra Zaheer

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I have graduated my DVM and M. Phil (Pathology) from University of Agriculture, Faisalabad (UAF) in 2012 and 2014 respectively. During my M. Phil, I had also been working as a Research Associate in Department of Pathology. I did my research on *In Ovo* vaccination with special reference to Infectious Bursal Disease (IBD). Currently I am pursuing my PhD in Pathology from UAF and have been offered PhD fellowship by the University. My PhD research project is about Molecular epidemiology of Fowl Adeno Virus in commercial poultry. My areas of research interest include: Molecular pathology, sero-epidemiology, Vaccinology I am also a regular member of World Veterinary Poultry Association (WVPA- Pakistan Branch) since 2013. I have helped to conduct multiple professional trainings, workshops/ seminars and have several professional publications to my credit.



TITLE:

ISOLATION, IDENTIFICATION, AND PROPAGATION OF FOWL ADENO VIRUS ALONG WITH GENETIC SEQUENCING

Abstract

In PSC- IPEX 2018, I won the award for best presenter for my M.Phil's research work titled, "immunopathological comparison of *in ovo* and post hatch vaccination techniques for IBD vaccine in layer chicks". I was awarded a prize money of Rs. 300,000/= for a foreign training. The grant aimed to enhance the research skills and provide hands-on trainings relevant to my area of research focus. Therefore, I secured the training Invitation letter of relevant subject by Universiti of Putra Malaysia (UPM), Selangor, Malaysia at the Faculty of Veterinary Science in March 2019.

The state-of-the-art Virology Laboratory at FVS, enabled me to gain hands-on training about latest cutting-edge technologies related to avian virology. Briefly, I was trained for the isolation, identification, and propagation of Fowl Adeno Virus along with genetic sequencing under the kind supervision of Dean/ Prof. Dr. Muhammad Hair Bejo. I had been successfully performing and troubleshooting the diagnostic tools like immunohistochemistry, cell culture technique with slight modifications, primer designing and phylogenetic analysis of Fowl Adeno Virus (FAdVs). In conclusion, this training session equipped me with the most recent techniques relevant to my ongoing PhD work. The hands-on training sessions helped me a lot in adequately standardizing various laboratory protocols to work with FAdVs *in vivo* and *in vitro*. I acknowledge the visionary approach and efforts of PPA for professionally nurturing the young cohort of scientists.

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Ms. Mahnoor Raza is a science graduate. She has recently completed her MPhil degree in Biosciences. She is currently working at Avee Rose Laboratory as Lab Officer.

TITLE:

SEROPREVALENCE AND MOLECULAR DIAGNOSIS OF AVIAN PNEUMOVIRUSES AMONG BROILER BREEDERS IN RAWALPINDI REGION

Abstract

A study was carried out to investigate the prevalence of Avian pneumovirus (APV) among broiler-breeder flocks in Rawalpindi region and investigate the impact of available vaccines for its control. For this purpose, ELISA based serological testing and PCR based molecular diagnosis was performed on samples obtained from vaccinated and non-vaccinated breeding flocks. Here eight commercial broiler-breeder flocks were studied in detail, which were following high standards of biosecurity management. Six of these farms were following standard APV-vaccination schedule. However, two of the farms included in this study were not using any APV. The data from four of the APV vaccinated farms revealed that systematic use of two live and one killed APV vaccines generated a stable and smooth pattern of post-vaccination response, with no evidence of field exposure to APV. This information was considered as base-line post-vaccination data against 2-live and 1-killed APV vaccines in broiler-breeder flocks between 10-50 weeks age. Two remaining vaccinated flocks showed significant increase in the ELISA antibody titres and also showed detection of APV through PCR at one occasion. This shows that despite using 3-shots of APV vaccines, some of the apparently healthy flocks got exposed to the field strains of APV, indicating failure of existing vaccines in protecting the flocks. The data from two of the non-vaccinated flocks, also showed high titres of ELISA antibodies indicating field exposure to APV. This study indicates the need to further investigate about different APV serotypes/genotypes prevalent in this region for developing more effective and type-specific vaccines matching with the locally prevalent field strains of APV.

Dr. Magali CHARLES

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Key Note Speaker:

Dr Magali Charles graduated in 1999 as a veterinarian from the French Veterinary School in Nantes with a specialisation in livestock production. After beginning her career in a French poultry integrator, she joined a breeder company where she held the position of animal health manager for turkeys, broilers and guinea fowls breeders. In 2015, she settled in Bangkok where she mainly services grandparent and parent stock breeders in South East Asia.



TITLE:

INFECTIOUS BRONCHITIS: ONE OF THE LEADING CAUSES OF ECONOMIC LOSSES

Abstract

Bronchitis in poultry production is a common problem worldwide. This coronavirus can affect the respiratory and genital tracts as well as the kidneys, at any age. Because this virus is an RNA virus, the recombination rates are high, which leads to the emergence of new variants. The circulation of IBV is well known, and despite vaccination programs, the disease is not well controlled globally. An accurate diagnosis of sanitary problems is essential for a vaccination program to be effective. The analysis relies on the observation of various symptoms and lesions, such as liquid albumen, respiratory symptoms, nephritis, egg drop, and the simultaneous decrease in the hatchability rate. Often bronchitis virus opens the door to other affection such as colibacillosis. Accurate monitoring of flocks is paramount to prevention. First, an analysis to distinguish which viruses are involved is essential (serology, PCR). During the rearing period, the live vaccines will provide a strong local immune defense and a booster for the inactivated vaccines. The implementation of carefully prepared vaccines plays a significant role in the success of the vaccination program. The live vaccine must reach the target organs (upper respiratory tract for IBV) to be successful. A mass vaccine associated with a 793-B vaccine at one day old will give the best protection against the risk of false layers (QX-like affection) which occurs in both layer and breeder flocks. In the case of field challenges, a combination of live and inactivated vaccines has provided excellent results in the protection at the start of the laying period. Strengthening the local immune system, in cases of egg drop, needs to be taken into consideration.

Dr. Ioannis Ch. Mavromatis

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Key Note Speaker:

In April 1980 Dr. Ioannis Mavromatis received his bachelor degree in veterinary medicine from the University of Messina in Italy, and in March 1996 he earned his Ph.D in Veterinary Medicine from the University of Thessaloniki in Greece. Dr. Ioannis has more than 38 years of experience in poultry industry. In the beginning of his career he worked in Poultry Integrations as broiler breeder, hatchery and broiler manager. Later, he established and ran his private consultancy office to provide consultancy to poultry integrations in Greece. From 1999 to 2005 he worked in VETERINSA, Greece, as manager of sales and marketing of livestock products, and he also collaborated as well as closely worked with the pharmaceutical companies that were represented in Greece by Veterin. In 2006 April, Dr. Ioannis joined Lohmann Animal Health (LAH) as Regional business manager–vaccines for Middle East, and in 2008 he also assumed the role of Country manager and Technical Support–vaccines and Feed Additives for the areas of North Africa, Turkey, Middle East, South Africa and Sub-Saharan African countries. From 2014 to 2016, when Elanco bought LAH, he continued to give Technical support on poultry vaccines in the above mentioned areas. Since November 2016 until now, Dr. Ioannis Mavromatis has been working for Utrix SARL (Middle East, Africa) as Business Development and R&D Manager.



TITLE:

ORGANIC ACIDS: INTESTINAL HEALTH AND PERFORMANCE IN INTENSIVE POULTRY FARMING

Abstract

Intestinal health is a major issue in broiler production, especially since the ban on antibiotic growth promoters in animal feed in many countries worldwide. Without the growth promoters and with ever-increasing levels of feed intake, broilers tend to develop an un-favourable intestinal microbiota composition, commonly known as dysbiosis or dysbacteriosis. In recent years, major research efforts have focused on the development of alternative feed additives to replace the growth promoting antibiotics.

Among the microbe- and feed-derived signalling molecules, a lot of attention has been paid to intestinal health promoting effects of microbe-derived short-chain fatty acids (SCFA) and plant-derived medium-chain fatty acids (MCFA). Variables that influence the antibacterial activity of organic acids are Chemical form (acid, salt, coated or not, α -monoglyceride), and the molecular weight. Organic acids and salts of acids are active at a low pH in un-dissociated form only. Antibacterial effects provided mostly up to pH 5.5, i.e. in a crop, stomachs and a very beginning of duodenum because they are pH depended. In opposite, glycerides of acids are not pH depended and are active in entire gastrointestinal tract. Glycerides of SCFA release efficient target of butyrate, inhibit gram-negative, *Clostridium perfringens*, stimulate gut development and improve animal performance. MCFA such as Monolaurin acts against gram-positive bacteria, fat enveloped viruses such as ND, IB and AI.

The use of SCFA and MCFA in poultry feed and drinking water can replace the AGPs and give excellent results for the control of harmful bacteria in the GIT.

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Dr. Shahid Mehmood is Assistant Professor in the Department of Poultry Production. He is serving the university since 2008 before that he also worked with renowned organizations like Big Bird, and Panjnad Feeds in private sector. His expertise are in the field of poultry housing and management and currently he is also involved in the project of dead bird composting first of its kind in Pakistan. He has published noteworthy literature in the national and international journals. He has published 53 national and international research papers and more than 100 abstracts.



TITLE:

PERFORMANCE EVALUATION OF COMMERCIAL LAYERS UNDER FREE RANGE, SEMI-INTENSIVE AND INTENSIVE REARING SYSTEMS

Abstract

A 14 wk study was executed to examine the effects of different rearing systems on production performance, egg geometry and quality traits in two commercial layer strains, Hy-line and Bovans. In total, 150 pullets (18 wk old), comprising 75 from each strain, were randomly assigned to 6 treatment groups in a 2 (strain) × 3 (rearing system) factorial arrangement under a randomized complete block design (RCBD). Each treatment had 5 replicates with 5 birds per replicate. Body weight, egg production, egg weight, egg mass and livability parameters of production performance, and egg length, egg breadth, shape index, egg surface area, egg volume, egg weight, eggshell thickness, Haugh unit and yolk index parameters of egg geometry and quality were evaluated. The results indicated higher body weight, egg production, and egg weight in pullets under intensive rearing system compared to those under semi-intensive and free range. Among the strains, Hy-line strain showed greater egg production and egg weight than Bovans. Interaction of treatments showed maximum body weight in Bovans and egg production in Hy-line strain under intensive rearing system, whereas egg weight was found to be minimum in Bovans strain under free range rearing system. Egg geometry and quality parameters remained unaffected among all treatments separately except in interaction where egg length was found to be maximum in Hy-line under free range and in Bovans under semi-intensive rearing system, whereas egg volume was found to be maximum in Hy-line strain only under intensive and in Bovans under both semi-intensive and intensive rearing systems. In conclusion, commercial layers could be reared in free range system without adverse effects on egg morphometry and quality traits.

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Dr. Hussain is working as an Assistant Professor at UVAS Lahore with more than ten years of collaborative research in the Poultry industry of Pakistan. Dr. Hussain has published more than 50 impact factor research papers pertaining to the various aspects of Poultry Production with special interest in devising strategies to address the performance of broilers, broiler breeders and overall hatchability. A review article published by Dr. Hussain "An overview of Poultry Industry in Pakistan" in Worlds' Poultry Science Journal (WPSJ) is the distinguished one in the sense that it has more than eighteen thousand (18000) reads from all across the globe.



TITLE:

ASSESSING THE IMPACT OF LIGHT STIMULATION DURING INCUBATION ON HATCHING TRAITS AND POST-HATCH PERFORMANCE OF BROILERS

Abstract

Incubation is one of the most important steps for better development and growth of chicken, as the environment during embryogenesis has lifetime effects on the performance and well-being of birds. Just like temperature, humidity, turning and ventilation, light also has very important role in embryonic growth and providing light during incubation stage of broilers can help the birds to adjust in the pre and post-natal environment as embryo start to respond to light from the second day of incubation. Yet, this factor not studied as much comprehensively as it should have been. Hence, keeping in view such scenario a comprehensive study was conducted at the Department of Poultry Production, UVAS Lahore, Pakistan. In this trial a total of 900 broiler breeder eggs of the same weight from the same flock were exposed to different intervals of photo-stimulation including zero (0), twelve (12) and twenty four (24) hours through using LED Bulbs to study the hatching traits in terms of egg moisture loss during incubation, early, mid and late embryonic mortality patterns, hatch of fertile, hatch window and overall hatchability. Stress response in terms of heterophil/lymphocyte ratio, physical asymmetry, feather score and gait score was also studied in response to light stimulation. Further, post-hatch broiler performance in terms of feed intake, body weight gain and FCR was also examined. Improved hatch window, overall hatchability and chick quality were observed in response to light stimulation for 12 hours. Likewise, a significant improvement was observed in stress response as well as growth performance of broilers in response to light stimulation, especially for 12 hours. Considering the appreciable results of the present study, it is recommended to adopt 12 hours of light stimulation during incubation as a prerequisite factor to attain improved hatching traits, stress response and overall growth performance of broilers.

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Mr. Sajid Khan Tahir is working as a Lecturer in the Department of Physiology, Faculty of Bio-Sciences, University of Veterinary and Animal Sciences, Lahore-Pakistan since 16th March, 2016. He has completed his DVM degree in January, 2013 from the Agricultural University Peshawar and MPhil degree in Physiology from the Department of Physiology, University of Veterinary and Animal Sciences, Lahore in February 2015. His area of research is nanotechnology with emphasis on studying the biological activities of nanoparticles as growth promoters in broilers.



TITLE:

PRODUCTION AND EVALUATION OF ZINC OXIDE NANOPARTICLES AS FEED ADDITIVE IN BROILERS

Abstract

The study is aimed at evaluating the effects of Zinc Oxide Nanoparticles (ZONPs), on growth performance, blood lipids and liver enzymes in broilers. Day-old broiler chicks ($n=120$) were randomly divided into four groups with each group having five replicates ($n=6$). The birds were fed a corn-based diet (Control) or the same ration supplemented with 80 mg ZnO/kg, or 40 or 80 mg ZONPs/kg of feed for 35 days. Feed intake was measured daily while, body weight, weight gain and feed conversion ratio (FCR) was calculated weekly. Blood was collected on day 35 to determine the serum lipid profile and activities of hepatic enzymes. Results showed that supplemented birds were heavier ($P<0.05$) compared with the non-supplemented birds. Broilers supplemented with 40 mg ZONPs showed higher BW ($P<0.05$) compared with control, lower feed intake ($P<0.05$) compared with ZnO supplemented and 80 mg ZONPs, and lower FCR ($P=0.098$) compared with control. The serum levels of ALT, AST, total cholesterol, triglycerides, and HDL-cholesterol were remained unchanged among the groups. ZONPs at the dose rate of 40 mg/kg of feed may be used as growth promoter with no harmful effects on hepatic enzymes in broilers.

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Mr. Muhammad Usman is a lecturer in Department of Poultry Production, UVAS, Lahore. He holds the degree of BS (Hons) Poultry Sciences from UVAS, Lahore. He has completed his Masters of Philosophy (M. Phil) degree in Poultry Production (UVAS). During his M. Phil research, he identified Single Nucleotide Polymorphic Markers controlling egg production and egg quality traits in different indigenous chicken breeds. Before joining University of Veterinary and Animal Sciences as a faculty member, he has been working as an Assistant Farm Manager in a breeder farm of Sadiq Poultry Private Limited. He is also a Ph.D Scholar in Department of Poultry Production. His research topic is "Performance of Dual Purpose Chicken Genotypes Under Alternative Production Systems".



TITLE:

EFFECT OF DIFFERENT STORAGE CONDITIONS ON THE PHYSICAL QUALITY TRAITS OF LEGHORN AND NAKED NECK CHICKEN EGGS

Abstract

This study was conducted to evaluate the egg quality of commercial (Leghorn) and indigenous (Naked Neck) chicken breeds at different storage conditions (duration and temperature) and their quality comparison. The experimental storage durations were 0 (control), 7th, 14th and 21st day of storage; while the experimental storage temperatures were 4°C and 18°C. The experiment was designed in the Randomized Complete Block Design (RCBD). The acquired data were analyzed through factorial ANOVA using SAS software. Significant means were separated through Tukey's HSD test. A total of 144 freshly laid eggs from both the breeds (72 each) were procured. There were sixteen treatments and each treatment was assigned nine eggs (number of replicate = 3; number of eggs in each replicate = 3 eggs). At each storage duration, eggs from both the storage temperatures were analyzed for the external changes *i.e.* weight loss %, egg specific gravity, egg shell thickness, shell surface area and internal quality alterations *i.e.* measurements of egg yolk and albumen index and haugh unit. Significant differences ($P \leq 0.05$) were observed in the weight loss percentage and specific gravity of the eggs of both the experimental breeds when compared at given experimental storage conditions (duration and temperature). In the internal quality, significant differences ($P \leq 0.05$) were observed in the haugh unit and albumen index of the eggs of both the experimental breeds when compared at given experimental storage conditions (duration and temperature). Overall, commercial chicken eggs (Leghorn) have shown more stability than the indigenous chicken eggs (Naked Neck) in the egg quality traits upon physical quality analysis when stored for longer durations.

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PhD in Animal Production Science. Research interests includes poultry production, reproduction, breeding and nutrition for enhanced productivity and fertility in broilers, layers and breeder flocks



TITLE:

INVESTIGATION OF ROLE OF NATURAL ANTIOXIDANTS ON LIQUID SEMEN STORAGE IN CHICKEN

Abstract

Artificial insemination (AI) in broiler breeders can increase number of chicks per female and make effective use of superior males. To run successful artificial insemination program, continuous supply of semen is required where semen availability in stored form can greatly enhance effectiveness of AI. In chicken lipid oxidation and production of reactive oxygen species is the biggest hurdle in liquid semen storage (LSS) of chicken semen. In this study we investigated role of supplementation of natural antioxidants i.e. L-Carnitine (LC), L-methionine (LM), Honey and Olive oil on liquid semen storage in breeders. For this purpose breeder males ($n = 20$) were housed in individual pens and for experimentation pooled semen from 4-5 males were used. Five treatments were prepared in lake's solution as followed. Treatment T_0 =controlled, T_1 =0.25 mM level of each of L-Carnitine and L-Methionine plus 0.25% W/V Honey plus 2mL Olive oil added in lake's solution, T_2 = 0.5mM LC plus 0.5 mM LM plus 0.5% w/v Honey plus 4ml Olive oil added in lake's solution, T_3 = 0.75 mM LC plus 0.75mM LM plus 0.75% w/v Honey plus 6ml Olive oil added in lake's solution, T_4 = 1.0mM LC plus 1.0mM LM plus 1.0% w/v Honey plus 8ml Olive oil added in lake's solution, and T_5 = 1.25mM LC plus 1.25mM LM plus 1.25% w/v Honey plus 10ml Olive Oil added in lake's solution. The semen was stored at 5°C and the data on sperm mass motility, membrane integrity, viability and morphology were recorded at 0, 12, 24 and 36 hours after storage. At 36 hours of storage, treatment T_2 had the highest sperm motility (62%), membrane integrity (68%) and the percentage of live normal sperm (73%). Whereas control, T_4 and T_5 treatments had the lowest values for all these parameters. We concluded that addition of 0.5mM LC plus 0.5 mM LM plus 0.5% w/v Honey plus 4ml Olive Oil to the lake's solution increase liquid semen storage in chicken at 5°C.

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A research oriented person, currently pursuing D.V.M at C.V.A.S Jhang. Aim to bring positive change in society through her skills. She is keeping an eye on current affairs in the industry and working for innovative solutions for uplifting of the industry devising ways and means for globalization.



TITLE:

DIGITAL CONNECTIONS IN POULTRY INDUSTRY, "A SAVIOR"

Abstract

Pakistan Poultry industry is at its peak in production performance, nutritional status and genetic diversity. Currently, commercial poultry farming includes broiler for meat, layer for eggs and breeder farming. Being the largest agro based segment of Pakistan having an investment of more than 750 billion rupees and contributing 1.3% to national GDP, poultry industry is playing key role in industry. Before the onset of commercial poultry production in 1962, backyard poultry was the reliance but insufficient to meet eggs and meat requirement. Being competent in meeting the demands of eggs and meat, commercial poultry proved to be a savior bridging the gap between supply and demand. Growth rate of poultry industry is 10%-12% per annum. As per data of poultry department of Govt. of Pakistan, small commercial rural farming produced 10-400 birds with investment of 10,000 to 50,000 in 40 days. Small commercial farming produced 500 to 6000 birds with investment of 50,000 to 500,000 in 40 days and large commercial poultry agribusiness produce more than 6000 birds with investment of 500,000 and above. Prior to 1962, Desi was raised with maximum production of 73 eggs per year under local conditions and now egg production is raised to 18000 million table eggs per annum by commercial layer farming (as per data by Pakistan Poultry Association). Commercial layer farming is a very effective way of increasing the egg production through improved feed and management reducing the expenditure and almost of same nutritive value. Layer birds start laying eggs from 18 to 19 weeks of age and keep laying continuously till 72 to 78 weeks of age producing 300 eggs per annum. There is dire need to streamline this huge business into digital connections, a software app has been devised and is ready to launch in commercial farming to make and strengthen connections among all the stakeholders of poultry industry. Through this app all importers, pharmaceutical companies, veterinarians, consultants, broiler, layer and breeder farms and even selling and purchasing of all poultry related commodities will be connected. This will reduce the marketing expenses and increase confidence of consumers on chicken meat and eggs. This app will provide a fast medium of communication between producers and consumers. This app will directly link market to the consumer increasing the reliability of consumers and moreover saving the time as all will be available just at the margin of a click. Shortening the chain connecting consumer to the producer, availability of wide range of desired thing, saving time and money expended in following the long chain linking consumer to producer via marketing professionals, whole sale dealers and availability of products at doorstep are some of its salient features. This app is not only a blessing for consumer but also the same for the producer saving the marketing expenses and increasing the customer confidence in product quality. Producers are able to dispatch their products with no delay and get services they need at their doorstep e.g getting a consultant or a vet nearest available in no time saving the massive mortalities. As everything will be on the record, rise and fall in market with respect to different items and consequences can be well monitored and documented channeling the way to improvement and extending its horizon to include other poultry birds as per need and requirement. In a nutshell, this app will open the door to globalization opening new avenues to success of the industry.

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Dr Nasir is a dedicated scientist did his PhD from UAF and Post Doctorate from Roslin, University of Edinburgh Scotland. He is vice president of World's Poultry Science Association Pakistan Branch and JVP of Asian Pacific federation of WPSA. He is global group leader of WPSA working group "Small Scale Family Poultry". He is the author of 6 books and 37 peer review articles published in national and international journals. He is pioneer in ostrich farming and commercialization in Pakistan. He is incharge of Department of Poultry Sciences and station for ostrich research and development-PMAS Arid Agriculture University Rawalpindi Pakistan. He has presented his dynamic viewpoints about Poultry and Ratite research in different national and international conferences.



TITLE:

APPLIED LOW AMINO ACIDS CONCEPT WITH PROTEASE ENZYME IN POULTRY NUTRITION

Abstract

The industrial utilization of microbial enzymes started to be used in the western world since last 100 years. Among available commercial enzymes, dietary proteases are efficiently used to enhance protein/amino acids digestion, its utilization rate and also decrease wastage in poultry ration. Poultry feed is the major cost which is almost 70-80% of total poultry production. Among all nutrients, protein is very expensive nutrient and proteases are used to enhance protein digestion and its utilization which ultimately reduces the input cost. The supplementation of protease enzyme in broiler diets improves the macronutrients availability which ultimately improves the body weight gain and feed efficiency by improving the solubility of different protein and the digestibility of amino acids. Low dietary amino acids modeling with supplementation of protease enzyme improves the performance of broiler under all type of environmental conditions in broilers. The first aim of the study is to assess the protease enzyme with different levels of low amino acids levels (lysine, methionine & threonine) along with canola meal based diets on growth rate and feed efficiency assessment of broilers. Secondly, to check the enhancing ability of protease enzyme with changing the level of low amino acids. The trial was conducted on day-old chicks of Hubbard classic strain. The 36 day old chicks were divided randomly into 8 major treatments within 24 pens. Each treatment had three replicates with 15 chicks in each treatment. Four experimental rations were formulated viz., Ration C

(Control), L (Lysine), M (Methionine), and T (Threonine) and each ration was further subdivided into two subgroups. Ration C was served as control and subdivided into two subgroups (negative control; CN and Positive control; CP). The positive control ration (CP) was supplemented with protease enzyme and no enzyme was added to negative control ration (CN). The subgroups L5, M5 and T5 of treatments groups were supplemented with protease enzyme with 5% less lysine, 5% less methionine and 5% less threonine than recommended breed profile, respectively. Similarly, subgroups L10, M10 and T10 were supplemented with protease enzyme with 10 % less lysine, 10 % less methionine and 10 % less threonine than recommended breed profile, respectively. The trial was terminated at 38 days of age. Body weights gain, livability, feed efficiency and meat traits were investigated at the end of experiment. The data collected during the experimental period regarding various parameters was analyzed statistically by using one-way ANOVA. Duncan's Multiple Range test was used for comparison of means of treatment. P value < 0.05 was considered statistically significant. The body weight and feed intake was 9.8% higher ($P < 0.05$) in protease supplemented diets than un-supplemented diets in growing phase. Similarly, the feed intake during the whole life cycle (1-38 d) in protease supplemented diets was higher ($P < 0.05$) than un-supplemented ration. The FCR at 21st day in protease supplemented diets is 1.36 than un-supplemented diets. The better FCR was found in CP, M5 and followed by L5, M10, T10, L10, T5 and CN. Similarly, the FCR at day (22-38) in CP was better than CN. European broiler index is also better in CP than CN. The better European broiler index found in CP (244.088) followed by M5, T5, M10, L5, T10 and CN. Likewise, the detail results regarding litter traits and diarrhea scoring were shown in figure-1. The carcass weight, yield, breast weight and breast yield were higher ($P < 0.05$) than CN. Protease enzyme improves the European broiler index which is collectively improved by the higher body weight gains, less feed intake, better feed efficiency and less mortality. Protease improves the nutrients digestion by optimizing the gut health and resultantly improves the litter quality and welfare issues. Protease enzyme increases the carcass weight by better nutrients digestion and absorption which ultimately increase the muscle growth. Protease is an excellent option to improve the growth response in broiler with low amino acid levels under hot climate condition. Data of present trial reveals that the protease supplementation in the basal diet with low crude protein diet improves the growth and feed efficiency. The data of trail suggests that protease improves only weight gain in starter phase not in finisher phase in broilers. It is suggested that dietary protease enzyme can be beneficial at the rate of 5% less essentials amino acids levels in broiler diets.

Mr. Andrew Bourne

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Key Note Speaker:

Andrew Bourne has many years of poultry experience beginning in the chicken industry in South Africa where he managed a number of broiler farms. He moved to the United Kingdom in 1999 and spent 5 years running a broiler contract business.

He has a B.S. (Hon) & MBA from the University of Stellenbosch South Africa. Andrew joined Cobb in 2005 and joined the World Technical Support team based in the United Kingdom. He moved to the U.S.A. 11 years ago and is providing housing & ventilation specialist advice to customers in South America & Asia.



TITLE:

IMPACT OF VENTILATION ON PERFORMANCE OF BROILERS

Abstract

The drive for ever higher levels of efficiency has seen the broiler housing and equipment industry continues to develop, introducing modern technologies in line with trends in modern management, communication and ventilation systems. Many new investment decisions are often made without taking into full consideration the high levels of environment control needed to ensure optimum bird performance. Designing and managing the environment control system in a broiler house is critical to guarantee optimum performance.

Dr. Paul Ebner

Professor and Assistant Head

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Key Note Speaker:

Dr. Paul Ebner is a professor in the Department of Animal Sciences at Purdue University with an integrated appointment and responsibilities across the three land grant university missions. His research focuses on microbiology and the development of practical and effective production methods and technologies to limit bacterial pathogens in both live animals and different types of food animal products. Dr. Ebner also has a strong interest in international engagement with highly active and productive partnerships with universities, extension professionals, and non-governmental organizations (NGOs) in Pakistan, Egypt, Romania, and Afghanistan.



TITLE:

TRANSITIONING TO ANTIBIOTIC FREE PRODUCTION IN THE US: CURRENT AND EMERGING CHALLENGES

Abstract

Numerous integrated poultry producers in the US have transitioned entirely or in part to antibiotic-free broiler production. The reasons for transitioning to antibiotic-free production are numerous, but are mostly driven by consumer-choice and potential premiums associated with verified process claims. Additionally, the US very recently adopted new policies that limit the use of medically important antibiotics (as designated by the US Food and Drug Administration) in livestock and poultry production for performance indications, such as improved feed efficiency. Regardless of the actual drivers, it is estimated that 40% of current US broiler production is antibiotic-free. The exclusion of antibiotics, however, can pose significant production challenges, namely in controlling bacterial and secondary infections and maintaining efficiencies needed for economic sustainability. In this talk, the presenter will give an overview of antibiotic-free broiler production in the US, including past, current, and emerging challenges. Special focus will be placed on the efficacy of various management practices and other interventions currently in use or in development that may offset issues that regularly arise in antibiotic-free broiler production.

Dr. Hammad Ur Rehman

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Hammad Ur Rehman is a PhD scholar in University of Veterinary and Animal Sciences Lahore, Pakistan. He holds degree in Doctor of Veterinary Medicine and Master of Philosophy in Microbiology from University of Veterinary and Animal Sciences Lahore, Pakistan. Now, he is serving as a Research Associate in Department of Microbiology, University of Veterinary and Animal Sciences Lahore, Pakistan. He was a delegate speaker in 4 th World Veterinary Poultry Association Asia meeting 2018, which was held in Kuala Lumpur, Malaysia.



TITLE:

EVALUATION OF MICROBIAL QUALITY AND ANTIBIOTICS IN POULTRY MEAT AND FEED

Abstract

Salmonella enteric subsp. *enterica* poses a threat to both human and animal health, with more than 2500 reported serovars. A total of 80 samples were collected in which 30 from poultry meat (10 from poultry shops, supermarkets and processed meat each), 30 from poultry feed (15 from store and shed each) and 20 swabs from carcasses and mucky of poultry shops. The samples were assessed microbiologically for TVC, TCC, *Salmonella* detection and presence or absence of antibiotics. The mean log values of total viable counts of meat samples of traditional poultry shops, super markets and processed meat are 5.70, 4.65 and 3.60 respectively and results are significant ($P < 0.05$). The mean log values of total coliform counts in meat samples 2.7, 2.31 and 2.11 respectively. From coliform bacteria, *E.coli* occurrence was 73% of all samples. The isolation of *Salmonella* was done and then identified through biochemical tests and finally confirmed by molecular technique such as polymerase chain reaction (PCR) which targeting the *hisJ* gene and our results showed 2.5% occurrence. Out of 2.5% positive samples, retail poultry shops showed 10%, supermarkets showed 10% and no *Salmonella* was found in processed meat (nuggets). The mean log values of total viable counts of feed samples of store and shed were 7.21 and 7.56 respectively. There were no coliform bacteria present in feeds of store and shed. There was no occurrence of *Salmonella* in feed samples. Out of 20 swabs only 5% showed *Salmonella* occurrence. The presence of penicillin residues in meat was studied which showed 10% occurrence. The antibiotic groups such as aminoglycosides and bacitracin showed 53% occurrence in feed. The study showed that poultry meat has highest bacterial load which reflects unsatisfactory sanitation and hygienic conditions in poultry environment that ultimately cause food borne infections. Besides this, feed also becomes a source of bacterial contamination and antibiotic resistance in animals and humans. This study is also helpful in devising strategy to provide safe food for public consumption.

Mr. Hafiz Anwaarul Haq

Production Officer, Neat Foods, Olympia Group

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Anwaar ul haq is a former student of the Department of Meat Science and Technology, UVAS. He has done his MPhil research on the effect of oregano essential oil and lactic acid on the shelf life of broiler meat under different packaging conditions. Currently he is working as a production officer at one of the chicken processing facility of Olympia group.



TITLE:

SHELF LIFE EXTENSION OF CHILLED BROILER MEAT USING LACTIC ACID AND OREGANO ESSENTIAL OIL UNDER THE AEROBIC AND MODIFIED ATMOSPHERE PACKAGING

Abstract

The purpose of this study was to investigate the effect of 0.2% oregano essential oil and 1.25% lactic acid under the aerobic and modified atmosphere packaging (MAP) technology on the shelf life of fresh chilled broiler meat. The parameters analyzed were; total viable count, color, pH, lipid oxidation and sensory (odor, taste) attributes. It was observed that the broiler meat treated with 1.25% lactic acid and 0.2% oregano essential oil showed significantly ($P < 0.05$) lower bacterial count as well as lipid oxidation throughout the 12 days of refrigerated storage. Bacterial count was significantly lowered in High Oxygen (Hi-O_2) MAP. The meat samples treated with lactic acid exhibited low pH value as compared to the oregano oil treatment and controlled samples. The treatment of samples with lactic acid and oregano oil showed lighter color L^* values of meat as compared to the untreated samples. The application of 1.25% lactic acid spray did not show any effect on the odor and taste of meat sample while a strong aroma and taste was observed in the sample treated with oregano essential oil. This study concluded that treating broiler meat immediately after slaughter by spraying 1.25% lactic acid or 0.2% oregano essential oil in aerobic packaging add 4 days to the shelf life as compared to the untreated samples under refrigerated temperature. However, oregano essential oil affects the sensory properties of the meat. Whilst, in case of meat stored in Hi-O_2 MAP, bacterial load was reduced up to 1 log.

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Lecturer

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Mr. Iftikhar Hussain Badar is working as a Lecturer in the Department of Meat Science & Technology, University of Veterinary and Animal Sciences. He holds MPhil (Meat Science & Technology) degree from University of Veterinary and Animal Sciences. His main area of research interest is meat quality, meat processing and meat packaging technologies. He has published various research articles in international peer-reviewed Journals. He has attended various national and international trainings on Food Safety, Quality Assurance, Further Processing and halal food management system.



TITLE:

DO GENETIC STRAINS OF BROILER HAVE AN IMPACT ON MEAT QUALITY CHARACTERISTICS, REARED UNDER LOCAL CLIMATIC CONDITIONS IN PAKISTAN?

Abstract

The objective of the study was to compare the meat quality and processing performance attributes of four exotic commercial broiler strains (Hubbard Classic®, Arbor acre Plus®, Ross-308® and Cobb-500®) during extremely hot and humid weather conditions in Pakistan. During the trial 2040 day-old broiler chicks of 4 different strains with 102 birds each in five replicas were reared under simulated commercial conditions. 30 birds, 15 of each sex, from 5 replicates of each strain were randomly selected on achieving average body weights of 1800g, 2100g and 2400g. Birds were slaughtered and deboned at 4h post-mortem. Breast fillets were analyzed for pH, color attributes, drip loss, marination, cooking loss, and shear force. Hubbard Classic showed comparatively superior tenderness and cooking yield. Arbor acre Plus® and Cobb-500® revealed comparable characteristics regarding the meat quality and processing traits. On the other hand, Ross-308® revealed significantly lower pH values and significantly higher lightness, drip loss, shear force, brine uptake, brine loss, and cooking loss values as compared to the other three strains. In conclusion, the meat quality and processing characteristics of these commercial broiler strains are entirely different from their comparative production performance under local climatic conditions.

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Mr. Muhammad Kashif Yar is a PhD Scholar in the discipline of Meat Science and Technology. He is also working as a Research Associate in the Department of Meat Science & Technology, University of Veterinary and Animal Sciences, Lahore. His main research areas are meat quality, meat processing and packaging technologies. He has attended various workshops/trainings related to quality assurance, meat safety, further processing and halal food management system.



TITLE:

SYNERGISTIC EFFECT OF SODIUM CHLORIDE AND SODIUM TRIPOLYPHOSPHATE ON PHYSICOCHEMICAL PROPERTIES AND SENSORY ATTRIBUTES OF MARINATED BROILER BREAST FILLETS

Abstract

The objective of this study was to compare the carcass characteristics, cut-up and boneless yield of four exotic commercial broiler strains (Hubbard Classic®, Arbor acre Plus®, Ross-308® and Cobb-500®) during extremely hot and humid weather conditions in Pakistan. During the trial 2040 day-old broiler chicks of 4 different strains with 102 birds each in five replicates were reared under simulated commercial conditions. 30 birds, 15 of each sex, from 5 replicates of each strain were randomly selected on achieving average body weights of 1800g, 2100g and 2400g. Birds were slaughtered and deboned at 4h post-mortem. Cobb-500® showed significantly higher carcass yield, whole breast, outer fillet, inner fillet, wings boneless and total boneless as compared to other three strains. Whereas, Hubbard Classic® showed higher yield of skin & feathers, offals, legs, wings, back, neck, legs boneless, thighs boneless and drumsticks boneless. Among different weight categories, 1800g body weight category presented highest yield of wings, whole breast and wings boneless while, 2100g body weight category showed significantly higher legs boneless, thighs boneless, and drumsticks boneless and 2400g body weight category showed the highest yield of skin & feathers, back, neck, outer fillets, inner fillets and total boneless. In conclusion, the variation and measurable differences in carcass characteristics, cut-up and boneless yield of the exotic commercial genotypes suggest the careful selection of the broiler strain according to the demand of the poultry market in Pakistan.

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Dr Noreen Sarwar is Assistant Professor in Department of Microbiology, UVAS, Lahore. She did her DVM and M.Sc Hons from University of Agriculture, Faisalabad. She earned her PhD degree from UVAS, Lahore on HEC indigenous scholarship. During her PhD, she visited The Animal Diagnostic Laboratory (ADL) of Pennsylvania State University, USA on IRSIP funded by HEC. In ADL-PSU Dr Sarwar conducted a research study on “Phenotypic and Genotypic characterization of *Pasteurella multocida* isolated from buffalo calves”. She also participated in routine bacteriological diagnostics performed in ADL and was trained in different procedures including CLSI based determination of antimicrobial resistance profile of *P. multocida* using microbroth dilution technique, isolation and characterization of *P. multocida* plasmid, detection of virulence genes of *P. multocida* by using RT-PCR, Genotyping of *P. multocida* by using Pulse field Gel Electrophoresis (PFGE), ELISA etc. Before joining UVAS, Dr Sarwar has served in Lahore Garrison University and The University of Lahore as Assistant Professor in Microbiology Department. Along with teaching activities, she also has supervised M.Phil, MS and B.S students.



TITLE:

MICROBIOLOGICAL PROFILE AND QUALITATIVE SCREENING OF ANTIMICROBIAL DRUG RESIDUES IN COMMERCIAL POULTRY MEAT

Abstract

This study was aimed for microbial examination and to determine antimicrobial drug residues in commercial chicken meat. 50 samples (liver and muscle) were collected randomly from different broiler meat shops in Lahore. Samples were analyzed for total viable bacterial count and total coliform count and were subjected to detection and identification of microorganisms by inoculation on different culture media and by different biochemical tests. Antimicrobial residues were detected by disc diffusion method. Two plate method was used by using *E.coli* ATCC25922 and *Pseudomonas* ATCC2785. The presence of antibiotic residues in the sample was indicated by the presence zone of inhibition diameter of 2 mm or more. Six different species of bacteria such as *E.coli* (68%), *Klebsiella* (44%), *Salmonella* (40%), *Shigella* (30%), *S. epidermis* (6%) and *Pseudomonas* (42%) were isolated. Liver samples showed highest percentage of positive samples for antimicrobial residues i.e. 48% for *E.coli* and 52% for *Pseudomonas*. While 15% of muscle samples were found positive. The routine screening of antimicrobial residues as well as awareness among farmers about the misuse of drugs is needed to avoid any effect on public health.

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Mr. Faisal Hussnain is a PhD Scholar and working as lecturer in the Department of Poultry Production, UVAS, Lahore. His area of expertise is poultry processing and in his PhD research he has been working on Meat Quality and physiological response as influenced by transportation distance, crating density, and climatic indices.



TITLE:

LOSSES ASSOCIATED WITH BROILER TRANSPORTATION DISTANCE AND CRATING DENSITIES DURING SUMMER SEASON IN PAKISTAN

Abstract

Transportation of broilers from different localities to the processing plants is a critical step in farm to fork chain and any disturbance in this chain may result into worst consequences. Keeping this scenario in view, a study was conducted to determine the extent of losses at different transportation distance (~ 80, 160, 240 km) and crating densities (10, 12, 15 birds/crate) during hot and humid summer in Pakistan. The uniform weight birds were picked from a farm and placed in plastic crates and transported in commercial trucks. Body weight loss and dead on arrival % increased significantly while carcass yield % decreased with the increase in transportation distance above 80 km and crating density above 10 birds. A significant increase in serum catalase concentration was observed when birds were transported for more than 160 km at crating density of more than 12 birds per crate. In meat quality parameters, significantly higher drip loss %, thaw loss %, cooking loss %, and shear force were observed in birds transported up to 240 km along with reduction in marinade retention capacity of meat. While different crating densities did not show any effect on meat quality parameters. Thus, transportation below 80 km and crating density, below 12 birds/crate, during hot and humid weather may be considered as less stressful for broilers. The developing processing industry also needs to establish future projects in such a way that birds need to travel a minimum.

Dr. Shahid Waheed

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Key Note Speaker:

Dr. Shahid Waheed, BSc. (Hons) A.H graduate and MSc. (Hons) Animal Nutrition in 2001 from University of Agriculture Faisalabad. Had been part of most reputed feed mill industry (SB, Islamabad, Kashmir and Sind Feeds) from last 18 years. Recently, in 2018, he has completed PhD in Food Science & Technology from University of Karachi. He is an experienced nutritionist and speaker at different local and international forums.



TITLE:

BROILER CHICKEN AND EGGS ARE BEST PROTEIN AND SAFEST FOOD

Abstract

According to many reports on food and nutrition, millions of people in Pakistan are protein deficient. Stunted growth reported in almost 40 % children. Unfortunately consumption of eggs and broiler meat in Pakistan is very low and major factor is the consumer education. Poultry products are economical meat proteins which can eliminate nutritional deficiencies. Statistics show that poultry products are better than other foods in nutrition, density, health, safety, availability and constant quality. During last twenty years, poultry production has improved in skill, management, biosecurity, genetic diversity, health, meat processing and scientific research. Feed mills are best in technology and quality control systems, managed by professional nutritionists. Feed mill laboratories of prime standards are can analyze proteins, energy, fats, amino acids, fatty acids, vitamin and minerals in ingredients and feed. Feed safety, mycotoxin detection, microbial testing and toxic chemical traceability are basic parameters in current laboratory screening. Research is continued for in-vivo trials to assure quality of meat. In labs, eggs and meat are analyzed for nutritional, microbial and anti-nutritional status, so as to make sure safest poultry product for consumers. Coordination among media, government and poultry industry may increase export of valuable chicken products.

Ms. Saba Sana

Lecturer

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Saba Sana has been working as Lecturer in Department of Microbiology, University of Veterinary & Animal Sciences Lahore, Pakistan since November 2017. She holds BS (Hons.) Applied Microbiology and M.phil Microbiology degrees. She is gold medalist in BS (Hons.) session (2008-2012) and silver medalist in M.Phil session (2012-2014). Recently she completed her Ph.D (Microbiology). She participated in fifteen National/International workshops/conferences and has seventeen research articles published in national and international journals.



TITLE:

EVALUATION OF ANTIFUNGAL POTENTIAL OF PLANT ESSENTIAL OILS AGAINST AFLATOXIN PRODUCING *ASPERGILLUS FLAVUS*

Abstract

Aspergilli flavus isolated from home mixed poultry feed samples (n=40) were identified and confirmed by macroscopic, microscopic characters and polymerase chain reaction. Toxin producing *A. flavus* isolates were screened by Thin Layer and High-Performance Liquid Chromatography. Aflatoxin producing *A. flavus* (n=08) were optimized for biomass production under different physico-chemicals parameters; temperature, pH and substrates with varying concentrations. Essential oils of *Syzygium aromaticum*, *Elettaria cardamomum*, *Ferula asfetida*, *Allium sativum*, *Cuminum cyminum*, *Eucalyptus globulus*, *Cinnamomum verum* and *Curcum longa* were assessed for anti-fungal potential against aflatoxin producing *A. flavus* and minimum inhibitory concentrations of effective essential oils was calculated. Poultry feed samples (22/40) were harbouring aflatoxin producing *A. flavus* isolates. The highest mean biomass (8.84 ± 0.02 g) was produced by *A. flavus*-cpf15.1 at pH 6 in Sabouraud's dextrose broth at 22°C. Essential oils of *E. globulus*, *S. aromaticum* and *E. cardamomum* detected as antifungal and minimum inhibitory concentration were 1.30 ± 0.45 , 0.65 ± 0.22 and 2.60 ± 0.90 μ L /mL respectively. It was concluded that essential oils have potential to inhibit growth of aflatoxin producing *A. flavus*.

Ms. Huma Mujahid

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I am working as lecturer Biochemistry at University of Veterinary and Animal Sciences Lahore since 2011. I have supervised 10 MPhil students. I am also a PhD scholar and recently submitted my thesis. I have worked on my PhD research project in collaboration with Hi tech feeds private limited.



TITLE:

PROTECTIVE EFFECT OF YEAST SLUDGE AND WHEY POWDER AGAINST OCHRATOXICOSIS IN BROILER CHICKS

Abstract

The aim of the present study was to determine the detoxification potential of the food industry by-products such as yeast sludge (YS) and whey powder (WP) against harmful effects of ochratoxin A (OTA) on broilers. One day old broilers chicks (n=1250) were randomly divided into five groups replicated five times with each replicate having 50 birds. The experimental feed in different groups was as; group A (basal feed), group B (200ppb OTA), group C (200ppb OTA and 0.2% Dried YS), group D (200ppb OTA and 0.2% WP) and group E (200ppb OTA and 0.2% protomyc). OTA adversely affected body weight gain, feed consumption and feed conversion ratio (FCR) of broiler chicks. Haematobiochemical parameters such as alanine amino transferase (ALT), aspartate amino transferase (AST), and creatinine levels raised by OTA feeding were significantly ($P>0.05$) reduced in YS and WP supplemented group. Residues of OTA were detected in all the tissues studied, with highest levels observed in kidneys, YS and WP significantly reduced the tissue residues of OTA. In conclusion, present study suggested that addition of YS and WP in broilers feed reduce the harmful effects of OTA in broiler chicks as efficiently as protomyc a commercial mycotoxin binder.

Dr. Assad Ullah

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Senior Farm Manager in sharif poultry industry (since March 2010), PhD student in the department of Microbiology UVAS. Research work completed and thesis submitted.



TITLE:

IN-VIVO EVALUATION OF IMMUNE MODULATION ACTIVITY OF ETHANOLIC EXTRACT OF *EUCALYPTUS GLOBULUS* LEAVES IN BROILER CHICKS

Abstract

The study was designed to find immune modulation role of ethanolic extract of *E. globulus* leaves in broiler birds. The plant extract powder was added in poultry feed at rate of 700 mg per Kg of feed (dose rate determined through MIC, MTT-assay and *In-ovo* toxicity). Day old chicks (n=105) were divided into five groups, including antibiotic free feed (control), antibiotic, probiotic (commercial), *E. globulus* groups having 21 birds per group. Each group was divided into three replicates further (7 birds per replicate). Birds were vaccinated according to Pakistan poultry association (PPA) suggested broiler vaccination schedule against Infectious bursal disease (IBDV), Newcastle disease virus (NDV) and Avian Influenza virus (AIV). Weekly serum titers were calculated. ND and AI vaccine titers were determined through HI test method. Titers for IBD vaccine were calculated through commercially available ELISA kit. Geometric mean titer for ND vaccine at day 35 were highest for *E. globulus* extract (22.6) as compare to probiotic (12.1), antibiotic (3.5) and control group (8). Geometric mean titer for AI vaccine at day 35 were highest for *E. globulus* extract (26) as compare to probiotic (12.1), antibiotic (11.3) and control group (11.3). Weekly, titers for IBD were highest at 35th day of birds age for *E. globulus* (2641.22 ± 820.25) followed by probiotic (1595.72 ± 452.07) control (1643.30 ± 562.13) and antibiotic group (1437.58 ± 487.55). In conclusion, it was found that ethanolic extract of *E. globulus* has immune modulation activity in broiler chicks and its extract can be used to replace low level of antibiotics used in poultry feed.

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TITLE:

IN-VIVO EVALUATION OF GROWTH ENHANCING, D-XYLOSE ABSORPTION AND GUT VILLUS PARAMETERS OF ETHANOLIC EXTRACT OF *EUCALYPTUS GLOBULUS* LEAVES IN BROILER CHICKS

Abstract

This research study was designed to evaluate the growth enhancing effects of ethanolic extract of *E. globulus* leaves in broiler chicks. Total, 80 day old chicks were divided into four groups (20 birds per group). Each group was divided into four replicates further (5 birds per replicate were included). The plant extract powder was added in poultry feed with ratio of 700 mg per Kg of feed (dose rate based on cytotoxicity assay of ethanolic extract of *E. globulus* leaves). The experimental designed groups were composed of control (antibiotic free feed), antibiotic, probiotic and ethanolic extract of *E. globulus* powder group. Birds were vaccinated according to Pakistan Poultry Association (PPA) suggested broiler vaccination schedule. Weekly feed intake, weight gain and feed conversion ratio (FCR) were measured for each group. Average weight at 35th day of age was highest for *E. globulus* extract group (1794.00 ± 67.28), followed by probiotic (1734.00 ± 38.62), control (1654.50 ± 113.10) and antibiotic group (1647.50 ± 74.41). Weekly FCR was found highest for *E. globulus* extract (1.63) followed by probiotic (1.69), antibiotic (1.79) and control (1.88). To determine, the gut nutrient absorption capacity of the experimental groups, D-xylose test was performed at 0, half, one, and one and half hour. The experimental groups designed were, negative control, positive control, antibiotic, probiotic and *E. globulus* extract group. In half an hour the D-xylose concentration in plasma was found highest for *E. globulus* extract group (75.80 ± 5.55), followed by probiotic (62.82 ± 6.86), antibiotic (55.70 ± 5.41), control positive (43.40 ± 10.86) and control negative group (6.95 ± 2.49). To ascertain the, histological changes in gut villus, the experimental groups were divided into control, antibiotic, probiotic and *E. globulus* extract group. The villus parameters (μm) considered were villus height, villus width, crypt depth, villus height: crypt depth, villus surface area. The research data showed that there was comparative increase in villus height, width and surface area in *E. globulus* group as compare to other experimental groups. In conclusion, it is evaluated from the designed research study, that ethanolic extract of *E. globulus* can be used in poultry feed to replace use of low level of antibiotics used as a growth promotor. The research data, revealed that *E. globulus* has growth enhancing effects in broiler chicks. It also improves FCR of birds. It has role in fast absorption of nutrients. It also augments villus height, width and surface area.

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TITLE:

BIOLOGICAL DETOXIFICATION OF AFLATOXINS BY USING PROBIOTIC STRAINS OF LACTOBACILLI

Abstract

Aflatoxins are toxic secondary metabolic products of fungi and lactobacilli have the potential to bind the aflatoxins *in-vitro*. For this study characterized probiotic lactobacilli (n=5) and toxigenic *Aspergillus flavus* (n=5) were used. Source of lactobacilli was yogurt. Microscopy and biochemical tests were applied just to ensure the strains. Thin layer chromatography (TLC) was performed to screen the *A.flavus* for toxins production and fungal isolates were confirmed by polymerase chain reaction (PCR). Lactobacilli were screened for antifungal activity against *Aspergillus flavus* on Sabouraud's dextrose agar (SDA). Effect of lactobacilli on biomass and aflatoxins production of *Aspergillus flavus* was checked by co-culturing lactobacilli and *A.flavus* in three different media (yeast extract sucrose broth, De Man Rogosa and Sharp broth, Sabouraud dextrose broth). Biomass was calculated in grams and aflatoxins quantity was determined by HPLC. Binding capacity of lactobacilli spp was determined by adding a known quantity of aflatoxins with standard inoculum of lactobacilli. Quantity of unbound toxins was determined by HPLC and percentage reduction was calculated. On the basis of results *Lactobacillus delbrueckii* gave 100% reduction for aflatoxins (AFB₁, AFB₂, AFG₁ and AFG₂). *Lactobacillus fermentum* (FY₁, FY₂ and FY₃) reduced the aflatoxins production when they were co-cultured with *A.flavus* but lactobacilli did not cease (reduce) the biomass production in YESB and SDB and no biomass production in MRSB. These lactobacilli with ability to bind aflatoxins and mitigate its production *in vitro* should be evaluated for their binding capacity *in vivo* and might be used as bio-control agent and toxin binder in poultry feed.

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TITLE:

EVALUATION OF *EUCALYPTUS GLOBULUS* FOR ANTIMICROBIAL ACTIVITY AGAINST MULTI-DRUG RESISTANT BACTERIA ISOLATED FROM POULTRY

Abstract

Antimicrobial resistance is a global health threat. Antimicrobial resistance may transfer from poultry pathogens to human pathogens. It is a dire need of time to develop some alternates to combat the resistant bacteria. It is a hope that plant's essential oils have antimicrobial effect. Essential oil from *Eucalyptus globulus* was evaluated for antimicrobial effect against poultry isolates of *Escherichia coli*, *Salmonella enterica* and *Clostridium perfringens* type A (n=10, each). Antibiotic resistance profile of isolates was checked by disk diffusion assay and zones of inhibition were measured. Leaves from *E. globulus* were processed for extraction of essential oil by steam distillation. Antibacterial activity of *E. globulus* oil was determined against MDR poultry pathogens by well diffusion method. Minimum Inhibitory Concentration of essential oil having antimicrobial activity against MDR isolates was performed by broth micro dilution method. Cytotoxicity of *E. globulus* oil was assessed through 3-(4,5-Dimethylthiazol-2-Yl)-2,5-Diphenyltetrazolium Bromide (MTT) assay. GC-MS analysis of essential oil was also performed. Essential oil of *E. globulus* showed antimicrobial activity against *E. coli* (Mean ZOI, 16.6mm), *S. enterica* (Mean ZOI, 16.4mm), *C. perfringens* (Mean ZOI, 13mm). The mean MIC against *E. coli*, *S. enterica* and *C. perfringens* were 6.25, 6.25 and 25 μ L respectively. The concentration of *E. globulus* up to 12.5uL was considered safe in MTT assay. Essential oil of *E. globulus* will be available to control the diseases caused by *E. coli*, *S. enterica* and *C. perfringens* type A in poultry field.

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TITLE:

ACTIVITY OF ESSENTIAL OILS OF DIFFERENT MEDICINAL PLANTS AGAINST *E.COLI* AND *S.AUREAU* ISOLATED FROM POULTRY FEED

Abstract

Poultry feed is mostly composed of cereals, seed products, legumes and phytate (salt of phytic acid). The aim of the present study was to determine the activity of Plants essentials oils against *S.aures* and *E.coli*. Total (n=40) poultry feed origin sample were identified by colony morphology, microscopic characters and biochemical testing. The phenotypically identified *S. aureus* and *E. coli* isolates were screened for antibiotic susceptibility against amoxicillin, ampicillin cefixime, ceftriaxone, ciprofloxacin, gentamicin, nalidixic acid, co trimoxazole and tetracycline. The *E.coli* and *S. aureus* showed high resistant (100 percent) against penicillin, ampicillin, amoxicillin and Cefixime and 70 percent resistant against tetracycline, ceftriaxone, Co-trimoxazole and gentamicin was determined. Essential oils of Hing (*Ferula asafetida*), Haldi (*Cercum longa*), Laung (*Syzgium aromaticam*) and laychi (*Elettaria cardamom*) were evaluated for antibacterial activity by well diffusion method. Zones were measured in millimeters. Out of four commercially available essential oils laung (ZOI 17 and 16 mm) and laychi (26mm ZOI) have greatest antibacterial activity against *S. aureus* and *E. coli* (ZOI, 16mm, 27mm) isolates of poultry feed. The minimum inhibitory concentration (MIC) was determined by micro broth dilution method and mean MIC values for *S. aureus* and *E. coli* were ≥ 0.47 - ≥ 0.47 ul/mL and ≥ 0.19 - ≥ 0.156 respectively. The Concentration of essential oil was detected as safe upto 5ug/mL-0.091ul/mL essential oil of Laung (*Syzgium aromaticam*) and the concentration of laychi (*Elettaria cardamom*) 12.5ul/mL to 0.097ul/mL was detected as safe. Essential oils have antibacterial activity against poultry feed isolated to control the diseases caused by *S. aureus* and *E. coli*.

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Gull Naz has been working as Lecturer in Department of Microbiology, Government College University Faisalabad, Pakistan. She holds B.E.M.S and M.phil Microbiology degrees. She completed her M.phil (Microbiology) from University of Veterinary and Animal Sciences Lahore Pakistan and got silver medal.



TITLE:

MOLECULAR CHARACTERIZATION AND ANTIFUNGAL SUSCEPTIBILITY OF OCHRATOXIN A PRODUCING FUNGI ISOLATED FROM POULTRY FEED TO ESSENTIAL OILS

Abstract

Occurrence of Ochratoxin A producing fungi in poultry feed is common problem and a potential hazard to poultry. There is a need to control fungal growth to improve the quality of feed. Essential oils (Garlic, turmeric, Black seed, Eucalyptus, Clove, Cumin, Cardamum and Cinnamon oil) were evaluated for antifungal activity against ochratoxin A producing fungi isolated from poultry feed and feed ingredients (n=120). The fungi were characterized by macroscopic and microscopic characters followed by polymerase chain reaction. Ochratoxin A production was detected by thin layer chromatography and High-performance liquid chromatography. A total of 1842 fungal isolates were recovered and *A. ochraceous*, *A. terreus*, *A. parasiticus* and *A. carbonarius* were detected as ochratoxin A producing fungi. Among tested essential oils Cumin, Cinammon, Clove and Cinammon showed antifungal activity against *A. ochraceous* ($33.67 \pm 0.57\text{mm}$), *A. parasiticus* ($24.00 \pm 2.00\text{mm}$), *A. carbonarius* ($34.67 \pm 0.57\text{mm}$) and *A. terreus* ($54.67 \pm 0.57\text{mm}$) by well diffusion. The lowest minimum inhibitory concentration determined by micro-broth dilution method was 0.52 ± 2.2517 , $1.04 \pm .45\text{ug}$ of cinammon, $1.04 \pm .45$ and $0.65 \pm .22\text{ug}$ of clove against *A. ochraceous*, *A. parasiticus*, *A. carbonarius* clove, *A. terreus* respectively. It was concluded that essential oils have ability to inhibit Ochratoxin A contaminating fungi of poultry feed.

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TITLE:

ANTIFUNGAL ACTIVITY OF COMMONLY AVAILABLE DISINFECTANTS AGAINST OCHRATOXIN A PRODUCING FUNGI

Abstract

Ochratoxin is the most common contaminant of poultry feed. A total of (n=120) samples of poultry feed (Home mixed, commercial pelleted and commercial mesh) and feed ingredients (wheat, maize and rice) were evaluated for fungal load and occurrence of ochratoxin A producing fungi. Colony forming units of fungi recovered from home mixed, commercial mash, commercial pellet, rice, maize and wheat recorded were 1.41×10^2 - 9.12×10^2 , 1.00×10^2 - 1.05×10^3 , 1.82×10^1 - 1.32×10^2 , 2.88×10^2 - 4.79×10^3 , 3.63×10^3 - 7.94×10^4 and 1.82×10^3 - 1.78×10^4 , respectively. The highest mean fungal count was observed in maize grains (2.37×10^4 CFU/g) and the lowest in stored rice (1.98×10^3 CFU/g). The fungal genera identified were *Aspergillus*, *Penicillium*, *Mucor*, *Alternaria*, *Cladosporium* and *Fusarium*. The highest numbers of isolates were *Aspergillus* species (n=1842). *A. fumigatus* was predominant specie (53.92%) followed by *A. flavus* (27.84%), *A. niger* (13.63%), *A. parasiticus* (0.44%) and *A. terreus* (0.17%). The other genera less frequently isolated were *Fusarium* (0.12%), *Mucor* (1.94%) and fungi from *phaeoid* group (0.38%). Each of the pure fungal isolate was screened for ochratoxin A production. The ochratoxin A (OTA) was detected using Thin Layer Chromatography TLC. Among total isolates 2.2 percent isolates were found positive by TLC and HPLC. These isolates were of *A. ochraceous*, *A. carbonarius*, *A. parasiticus* and *A. terreus*. Highest percentage of ochratoxin A producing fungi were found in stored rice (9.37%) followed by wheat grains (6.25%), commercial mashed poultry feed (5.07%), commercial pelleted poultry feed (4.34%), home mixed poultry feed (1.70%) and maize grains (0.34%) respectively. Antifungal activity of commercially available disinfectant (quaternary ammonium compounds, biguanides, hypochlorite and isopropanol) was evaluated by well diffusion and log reduction was calculated. Among tested commercial disinfectants Distel high level medical instrument and Descoeidantiseptical (quaternary ammonium compounds and biguanides) were found most effective against ochratoxin producing fungi.

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Ms. Fatima Malik is a microbiologist with BS Hons degree in Applied Microbiology from Department of Microbiology, UVAS with excellent grades. After BS she did her M. Phil Microbiology with thesis on "Isolation, characterization and transferability of antibiotic resistance enterococci of poultry gut origin" from UVAS, Lahore. During her post-graduation she won a scholarship under the Pakistan Scottish scholarship scheme for women 2018 from British Council on the basis of excellent research. She is aspiring to decipher the antibiotic resistance mechanisms in bacteria and development of alternatives of antibiotics for control of bacterial pathogen of poultry and human importance.



TITLE:

ENTEROCOCCI IN POULTRY GUT – A POTENTIAL ANTIBIOTIC RESERVOIR

Abstract

Enterococcus is a normal inhabitant of gastrointestinal tract of humans and animals and it has been emerged as a significant antibiotic resistant nosocomial pathogen because extended use of drugs produces antimicrobial pressure not only on pathogenic but also on commensal organisms. Current study was undertaken to determine the antibiotic resistance pattern of *Enterococcus spp.* recovered from broilers in Lahore and analyze the antibiotic resistance genes harbored by isolated strains along with the study of transfer potential of antibiotic resistance from resistant enterococci to susceptible pathogenic *Staphylococcus aureus* *in vitro*. Enterococci were isolated from 118 poultry cloacal swab samples collected from different meat shops of Lahore. Prevalence of *Enterococcus faecalis* and *Enterococcus faecium* recovered from broilers, as detected by PCR, was 58% and 33% respectively demonstrating that *E. faecalis* is the pre dominant specie in broilers followed by *E. faecium*. The prevalence of antibiotic resistances in enterococci was lincomycin (97%), tetracycline (86%), erythromycin (77%), streptomycin (76%), doxycycline (51%), penicillin (26%), chloramphenicol (26%), amoxicillin (17%), ciprofloxacin (15%), augmentin (12%) and vancomycin (10%). Over 80% isolates were found multidrug resistant (MDR) enterococci. On the basis of PCR analysis, the occurrence of *erm(B)* and *tet(M)* genes was 100 % in all isolates which were phenotypically resistant to erythromycin and tetracycline respectively. Only 9 strains of enterococci were found resistant to vancomycin-VRE and 4VRE were classified as *Enterococcus faecalis* *van (B)* indicating that only 44% of VRE harbors *van (B)* gene. Resistant gene *van (A)* was not examined in any VRE. Acquired antibiotic resistance has been scattered and distributed throughout enterococci via horizontal transfer of antibiotic resistant genes by conjugative plasmids. Erythromycin resistance was transferred from resistant *E. faecalis* to susceptible pathogenic *Staphylococcus aureus* in broth mating experiment proving that *Enterococcus* acts as a good donor of acquired antibiotic resistance to susceptible pathogenic organisms that indirectly infects humans through food chain. The development of acquired and transferable antibiotic resistance in commensal bacteria of poultry evoked a major horrific threat to human beings

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Mr. Adnan Mehmood is currently a PhD Scholar in the department of Microbiology UVAS, Lahore. He is working as a Research Associate in HEC funded research project. He is Post Graduated from University of Agriculture Faisalabad from the institute of Microbiology. During his MPhil studies he explored the “Public health concerns of *Legionella pneumophila* in District Faisalabad”. Now he is working on alternative approaches to control Salmonellosis in Poultry.



TITLE:

ALTERNATIVE APPROACHES TO CONTROL SALMONELLOSIS IN POULTRY

Abstract

Salmonellosis is a bacterial disease of poultry that caused huge economic losses worldwide. It is caused by *Salmonella* and mortality rate in chicken affected with this agent can reach up to 90%. In developed countries this disease has been eliminated while developing countries are still facing this problem due to the lack of effective control measures. *Salmonella gallinarum* is poultry specific and rarely cause illness in humans. It occurs in chicken of any age and the affected birds represent the sign of less feed intake, yellowish green diarrhea, high fever and enervation. In newly hatched chicks its transmission occur via contaminated egg and by contaminated equipment and materials such as egg trays, manure, litter, clothes, feed and from the carcasses of birds. Various methods have been used to control salmonellosis in poultry which include antibiotic therapy, biosecurity practices and effective vaccination programme. The large scale use of antibiotics in poultry industry has led to the emergence of multidrug resistance *Salmonella* which can be transmitted to human via consumption of contaminated food. Probiotics, nanoparticles and bacteriophages are an alternative approaches to antibiotics which can be used to control *Salmonella* infection in poultry. Probiotics are good bacteria which when given in appropriate amount provides a health benefit to host. Probiotics in drinking water inhibits the colonization of *Salmonella* in intestine of newly hatched bird. Commonly two types of microbial flora colonized the gastrointestinal tract in animals, named as beneficial and pathogenic microbes. Harmful microbes are potentially pathogenic to host while beneficial microbes developed symbiotic association with host. Under normal circumstances, the beneficial microbes predominate and prevent the colonization of pathogenic bacteria to gastrointestinal tract, supply nutrients to host and increased the nutrients digestibility ratio. In recent years the natural compounds of medicinal plant extracts such as cinnamon oil, oregano oil and clove oil have gained more importance. These compounds possess antimicrobial activity and can be used to control *Salmonellosis* in poultry.

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I am currently working as Associate Professor and Chairman, Department of Microbiology, Government College University Faisalabad. I have total 15 years of teaching and research experience in the field of Microbiology. Author of about 70 impact factor research publication and supervised 04 PhD and 30 MPhil students as major supervisor. My areas of research are molecular virology, Vaccinology, cell culture and antimicrobial resistance.



TITLE:

EVALUATION OF ALOE VERA POLYSACCHARIDES AS IMMUNO-STIMULANT AGAINST ESCHERICHIA COLI INFECTION IN POULTRY

Abstract

Avian colibacillosis caused by *Escherichia coli* is the most common bacterial infection in poultry. Due to high morbidity and mortality, it results in huge economic losses in poultry industry. The irrational use of antibiotics in poultry results in resistance to disease causing microorganism, now world is moving towards plant treatment. Therefore present study was designed to evaluate *A. vera* polysaccharides as an immunomodulatory agent against colibacillosis in chickens. *E. coli* was isolated and characterized from different outbreak cases of colibacillosis and identified by using API-20E kit. *A. vera* polysaccharides were isolated from *A. vera* leaves and adjusted in graded doses. The effects of *A. vera* polysaccharides as an immunomodulatory agent were evaluated in broiler chickens. Results exhibited a significant ($p < 0.05$) lymphoproliferative response to PHA-P in chickens supplemented with *A. vera* in comparison to control group. Carbon particle clearance assay revealed significantly greater clearance index (K) in control group and phagocytic index (α) revealed significantly greater response in all 3 polysaccharides supplemented groups in comparison to control. Total Igs, IgM and IgG titers were also significantly higher in groups supplemented with *A. vera* polysaccharides. Polysaccharides supplemented chickens revealed improved weekly weight gains in comparison to control group. On challenge with pathogenic *E. coli* greater protection was observed in all polysaccharides supplemented groups. It was concluded that *A. vera* polysaccharides may be used as an immunomodulatory agent against colibacillosis in poultry as an alternate to antibiotics.

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I am currently working as Associate Professor and Chairman, Department of Microbiology, Government College University Faisalabad. I have total 15 years of teaching and research experience in the field of Microbiology. Author of about 70 impact factor research publication and supervised 04 PhD and 30 M.Phil students as major supervisor. My areas of research are molecular virology, Vaccinology, cell culture and antimicrobial resistance.



TITLE:

USE OF *ALOE VERA* POLYSACCHARIDES AS IMMUNO-STIMULANT AGAINST *SALMONELLA* INFECTIONS IN POULTRY

Abstract

Salmonella is an important group of pathogens responsible for human and animal diseases. Salmonellosis is one of serious problem in the poultry industry of the world especially in the developing countries like Pakistan. The irrational use of antibiotics in poultry results in resistance to disease causing microorganism, therefore now world is moving towards plant treatment. Thus present study was conducted to evaluate *Aloe vera* polysaccharides as an immunomodulatory agent against Salmonellosis in chickens. For the isolation and detection of *Salmonella*, Salmonella Shigella agar was used. Biochemical confirmation was done using API 20E. Results revealed that chickens supplemented with *A. vera* polysaccharide showed a significantly higher lymphoproliferative response ($p < 0.05$) to Phyto haemagglutinin-P as compared to control group. Carbon particle clearance assay revealed a significantly high clearance index (K) and phagocytic index (α) revealed significantly high response in all three *A. vera* administered groups. The total Immunoglobulins (Igs), IgG and IgM titers were significantly higher in *A. vera* supplemented groups. Weekly weight gains were also highly significant ($p < 0.05$) in all treatment groups in contrast to control. The current study showed *A. vera* has the potential to be used as immunomodulatory agent in future as an alternate to antibiotics in poultry birds.

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Dr. Muhammad Adil Rasheed is serving as Assistant Professor in the Department of Pharmacology and Toxicology, UVAS and holds PhD in the discipline of Pharmacology and Toxicology. He has over 15 years of teaching, research and administrative experience. He developed a chromatography laboratory in the Department. He has won two research grants as Co-Principal Investigator from HEC and Ministry of Health Pakistan. He has supervised 31 post graduate students and served as member of supervisory committees for more than 35 students. Dr. Adil has published 21 research papers in national and international impact factor journals. He is the author of eight national and international books. He has more than 40 articles published in various national newspapers and veterinary magazines.



TITLE:

ANTIBACTERIAL AND CYTOTOXIC EVALUATION OF SEQUENTIAL EXTRACTS OF *EUCALYPTUS GLOBULUS* L. LEAVES AGAINST COMMON POULTRY PATHOGENS

Abstract

The aim of this study was to evaluate antibacterial activity of four sequential extracts (hexane, chloroform, ethanol and aqueous) of *Eucalyptus globulus* L. leaves against common poultry pathogens; *Staphylococcus aureus*, *Escherichia coli*, *Salmonella enterica*, *Clostridium perfringens* type A and *Haemophilus spp.* by agar well diffusion and microdilution method and results were compared using one way ANOVA. The mean zones of Inhibition (ZOI) showed by hexane, chloroform, ethanol and aqueous extracts against *Staphylococcus aureus* were 0.0mm, 19.3mm, 20.3mm and 23.3mm; against *Clostridium perfringens* type A were 14 mm, 22.3mm, 14.0mm and 15.3mm; against *Escherichia coli* were 0.0mm, 12.6mm, 13.3mm and 15.6mm; against *Salmonella enterica* were 10mm, 12.3mm, 18.6mm and 21mm; against *Haemophilus spp.* were 0.0mm, 8.6mm, 14mm and 18mm respectively and the mean minimum inhibitory concentrations (MIC) of hexane, chloroform, ethanol and aqueous extracts against *Staphylococcus aureus* were 0.00 µg/ml, 104.1 µg/ml, 32.55 µg/ml and 312.5 µg/ml; against *Clostridium perfringens* type A were 52.08 µg/ml, 39.06 µg/ml, 16.27 µg/ml and 312.5 µg/ml; against *Escherichia coli* were 0.00 µg/ml, 78.12 µg/ml, 260.4 µg/ml and 625.0 µg/ml; against *Salmonella enterica* were 13.02 µg/ml, 104.1 µg/ml, 130.2 µg/ml and 416.6 µg/ml; against *Haemophilus spp.* were 0.00 µg/ml, 104.1 µg/ml, 260.4 µg/ml and 416.6 µg/ml respectively. The MTT assay on Vero cell line showed that hexane extract was cytotoxic at concentration $\geq 312.5\mu\text{g/ml}$, chloroform extract at concentration $\geq 375\mu\text{g/ml}$, ethanol extract at concentration $\geq 625\mu\text{g/ml}$ and aqueous extract was cytotoxic at concentration $\geq 312.5\mu\text{g/ml}$. The replacement of the antibiotics with natural bioactive moiety may lead to cost-effectiveness of the therapy and can contribute towards minimization of the economic burden in the health care system of the developing countries.

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Iqra Nazir did her MPhil from Department of Microbiology of University of Veterinary and Animal Sciences Lahore. She is university color holder in the game of chess and represents UVAS at various national and international events. Her M.Phil research work is "In ovo evaluation of antiviral activity of herbal extracts against avian influenza virus and Newcastle disease virus".



TITLE:

IN OVO EVALUATION OF ANTIVIRAL ACTIVITY OF HERBAL EXTRACTS AGAINST AVIAN INFLUENZA VIRUS AND NEWCASTLE DISEASE VIRUS

Abstract

The emergence and spread of various pathogens results in devastating losses in economics of poultry industry. Antiviral drug resistance became an emerging issue. Multiple mutations and insufficient inhibition of viral replication by antiviral drugs are major factor towards high level of resistance in viruses. With passage of time, frequencies of viral resistance to antiviral drugs are increasing. Influenza viruses cause recurrent epidemics in human, animals and poultry results in high morbidity and mortality. Similarly, Newcastle disease (ND) is also considered as major threat related to poultry industry. Due to antimicrobials failure, search for natural products is focused by researchers as source of new bioactive molecules to treat viral infectious diseases. The natural products are preferred for treatment of various infections as an alternate source because of its least side effects.

In the present study, antiviral activity of seven different flowers ethanolic extracts named as *Rosa damascena* Miller, *Achillea millefolium*, *Woodfordia fruticosa* Kurtz and *Bombax ceiba* L. = *bombax melabaricum*, *Taxacum officianale* weber, *Hyssopus officianalis* and *Chrysanthemum cinerifolium* was examined against Avian Influenza virus (H9N₂) and NDV. Chemical constituents of each flower were analyzed through GC-MS. The antiviral activity was determined in ovo through chicken embryonated egg inoculation. The current results reveal that ethanolic extracts of these flowers possess strong antiviral activity because of active ingredients in them.

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I am Muhammad Rizwan Younis, Student of MPhil Pathology In University Of Veterinary And Animal Sciences Lahore. My Research Topic Is "A Study on Anticoccidial Effect of Garlic (*Allium sativum*) And Turmeric (*Curcuma Longa*) In Broiler Birds". I Completed My Doctor Of Veterinary Medicine Degree From University of Agriculture Faisalabad In 2017. I Belong To Okara District of Punjab.



TITLE:

GARLIC (*ALLIUM SATIVUM*) AND TURMERIC (*CURCUMA LONGA*) HAS ANTICOCCIDIALS EFFECTS AND CAN BE USED AS ALTERNATIVE TO OTHER COCCIDIOSTATS IN BROILER BIRDS

Abstract

The present study was intended to compare the efficiency of prebiotics Turmeric (*Curcuma longa*), Garlic (*Allium sativum*) and conventional anti coccidial against coccidiosis in commercial broiler. A total of 225 broiler birds were reared and separated into 9 groups .Birds were fed starter and finisher commercial basal diet with TURMERIC and GARLIC powder at doses of 05 and 10 g/litre as per experimental protocol.

Group A and Group B were negative and positive control respectively. Group C was given no infection but garlic powder was given from 1st day @ 5g/litre of drinking water. Group D was given infection at day 14th and garlic powder was given from 1st day @ 10g/litre of drinking water. Group E was given infection at day 14th and garlic powder was given after 24hrs of infection @ 10g/litre of drinking water. Group F was given no infection but turmeric powder was given from 1st day @ 5g/litre of drinking water. Group G was given infection at day 14th and turmeric powder was given from 1st day @ 10g/litre of drinking water. Group H was given infection at day 14th and turmeric powder was given after 24hrs of infection @ 10g/litre of drinking water. Group I was given infection at day 14th and Amprolium was given after 24hrs of infection @ 1.25g/litre of drinking water.

All chicks were subjected to the oocysts index, total leucocytic count and histomorphology of ceca. The present study revealed the results of EPG (egg per gram) count of group D (538 ± 60.0^a) and group G (1150 ± 96.8^b) at 7th day post infection and groups D and G were fed garlic and turmeric from day one respectively. EPG count of group D showed results which were statistically significant from the group G. Similarly, results obtained at day 7th of group E, H and I treated with garlic, turmeric and amprolium post infection respectively were (650 ± 86.6^c), (1250 ± 96.8^b) and (600 ± 66.1^c) respectively. These results of 7th day showed that garlic and amprolium treated groups depicted significant results than turmeric treated groups. Similarly, results obtained at 9th day showed that group D (350 ± 61.2^c) exhibited significant results

than group G (750 ± 86.6^b) when garlic and turmeric were given at day one. Likewise, results of group E (300 ± 61.2^c), H (950 ± 61.2^b) and I (288 ± 60.0^c) given garlic, turmeric and amprolium post infection showed that group E and I showed almost same results and these results were significant than group H. However, group B which was control positive showed highest count at day 7 (2750 ± 86.6^b) and day 9 (4750 ± 66.1^b). The present study revealed the results of TLC (total leucocytic count) of group D (29000 ± 563.4^b) and group G (27500 ± 452.7^b) at 17th day post infection fed garlic and turmeric from day one respectively. TLC count of group D and G showed non-significant results but the count of group D was bit higher than group G. Similarly, results obtained at day 17th of group E, H and I treated with garlic, turmeric and amprolium post infection respectively were (37500 ± 560.7^d), (34300 ± 547.7^c) and (35200 ± 458.2^c) respectively. These results of 17th day showed that garlic treated group depicted significant results than turmeric and amprolium treated groups. Similarly, results obtained at 27th day showed that group D (35500 ± 567.8^b) and group G (32800 ± 412.3^b) showed non-significant results when garlic and turmeric were given at day one. Likewise, results of group E (55600 ± 556.7^d), H (47000 ± 583.0^c) and I (49200 ± 526.7^c) given garlic, turmeric and amprolium post infection showed that group E showed significant results than turmeric and amprolium treated group. However, group B which was control positive showed TLC at day 17th (38500 ± 665.2^d) and highest count at day 27th (76500 ± 471.6^e). Thus, from our results it was concluded that between garlic and turmeric, significant results were shown by garlic and these results of garlic were even higher than of amprolium. The present work also showed the histopathological examination of ceca from all the groups. . In groups A, C and F normal villi were present because these were non-infected. In group B which was control positive, infiltration of inflammatory cells and necrosis was evident. In garlic treated groups D and E, sloughing of epithelial lining and necrotic debris was marked. Similarly in turmeric treated groups G and H, vacuolations, degenerative changes in villi and mild haemorrhages in mucosa was seen in group G whereas in group H, congestion in serosa and mild haemorrhages were obvious. In amprolium treated group I, necrosis in mucosa was seen villi were not normal. Results showed that garlic treated groups showed significant results as compared to that of turmeric treated groups. Oocysts counts of garlic treated groups were comparable to that of amprolium treated group. Garlic @ 10 g/litre showed more significant results than 05 g/litre.

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The presenter is PhD scholar at the Department of Microbiology, Government College University Faisalabad. He is working under the domain of antimicrobial resistance among *E. coli* isolates from Broiler birds in different regions of Punjab, Pakistan. The presenter has completed his DVM and MPhil Microbiology from University of Agriculture, Faisalabad and worked in the similar domain. Further, he has published some of his previous data in International Journal "Eco Health" (Impact Factor: 2.69) regarding antimicrobial resistance among different migratory birds in Pakistan.



TITLE:

DISTRIBUTION OF ANTIBIOTIC RESISTANCE GENES AMONG *ESCHERICHIA COLI* ISOLATES FROM BROILER CHICKENS

Abstract

Escherichia coli belong to family *Enterobacteriaceae* and is a Gram negative rod shaped non-motile bacterium. *E. coli* is normally present at the lower parts of Gastro Intestinal Tract and is responsible for various disturbances including diarrhea and gastroenteritis, the bacterium also has zoonotic potential. Mutations and genetic variations among gastro intestinal *E. coli* result in resistance to various antibiotics. In the current study, a total of 50 fecal samples were collected from different broiler chickens farms from different regions of Punjab, Pakistan. The samples were processed initially on the MacConkey agar, Eosin Methylene Blue agar and CHROM agar for isolation of *E. coli*. Following the initial confirmation of *E. coli* through biochemical tests, the isolates were further confirmed and characterized by genomic amplification using PCR targeting the *E. coli* specific primers i.e. β -Glucoronidase (*uid*). All amplified DNA of *E. coli* were analyzed for antibiotic sensitivity profile using Muller Hinton agar according to EUCAST guidelines. Further, the extended spectrum β -lactamases (ESBLs) producing *E. coli* were detected. The antibiotic resistance genes were characterized including *aadA1*, *aac(3)-IV*, *sul1* and *qnrA* genes which were responsible for resistance to streptomycin, gentamicin, sulfonamides, tetracycline and quinolones resistance respectively. The ESBL's genes like *bla-TEM*, *bla-CTX-M* were also characterized using PCR. 43 *E. coli* were confirmed phenotypically and 26 *E. coli* were confirmed genotypically using *uid* gene primers. Among 26 isolated *E. coli*, 13 were detected for resistant against different antibiotics phenotypically. Genotypically, 04 isolated *E. coli* were positive for gentamicin resistance, 06 isolated *E. coli* were positive for colistin sulphate resistance, 01 isolated *E. coli* was positive for streptomycin resistance, 07 isolated *E. coli* were positive for tetracycline resistance, 04 isolated *E. coli* were positive for *bla-TEM* gene. *Nobla-CTX-M* and quinolones resistance genes were found positive. All the amplified DNA products were sequenced and aligned homology using NCBI database. Altogether, the present data represents the current situation of high incidence of antibiotics resistance genes among *E. coli* isolates from broiler chicken in different regions of Punjab, Pakistan.

Dr. Sajida Naeem

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Miss Sajida Naeem is DVM graduate of University of Veterinary and Animal Sciences Lahore. Currently she is pursuing her M. Phil in discipline of Physiology in the same institute. She has conducted her M. phil. research on poultry under the research area of Basic and applied physiology. She has also joined department of Physiology as teaching assistant in August 2017 and serving the same post to date



TITLE:

SINGLE AND COMBINED EFFECTS OF CHROMIUM AND CHITOSAN SUPPLEMENTATIONS ON GROWTH PERFORMANCE, VISCERA DEVELOPMENT, AND SERUM METABOLITES IN BROILERS

Abstract

Present research was aimed to evaluate the single and combined effects of chromium and chitosan supplementations on growth performance, viscera development and serum metabolites in the broilers. A total 160, one-day old broiler chicks were randomly divided into four groups. Each group was replicated five times (n=8). Group-A served as control and was fed corn soya-bean based diet. Groups-B, -C, and -D were supplemented with 1200 µg/kg chromium chloride (CrCl_3), 1g/kg chitosan, and 1200 µg/kg CrCl_3 +1g/kg chitosan, respectively, for 35 days. Feed intake was measured daily, while weight gain and feed conversion ratio (FCR) were calculated weekly. On day 35, two birds per replicate were randomly slaughtered to collect blood and organs for biochemical analysis and relative viscera weights and lengths determination, respectively. Weight gain, feed intake and FCR remained unaffected. Relative viscera weights and lengths were also found unaffected except for the relative weight of caecal tonsils and length of small intestine that were increased ($P<0.05$) with chitosan supplementation only compared with the control group. Serum metabolites (glucose, liver enzymes, serum proteins, creatinine, and uric acid) remained unchanged but the serum albumin was increased ($P<0.05$), while the serum globulins ($P=0.09$) tended to decrease with supplementation of chitosan alone and also in combination. In conclusion, chromium and chitosan supplementations alone or in combination did not improve the growth performance but chitosan alone improved the small intestine length and weights of selected immune organs.

Mr. Muhammad Furqan Shahid

PhD Scholar

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Muhammad Furqan Shahid has completed his Doctor of Veterinary Medicine from Bahauddin Zakariya University Multan in 2012. He has done MPhil in Pathology from University of Veterinary and Animal Sciences, Lahore in 2016. Now he is doing his PhD in Microbiology from UVAS, Lahore. He is working as Research Associate in Department of Microbiology from October, 2015. He has completed different projects under the kind supervision of Prof. Dr. Tahir Yaqub. His research interest is the molecular identification and phylogeography of emerging viruses like Influenza, Crimean-Congo Hemorrhagic Fever Virus, West Nile Fever Virus, Chikungunya Virus and Dengue Virus.



TITLE:

PATHOGENIC POTENTIAL OF THREE AVIAN INFLUENZA A/H9N2 VIRUSES ISOLATED FROM COMMERCIAL, BACKYARD AND FANCY BIRDS

Abstract

Poultry industry is confronting numerous viral infections particularly low pathogenic avian influenza virus (LPAIV) H9N2, which can bring exceptional abatement in trade of poultry products in endemic countries such as Pakistan. The current study was conducted to evaluate the infectious and antigenic potential of three different AIV (A/H9N2) variants isolated from commercial, backyard poultry and fancy birds (partridge). Commercial broiler birds were infected experimentally at the dose of 10^6 EID₅₀ by using these three isolates. Results revealed that onset of clinical signs was started at 2nd day post infection (DPI) followed by severity in redness and swelling of eyes, sneezing and lacrimation at 3rd DPI that lasts up to 5th DPI. Cross reactivity of Anti-H9N2 antibodies was compared among reference isolates when challenged in broilers Partridge origin anti-H9N2 antibodies showed varied hemagglutination inhibition results ($4\log_2$ to $15\log_2$ when cross reacted with different antigens, suggesting H9N2 viruses are circulation with different antigenic characteristics. Sero-biochemical analysis of blood collected at 7th DPI revealed an increase in aspartate amino transaminase (246-308 U/L), alanine amino transferase (31-58 U/L) and blood urea nitrogen (11.21-22.58 mg/dl).

Dr. Saima Masood

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Dr Saima Masood received her DVM and MSc (hons.) degrees from UAF. She earned her doctoral degree from Graduate University of Chinese Academy of Sciences (GUCAS), Beijing, China in the discipline of cell biology. Dr Saima Masood is actively involved in teaching of undergraduate and post graduate courses and research activities of the department. She is serving as secretary of UVAS PAK-China desk, arranging every year Basic Chinese Language course for the university students and she is the secretary of MPhil Research Synopsis Scrutiny Committee (FBS) and member of departmental board of studies. She is HEC approved supervisor.



TITLE:

MODULATION OF POST HATCH-GROWTH AND MORPHOMETRIC PARAMETERS OF TIBIA BONE THROUGH IN-OVO ADMINISTRATION OF L-ARGININE IN JAPANESE QUAIL (*COTURNIX JAPONICA*)

Abstract

The present study was aimed to investigate the *in ovo* effect of L-arginine on gross morphometric parameters of tibia bone and alkaline phosphatase enzyme in Japanese quail. A total of 240 Japanese quail (*Coturnix japonica*) hatched from *in ovo* treated eggs at day zero of incubation were divided into four groups (1%, 2%, 3% *in ovo* L-arginine injected at day zero of incubation period and control group) with six replicates (n=10) in each group. All the groups were reared for four weeks on basal metabolic diet. The results revealed a significant increase ($P < 0.05$) in *In ovo* inoculation of L-arginine at the level of 3% (3g/100ml). This group also demonstrated significant difference in FCR: 1.76, gross parameters of tibia bone (Weight: 690.70 mg, Length: 55.81 mm, Medullary canal diameter: 1.88 mm, Diaphysis diameter: 3.18 mm) and level of alkaline phosphatase in Japanese quail.

Ms. Saba Usman

PhD Scholar

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I am Saba Usman, I have recently completed my MPhil in Department of Pathology, UVAS-Lahore. I did my research work from Harbin Veterinary Research Institute-China under the project entitled as "Study on Avian Major Infectious Diseases Prevention and Control and Development of International Scientific and Technological Co-operation Platform" through the program "The National Key Research and Development Program" (2016TFE0203200). My research interest is in avian pathogens especially of hatchery borne diseases.



TITLE:

ISOLATION AND MOLECULAR CHARACTERIZATION OF ESCHERICHIA COLI FROM DEAD CHICKEN EMBRYO

Abstract

Embryonic mortality is a major problem faced by the poultry industry. It may result either from environmental, nutritional causes or the bacterial agents that may penetrate the shell of freshly laid fertile eggs. *Escherichia coli* infections are of significant concern for the poultry industry that has the potential of causing a wide variety of disease syndrome in birds. In my research work, 180 unhatched eggs at 21st day of incubation were collected from three breeder flocks of different ages, (n=60/flock). In this study, *E. coli* was isolated and confirmed through nucleotide gene sequencing along with the pathological lesions observed in dead embryo. 14 strains of *E. coli* were identified on the basis of PCR targeting 16S rRNA gene. The nucleotide sequence analysis showed 20 variable regions with already reported pathogenic strains on NCBI GenBank with the percentage homology between 98.7%-99.9%. The isolated strain PAK/SA1 (MK778496) showed 99.8% nucleotide similarity with the shiga-toxin producing O157:H7 str. Sakai. 4 strains showed 99.9% nucleotide similarity with PSUO78, originally isolated from chicken peritoneal cavity. Only one embryo obtained from the post-peak production breeder flock showed malformation and had a double beak. The prevalence of malformations among different age groups of breeder flock was not significantly different. 143 (79%) cases of mal-positions were observed. Higher mal-positions were observed in post-peak and pre-peak production flocks as compared to the peak production breeder flock with a significant difference ($P<0.05$) between the flocks. The necropsy examination of the liver, lungs, and intestine showed marked congestion. Most of the liver showed whitish yellow discoloration and the yolk contents were also found discolored. Microscopic lesion score depicted moderate to severe pathological changes in the liver. The inflammatory cells infiltration, hepatic congestion, steatosis, and necrosis were evident in the liver of dead embryos from pre-peak and post-peak breeder flock, while moderate degenerative changes were observed in the dead embryo from peak breeder flock group. It can be concluded from this study that *E. coli* is one of the causes of embryonic mortalities in chickens with a significant impact on poultry industry hence preventive measures should be adopted to mitigate the economic losses.

Ms. Anam Munir

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I am working as research associate in TDF02-041 HEC project. I am PhD scholar in department of Microbiology. I have secured Gold Medal in Masters.

TITLE:

ANTIBACTERIAL ACTIVITY OF VARIOUS PLANT EXTRACTS AGAINST WATERBORNE BACTERIA

Abstract

Contamination of water is major problem in Pakistan. With increasing population, it becomes very hard to provide supply of high quality of portable water from surface and water stocks. According to a report of the Pakistan Council of Research in Water Resources, 62 percent of Pakistan's urban and 84 percent of Pakistan's rural population does not treat their water properly. So disinfection is necessary for safe drinking water. Chemical methods for disinfection lead to serious health issues due to disinfection byproducts (DBPs). Herbs are safe, cheap and easily available in rural areas. *Octimum sanctum* (Tulsi), *Azadirachta indica* (Neem) and *Nigella sativa* (Kalonji), which have profound antibacterial activity, are used to overcome these problems. In current studies, 50 samples collected from rural areas of Lahore and were proceeded to evaluate level of contamination and presence of coliforms. 15 samples, which gave countable colonies, were further proceeded. 8 samples were identified for presence of coliforms. Ethanolic, aqueous and fresh juice extracts of Tulsi, Neem and kalonji were obtained and tested for antibacterial activity. Comparison of TVC (total viable count) before treatment and after treatment told efficacy of herbal extracts. Ethanolic extracts of all three herbs had great antibacterial activity against waterborne bacteria. Present study demonstrates that contaminated water is major issue of Pakistan in order to disinfect such water, herbal extracts could be used. Statistical analysis showed that ethanolic extracts of all herbs have significant activity with aqueous and fresh juice extracts. There is no significant difference between antibacterial activity of Tulsi, Neem and kalonji as $p > 0.05$. When diluents were compared with respect to control ethanolic extracts showed significant results as $p < 0.05$. So, any herb can be used for disinfection of water as all three are equally effective according to statistical results.

Ms. Nida Luqman**M.Phil Scholar, Pathology****Email:** Nidaluqman12@gmail.com

Dr. Nida Luqman is working as a Veterinary officer in the Department of Livestock and Dairy Development and also a post graduate (MPhil) student in the Department of Pathology, UVAS, Lahore. She did DVM from University of Veterinary and Animal Sciences, Lahore. Her MPhil research thesis is on "HEPATOPROTECTIVE ROLE OF CHICORY (*CICORIUM INTYBUS*) LEAVES AGAINST EXPERIMENTAL AFLATOXIN INFECTION IN BROILERS"

TITLE:**CHICORY (*CICORIUM INTYBUS*) LEAVES AS A HEPATOPROTECTIVE AGAINST EXPERIMENTAL AFLATOXIN INFECTION IN BROILERS****Abstract**

Nature has bestowed mankind with several plants which contains natural substances which cure diseases & promote health. *Cichorium Intybus* is traditional medicines used for cure of liver diseases and its potent hepatoprotective activity. In this study total 60 one day old broiler chicks were used in this trial. At the age of 5-day birds were divided into 4 groups (A, B, C, D) having 15 birds in each group and different treatment was given to them. Group A was treated with *Cichorium Intybus* leaf powder (@0.2gm/kg) with aflatoxin contaminated feed, group B was offered with *Cichorium Intybus* leaf powder (0.4gm/kg) with aflatoxin contaminated feed, third group (C) was offered with basal feed with no treatment (control group) and group D was offered only with aflatoxin contaminated feed. The parameters studied were body weight gain, feed consumption, FCR and other serum biochemistry test. Histopathology of liver samples of all the groups was also done. Results revealed that birds fed with aflatoxin contaminated feed + chicory powder at both level (0.2, 0.4gm/kg) significantly ($P < 0.05$) restored the adverse effects executed by aflatoxin contaminated feed group in dose dependent manner. Level of total protein in Group B that were fed with 0.4gm/kg chicory leaves powder was significantly higher than group D indicating minimal damage of liver parenchyma. Group D showed higher mean value of ALP, ALT and AST as compared to other groups due to liver damage.

Dr. Muhammad Shafique

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Dr. Muhammad Shafique is working as Assistant Professor in Department of Microbiology, Government College University Faisalabad. He is currently involved in academics as well as supervisions research of several postgraduate students. His research group is focusing on important viral/bacterial diseases of humans like HCV, HBV, RSV & Measles as well as animals such as NDV. He won HEC-NRPU & GCUF-RSP projects. Moreover, he is also involved in elucidation of different immunological and metabolic biomarkers associated with atherosclerosis in heart disease patients. Currently, his doctorate students are working on isolation and characterization of multidrug resistance *Pseudomonas aeruginosa* isolated from clinical specimens.



TITLE:

SEROPREVALENCE OF *MYCOPLASMA GALLISEPTICUM* IN BROILER FROM DISTRICT OKARA

Abstract

Mycoplasmosis is caused by *M. gallisepticum* that is the main avian *Mycoplasma*. Mycoplasmosis causes huge financial losses to poultry sector in the form of mortality, poor weight gain, decreased egg production and decreased feed conversion ratio. *M. gallisepticum* causes considerable losses mainly in broiler that were used for meat purposes. *M. gallisepticum* infection may remain without clinical signs; however, it can make birds at risk to secondary bacterial infections. The current study was designed to investigate the seroprevalence of *Mycoplasma gallisepticum* in broiler from various poultry farms of district Okara. A total of 300 sera samples of broiler were collected from three Tehsils (Tehsil Okara, Tehsil Depalpur and Tehsil Renala khurd) of district Okara. From each Tehsil, 100 sera samples were collected and a maximum of 5 sera samples were taken from each farm house. A serum plate agglutination test was performed for detection of *M. gallisepticum* infection in broiler. The data showed that overall seroprevalence of *M. gallisepticum* was 62% (n=186/300) in district Okara. Seroprevalence of *M. gallisepticum* was higher 70% (n=49/70) in larger flock size than smaller flock size that was 57% (n=49/85). The prevalence was 54% (n=75/139) in males while 69% (n=111/161) in females. Further investigations showed that the highest seroprevalence of *M. gallisepticum* in broiler was found at the age of 0-10 days that is 72% (n=47/65), at 11-20 days of age seroprevalence was 65% (n=52/80), at 21-30 days of age seroprevalence was 58% (n=41/70) and above 30 days seroprevalence was 54% (n=46/85). This study concludes that as age of the bird increases, the seroprevalence of *M. gallisepticum* infection decreases in birds. This study reveals a higher frequency of *M. gallisepticum* causing chronic respiratory disease infection in poultry in District Okara, Pakistan.

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Dr. Abdur Rahman Ansari is member of PVMC, Islamabad and European Association of Veterinary Anatomists (EAVA). He is HEC approved PhD supervisor. Dr. Ansari has more than 20 peer reviewed research publications in well-reputed national and international scientific journals.



TITLE:

MORPHOLOGICAL ALTERATIONS IN IMMUNE ORGANS OF JAPANESE QUAIL UNDER LIPOPOLYSACCHARIDE (LPS) STRESS

Abstract

The poultry industry is economically vibrant sector and flourishing significantly globally day by day. Rearing of quail is gaining popularity among poultry farming in several countries. However, many constraints like bacterial stress may disrupt the histo-morphological organization of primary avian lymphoid organs. Therefore, the present study was performed for better understanding of morphological alterations in immune organs of Japanese quail under lipopolysaccharide stress. The weight of Japanese quail was measured at several time points (0 h, 12 h, 36 h, and 72 h) post LPS stimulation. Experimental Salmonella LPS treatment induced significant loss in weight of Japanese quail as compared to saline (control) at different time points (0, 12, 36 and 72 hours). Significant decrease in body weight was observed at 36 hours post LPS. To find out the LPS related histo-morphological changes in thymus and bursa of Fabricius, H&E staining was performed at 0h, 12 h, 36 h and 72 h following saline or LPS stimulation. This experiment explored that LPS stimulation disrupts the internal structure of bursa of fabricius and thymus. We also stained eosinophils and the results showed that eosinophils in bursa of Fabricius and thymus of Japanese quail exhibited no significant difference after LPS treatment at different time points (0, 12, 36 and 72 hours). Moreover, no significant change in number of eosinophils has been observed in bursa and thymus of Japanese quail with the increase in age of the birds. Thus, this project has found the mechanism of LPS induced histomorphological alterations in quail lymphoid organs. Secondly, the expression and distribution pattern of immune related cells (mast cells and eosinophils) in lymphoid organs (thymus and bursa of Fabricius) was explored in young Japanese quail chick under LPS stress.

Mr. Zia ul Hassan

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Did his DVM from Islamia University Bahawalpur in 2016, as well as completed MPhil Pathology from UVAS.



TITLE:

A STUDY ON COCCIDIOCIDAL EFFECT OF *NIGELLA SATIVA* (KALONJI) AGAINST COCCIDIA INFECTION IN BROILER BIRDS

Abstract

The current study was planned to compare the efficacy of a prebiotic (*Nigella Sativa*) and conventional anticoccidial drugs against coccidiosis in commercial broiler. The purpose of this study was to evaluate *Nigella sativa* as alternate of anticoccidial drug (amprolium) to avoid harmful effects of anticoccidial in broiler meat, as well as to compare the result of *Nigella sativa* and anticoccidial drugs on FCR, weight gain and histomorphology of ceca. The broiler birds were divided into eight groups with 3 replicates in each group and each group having 30 birds. Group A (Negative control): No infection and no treatment. Group B (Positive control) infection at day 14th but no treatment. Group C no infection but treated with *Nigella Sativa* powder @ 1000 ppm/kg from day 1st to onward. Group D infection at day 14th and treated with *Nigella Sativa* powder @ 1000 ppm/kg from day 1st to onward. Group E infection at day 14th and treated with *Nigella Sativa* powder @ 1000 ppm/kg 24hr after infection to onward. Group F no infection but treated with anticoccidial (amprolium) from day 1st to onward. Group G infection at day 14th and treated with anticoccidial (amprolium) from day 1st to onward. Group H infection at day 14th and treated with anticoccidial (amprolium) 24hr after infection to onward. All chicks were subjected to the parasitological study (oocyst index), total leucocytic count and lesion scoring of ceca. However, result of the ANOVA regarding egg per gram count, total leucocytic count and lesion scoring revealed statistically significant at the $P < 0.05$.

Dr. Ali Rafiq

DVM, M Phil (Parasitology)

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My name is Ali Rafiq. I am a DVM graduated from UVAS, Lahore in the year 2006-2011. I have done my M Phil from College of Veterinary and Animal Sciences, Jhang in the year 2017-2019. I am doing my job as an Agri Services Officer in Engro Foods, Pakistan with over six years experience in Dairy industry.



TITLE:

PARASITOLOGICAL AND PATHOLOGICAL ACTIVITY OF HERBAL COMPLEX IN BROILER CHICKENS CHALLENGED WITH EIMERIA SPECIES

Abstract

Coccidiosis is a murderous managerial disease of poultry which causes huge economic losses in poultry industry of Pakistan. It is a source of high mortality for poultry and due to this disease poultry industry face annual loss of millions of US dollars. To control coccidiosis, yearly outlay on anti-coccidial drugs total approximately \$ 650,000 and for poultry industry, this is probably the massive outlay for medication. The present study was planned to eliminate problem of coccidiosis from our poultry industry by using some indigenous recourses. The study was conducted in the Research Centre of College of Veterinary and Animal sciences, Jhang for 42 days. For this purpose six medicinal plants Azadirachta indica (Neam), Holarrhenapubescens (Kurchi), Embeliaribes (Baobarang), Lactobacillus bulgaricus (Yogurt), Curcuma longa (Termeric), Citrulluscolocynthis (Bitter apple) were used individually as well as in the form of mixtures with the different dose rates in broiler ration. Total of 780 broiler chicks of 01 day old were taken and divided into 26 groups and each contained 30 birds with 2 replicates. One group kept as non-infected non-medicated group, Negative Control group and one as infected non-medicated group. All the groups were inoculated with 75000 sporulated oocytes of Eimeria species except non-infected non-medicated group. Weekly observations were recorded for live body weight, Feed conversion ratio and oocytes count by using Mac Master Technique. Clinical signs, Gross lesions, histopathological and hematological aspects were also recorded. All the treated groups showed significant results but Group T treated with Embeliaribes, Holarrhenapubescens, Lactobacillus bulgaricus, Group U treated with Azadirachta indica, Curcuma longa, Holarrhenapubescens, Group Y treated with Azadirachta indica, Lactobacillus bulgaricus, Curcuma longa, Holarrhenapubescens and Group W treated with Holarrhenapubescens, Lactobacillus bulgaricus, Curcuma longa showed more notable and remarkable results. From this research, we had developed an Herbal product named as "Herbicox" to upgrade our Poultry industry from the problem of coccidiosis. As soon as possible, we are going to commercialize our Herbal product in the market to facilitate the industry as well as farmers, to solve the problem of coccidiosis. In summary, this study suggests the use of herbal complex as a substitute anti-coccidial agent to chemotherapeutic drugs for Eimeria species control.

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I have completed DVM and MPhil (Parasitology) from University of Agriculture, Faisalabad. Currently working as Research Assistant at CVAS Jhang, and also doing PhD. I am also assistant editor or veterinary news and views.

**TITLE:****EIMERIA AVIUM; DANGER FOR POULTRY****Abstract**

Eimeria avium, the causative agent of coccidiosis in chickens and other fowls, is probably the most serious parasitic menace acknowledged to commercial chicken raising especially so where large numbers of fowls are handled on limited areas. It is obvious that the most rational means of overcoming the coccidiosis phase of the soil contamination problem is principally dependent upon knowledge of the life history and biological features of the pathogenic agent involved. Since it is so common to find a diversity of disease-producing organisms, such as intestinal worms, flagellates, varied bacterial flora, etc., coexistent in the same fowl the true importance of coccidian infection is not generally appreciated. It is credible that the presence of common macroscopic parasites, such as intestinal worms, has misled many to find a less significant cause of disease in fowls, while the most destructive offender remained in obscurity. Expansion of caecum with clotted blood, haemorrhages throughout caecal mucosa, thickened caeca, contracted and consistent cases of necrosed blood cells and change in coloration from reddish to milky white are witnessed.

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**TITLE:****INFECTIOUS BRONCHITIS: AN EMERGING VIRAL DISEASE IN POULTRY INDUSTRY****Abstract**

Infectious bronchitis (IB) is one of the main economically significant poultry diseases distributed worldwide. It is caused by infectious bronchitis virus (IBV) and disturbs both galliform and non-galliform birds. Its financial impact includes decreased egg production and poor egg quality in layers, stunted growth, poor carcass weight, and death in broiler chickens. Although primarily affecting the respiratory tract, IBV exhibits a wide range of tissues tropism, including the renal and reproductive systems. Therefore, disease outcome may be influenced by organ or tissue involved as well as pathotypes or strain of the infecting virus. Acquaintance on the epidemiology of the prevalent IBV strains in a particular area is therefore significant to guide control and preventions. Meanwhile previous diagnostic approaches such as serology and virus isolations are less sensitive and time consuming, respectively; existing techniques, such as reverse transcription polymerase chain reaction (RT-PCR), Restriction Fragment Length Polymorphism (RFLP), and sequencing, offer extremely sensitive, rapid, and accurate diagnostic results, thus enabling the genotyping of new viral strains within the shortest likely time.

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I have completed DVM from University of Agriculture, Faisalabad. Currently I am working as a lecturer.



TITLE:

GLOBAL GIGANTIC HEALTH PROBLEM FOR POULTRY

Abstract

Infectious bursal disease (IBD) is an acute, extremely contagious and immunosuppressive poultry disease caused by IBD virus (IBDV). The consequential immunosuppression upsurges susceptibility to other infectious diseases and the risk of ensuing vaccination failure as well. Since the genome of IBDV is comparatively small, it has a limited number of proteins inhibiting the cellular antiviral responses and acting as demolishers to the host defense system. Thus, these virulence factors must be multifunctional in order to finish the viral replication cycle in a host cell. Insights into the roles of these viral proteins along with their multiple cellular targets in unlike pathways will give rise to a rational design for safer and operative vaccines. Infectious Bursal Disease Virus (IBDV) attack and abolish the developing B-lymphocytes in the bursa of Fabricius (BF), the central immune organ for the growth and maturation of B cells and the generation of diverse antibody repertoire in young chickens. Chickens of 3 to 6 weeks, at the utmost stage of BF development, are vulnerable to IBDV infection. In the case of very virulent IBDV (vvIBDV) infection, 50% to 100% mortality in young chickens can be detected. Like most RNA viruses that develop the "bite and run" approach, the acute IBDV infection causing clinical manifestations lasts for only 3 to 4 days. Thus, IBDV infection is a stern problem threatening poultry industries across the globe. It was primarily reported in Europe; soon it spreads worldwide and causes drastic losses. In Pakistan, initially it was reported in 1971.

Dr. M. Kashif Saleemi

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Dr. M. Kashif Saleemi did his DVM in 2001, M. Sc (Hons.) Vet. Pathology (2003; Silver Medal) and PhD in Vet. Pathology in 2010 from UAF. He was awarded with US National Academy of Sciences One-Health Fellowship in 2016-17. Currently working as Assistant Professor on TTS in Department of Pathology, UAF. He is working on Toxicologic pathology and Infectious Diseases of Poultry (IBV, FAdV and CAV). He has supervised > 60 M. Phil and 3 PhD students. At present, he is supervising 5 PhD and 14 M. Phil students. He has completed three research projects and currently he has two ongoing research projects. Dr. Saleemi is experienced and renowned consultant poultry pathologist for public and private sector. He is member of NDCC. He has won research productivity award (RPA) two times from PCST. He has Published >94 research papers (total Impact Factor >124) in well reputed international Journals. He is senior Academic Advisor to Dean Faculty of Veterinary Science. Currently He is Associate Editor of Pakistan Veterinary Journal. Member Editorial Board Journal of Elementology (Poland). He is National Branch Secretary of WVPA Pakistan.



TITLE:

MOLECULAR AND SERO EPIDEMIOLOGY OF CHICKEN INFECTIOUS ANEMIA IN COMMERCIAL POULTRY: ONE YEAR STUDY

Abstract

The current study was planned to investigate the prevalence of chicken infectious anemia (CIA) in commercial poultry in Faisalabad division, Pakistan. To calculate the prevalence, 895 samples from commercial poultry (Broiler, Layer, Breeder) were collected from different commercial poultry farms. Samples seroprevalence results indicated for week 1-5 showed 83.3% positive farm wise with a total number of 30 farms, 6-10 weeks results indicated 66.67% positive from 33 farms and for 11 to 15 weeks with 100% positive titers from all the 6 farms. Overall total positive percentage was 86.11% were positive and 13.81 were negative. These samples were subjected for CIA through polymerase chain reaction (PCR). Results indicated that 21 (11.73%) samples came out positive for chicken anemia virus (CAV) through PCR. Phylogenetic analysis was performed by amplification of VP2 gene through nucleotide sequencing and using MEGA version 5.2 software. The phylogenetic analysis of 14 CAV samples showed a maximum homology of 99% with the Egyptian and Chinese variants. All the 14 CAV VP2 sequences showed 99% nucleotide identity for VP2 region in Genbank. All the sequences in this study were closely related. The result showed samples and the reference sequence has common ancestor furthermore results concluded that the disease is prevalent in commercial poultry and this might be the first report of presence of CIA through vertical as well as horizontal route in different age groups birds exceeding upto 60 weeks of age.

Ms. Uzma Mehreen

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I am Uzma Mehreen Working as a Research Assistant (MPhil student) in Department Pathobiology, Section Parasitology, DVM session 2012-2017 Islamia University, Bahawalpur



TITLE:

PREVALENCE OF THE PARASITES IN THE INTESTINAL TRACT OF INDIGENOUS POULTRY IN JHANG AREA

Abstract

This study was carried out to find occurrence and distribution of different intestinal parasites of domestic chicken. 120 intestinal specimen were collected from poultry meat shop at periphery of Jhang. Of the specimens examined, 48 birds were found positive for parasites. Most prevalent parasite was *Eimeria tenella* 31.25% (15/48), followed by *Heterakis gallinarum* 27% (14/48), *Ascaridia galli* 22% (11/48) and *Strongyloid avium* 16% (8/48). None of the chicken found with clinical ill, however, high prevalence of these parasites depicts poor control practiced in the study area. Backyard poultry keepers should be motivated to adapt effective control, prevent and treat measures.

Ms. Warda Qamar

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I am Warda Qamar, I am working as Research Associate in a project titled "Farmer Friendly Molecular Assay for the Detection of Anthelmintic Resistant Stomach Worm" in section Parasitology Department of Pathobiology, CVAS, Jhang. Under the supervision of Dr Muhammad Arfan Zaman



TITLE:

IN VITRO, ANTHELMINTIC ACTIVITY OF *ORIGANUM VULGARE* AND *CINNAMOMUM VERUM* IN COMBINATION AGAINST *ASCARDIA GALLI*.

Abstract

The aim of this study was to assess the anthelmintic efficacy of combine aqueous-extract of Oregano (*Origanum vulgare*) and cinnamon (*Cinnamomum verum*) against *Ascaridia galli* *in-vitro*. Various concentrations (12.5, 25, 50, and 75 mg ml⁻¹) of the herbal combination was tested in this bioassay and paralysis and death of the worms were recorded. Fenbendazole was used as reference standard with concentration 5mg ml⁻¹ against *A. galli* and NaCl solution (0.9%) as zero control. All the concentration of HC exhibited significant anthelmintic activity. Efficacy against adult worms at 50 and 75 mg ml⁻¹ of aqueous extract of HC at 24 h was 86% and 100% respectively. Whereas at 12.5 and 25 mg ml⁻¹ concentration the efficacy was 65% and 72 % which was comparable with the efficacy of the fenbendazole. The results seem to be promising as alternative of synthetic anthelmintic against *A. galli*.

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Muhammad Kiwan Akram has recently completed MPhil, Animal Nutrition from UVAS. He also worked as Research Associate in Department of Pharmacology and Toxicology, UVAS in Higher Education Commission funded project titled "*Replacement of low-level antibiotic feeding with extracts of medicinal plants in poultry*" worth of 2.3 Million. He has specialties in Phytochemical extraction and isolation, Characterization of Phytochemical, Antioxidant Analysis, Feed Formulation, Proximate Analysis, All physical and chemical Analysis of Ingredients



TITLE:

INFLUENCE OF *EUCALYPTUS GLOBULUS* AND *MORINGA OLEIFERA* LEAVES EXTRACT ON GUT ABSORPTION, REDOX STATUS AND GROWTH PERFORMANCE OF BROILERS

Abstract

Present study investigated the effect of dietary supplementation with phytobiotic feed additive, *Eucalyptus globulus* leaves extract (EGLE) and *Moringaoleifera* leaves extract (MOLE), on growth performance, antioxidant activity and intestinal absorption in broiler. Two hundred and seventy Cobb-500 broilers were randomly allocated to nine dietary groups had 3 replicates with 10 birds each. The dietary treatments were consisted of un-supplemented basal diet as negative control group, supplemented with antibiotic (0.5gKg⁻¹ Zinc bacitracin) and prebiotic (1gKg⁻¹Safmannan) as a positive control and three different levels of EGLE (0.1%, 0.3% & 0.5%)and MOLE (0.1%, 0.3% & 0.5%). The feed trial lasted for 35 days. Gut absorption and in-vivo redox status were determined on day 32 by D-xylose absorption test and 2,2-Diphenyl-1-picrylhydrazyl (DPPH) radical decomposition, respectively. In-vitro antioxidant activity was assessed by DPPH scavenging activity complimentary with total phenolic contents (TPC) and total flavonoid contents (TFC). DPPH scavenging activity of EGLE had 50% inhibition concentration (IC₅₀)29.97 while MOLE had 53.76. EGLE had TPC= 136.99mgGAg⁻¹, TFC= 229.85mgQEg⁻¹while MOLE had TPC= 127.13mgGAg⁻¹, TFC= 212.94 mgQEg⁻¹. In comparison with the control groups, birds fed with the EGLE and MOLE up to 35th day had higher serum DPPH radical decomposition ($P \leq 0.05$)while between EGLE and MOLE fed groups, birds fed with EGLE had higher DPPH radical decomposition ($P \leq 0.05$). The D-xylose absorption was higher in birds group fed with EGLE and MOLE as compared to control groups ($P \leq 0.05$)while MOLE fed birds had greater D-xylose absorption ability than EGLE ($P \leq 0.05$). Final body weight, body weight gain, production number and feed conversion ratio were higher in birds fed with EGLE and MOLE compared to control groups while among EGLE and MOLE, MOLE fed birds group showed better growth performance than EGLE. However, inclusion of 0.5% EGLE significantly enhanced redox status while 0.5% MOLE enhanced the gut absorption and growth performance in broilers. These findings suggest that inclusion of EGLE or MOLEin poultry ration enhance the growth performance, gut absorption and redox status, and could replace with the low level finding antibiotics and prebiotics in poultry feed.

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**TITLE:****EFFECT OF VARIOUS STOCKING DENSITIES ON GROWTH PERFORMANCE AND INTESTINAL MORPHOLOGY SUPPLEMENTED WITH DIFFERENT GROWTH PROMOTERS****Abstract**

The aim of the present study was to investigate the influence of different growth promoters on broiler performance and intestinal morphology reared under various stocking densities. A total of 900 day old (Ross-308) straight run broilers were randomly divided into fifteen treatment groups according to completely randomized design. A 5×3 factorial arrangement of treatment was employed. Treatments were consisted of four growth promoters (antibiotics, prebiotics, probiotics, and symbiotics) and control group with three stocking densities (0.5, 0.6, 0.7ft²). Each treatment was replicated 6 times with 10 birds in each. Regarding growth performance, feed intake ($P = 0.0008$), body weight ($P = 0.0085$) and feed conversion ratio ($P = 0.0001$) were improved with supplementation of symbiotic in diet whereas lower body weight was noted in control group. In terms of intestinal morphology, villus height ($P = 0.0011$) and villus to crypt ratio ($P = 0.0001$) were significantly higher in symbiotics treatment group as compared to control group. Moreover, birds reared under 0.70ft² stocking density showed improvement in body weight, feed conversion ratio and livability as compared to other treatment groups. It can be concluded that supplementation of symbiotics in diet of commercial broiler reared under 0.7ft² stocking density had positive influence on overall growth performance and intestinal morphology.

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TITLE:

COMPARATIVE EFFICACY OF ORGANIC, IN-ORGANIC AND MIXED TYPE TOXIN BINDERS TO COUNTER FEED TOXICITY IN QUAILS

Abstract



More than quarter of the world's agriculture produce is effected by mycotoxins. Being largest consumer of the agro-byproducts, poultry species are always at the risk of feed toxicity. To avoid this problem toxin binders are commonly used in poultry feed. Nevertheless with the advancement in technology and expansion in trade certain new types of toxin binders are available in market, yet little is known about their capacity to counter feed toxicity in local conditions. So, comparative efficacy of different toxin binders (i.e. in-organic, organic, and mixed type) to counter feed toxicity problem was investigated in this study using Japanese quail. For this purpose mixed sex quails (n=330) were offered eleven treatment diets in three replicate each. Treatment T₁ was basal feed and T₂ was basal feed containing 0.2ppm mycotoxin/kg of feed. While T₃ –T₅ were prepared adding A, B or C toxin binders of inorganic origin to feed containing 0.2ppm mycotoxin/kg of feed. Similarly T₆-T₈ were respectively prepared adding D, E or F toxin binders of organic origin, and T₉-T₁₁ were respectively prepared adding G, H or I toxin binders of mixed type composition in a feed containing 0.2ppm mycotoxin/kg of feed. The trial duration was 1st to 28th day of quail age. The quail fed on T₂ diet had significantly lower growth compared with all other treatments. On overall basis quail diet supplemented with organic and mixed type toxin binders showed high performance in terms of body weight gain and feed conversion ratio, however they did not differ significantly from the in-organic toxin binder supplemented groups. Similarly the blood levels of cholesterol and triglycerides did not differ significantly between the toxin binder supplemented groups. We concluded that supplementation of in-organic, organic and mixed type toxin binders to the quail feed (containing 0.2ppm mycotoxin/kg of feed) give similar results however there is tendency of improved performance with organic and mixed type toxin binders.

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Dr Nasir is a dedicated scientist. He did his PhD from UAF and Post Doctorate from Roslin, University of Edinburgh Scotland. He is vice president of World's Poultry Science Association Pakistan Branch and JVP of Asian Pacific federation of WPSA. He is global group leader of WPSA working group "Small Scale Family Poultry". He is the author of 6 books and 37 peer review articles published in national and international journals. He is pioneer in ostrich farming and commercialization in Pakistan. He is incharge of Department of Poultry Sciences and station for ostrich research and development-PMAS Arid Agriculture University Rawalpindi Pakistan. He has presented his dynamic viewpoints about Poultry and Ratite research in different national and international conferences.



TITLE:

EVALUATION OF HATCHABILITY AND FEED LOSSES THROUGH REPRODUCTIVE TRAITS ASSESSMENT IN BROILER BREEDERS

Abstract

Hatchability is a trait of economic importance in the broiler breeder production cycle because it has a strong effect on chick yield and quality. During most of the laying period, 90% fertility in breeder flocks is an acceptable phenomenon. Any inaccurate condition provided to fertile eggs during collection, storage or incubation may damage the inherent ability of eggs to produce a good quality chick. Besides the careful management of fertile eggs, many other factors affect the hatchability of eggs such as the age of flock, egg storage duration and conditions and egg shell quality. Female fertility can affect the number of chicks hatched as unfertile eggs. An excessive intake of nutrients resulted in the obese dam that decreased fertility due to a decrease in hen ability to store and transport sperm cells as a consequence of fat blockage of storage tubules. The basic aim to investigate the difference between company's standard and existing field conditions regarding the economics of feed intake and hatchability percentage and per hen chick production in running flocks. Complete production record of 20 Hubbard Classic broiler breeder flocks was selected out of 49 flocks, from 26 to 60 weeks of age at random for the years 2005 to 2011 (seven years). Data were collected from the actual computer records saved at commercial broiler breeder farms. The data were evaluated for reproductive traits of parent flock. Average performances observed from selected flocks were compared with the breed Standards. Annual effect of day-old chick per hen housed on feed

consumption and feed cost in country was also calculated. Regression analysis showed that reproductive traits were below than the breed standers in all respects. The detail of reproductive traits was presented in figure 1 & 2. Hen housed eggs (total egg/hen housed) and hatching eggs per hen housed remained below breed standard throughout production period but this difference the increased directly with increase in production period. This increase in egg weight with age was due to the increasing weight of the yolk rather than white, whose proportion in the egg mass decreased with age. Average egg hatchability remained below standard hatchability but this difference was very high during early and late stages of the production period. A number of chicks produced per hen housed remained below standard but this difference increased directly with the increase in production periods. There was a strong positive correlation ($r^2 = 0.980$) between the hatchability and the number of chicks produced per hen housed. In the current study, average egg hatchability dropped rapidly after 50 weeks due to increase in egg weight as hatchability is different for different egg sizes. The best hatchability when egg weight ranged between 55-65 g in broiler breeder. From this field study, it was observed that there was a strong negative correlation ($r^2 = -0.833$) between the number of chicks produced per hen housed and feed consumed to produce one-day old chick per hen housed as shown in figure-1 and this relation was highly significant ($p\text{-value} = 0.000$). Production performances (egg production, egg weight, egg hatchability, total eggs/HH, hatching egg/HH, total chicks/HH, feed/hatching egg, feed/ day-old chicks and female body weight) differed significantly ($P < 0.05$) while hatching eggs percentage and male body weight differed non- significantly ($P > 0.05$) from standard. Annual feed losses in 12 million in broiler breeder at country level are shown in table-1. Average production performances of broiler breeders in country are below than strain's standards in term of hatchability due to higher feed intake per chicks' production. There is a need to improve the management practices at broiler breeder's farms and broiler hatchery to improve hatchability and number of day-old chicks per hen housed and to reduce the feed consumption per day-old chick. Abrupt change in male and female body weights during production periods an excessive increase in female body weight and egg weight result in low hatchability, less number of day-old chicks per hen housed and maximum feed consumption per day-old chicks.

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Dr. Muhammad Aziz ur Rahman completed his PhD degree in Animal Nutrition from world renowned university China Agriculture University Beijing. His main research focus is on Nutritional manipulation effects on Animal physiology and Animal Behavior. He has published more than 30 research paper in well ranked Journals with impact factor more than 50. Currently he is working in Institute of Animal and Dairy Sciences, University of Agriculture, Faisalabad, as Assistant Professor.



TITLE:

EFFECT OF PHYTASE WITH OR WITHOUT ORGANIC ACID SUPPLEMENTATION ON GROWTH PERFORMANCE, PROTEIN AND MINERAL DIGESTIBILITY IN STARTER PHASE OF BROILER CHICKENS

Abstract

The objective of current study was to investigate the effects of phytase supplementation with or without organic acid (OA) on feed intake, weight gain, protein and mineral digestibility in broiler chickens fed low calcium (Ca) and low phosphorus (P) diets in comparison to a high Ca and high P diet with standard specifications. For this purpose, two iso-nitrogenous and iso-caloric diets were prepared in such a way that one diet had high Ca (9.80) and high P (4.50) and second diet had low Ca (8.50) and low P (2.40), respectively. Low Ca and low P diet were further supplemented with phytase (500 FTU/kg), phytase (500 FTU/kg) + organic acid (1 kg/ton). Starter rations were offered to seven replicates of ten birds each from day 1 to 21. Results revealed that dietary treatments had no effect on intake, and growth performance of birds in starter phase ($P>0.05$). Fecal P and Na digestibility was high ($P<0.05$) in birds fed low Ca low P with phytase supplementation as compared to diet without phytase supplementation. It is concluded that phytase and OA supplementation in starter diet with low Ca and low P level did not influence intake, growth and feed conversion of broilers. However, thigh meat yield percent and mineral digestibilities (P and Na) increased in broiler received diet with low Ca and low P level and supplemented with phytase in starter phase of broiler

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TITLE:

EFFECT OF DIFFERENT REARING SYSTEM ON PRODUCTION PERFORMANCE AND CARCASS QUALITY OF BROILER

Abstract

Experiment was conducted to evaluate the effect of different rearing systems (cage vs. floor) on growth performance, carcass quality and immune response in broilers. First week was adjustment period in which 250 chicks were reared on floor at the start of 2nd week 240 chicks with average weight were selected and divided into three group (G1, G2 and G3) with four replicates under each group (20 chicks in each replicate). Group G1 served as control group in which birds were kept on floor. Whereas, birds in treatment group G2 and G3, were kept in cage type 1 and cage type 2, respectively. Cage type 1; length, width and height was 3x4x2.5 ft³ with central feeding system (round feeder). Cage type 2; length, width and height was 3x4x2.5 ft³ with side wall feeding system, trough feeder were used in this group. All the experimental birds were fed same feed and kept in similar environmental condition. Total experimental period was five weeks, data regarding growth performance was collected on weekly bases and at the last day of experiment two birds per replicate were slaughtered for blood collection and carcass quality. Data collected for each parameter was analyzed using PROC GEM procedure. The means were compared using Turkey's test and the differences were checked for statistical significance ($P < 0.05$). Weight gain was significantly higher in treatment group G2 and G3 as compared with G1. Feed intake was significantly differ among the treatment groups, higher feed intake was observed in group G2 and compared to group G3 and G1, respectively. Feed conversion ratio was significantly better in group G2 as compare to G1 and G3. There was no significant difference, among treatments regarding all parameters of carcass quality. However, significantly higher values of ND and IBD titer levels were observed in treatment group G1 and G2 as compared to group G3.

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Dr. Muhammad Ashraf completed his PhD degree in Poultry Science from University of Agriculture, Faisalabad, Pakistan. He is currently working as Lecturer in the department of Poultry Science, University of Agriculture Faisalabad. His main research focus is to evaluate the genetic potential of different poultry breeds, to evaluate the effect of different vegetable oils such as olive oil, black seed oil, flaxseed oil on the performance, immune response and meat quality of broiler birds and to check the effect of various medicinal plants and their products on the performance of poultry birds.



TITLE:

EFFECT OF DIFFERENT LEVELS OF DRIED SWEET ORANGE PULP SUPPLEMENTATION ON PERFORMANCE AND IMMUNE RESPONSE OF BROILERS

Abstract

The present study was conducted at Poultry Research Center, University of Agriculture, Faisalabad, to evaluate the effect of different levels of dried sweet orange pulp supplementation on growth performance and immune response of broilers. One hundred and twenty, day old broiler chicks were purchased from a local hatchery. The experimental chicks were divided into 4 groups as A, B, C and D. Each group had 30 chicks with 3 replicates and each replicate was contained 10 chicks. Group A was offered commercial feed while the diet of group B, C and D were supplemented with dried sweet orange pulp at the rate of 1, 2 and 3 % respectively. Birds were raised for 35 days under uniform management conditions. Data was recorded regarding initial body weight, weekly feed consumption and weekly body weight gain to calculate feed conversion ratio. Mortality was recorded. At the end of experiment 2 birds from each replicate were randomly selected and data on live weight, immunity test against ND and IBD, dress weight and weight of heart, gizzard, liver, breast and intestine was recorded. Economics of each group was also calculated. The data thus collected was statistically analyzed using Analysis of Variance under Completely Randomized Design (SPSS). Treatment means were compared by Least Significance Difference test. Feed intake of birds was unaffected ($P > 0.05$) by the dietary treatment. Weight gain of birds offered at 2 and 1% level of pulp was higher ($P < 0.05$) compared to control. Addition of 2% orange pulp resulted in efficient ($P < 0.05$) FCR compared to other treatments. ND and IBD titer of birds offered 2% orange pulp in diet was higher ($P < 0.05$) as compared to other dietary treatments. On the basis of results of current study, it is concluded that dried sweet orange pulp is a useful natural growth promoter and its supplementation in diet at the rate of 2% improved growth performance and immune response in broilers.

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Dr. Kashif Nauman is serving as Assistant Professor in Department of Meat Science and Technology, UVAS and holds Ph.D. in Meat Science and Technology from Institute of Meat Hygiene, Meat Technology and Food Sciences, University of Veterinary Medicine, Vienna, Austria. Before joining UVAS he served in export Meat Industry as a Quality Controller for beef and mutton lines.

Presently, he is working on development of new beef products which are safe in local Pakistani high temperature environment, application of new non-thermal technologies for making packaging safe and clean, conversion of low-cost meat in value added products, Risk assessment of beef and beef products supply chain. His work also includes application of different natural acids on packaging material for enhancement of shelf life, quantification of microbial by products in meat environment.



TITLE:

COMPARATIVE EVALUATION OF AIR AND WATER IMMERSION CHILLING ON BROILER MEAT QUALITY ATTRIBUTES

Abstract

The present study was conducted to investigate the effect of different chilling methods (air and water immersion) on quality attributes of broiler meat i.e. moisture pickup, marination uptake, retention, cooking yield, cooking loss and tenderness. Experimental birds were purchased from local market, slaughtered while half of the carcasses were air chilled and remaining was chilled by water immersion chilling. Post-chill carcasses were weighed to measure moisture uptake or loss and stored in display chiller at 0-4°C for 4 h. After deboning breast fillets were marinated in a vacuum tumbler for 10 minutes at 4°C with 20% w/w marinade solution of 3% NaCl and marination uptake and retention was measured. After cooking, tenderness was determined by using Texture analyzer (Warner-Bratzler). Results showed that moisture loss of air chilled carcasses was 2.8% of prechill weight and in contrast, moisture uptake of water immersion chilling was 4.14% of the pre-chill weight. Marination pickup and retention was significantly higher in air chilled samples compare to water immersion chilling ($P>0.05$). No significant difference was observed when samples of different chilling methods were compared for cooking yield and tenderness. It can be concluded that water immersion chilling can increase the initial yield as the meat moisture pick up from the chilling medium and can be used effectively to increase the profitability of primary processed raw broiler meat. Air chilling meat moisture pickup and retains more marinade solution so; air chilling can prove more suitable for the further processed broiler meat and meat products.

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Muhammad Sohaib, is Assistant Professor in the Department of Food Science and Human Nutrition, at University of Veterinary and Animal Sciences, Lahore. His research interest includes exploring possibilities of developing functional food with special reference to healthy meat and meat products. Additionally, he is working on food safety aspects of various animal origin foods. He has authored more than 30 papers in impact factor bearing journals.



TITLE:

ASSESSMENT OF STAKEHOLDERS PROSPECTIVE REGARDING STEROIDS GROWTH HORMONES AND ANTIBIOTICS AS FOOD SAFETY HAZARD IN CHICKEN

Abstract

Antibiotics and hormones are major food safety hazard that may be present in feed as well as meat of chicken birds, considered detrimental for consumer health. Antibiotics used in poultry to improve bird's health as well as protect them from disease. It is also a common perception that steroids growth hormones being used in the poultry for rapid growth of chicks. Additionally, perception exist that various stakeholders involved in chicken meat production & processing, regulatory agencies as well as consumers of chicken meat possess knowledge regarding steroid growth hormones and antibiotics in chicken. In this context, current study carried out to evaluate the knowledge gap of different stakeholders (consumers, poultry growers, feed producers, veterinary officers, food safety officers as well as allied health professionals) regarding steroid growth hormones and antibiotics in chicken feed and meat. For this a cross sectional study involving structured questionnaire for accessing knowledge was done. Results indicated among consumers, 38% like chicken meat, 59% believed hormones and steroids present in chicken feed, 52% said steroids growth hormones increase weight gain in birds as well as 73% reported early puberty in children's is due to chicken meat consumption. For poultry growers, 82% never conducted / participated in campaign regarding health concern of antibiotic and steroid hormones in chicken birds. For health professionals, 32% said that poultry is safe to consume for health as well as 52% believed that hormones and steroids present in chicken meat. For food safety professionals, 73.3% said that growth hormones and steroids are not used in poultry feed as well as more than 70% did not have idea about maximum residual limit (MRL) values for different antibiotics in poultry. The findings suggest reasonable gap exist regarding knowledge of steroid growth hormones and antibiotics in chicken available for consumers. Pakistan Poultry association (PPA) should takes steps to improve this gap regarding steroids hormones/antibiotics in chicken bird meat.

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Iftikhar Younis is currently doing PhD in food and Nutrition from in the Department of Food Science and Human Nutrition, University of Veterinary and Animal Sciences, Lahore since April 6, 2018. He has completed MPhil. Food Safety and control in 2018 and currently also working as research associate in a project in the same department

**TITLE:****EVALUATING FOOD SAFETY KNOWLEDGE, PRACTICES, AND MICROBIAL PROFILE OF MEAT IN ABATTOIRS AND BUTCHERY SHOPS IN LAHORE, PAKISTAN****Abstract**

The current study envisaged to assess food safety knowledge and practices of abattoirs and butchery shops workers to handle meat and to determine bacterial load in meat available in Lahore, Pakistan. Accordingly, descriptive survey was used via questionnaire to access status of food hygiene and sanitation practices by interviewing workers. The bacterial load of meat samples was accessed by determining total plate count (TPC) and *Escherichia coli*, *Staphylococcus aureus*, and *Salmonella* were detected in collected meat samples. The findings indicate poor food safety practice as 94.8% of workers had no health certificate and non availability of sanitizers at premises. Also, 80% butchers do not use protective clothes during meat handling that can be a major source of contamination. Mean values of total plate count for beef, mutton, and chicken were 6.25×10^6 , 3.87×10^7 and 4.27×10^7 cfu/g, respectively that also indicates higher values as compared to those set by the Punjab Food Authority which is regulatory body of Pakistan. Study concludes meat handlers have poor knowledge regarding food safety and practices as well as microbial load in samples was also higher compared to standards of world health organization. Therefore, it is highly recommended that regulatory authorities should pay attention to improve food safety situation for meat in Lahore city.

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Presently, he is working on development of new beef products which are safe in local Pakistani high temperature environment, application of new non-thermal technologies for making packaging safe and clean, conversion of low-cost meat in value added products, Risk assessment of beef and beef products supply chain. His work also includes application of different natural acids on packaging material for enhancement of shelf life, quantification of microbial by products in meat environment.



TITLE:

EVALUATE THE INDIVIDUAL AND COMBINED EFFECT OF POMEGRANATE AND ORANGE EXTRACTS ON CHICKEN MEAT QUALITY UNDER CHILLED STORAGE TEMPERATURES

Abstract

The present study was conducted to investigate the individual and combined effect of pomegranate and orange peel extracts as antimicrobial agent on chicken meat quality under different storage temperatures. Raw chicken meat without skin was inoculated with known concentration of *E. coli*, lactic acid bacteria (LAB) and pseudomonas to check the effect of extracts at 2°C and 8°C for 0, 2, 4, 6 and 8 days. Enumeration of total aerobic count (TAC), *E. coli*, LAB and pseudomonas was done with the help of TEMPO® (bioMérieux). Results shows that at 8th day of treatment and at 2°C, samples treated with combined extracts samples have 2 log reductions in *E. coli* and pseudomonas while 1log reduction in LAB. While individual effect of extracts shows less promising results. In the same way at 8°C no reduction in CFU/g was observed with either combined or individual application of extracts on without skin samples. At 8°C, it is observed that on opening of samples treated with pomegranate extract, there was an offensive smell and while orange peel extract causes little change in colour. Untreated samples incubated at 8°C without skin shows 1 log increase in the population of *E. coli* and LAB bacteria. These results demonstrate that pomegranate and orange extracts in combine has promising effect against microbial growth at chilled storage temperature and their effective concentration could be further studies for more promising results in different packaging conditions.

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I am currently working as Veterinary Officer (H), L&DD department, Additionally serving as a Superintendent Slaughter House / Meat Inspector City Khanpur. I graduated from UVAS, Lahore as Doctor of Veterinary Medicine and further did my M. Phil from the same institute in Meat Science and Technology. I worked NGOs; USAID-DRDF as Master Trainer, UKAID- PSDF as Trainer, Brook Equine Welfare as Veterinary Officer that broadened my views about meat safety, public health concern and it's application in industry.



TITLE:

INFLUENCE OF MULTIPLE FREEZE THAW CYCLES ON TEXTURE AND WATER HOLDING CAPACITY OF CHICKEN MEAT

Abstract

This study was conducted to determine the influence of multiple freeze thaw cycles (0-4) on texture and water holding capacity of chicken meat. Water holding capacity is ascertained by total moisture loss including thawing loss, drip loss and cooking loss. While physicochemical property is determined by pH, lipid oxidation, color and tenderness of chicken meat after four days of freezing with core temperature - $18^{\circ}\text{C} \pm 2$ (C0-C4). The results showed that water holding capacity was significantly decreased with increased in the number of freeze thaw cycles through structural changes by the formation of ice crystals. Pro-oxidant were released due to mechanical damage of muscle system by ice crystals which potentiated the lipid oxidation and structural denaturation increased the tenderness of chicken meat ($P < 0.05$). Color (L^* ; Lightness, a^* ; Redness and b^* ; yellowness) values showed inconsistent change throughout freeze thaw cycles. Experimental data was evaluated by one way ANOVA and post hoc tukey's test. This study concluded, multiple freeze thaw cycles adversely affect water holding capacity and texture of chicken meat which leads to weight loss and drop the customer acceptability.

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I am currently working as lecturer in department of Meat Technology, Cholistan University of Veterinary and Animal Sciences, Bahawalpur. I graduated from UVAS, Lahore as Doctor of Veterinary Medicine and further did my M. Phil from the same institute in Meat Science and Technology. I worked as Quality Assurance Manager in Kold Kraft for 2 years. I qualified for One health training program, Duke University, USA that broadened my views about meat safety and public health concern and it's application in industry.

My future goal is to create Industry-Academia linkage to provide solutions of industrial problems in product development using modern processing technologies.



TITLE:

EFFECTS OF VACUUM PACKAGED FROZEN STORAGE DURATION MEAT QUALITY AND MUSCLE STRUCTURE OF FOUR COMMERCIAL BROILER STRAINS

Abstract

This study was conducted to determine the effects of vacuum packaging (VP) and long-term storage at - 20°C (12 and 18 months) on the physicochemical properties (Color, pH, Tenderness, Thawing loss, Cook loss, and Myo-Fibre diameter) of four different strains of commercial broiler (Arbor-Acre, Cobb 500, Hubbard Classic and Ross 308). Broiler breast fillets were packed in Vacuum packaging and stored at - 20°C for 12 and 18 months, were evaluated for different meat quality parameters after thawing in air chiller at 4°C for 24 hours. Results revealed that all four broiler strains performed differently at different frozen storage durations. Frozen storage of vacuum-packaged breast fillets had a significant ($P > 0.05$) effect on color parameters i.e. yellowness (b^*) and hue angle (h) increased while lightness (L^*) and redness (a^*) decreased. With the increase in vacuum-packed frozen storage duration (VFSD) pH decreases while tenderness increased significantly in meat stored for up to 18 months. Thawing and cooking loss interaction shows no significant outcome in long term stored vacuum-packed frozen breast fillets.

Keeping in view the importance of poultry industry, UVAS in collaboration with Pakistan Poultry Association is organizing Poultry Science Conference. By this conference UVAS and PPA are providing a platform to bring together academia, researchers poultry farmers, poultry professionals and industrialist. With this platform, academia and researchers will be able to share their relevant research work and learn from poultry farmers their researchable problem and current challenges which will help the process of making new discoveries and then translating them into products and services for the marketplace. It might be only a starting point but with hard work and determination we will streamline our research efforts for the benefit of poultry sector. Maybe this doesn't appear significant in the short term but it may make a tremendous impact in the future.