Proceedings of the
2nd International Workshop on

Dairy Science Park

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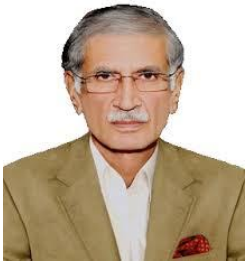
Chief Minister
Khyber Pakhtunkhwa



The province of Khyber Pakhtunkhwa has been facing numerous challenges in the recent past affecting the socio-economic status of the people. The present government has decided to take concrete steps to revive the economy, pave way for huge investment, setup strong industrial base and promote tourism and trade activities in the province under a comprehensive plan. For this purpose the Khyber Pakhtunkhwa Investment Board is being revitalized and given more powers and approving generous incentive to the investors besides creating congenial atmosphere for industrialization.

Similarly survey has been initiated for setting up new industrial Estates near Big cities including Peshawar, Nowshera, Charsadda, Mardan, Kohat, Malakand and suitable places on both sides of motorway. In this regard high level meeting of KP Investment Board was held at Peshawar wherein the progress made so far was reviewed and necessary decisions were taken. It is pertinent to mention here that the KP Investment Board was constituted one year back but till then remained inactive but soon after PTI government coming into power, reconstituted and streamlined it with induction of the senior industrialist Mohsin Aziz as Vice Chairman giving him the task of making the province attractive for investment and industrialization.

The people of this province are hard working and get their livelihood support from agriculture and livestock resources. However, the productivity status is low due to poor practices and low socio-economic status of the farmers. The International Workshop on Dairy Science Park 2013 is an excellent opportunity for the scientists, development practitioners and business community to discuss various aspects of livestock health and production and suggest recommendations for improving income of the farmers and quality of the product. It will lead to enhanced living standard of the farming families and reduction in the risk of human diseases of animal origin.

The novel step taken by the University of Agriculture supported by the provincial government departments, the Khyber Pakhtunkhwa Chamber of Commerce and Industry and SMEDA is commendable. I hope that the delegates will be successful in formulating a joint strategy for developing the livestock resources for the welfare of people of this province. The provincial government will extend all possible support for making the Dairy Science Park a success story on the world map.

Mr Pervez Khattak

Message by

Mr. Shahram Khan
Minister, Agriculture and
Information Technology

Welcome delegates, to Peshawar, the gateway to Central Asia. The people of Khyber Pakhtunkhwa have been getting livelihood support mainly, from agricultural and livestock holdings. The Department of Agriculture, Livestock and Cooperatives is responsible for conserving and developing these resources.

The Department has been extending its services through a network of civil veterinary hospitals, dispensaries, artificial insemination centers and livestock farms. The provincial livestock department comprises extension and research wings. The Directorate General of Livestock and Dairy Development (L&DD) (Extension) undertakes to accomplish various assigned tasks in discharge of its responsibility towards the development of livestock sector. Breed improvement directorate and Animal Husbandry In-service Training Institute are working for their specialized mandates. Animal health facilities and services are provided to livestock farmers through curative and prophylactic measures and maintenance of veterinary hospitals, dispensaries and centers in functional order. Improvement of local breeds of cattle and buffalo is another focused area through the provision of artificial insemination service to the livestock farmers; establishment and maintenance of artificial insemination centers and sub-centers. Livestock production extension services are provided to the livestock farmers (and female farmers in selected cluster areas) through a network of veterinary institutions.

The Directorate General L&DD (Research) comprises Veterinary Research Institute and the Directorate of Livestock R&D. The main campus takes care of vaccine production and research on bacterial, viral and parastitic infections. With a view to extend research and diagnostic facilities to the remote areas four Veterinary Research and Diagnostic Laboratories (VR&DL) were established at D.I.Khan, Swat, Mansehra and Kohat during 1988-91. In 1992 Center of Animal Biotechnology was established to undertake research in the specialized field of Biotechnology for better disease diagnosis and control in animals through advanced techniques like ELISA, Electrophoresis etc. and enhancement of livestock productivity using appropriate biotechnology. The Directorate of Livestock Research and Development is working on various aspects of livestock production like animal nutrition, dairy technology and fodder production.

I appreciate the efforts the University of Agriculture Peshawar for networking the stakeholders through the Dairy Science Park and highlighting the commercial aspects of the Livestock Sector. The farming system needs improvement to introduce cost-effective productivity and enhancing products quality. I hope the workshop will come up with feasible recommendations for implementation by the public and private sector organizations.

Mr Shahram Khan

Message by

Rafaqat Ullah Babar

Head Investment Promotion Cell
Chief Minister Secretariat KPK

I was pleased to know about the Dairy Science Park 2013 through a telephonic discussion with the Chief Organizer. Another pleasure was that it is the second international workshop in the series and that it has explored another valuable natural resource of the Khyber Pakhtunkhwa, the meat production terrain of the northern and southern parts of the province.

I welcome the distinguished delegates of the Dairy Science Park 2013 to the Khyber Pakhtunkhwa situated strategically at the corridors of the historic silk route. The province is rich in a number of resources. We have known reserves of precious minerals and gem stones, slopes where one can tame the wild water to produce hydel energy, breathtaking sceneries and a rich cultural heritage to lure domestic and international tourism. And, of course, we cannot forget the livestock sector, a source of livelihood support for the rural masses and nutritious food for the consumers.

We have undergone an intensive exercise to ensure that caring for our investors remains at the heart of core business processes of government machinery. The purpose of this Investment Promotion Cell is to provide one window service to investors. We have the expertise to enrich you with information about business sectors you want to explore. We have a mandate and authority to liaison and form a bridge between investors and relevant government authority, technical experts, financial institutions.

I appreciate the theme of the current workshop highlighting the export potential of the province for Halal Meat. Involvement of the people of this province in the meat production and export in Thailand has been a welcome development. Why can we not utilize their skills and wisdom in developing our own resources for domestic and international markets? The Government of Pakistan has recently entered into cooperation with Thailand and we would like to be a part of such initiatives. We must also explore cooperation with Brazil, holding 55% share in International Halal Meat Export and Turkey a big meat importer.

Let me be optimistic about the current workshop, providing an opportunity to the relevant stakeholders to present their scientific papers, development success stories, entrepreneurial capacity of the livestock-related business and safety and Halal aspects of the meat production. I invite all delegates to come and explore the investment opportunities in KPK. We will welcome you with traditional courtesy and hospitality KPK is known for.

Rafaqat Ullah Babar

Message by

Zahidullah Shinwari

President, Khyber Pakhtunkhwa
Chamber of Commerce and Industries

I am pleased to welcome distinguished delegates of the Dairy Science Park 2013 to the Khyber Pakhtunkhwa, the land of hospitality. This region had served as a major conduit for the export goods to the western and Central Asian States. Peshawar remained an international focus for the massive trade activities with Afghanistan in particular and other countries of the region in general. In the old good days, the convoys of Traders and Businessmen from the Central Asian Republics, India, China, and Iran used to stay in the city on their way to Afghanistan, Tashkent, Samarkant, Bukhara and other parts of the Central Asian Republics. Peshawar was a hub of business activities and the local businessmen and traders had time-tested business relations with their counterparts in Afghanistan and Central Asian Republics.

The Khyber Pakhtunkhwa is blessed with abounding natural resources such as minerals, precious stones, marble, wood, hydropower potential and copious water resources. There are over 2000 industrial units in the province. There are 3 industrial estates and 10 small industrial estates in Khyber Pakhtunkhwa. The three main industrial hubs include Peshawar, Hattar and Gadoon industrial estates while small-scale industries are concentrated at Peshawar, Mardan, Abbottabad, Mansehra, Haripur, Kohat, D.I.Khan, Bannu and Charsadda areas.

A recent presentation of the team of the University of Agriculture Peshawar, led by Prof M Subhan Qureshi, Dean, was an exciting event followed by a hot discussion on the potential of the province to support the provincial economy. His dream of utilizing the provincial livestock and poultry resources and getting US$ 1.00 billion through meat export is really thrilling. We have got larger hilly areas and arid regions in the northern and as well as southern part of the province. The hard working farmers, their younger generation and a network of state institutions having the required manpower and infrastructure are available. However these would have to be utilized efficiently for materializing the dream of entering into International Halal Meat Market. The KPCCI is ready to play its due role in this nation building task.

Zahid Ullah Shinwari

Message by

Dr Mukhtar Ahmad
Executive Director
Higher Education Commission
Islamabad

I am pleased to invite you to the 2nd International Workshop on Dairy Science Park at the University of Agriculture, Peshawar. Let me call it a success story, based upon several facts. That the first workshop during 2011 proved to be a mega event attracting 500+ delegates, 105 speakers, 10 business companies and development partners, publishing 49 research papers in an impact factor journal, generating the funds through resources from outside the University. The workshop was inaugurated by the Minister for Agriculture and concluded by the Minister for Livestock; however the two authorities could not provide funds materializing the business incubation concept of the Dairy Science Park for producing, value addition, quality control and marketing of Halal meat supported by graduate self employment. The second workshop in the series reflects commitment of the organizers and the University administration to the cause.

The Higher Education Commission is committed to develop sustainable, dynamic and internationally competitive research sector in Pakistan that makes a major contribution to economic prosperity, national wellbeing and the expansion and dissemination of knowledge. A paradigm shift may be seen in HEC policies towards the innovation & entrepreneurship, market based research and close university-community and industry linkages. Since inception of HEC, universities in Pakistan have responded vociferously to the initiatives taken by HEC towards the promotion of R&D. As a result of these efforts, academic employment and retention of doctoral scientists and engineers grew over the last decade and has reached to a record high of 5,826 in 2012 in universities & degree awarding institutions. 80% of the research publications from Pakistan are coming from universities.

Several initiatives have been taken to promote research culture at the higher education institutions of Pakistan, like establishment of the six business & technology incubators, 26 Offices of Outreach, Research, Innovation & Commercialization and three Centers of Advanced Study and Research in the areas of Energy, Food security and water, in addition to the national innovation policy being worked out.

I appreciate the efforts of the Pakistan Veterinary Medical Council in standardizing the education and research in veterinary and animal sciences through revision of syllabus and constant monitoring of the degree awarding institutions for the purpose of accreditation. Prof M Subhan Qureshi, the Chief Organizer has been promoting these efforts as an HEC representative in the Council and I congratulate him for these endeavors in addition to organizing the Dairy Science Park, recognized by HEC through the Best University Teacher Award this year.

Participation of various stakeholders from the business and development agencies through the Dairy Science Park is commendable. I can see this activity as another addition into the business incubation initiatives of the country, enabling the people of northern Pakistan to establish an export base for Halal Meat Market.

Dr Mukhtar Ahmad

Message by

Prof Dr Muhammad Afzal
Vice Chancellor
The University of Agriculture

This is my privilege to welcome the distinguished delegates of the Dairy Science Park to the University of Agriculture Peshawar. I am thankful to all of you for sparing time to visit Peshawar and this University for attending the conference, meeting your friends and sharing your skills, knowledge and experience with fellow scientists, development practitioners, farmers and business community representatives. I hope you will enjoy this tour as a memory of your life and will return back to your organization with fresh ideas and plans.

I appreciate the faculty members of the Faculty of Animal Husbandry and Veterinary Sciences for their hard work and introduction of the Doctor of Veterinary Medicine program at the Campus. The University has been extending all possible support in form of appointment of new staff and other available resources. The mega development project of the Higher Education Commission of Pakistan supported the faculty in form of establishment of clinics, feed mill, dairy farm and various laboratories under the Animal Health Department. The Pakistan Veterinary Medical Council has provisionally accredited the degree program and identified some deficiencies to meet the minimum standards. However, through the joint efforts of the faculty members as well as the University administration we have overcome the deficiency and I am hopeful that the degree program will get permanent recognition by the Council.

In addition to two journals already being published by this University titled Sarhad Journal of Agriculture and Journal of Weed Science, the University has launched the Pakistan Journal of Meat Science. This journal has been initiated as a continuation of the First International Workshop on Dairy Science Park 2011 and has provide a wider scope covering livestock and poultry health and production, entrepreneur development, feeds and fodder production and Halal certification. The public health aspect of animal production is one of the core objectives of the journal.

Beyond various degree programs at this campus, this University has procured land at Mardan for Amir Muhammad Khan Campus. The concept of Dairy Science Park for industrialization of the livestock sector can be better visualized there. Various commercial activities like calf fattening for beef production, sheep and goats farming for mutton production would be demonstrated. Poultry, quails and turkeys farming would be facilitated at the Campus. All these activities are focused on cost-effective meat production supported by good practices, quality control setup, feed/medicine/equipment dealers and abattoirs. The Conference organizers are working hard to get resources for such activities from various development support organizations and private investors. These activities would be taken as graduate entrepreneurs and are in line with the business incubation concept of the Higher Education Commission of Pakistan and the Youth Development Program of the provincial government.

Prod Dr Muhammad Afzal

Message by
Prof M Subhan Qureshi
Chief Organizer
Dairy Science Park

The Khyber Pakhtunkhwa province of Pakistan is rich in natural resources, dominated by livestock, including the 14.84 million sheep and goats valuing Rs.160 billion and 27% share in the national poultry sector having an investment of Rs.200 billion, producing 834 billion kg meat. The huge assets have got the potential to support the agro-based economy of the province through income generation, self employment and production of certified high quality food items for domestic and international Halal Food Market. However, a lot has to be done to achieve this goal, through technical and marketing interventions to boost up the per unit productivity and introduce quality control system.

The Dairy Science Park 2011 was held at the University of Agriculture, Peshawar with the theme: developing a hub of dairy enterprises in the flood affected regions of Khyber Pakhtunkhwa through partnership of academia, government, entrepreneurs & civil society. The Workshop, attended by about 500 delegates, with 105 oral and poster presentations, comprised 10 stalls exhibiting products and services of various development and business organizations. A special committee came up with recommendations including Business Support, Infrastructural Support, Legislative And Policy Support, Animal Production Support, Animal Health Support, Environment And Energy Solutions, Institutional Strengthening and Coordination. The recommendations were submitted to the provincial government and other concerned agencies for implementation. Some projects were initiated at this University and its associated organizations.

Besides teaching and research undergoing under the Pakistan Veterinary Medical Council's monitoring, the Faculty of Animal Husbandry and Veterinary Sciences of this University is also contributing the private sector through outreach organizations, farmers' and business community and NGOs. Various training courses, workshops and seminars are frequently arranged. Collaboration with the Livestock Trainers and Consultants, Agribusiness Support Fund, the Boorke Hospital for Animals, and other organizations has been established. Veterinary Camping Service has been another periodical feature of the Faculty backed up by University Pharmacy Shop. An MoU was signed with the Relief International which helped in investigating zoonotic diseases, communicable from animals to humans. A Zoonotic Information Resource Center and a diagnostic lab were established and several research studies have been completed/are ongoing. A liaison has been maintained with SMEDA and KPCCI for supporting commercially viable projects. Halal Research Council has been collaborating with us under another MoU.

The Dairy Science Park 2013 is focusing on Meat R&D involving all stakeholders. Let us hope for a prosperous Khyber Pakhtunkhwa involving the youth in economically viable graduate entrepreneurs for scientific meat production supported by quality control, giving us an excess to the multibillion dollars Halal Meat Market.

Prof M Subhan Qureshi

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2nd INTERNATIONAL WORKSHOP ON DAIRY SCIENCE PARK

(November 18-20, 2013)
Venue: The University of Agriculture, Peshawar-25120, Pakistan
http://aup.edu.pk/dairy-science-park2013.php
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(November 18-20, 2013)

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PS-28	PREVALENCE OF *SALMONELLA ENTERITIDIS* IN HATCHERIES AND BROILER RETAIL OUTLETS IN RAWALPINDI *Saeed A., Mushtaq H., Umar S., Iqbal MF., Din MU., & Ashraf K.*	UAAR Rawalpindi
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PS-30	FEEDING VALUE OF EXTRUDED HATCHERY WASTE MEAL AND ITS IMPACT ON EGG PRODUCTION AND QUALITY IN LAYING HENS *Rafiullah., Mahmud A, Khan S., Saima, Chand N., Khan NA., Sultan A., & Inam M.*	UAP Peshawar
PS-31	COMPARATIVE EFFICACY OF THREE NEWCASTLE DISEASE VACCINE STRAIN IN LAYERS *Khan S., Alam S., Sultan A., Imtiaz N., Rafiullah, Inam M., Khan S., Hussain T. & Mushtaq M.*	UAP Peshawar
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No. FAHVS/DSP/CPO
Dated October 27, 2013

Prof M Subhan Qureshi
DVM, PhD
(Theriogenology)/
Adjunct Professor CSU,
Australia/
Chief Organizer, Dairy
Science Park
Dean

Record Note

Subject: **Implementation of the directive of the Minister for collaboration in Meat R&D.**

In pursuance to the directive of the worthy Minister for Agriculture and Information Technology during his visit to the University, a meeting of the Mr Ahmad Said, Chief Planning Officer, Dr Sher Muhammad Director General Livestock and Dairy Development and Prof M Subhan Qureshi Dean FAHVS, the University of Agriculture Peshawar was held on 26-10-2013 to discuss implementation strategy for the directive.

The Chief Planning Officer opened the discussion and reviewed progress on various development projects, however with the expansion of the technical programs the Department faces difficulty while introducing business support activities, for which modus operandi with the private sector has to be worked out and that is the difficult task. The Director General referred to the their meat project under which slaughter houses have to be setup and the Department has worked hard up to very high level; however issues like control of the slaughter houses by the Local Government Department and lack of mechanism for security of the business of the private investor, are to be settled. The Dean referred to the authority of the district administration and the legal courts to impose ban on meat export, which are not friendly for investment in the sector. The rising level of un-employment to the outgoing University graduates was discussed.

Looking at the bright side of the picture, the three officers of the opinion that we have demonstrated certain success stories in the private sector like setting up of fattening farms at farmers' levels and introduction of high yielding fodders and valuable crossbred cows in the field fetching price several times higher than the local ones. The Dean referred to the production of broilers and quails under a revolving fund at the University and training of graduates who have successfully established their entrepreneurs; but utilizing only their technical and farming skills, without any mentionable support from the business organizations. It has resulted into production of broilers, quails and Turkeys, but

not supported by a friendly marketing system to process and convey it to the consumers with attractive rates and quality.

The Dean was invited to present his proposal on self employment of the graduates. He mentioned that a good ratio of the outgoing graduates is interested in establishing their own business and the stay at the University provides the required skills, knowledge and confidence required for it. The SMEDA and KPCCI have already agreed to this idea in principal and another brain storming session is going to be held with them on Monday, the 28th October, 2013. The Investment Promotion Cell at the Chief Minister's Secretariat has appreciated the idea. The participants agreed on:

1. Introducing the business setup by the University graduates in broilers, quails, turkeys and ruminants farming, etc., and seeking the SMEDA support in developing the business further utilizing the latest techniques.
2. Inviting the KPCCI representatives to consider such enterprises for further investment, especially in establishing slaughtering facilities.
3. Launching research at the University on commercial aspects of the meat production and quality control, making the production system competitive at the international markets.
4. Establishing a mini-slaughter house at the University for graduate teaching and launching of postgraduate diploma courses livestock entrepreneurship.
5. Utilizing the resources, skills and knowledge available at the University and the L&DD Department for developing the private sector, enabling expansion and introducing quality control in the production and marketing chain.
6. Supporting the outgoing University graduates during their six-months mandatory internship as prescribed under the Pakistan Veterinary Medical Council Act 1996 through a joint project of the University and the L&DD Department.
7. Providing an enabling environment for establishing a private company by the Department and slaughter houses in the private sector.
8. Utilizing information technology in linking the enterprises effectively with the Department, the University, services/inputs providers and the International Halal meat market.
9. Holding 2nd International Workshop on Dairy Science Park, November 18-20, 2013, at the University in which the public and private sector and the Universities would be participating.

Prof M Subhan Qureshi
Dean

Cc:

- Chief Planning Officer
- Director General L&DD Ext

No: 10-DFAHVS/DSP/SMEDA Dated: Tuesday, October 29, 2013

RECORD NOTE OF MEETING WITH SMEDA

A meeting was held with SMEDA on 28-10-2013 at 11:00 am at SMEDA office. The meeting started with the recitation of Holy Quran by Dr. Sarzamin Khan and chaired by Rashid Aman (manager). Following attended the meeting

The University

1. Prof. Dr. M. Subhan Qureshi, Dean, Faculty of Animal Husbandry and Veterinary Science, The University of Agriculture, Peshawar
2. Professor Dr. Sarzamin Khan, Chairman, Poultry Science, UA Peshawar
3. Professor Dr. Umar Saddique, Chairman, Animal Health, UA Peshawar
4. Dr. Shoaib Sultan, Assistant Professor, Animal Nutrition, UA Peshawar
5. Dr. Asad Sultan, Assistant Professor, Poultry Science, UA Peshawar
6. Dr Abdur Rahman, Associate Professor, Livestock Management, UA Peshawar (absent)

SMEDA

1. Rashid Aman (Manager)
2. Muhammad Ali (Manager)
3. Hafizullah Khan (Assistant Manager)

PRIVATE SECTOR

1. Zafar Paracha, Dewan-i-Khas
2. Dr Asif Khan

The Dean highlighted the role of livestock in general and particularly of the KPK province. The house was told that livestock accommodates a huge potential to curtail poverty and generates employment opportunities both for professionals and farmers. The business incubation centre at the University of Agriculture has already trained people (men and women) of the different part of KPK with the help of various civil societies and other non governmental organizations. Such efforts have contributed a lot to eradicate poverty and unemployment. Dr. Sarzamin Khan discussed different success stories of creating employment opportunities and generation of income by women through quail farming.

Participants discussed various possibilities of creating employment opportunities like quail farming, turkey farming, layers/broiler farming, fancy birds production, dairy units, sheep and goat farming, fattening of animals for meat production, AI, poultry hatchery units, feed mills, mobile and non-

mobile veterinary clinics, meat processing units (beef, mutton and poultry), processing of animal wastes units for utilization in animal and poultry feed, wool and animal hides processing units. The following recommendations were made:

1. SMEDA will sponsor a 2 days trainings workshops for the final year DVM outgoing students to equip them on methodologies how to run and handle business. This will be jointly supported by The University of Agriculture and Livestock and Dairy Development Department.
2. The University will invite their graduates involved in livestock related businesses. SMEDA, DG L&DD and the University experts will evaluate their enterprises and help in developing their business into proper SMEs.
3. Business security shall be ensured to smoothly run all type projects. Proper legislative framework will be prepared through wide-based consultation of all stakeholders so that the interventions by various agencies may be minimized in running successful livestock and poultry based businesses.
4. The upcoming work plan of SMEDA will be examined by the University authorities for contributing their share in the development process.
5. The Dairy Science Park will be supplemented with a mega exhibition highlighting all the success stories generated at the University, the L&DD Department and the private sector. Private industry will be approached to showcase their products/machinery etc in the DSP, 2013 to attract local investors and students for investment. It was greatly felt that a world class EXPO centre should be established by the provincial government to arrange mega events of livestock and poultry exhibition in the future to attract foreign investors.
6. A model Slaughter House shall be established fully equipped with modern facilities in consultation with the owner/contractors of the already established slaughter houses in the region. Special protocols and other monitoring policies will be devised to fully eradicate health threats to the consumers' health.
7. Investment cell of Chief Minister Secretariat will be briefed about these business plans for funding to unemployed young graduates.
8. A working group will be constituted represented by SMEDA, L&DD, UAP and KPCCI to promote the self employment models in the province.

It was also decided that a presentation will be made to the Working Group to the President Zahidullah Shinwari on next Thursday, the 31-10-2013 at 1100 hours in the head office of KPCCI. The also desired that the provincial government may be represented for making the consultation more effective.

Minutes recorded by: Dr Asad Sultan
Minutes issued by:

Prof M Subhan Qureshi
Dean FAHVS/
Chief Organizer DSP

No:UAP/DSP/KPCCI Saturday, November 02, 2013

RECORD NOTE

Meeting of the officials of the University of Agriculture with the President KPCCI and his team

Pursuant to directive of the Minister for Agriculture and a meeting with the Chief Planning Officer and Director General, Livestock and Dairy Development Department, a meeting of Faculty of Animal Husbandry and Veterinary Sciences was held on 31st October, 2013 in the Khyber Pakhtunkhwa Chamber of Commerce and Industries with the President and member of KPCCI and private sector, chaired by the President, Mr Zahidullah Shinwari. List of participants is annexed at the end.

A detailed presentation was made by Dean, Prof M Subhan Qureshi titled Dairy Science Park – the Blueprint. Replying to a question the Dean informed the house that Punjab is best suited for Dairy Production; however the Khyber Pakhtunkhwa, mostly comprising of a hilly terrain and arid regions can support meat production though sheep and goats and cattle and buffalo in some regions. The small poultry farming have been adopted as small business; however all these activities need business support to produce quality feed at competitive rates. Huge investment in the sector must be made after appropriate feasibility studies and in phase manner. For controlling zoonotic disease the University is working closely with the Relief International Pakistan under postgraduate studies, a diagnostic lab and zoonotic information resource center. SMEDA have been constantly supporting the sector and was an active partner of the University during Dairy Science Park 2011.

Delegates from the FAHVS headed by the Dean and KPCCI President discussed in detail the potential of business plans using livestock activities as a model especially focused at graduate entrepreneurship. The President KPCCI highly appreciated the presentation and realized the potential of the sector playing its due role in eradicating poverty and creating employment opportunity. Its was agreed that this sector should further be strengthened by proper mechanism for the Standing Committee on Livestock was approved at the Chamber.

The Committee will advise the government for devising legal framework supporting and protecting new investment in the sector. The Committee will also advise the Chamber in developing graduate entrepreneurs in livestock and poultry production, commercial research, value addition and quality control. The Committee will make liaison with the provincial and federal governments and other national and international organizations in creating resources for supporting such entrepreneurs. Friendly countries will be approached for business development and trade in this area. A one window operation will be initiated in collaboration with the University of Agriculture and SMEDA, at the Chamber for supporting livestock and poultry related business models.

The President supported the proposal of the Dean for establishing an internationally accredited quality control setup at the University supported with commercial research, for local consumption and export certification of livestock and poultry products. The President invited the University to play a role in the Prime Minister's Youth Development program. For entering

International Halal Meat Market, we will have to ensure cost-effectiveness and quality standards of the products. He ensured the support of the Chamber for achieving these goals. It was suggested that UNIDO may support in establishing such labs for which the Chamber will have to endorse this proposal. This Skill Development Programs would be utilized for human resource development. The President suggested a Halal Certification Board for boosting export in meat and dairy sectors. Dr Asif recommended establishing livestock and poultry farming throughout the province under graduate entrepreneurship for which the support of the provincial and federal governments would be required. He also suggested an Expo Center at the province to boost the local industry.

The Dean invited the President and other members of the Chamber to attend the Dairy Science Park 2013, falling on November 18-20 and to invite business firms to display their products and services in livestock, poultry and allied sectors, through stalls. The meeting ended with vote of thanks by the Dean FAHVS and Secretary KPCCI.

Prof Dr M Subhan Qureshi
Dean/Chief Organizer

LIST OF PARTICIPANTS

Khyber Pakhtunkhwa Chamber of Commerce and Industries (KPCCI)

1. Mr Zahidullah Shinwari, President
2. Mr Pervez Khattak, Executive Member
3. Mr Faiz Rasool, Executive Member
4. Mr Hamidullah Yousafzai, Executive Member
5. Mr Fazl i Wahid, Executive Member
6. Haji Pervez Ahmad, Executive Member
7. Muhammad Shafiq, Senior Vice President
8. Mr. Faqir Muhammad, Secretary General
9. Mr. Sajjad Aziz, Deputy Secretary / Public Relations
10. Mr Kamran Khan, Dairy Farmer
11. Mr. Zafar Paracha, Meat Value Chain
12. Dr Asif Khan, Civil Society

Small and Medium Enterprises Development Authority (SMEDA)

1. Mr Rashid Aman, Manager
2. Mr Muhammad Ali, Manager

The University of Agriculture Peshawar (UAP)

1. Prof Dr M Subhan Qureshi, Dean FAHVS
2. Prof Dr Sarzamin Khan, Chairman Poultry Science
3. Dr Umer Sadique, Chairman Anima Health
4. Dr Naila Chand, Associate Professor, Poultry Science
5. Dr Ihsaullah, Assistant Professor, University Dairy Farm
6. Dr Shoaib Sultan, Assistant Professor, Animal Nutrition
7. Dr Asad Sultan, Assistant Professor, Poultry Science
8. Dr Muhammad Riaz, PhD student, CSU Australia
9. Mr Allahdad Khan, Visiting Professor, Extension Education
10. Ms Saadia Qureshi, Halal Food Associate

International Workshop on Dairy Science Park
(November 21-23, IW-DSP-2011)
Khyber Pakhtunkhwa Agricultural University, Peshawar
Tel 9221028, drmsuqureshi@aup.edu.pk

Recommendations

On advice of the Honorable Minister for Agriculture, Government of Khyber Pakhtunkhwa, a committee was notified vide No. DSP/564a dated 20th November, 2011, headed by Prof Zahoor Ahmad Swati and having representation from the University, the extension and research wings of the livestock and Dairy Development Department, Livestock Trainers and Consultants and SMEDA/KPCCI.

The committee members noted recommendations presented by the speakers and participants during scientific, development and business support sessions. Press releases were issued for information of the general public on daily basis and the information were compiled by Dr Asad Sultan and Dr Nazir Ahmad Jr and forwarded to Prof M Subhan Qureshi for finalizing the same and submission to the relevant authorities. The recommendations were focused on shaping up an action plan for implementation at the academic, extension, research and business organizations.

Honorable Minister of Agriculture, Government of Khyber Pakhtunkhwa, Arbab Muhammad Ayub Jan mentioned during the inaugural session of the workshop that unemployment is one of the major issues of our province and can only be addressed effectively if we develop dairy sector as there is a huge potential for its growth in the near future and to generate employment opportunities. The Honorable Minister for Livestock Haji Hidayatullah Khan has expressed his enthusiasm for increasing the size of ADP in the province and considered the livestock sector as having numerous benefits as explained in the light of the Holy Qur'an. Both the Honorable Ministers commended the inexorable efforts of the Vice Chancellor, Agricultural University Peshawar and the Dean, Faculty of Animal Husbandry and Veterinary sciences and stressed upon preparing and pursuing the recommendations of the workshop for welfare of the people.

Before finalization of the draft recommendation, the ***Business Incubation Program*** of the HEC and the ***Policy Action Plan for Implementation of Khyber Pakhtunkhwa Comprehensive Development Strategy 2010 on Livestock Sector***, prepared by a Think Tank on advice of the provincial government and hosted by the University, were reviewed. The recommendations are presented under several categories:

Business support

1. The Higher Education Commission of Pakistan has introduced the Business Incubation which is a business support process that accelerates the successful development of start-up and fledging companies by providing entrepreneurs with an array of targeted resources and services. These services are usually developed or orchestrated by incubator management and offered both in the business incubator and through its framework of contacts. A business incubator's main goal is to produce successful firms that will leave the program financially viable and freestanding. These incubator graduates have the potential to create jobs, revitalize neighborhoods, commercialize new technologies, and strengthen local and national economies.

a. promote the commercial research culture through the strong venture of university-industry Tag.
b. boost the economic development by verge of Industrial Research output.

c. foster the formation and development of start-up businesses to the point of obtaining significant, third-party investment support.
d. educate startup companies/entrepreneur about the process of new venture development to improve their potential for future entrepreneurial success.
e. create an entrepreneurial community to give students the experience of learning through mutual support, a process critical for successful entrepreneurship.

2. The Faculty of Animal Husbandry and Veterinary Science has worked in this direction through several programs. Broilers and quails production has been in practice for meeting the requirements of consumers at the Greater University Campus. Dairy Technology Center and Feed Mill have been run on sustainable basis for boosting the dairy enterprises in the accessible areas. The Dairy Herd Improvement Program of the Veterinary Clinics has linked private dairy farmers with the faculty.
3. The semi-commercial activities of the faculty will be pulled under Dairy Science Park at Agricultural University Peshawar, in line with the idea generated in Egypt during conversation between Prof M Subhan Qureshi, Chief Organizer IW-DSP, 2011 and Mr Abdur Rahman Ilyas, ICRISAT, India. The enterprises owned by the the business partners will be affiliated with the park as model enterprises for technology application and further replication.
4. Private sector will be encouraged and attracted to invest in livestock and dairy sector by providing them conducive environment and relief in policies. Government shall extend special benefits in terms of electricity charges, provision of barren land on lease basis and taxation etc, to all types of relevant enterprises.
5. Financing partners will be provided for the program through local institutions. International investment will be explored through foreign missions, especially the Middle East, Malaysia, Turkey, Iran and other friendly countries. The Khyber Pakhtunkhwa Chambers of Commerce and Industries will look for partnership with similar bodies in the rest of Pakistan and the friendly countries.
6. Creating an information system for all sorts of livestock activities to update farmers about market, institutions and other facilities available to them.

Infrastructural support

1. Establishment of salvage farms for rearing and caring of dry animal and to prevent them from slaughtering to maintain the genetic pool of best breeds of livestock population
2. Establishment of model dairy farms for extension, research and business demonstration purposes at regional level under partnership with the private sector
3. Establishment of modern slaughter houses with advance facilities to ensure the production of quality meat to the consumers and to be used for research purposes targeted at meat industry expansion and provision of ***HALAL MEAT*** to the entire Muslim community**.** The first model will be established at Agricultural University, Peshawar.

Legislative and policy support

1. Reviving the existing livestock policy and making a new policy compatible with local environment. Regulating the livestock production system for incorporating environmental, economic and public health concerns. Revising pricing policy for livestock and dairy products in accordance with input and output expenses in the business
2. Quality control systems shall be introduced and standards shall be defined for milk, meat and by-products to certify for entry into local and international markets. Quality control shall be introduced in milk and meat marketing.

3. New legislation shall be made to overcome problems associated with exporting livestock and dairy products
4. Devising and strict implementation of policies to control the smuggling of livestock across border to Afghanistan and other countries.
5. Periodic livestock census should be conducted to generate valid data and make right decision accordingly.
6. Regulating the slaughtering of animals to prevent the losses of potential animals, especially under-age and pregnant animals and to address public health concerns by rejecting animals carrying zoonotic risks.
7. Current marketing system is outdated and need to be re-structured and re-organized. This requires a detail analysis of the present marketing system to make it producers' and consumers' friendly and attract new investments. The income coming out of the slaughter houses and cattle market shall be spent on the business support initiatives proposed under this draft.

Animal production support

1. Integration of the four pillars into development strategy, i.e. 1) Genetics 2) Nutrition 3) Management 4) Health.
2. Local breed improvement programs should be launched and collaborated with other provinces. A provincial nucleus of different breeds of dairy animal should be established to improve their production potential and to conserve them through advance techniques. Achai conservation activities may be linked with research setup for meaningful data analysis and strategy development.
3. Camel has got extraordinary potentials to produce milk. This milk has been narrated as a panacea for different human diseases in Hadith. This miraculous milk should be investigated in modern scientific ways to be used as a good source of income and medicine.
4. Azikhili Buffaloes, a well known breed of the province has got wonderful features and milk producing potentials. It is warranted to deeply investigate their genetic make-up to fully exploit its milk production potentials and adoptability to the local climate.
5. Farmers must be educated to raise dairy goats (beetle) and sheep (damani) who are unable to raise cows and buffaloes due their rearing cost.
6. Nutritional status of livestock in the province should be improved by promoting high yielding and nutritive fodders and improving pastures conditions for grazing livestock.
7. Establishment of silos (for silage making) at commercial level to ensure the availability of feed for livestock throughout the year at affordable prices for both commercial and non-commercial farmers
8. Research work is needed to examine non-conventional feed resources in dairy animals to control and reduce high feed costs and to generate more income

Animal health support

1. Developing and testing locally produced medicines and vaccines to reduce health related costs and to create new employment opportunities.
2. The potential benefits of herbs in veterinary medicine shall be exploited on modern scientific basis to ensure safe end products for consumers.
3. Vaccine production shall be supported for qualitative and quantitative improvement against foot and against locally prevalent diseases and considered for export through incorporation of international standard.
4. Modern biotechnological techniques shall be used to minimize the reproduction and production losses in the dairy industry.

5. Efforts shall be made to investigate and minimize all sorts of stresses, especially heat stress to improve reproduction in dairy animals. Different approaches must be undertaken (nutritional and environmental) to cope with high heat stress during summer temperatures and production stress in the genetically improved animals.
6. Alternative and easy methods/tests shall be developed for minimizing losses in productivity and fertility e.g. newly emerging methods of early pregnancy.

Environment and energy solutions

1. Environment related issues should also be focused before launching any big dairy project to keep our environment safe.
2. Renewable energy solutions may be introduced for safety of environment and self sufficiency in energy production.

Institutional strengthening and Coordination

1. Various institutions in the public and private sectors are working to support the livestock related activities, however the coordination is not very affective. The major stakeholders namely academia, research, extension, civil society and industry must join hands for collaborating their activities and sharing information and resources for achieving the common goal of supporting the livestock sector to play its due role in food security and income generation. A working committee may be assigned this task.
2. An interactive forum for discussing the major issues to develop, update and implement a comprehensive policy for the development of the industry, is required. It may be mandated for frequent exchange and dissemination of information among different segments of livestock sector through successful organization of workshops, conferences and seminars.
3. Researchers and institutions need to be facilitated and strengthened to promote quality research and resolve problems of dairy sector. International standards shall be incorporated in the research system. Career development of the scientists for better delivery of services is required.
4. Creating new and re-organizing the existing extension system to provide facilities to farmers at their door steps. Extensive involvement of the extension officers in the development process.
5. Training of livestock workers, researchers and other scientist to cope with the new challenges of modern livestock and dairy sector. Short training courses for livestock farmers and school and college students (during summer vacations) in the rural areas.
6. Establishment of ISO standard laboratories to assess the quality of feed, water, drugs and other inputs for consumption by livestock and analysis of livestock products for fitness for human consumption. Devising on farm tests to check feed and water quality.
7. The ITAC Cell at the KPCCI will be assigned the task of livestock business support and linkages with the University, Livestock and Dairy Development Departments, (Extension and Research) and SMEDA. Effective linkage of the cell with other CCIs and financing agencies.
8. Incorporating the internship concept into the work plans of all relevant organizations for career development of the outgoing graduates and producing quality manpower for boosting the national economy through jobs finding in the local industry and abroad.

4a. ABSTRACTS
Animal Health

AH-1

PHYSICO-CHEMICAL FACTORS AUGMENTING *IN VITRO* BIOMASS PRODUCTION OF *PASTEURELLA MULTOCIDA*

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ABSTRACT

Pasteurella multocida causes hemorrhagic septicemia (HS), an economically devastating disease in buffalo and cattle. The disease is controlled effectively through mass scale vaccination of the susceptible animals. For a quality vaccine, biomass production of *P. multocida* along with its capsule (immunogen) is necessary. Physico-chemical factors such as composition of growth medium, temperature, pH, incubation time and stirring along with aeration affect its biomass production were evaluated. In Casein yeast sucrose (CYS) broth, there was maximum growth during 18 hours incubation. Optimum conditions for maximum growth of the bacterium were 35 to 40°C incubation temperature, 7.0 to 8.0 pH and 500 rpm stirring along with aeration during incubation of 24 hours. It was concluded that composition of growth medium, temperature, pH of the medium and stirring along with aeration of the broth during incubation are critical points for maximum biomass production of *P. multocida* that are basic requirements for preparation of effective vaccine.

Keywords: *Pasteurella multocida*, hemorrhagic septicemia, buffalo, cattle, vaccine, media

AH-2

ANTIBODY RESPONSE OF BUFFALO CALVES TO DIFFERENT LEVELS OF FOOT AND MOUTH DISEASE VIRUS IMMUNOGEN

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ABSTRACT

Antibody response of buffalo calves to different levels of Foot and Mouth Disease (FMD) virus immunogen in trivalent vaccine was investigated. The vaccine containing $10^{6.2}$ units of immunogen/$TCID_{50}$ of each of the three serotypes of FMD virus induced $\log_2(1.3\pm 0.4)$ units of anti-FMD"O" Complement Fixing Cumulative Geometric Mean antibody (FMD"O" CFT-CGM) titer, $\log_2(1.4\pm0.3)$ units of anti-FMD"A" CFT-CGM titer and $\log_2(2.0\pm0.7)$ units of anti-FMD"Asia-1" CFT-CGM titer. The vaccine containing $2x10^{6.2}$ units of immunogen of each of the three serotypes of FMD virus induced $\log_2(2.2\pm0.2)$ units of anti- FMD"O" CFT-CGM titer, $\log_2(2.1\pm0.25)$ units of anti- FMD"A" CFT-CGM titer and $\log_2(3.4\pm0.8)$ units of anti-FMD"Asia-1"

CFT-CGM titer. The vaccine containing $3x10^{6.2}$ units of $TCID_{50}$ of each of the three serotypes of FMD virus induced log_2 (5.3 ± 2.0) units of anti-FMD"O" CFT-CGM titer, log_2(4.6±1.9) units of anti-FMD"A" CFT-CGM titer and log_2(5.0±2.2) units of anti- FMD"Asia-1" CFT-CGM titer. The vaccine containing 4 x $10^{6.2}$ units of $TCID_{50}$ of each of the three serotypes of FMD virus induced log_2 (5.5±1.5) units of anti-FMD"O" CFT-CGM titer, log_2(4.4±1.9) units of anti-FMD"A" CFT-CGM titer and log_2(5.2±1.9) units of anti-FMD"Asia-1" CFT-CGM titer. Moreover, buffalo calves (n=3) which were primed and boosted with 60 days interval using vaccine containing $2x10^{6.2}$ units of immunogen of each serotype of FMD virus, showed $log_2$5.0 and $log_2$6.3 units of anti FMD"O"-CFT-GMT antibody titer, $log_2$4.6 and $log_2$6.0 units of anti FMD"A"-CFT GMT antibody titer, $log_2$5.6 and $log_2$6.0 units of anti FMD"Asia-1"-CFT GMT antibody titer, on 30 and 120 days post boosting, respectively. It was concluded that antibody response of buffalo calves was directly proportional to the amount of immunogen of FMD virus serotypes in the vaccine.

Keywords: FMD virus, Immunogen, Buffalo calves, antibody response

AH-3

GENETIC RESISTANCE & IMMUNE STATUS OF LOCAL & EXOTIC CATTLE AGAINST MYCOBACTERIUM TUBERCLOSIS & SALMONELLA TYPHIMURIUM

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ABSTRACT

Genetics plays a foremost and acute role in creating resistance in cattle against assertive zoonotic and infectious diseases. The existant study was conducted on genetic resistance and immune status of local and exotic cattle against *Mycobacterium tuberclosis* and *Salmonella* typhimurium. A health record of past 5 years was gethered from Government Cattle Breeding & Dairy Farm Harichand, the past disease protective potential was analyzed, no evidence of tuberclosis and salmonellosis was found while the animals suffered with ordinary complications. The animals were categorized in three groups. The sera of thirty cattle, 10 from each 3 breeds i.e., Holstein Fresian, Jersy and Achai were tested twice against *M.tuberclosis* & *Salmonella typhimurium* through ELISA. The antibody concentration was measured in terms of mean absorbance and mean OD (Optical density). All the cattle depicted lower antibody titre ≤ 2U/ml for tuberclosis comparable from SPC (Srong positive control=12U/ml) and ≤1U/ml for salmonellosis (Positive control =2.25 U/ml). The lowest antibody titre suggests that the cattle were immunzeded against the disease exigency. Genetic confirmation through polymerase chain reaction following candidate gene approach concludes, bovine carry disease resistance gene Natural resistance associated macrophage protein 1 (Nramp1),beared by all cattle groups which accord resistance against *M. tuberclosis* and *S. typhimurium*. The fragment size of each marker were scaled ranging from 100 to186bp for Nramp1(1)1,109 to142bp for Nramp1(2)and 60 to100bp for Nramp(3).The outcomes of this study confirmed that cattle bear natural resistance to *M. tuberclosis* and *S. typhimurium* by holding Nramp1.

Keywords: Genetic Resistance, Immune Status, Local, Exotic Cattle, Mycobacterium Tuberclosis, Salmonella Typhimurium

AH-4

EPIDEMIOLOGY OF BOVINE TUBERCULOSIS IN PAKISTAN: CURRENT AND FUTURE CONTROL PROGRAM

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ABSTRACT

Bovine tuberculosis is an important zoonotic disease of animals with trade barrier and is endemic all over the world. The advanced countries have reduced this disease in their animals through test and cull program but developing world has this disease with reasonably high prevalence. Pakistan is no exception to its prevalence and its magnitude vary in different parts of the country but unfortunately not much work has been done on its surveillance or at least or it has not been well reported. Most reports are from Faisalabad and Lahore or from Government Livestock Farms. An old report accessible trace back to 1969 and recently more studies have been carried out with the use of advanced diagnostic techniques. Recently on epidemiological front some good efforts have been made to find the risk factors associated with this diseaes. The important risk factor identified through use of logistic regression analysis were lactation status of buffaloes, presence of cattle at the buffalo farms and Nili Ravi than Kundi breed of buffaloes in a study carried out in Okara and Faisalabad. In cattle, the risk factors identified at 11 livestock experiment stations were age, number of calving, total milk produced, per day milk produced, lactation length, presence of sheep at the farm and total numbers of animals at the farm. The disease in small ruminants is less serious with low prevalence. The natural conditions or husbandry practices are such that the disease has not become serious in the country with major contribution coming from low herd size along with some other factors. But as the private livestock farming is on the increase, the disease in near future is speculated to get worsen and thus there is a dire need to think on some control programs. The control programs are needed to be discussed, debated and streamlined.

Keywords: Epidemiology, bovine tuberculosis, Pakistan, control program

AH-5

PCR AND MICROSCOPIC IDENTIFICATION OF ISOLATED LEISHMANIA TROPICA FROM CLINICAL SAMPLES OF CUTANEOUS LEISHMANIASIS IN HUMAN IN KOHAT KHYBER PAKHTUNKHWA

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ABSTRACT

Leishmania tropica was isolated from the clinical patients of cutaneous leishmaniasis in rural community of Distract Kohat in Khyber Pakhtunkhwa province and was identified through PCR, microscopy and culture techniques. A total of 113 samples from the clinical patients were examined through PCR, microscopy and culture which showed 87.61% (99/113), 53.98% (61/113) and 46.90% (53/113). During the study, 186 bp *Leishmania tropica* was identified through PCR. Thus the sensitivity of PCR is very high as compared to the conventional techniques.

***Keywords*:** Microscopy, PCR, Culture, Leishmania tropica

AH-6

DETECTION OF GIARDIA LAMBLIA AND ENTAMOEBA HISTOLYTICA IN DIFFERENT WATER SOURCES BY USING PCR METHOD IN RAWALPINDI REGION, PAKISTAN

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ABSTRACT

Contamination of community water by parasites causes waterborne diseases worldwide. *Giardia lamblia* and *Entamoeba histolytica* are most ubiquitous. 100 water samples were collected from Airport Employees co-operative Housing Society (AECHS) and Jabi, Rawalpindi. Water was filtered and DNA extracted from filtrate. Extracted DNA was amplified with specific primer by PCR method and detected through electrophoresis. The overall prevalence of *Giardia lamblia* was 19% and *Entamoeba histolytica* 10% through PCR. Prevalence of *G. lamblia* in AECHS was 1.7% in tap water and 50% in well water. *E. histolytica* was 8.3% detected in tap water while well water and filter water were found free of parasites. Similarly, *G. lamblia* was detected 31.1 and 15.5% of *E. histolytica* in well water samples in Jabi (Rawalpindi). Only two houses have tap water facility and were contaminated with Entamoeba species. No filter facility was present in the area. It is concluded that the water sources were highly contaminated with Giardia and Entamoeba spp. in the areas especially Jabi (Rawalpindi) where poor hygienic condition may lead to outbreak of these diseases.

Keywords: G.lamblia, E.histolytica, PCR, AHS and jabi.

AH-7

COMPARITVE STUDY ON THE INCIDENCE OF BLOOD PARASITES IN ACHAI AND CROSSBRED CATTLE IN DISTRICT SWAT

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ABSTRACT

The present study was conducted to compare the incidence of blood parasites in Achai and Crossbred cattle of different age groups in Upper and Lower areas of District Swat. A total of 276 blood samples, collected in Upper and Lower swat from Achai and Crossbred cattle (each sub-divided into pre-weaned, young and adult age group) were tested for blood parasites through Gimsa's staining. Result showed significant effect of breed (P = 0.001), age (P=0.001) and location (P = 0.023). Overall incidence of Theileria, Babesia and Anaplasma was 18.1, 8.7 and 4.3% in District Swat. While incidence rate of Theileria, Babesia and Anaplasma was 12.3, 12.04, and 2.89% in Upper Swat and 23.9, 13.5 and 5.79% in Lower Swat. Prevalence of Theileria, Babesia and Anaplasma was 11.5, 7.06 and 1.44% in Achai cattle while in Crossbred cattle it was 24.63, 18.47 and 7.24% respectively. In winter season, the incidence of Theileria, Babesia and Anaplasma was 10.86, 7.24 and 2.7%, while in summer season the incidence of Theileria, Babesia and Anaplasma was 24.2, 10.8 and 5.7, 8.69, 29.34 and 16.30% of prevalence of Theileria was observed

in pre-weaned, young stock and Adult stock cattle, and prevalence of Babesia in pre-weaned, young stock and Adult stock cattle was 5.43, 8.69 and 11.95%, while prevalence of Anaplasma was 1.08, 5.43 and 6.52% in pre-weaned, young stock and Adult stock cattle in District Swat. It is concluded that incidence of blood parasite in Lower Swat is higher than Upper Swat and Theileria parasite is found the most prevalent among blood parasites in district Swat. Blood parasites were prevalent more in Crossbred cattle as compared to Achai cattle. Whereas, blood parasites are more prevalent in young age cattle of Crossbred.

***Keywords*:** Blood parasites, Swat, Achai and Crossbred cattle.

AH-8

SCABIES A ZOONOTICALLY TRANSMITTABLE DISEASE

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ABSTRACT

Ectoparasites play a fundamental role in health problems among animals and humans. Sarcoptes scabiei mites (cause of itching and irritation in all individuals) among the ectoparasites are playing a major role in causing heavy economic losses in term of milk and meat in animals. The transmittability of mites was assessed in Humans having contact with S. scabiei infested animals. Though the S. scabiei mites spend their entire life on their respective host, some mites do fall off into the environment due to animal scratching and survive for up to 3 weeks, becomes source of spreading. Taking into consideration the above fact, about 300 scabies infested dogs, 150 camels drivers, 150 dairy man and woman dealing with scabies positive buffalo calves and 150 nomadic men keeping scabies infested goats were visited. After conducting the study, the main zoonotic transmitters found were dogs and camels. The transmittability percentage recorded in dogs 23%, camels 15%, buffalo-calves 2% and goats 2%. For experimental transmittability was assessed through syringing of 500 live S. scabiei var canis on the back of the healthy buffalo-calves, 250 live S. scabiei var bubalis over the back of healthy goats, 400 live Sarcoptes scabiei var cameli over the back of healthy dogs, 150 live S. scabiei var caprae over the back of healthy camels were carried out. S.scabiei var canis showed 10% transmittability to buffalo calves (observed 10 days PE), S.scabiei var bubalis showed 20% transmittability to goats (observed 8 days PE), S.scabiei var cameli showed 25% transmittability to dogs (observed 10 days PE) and S.scabiei var caprae showed 15% transmittability to camels (observed 12 days PE).

Keywords: Ectoparasits, transmittability, Scabies, Camels, Zoonotic

AH-9

PREVALENCE OF BRUCELLOSIS IN ABORTED DAIRY ANIMALS AND THEIR HANDLERS IN DISTRICT BANNU, KPK

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ABSTRACT

The objective of the present study was to investigate the prevalence of brucellosis in dairy animals and their handlers. For this purpose, three experiments were carried out. In experiment 1, a total of

100 dairy animals with previous history of abortion (cattle=77, buffalo=23) were selected. In experiment 2, 73 persons (male=50, female=23) having close association with the aborted animals were evaluated for prevalence of brucellosis. In experiment 3, veterinary staff (n=50) deputed in the area were investigated. The seroprevalence of Brucella in dairy aborted animals determined was 27% (27/100) and 10% (10/100) on the basis of SPAT and RBPT respectively. Out of 27 samples declared positive by SPAT and RBPT, only 41% (11/27) were found positive through PCR. Among the handlers out of 73 samples (male=50, female=23), 24.65% (18/73) showed seropositivity with SPAT and 6.84% samples were positive with RBPT. When the positive samples (n= 18) were further analyzed through PCR which resulted in 50% (9/18) confirmation of the sample to be positive and 50% (9/18) were found negative with PCR. The seroprevalence of Brucella in veterinary staff was 30% (15/50) and 4% (2/15 with SPAT and RBPT respectively. Out of 15 samples declared as positive with SPAT and RBPT, 47% (7/15) were confirmed to be positive using PCR. Chi-square test revealed six study variables in animals to have highly significant association with Brucellosis ($P<0.05$) using SPAT. These variables were age, breed, breeding method, contact with infected animals, introduction of new animals and sanitation. Body condition and grazing were not associated with the disease ($P>0.05$). In handlers, age was significantly associated with brucellosis on the basis of SPAT ($P<0.05$) while it had no association with the disease using RBPT and PCR ($P>0.05$). A significant association of clinical signs and contact with infected animals was found with the disease ($P<0.05$) using SPAT, while gender and abortion history in family had no significant association with brucellosis ($P>0.05$). In veterinary staff, the study variables which had no association with brucellosis ($P<0.05$) were age, handling aborted animals, handling aborted placenta and use of mask with SPAT, while use of gloves was significantly associated ($P<0.05$) on the basis of PCR and clinical signs were significantly associated ($P<0.05$) on the basis of SPAT. In conclusion brucellosis is prevalent in dairy animals and their handlers and extension program must be launched to educate the farmers about the disease. The veterinarian should adopt precautionary measures to avoid chances of infection while handling the suspected animals. The PCR can be used as a confirmatory test for accurate diagnosis of Brucellosis.

***Keywords*:** brucellosis, seroprevalence, dairy animals, handlers, veterinary staff.

AH-10

IN PROCESS QUALITY CONTROL FACTORS EFFECTING POTENCY OF PESTE DES PETITS RUMINANTS VIRUS VACCINES IN GOATS

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ABSTRACT

Pesti des Petits Ruminants (PPR) is an acute contagious viral disease of small ruminants and is causing heavy economic losses to goat industry. It is controlled by mass vaccination and bio-security measures. In present study, in process quality control factors such as variable biological titer, different adjuvants and shelf life of the PPR vaccines affecting antibody response of the goats were evaluated. The freeze dried vaccine with a biological titer of $10^{5.00}$ $TCID_{50}$ per dose provoked maximum antibody titer followed by the ones with a titer of $10^{3.00}$ or $10^{4.00}TCID_{50}$ which provoked nearly equivalent antibody response while the goats inoculated with a vaccine having $10^{2.00}$ $TCID_{50}$ virus concentrations developed minimum antibody titer. The oil based PPR virus vaccines elicited significantly higher antibody response ($p<0.05$) while gel based vaccines induced relatively less

antibody titer but freeze dried PPR vaccine induced minimum antibody titers. Each of the adjuvant vaccines (oil or gel) and non-adjuvant vaccine containing biological titer of $10^{4.00}$ $TCID_{50}$ induced more than 50 Percent Inhibition (PI) values (protective antibody titer). The freeze dried vaccine stored at 4 °C did not show any significant drop in the biological activity of the virus even after 12 months of the storage. Moreover, both the freeze dried and adjuvant vaccines when stored for 12 months at 4 °C did not show any effect on their antibody response in the vaccinated goats. It is concluded that oil adjuvant vaccine with $10^{4.00}$ $TCID_{50}$ units of biological titer of virus induced the highest antibody titer in goats that persisted for more than 10 months post priming.

***Keywords*:** PPR vaccine, goats, adjuvant, antibody response

AH-11

AUGMENTATION OF BIOLOGICAL TITER OF FOOT AND MOUTH DISEASE VIRUS IN *IN VITRO* CULTURE

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ABSTRACT

Foot and Mouth Disease (FMD) virus grew well on BHK-21 cell line. The virus showed poor tissue culture infective dose 50 or $TCID_{50}$ (log $10^{3.2\pm0.2}$) in BHK-21 cell line having Glasgow Minimal Essential Medium (GMEM) without Fetal Calf Serum (FCS). Addition of FCS in the medium @ one percent increased log $10^{7.1\pm0.2}$ units of virus $TCID_{50}$. Incubation temperature of 35 ^{0}C and 37 ^{0}C supported the multiplication and maintenance of BHK-21 cells and yielded $log10^{6.6\pm0.1}$ and $log10^{7.0\pm0.2}$ units of virus $TCID_{50}$, respectively. Each serotype of FMD virus showed $log10^{6.29\pm0.07}$ units of virus $TCID_{50}$ in the stationary monolayer of BHK-21 cells in roux flask ($75cm^2$), $log10^{7.66\pm 0.02}$ units of virus $TCID_{50}$ in roller bottles ($490cm^2$) and $log10^{8.34\pm0.07}$ units of virus $TCID_{50}$ on 0.2 g of micro-carriers suspending in 200 ml of the growth medium in stirring bottle. The infectivity titer/$TCID_{50}$ of each of the virus serotypes was significantly higher in roller bottles than that achieved in roux flasks ($p<0.05$) and was significantly higher in stirring bottle containing micro-carriers suspending in the growth medium than that of harvested in roller bottle ($p<0.05$). It is concluded that the infectivity titer of the virus is directly proportional to number of BHK-21 cells in the culture system.

***Keywords*:** Anchorage dependant BHK-21 cells, roller bottles, infectivity titer, FMD virus

AH-12

IN-VIVO ANTI-THEILERIAL ACTIVITY OF MEDICINAL PLANTS IN COMPARISON TO BUTALEX

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ABSTRACT

Tropical theileriosis is an important disease of cattle in tropical regions which leads to significant economical losses with high mortality in crossbred cattle particularly calves. This study was designed to evaluate therapeutic efficacy of extracts of *Peganum harmala* and *Calotropis procera* against the theileria infected crossbreed calves in comparison to Butalex. Theileria infected calves (confermed by PCR) were randomly divided into six groups (n=5). Calves of group A were treated

with *C. procera* water extract at 3mg/kg BW I/M and that of B with chloroform extract while calves of group C were treated with *P. harmala* water extract at 3mg/kg BW I/M and D with chloroform extract. Calves of group E were treated with Butalex at 2.5mg/kg BW I/M while group F acted as control positive (diseased untreated) and G as control negative (disease free). Anti-Theilerial efficacy of treatments was estimated by evaluating the clinical manifestation of disease and parasitological findings. Beside this treatment effect on hematological and biochemical reactions of liver and kidney functions was determined. It was found that calves dosed with *C. procera* chloroform extract and butalex had rectal temperature in normal range by the day 7 of post-treatment. A non-significant difference (*P>0.05*) in schizonts and piroplasms in various treatments (A, B, C, D and E) was observed at 14 and 21 day of treatment respectively. All treatments (A, B, C, D and E) had a significant difference (*P<0.05*) in uric acid level (g/dL) and creatinine at day 21 in comparison to control positive F. Calves treated with Butalex (group E) had a significantly lower (*P<0.05*) AST concentration as compared to treatment groups A, B and F. On day 21 of post-treatment, cure rate was 60, 100, 60, 80 and 100 % for the treatments A, B, C, D and E, respectively. From this study, it was concluded that chloroform extract of *C. percura* and *P. harmala* flowers can be used as an alternate to butalex for the treatment of theileriosis in cattle.

Keywords: Thileria annulata, Butalex, *Calotropis procera*, *Peganum harmala*

AH-13

DYNAMIC DISTRIBUTION OF HARD TICKS (ACARI: IXODID) INFESTING DOMESTIC ANIMAL POPULATION OF HAJIRA AZAD KASHMIR

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ABSTRACT

Ticks are obligate ectoparasite of mammals which play a vital role of pathogen transmission in animals as well as human. This study was conducted to explore hard tick infestation in the livestock population of Tehsil Hajira of Azad Kashmir from July to December 2011. For this purpose, a total of 675 animals including 300 goats, 150 sheep, 116 cattle and 109 buffaloes from randomly selected villages of respective Tehsil were screened for tick infestation. Ticks were identified by using standard identification keys. Overall prevalence of ticks was found 51.25% (346/675) where it was found highest in cattle population (55.45%) as compared to that of sheep (54.66%), buffalo (48.69%) and goats (48.33%). *Hyalomma* was most abundant genus with prevalence of 39.19% followed by *Rhipicephalus* (33.26%) and *Haemophysalis* (27.55%). Sheep population was found with the highest prevalence (48.57%) of Hyalomma followed by goats (38%), buffalo (36.6%) and cattle (28.68%) whereas goats (33.79%) were at more risk of *Haemophysalis* than that of sheep (28%), cattle (20.49%) and buffalo (17.85%). *Rhipicephalus* was found only prevalent in cattle (24.59%) and buffaloes (16.96). Ticks infestation was higher in the month of July (58.53%) and August (57.33%) whereas, it was found lowest in the month of December (29.03%). The results of present study provide probably the first report of tick infestation in the domestic animal population in the region. Therefore, a wide-scaled, randomized surveillance is recommended to be planned in order to determine the associated risk factors which can positively influence the risk of tick infestation in the study area.

Keywords: Prevalence, Ticks, Ixodid, Livestock, Hajira, Azad Kashmir

AH-14

CELLULAR AND MOLECULAR MECHANISMS UNDERLYING THE ANTIOXIDANT AND ANTI-INFLAMMATORY ACTIVITIES OF HESPERIDIN IN CHICKENS

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ABSTRACT

Flavonoids, a group of polyphenolic compounds found mainly in fruits and vegetables, are one of the widely researched non-antibiotic feed additives in animal nutrition. The objective of this study was to determine the *in vivo* cellular and molecular mechanisms underlying the antioxidant and anti-inflammatory activities of hesperidin, a citrus flavonoid, in chickens. A total of 480 one day-old broiler chicks were randomly divided into 5 groups and received a common basal diet with hesperidin added at either 0 (control), 2.5, 5, 10 or 20 mg/kg diet, respectively. At day 21 and day 42, blood and liver samples (six from each replicate) were collected to analyze the effect of hesperidin on antioxidant and anti-inflammatory parameters. Overall, hesperidin exhibited age and dose dependent effects. The plasma SOD and TAOC concentrations of hesperidin treated birds were lower than the control group on day 21 and 42 indicating a decreased free oxygen radical scavenger status in birds. However, the plasma MDA, an indicator of lipid oxidation, overall showed a significant decrease in birds fed 20 mg hesperidin/kg. Significant decrease in PGE_2 and LTB_4 production was also observed on day 42 in hesperidin supplemented birds. The study of molecular mechanisms of action of hesperidin revealed significant down-regulation for hepatic HSP-70 mRNA level and iNOS mRNA level on day 42 and for COX-2 gene expression on day 21 in a dose related fashion. In conclusion, the *in vivo* beneficial effects of hesperidin are attributed, in part, to the suppression of inflammatory parameters while its effect on antioxidant activity is minimal in birds. These results may have implications for the development of new flavonoid-based pharmaceutical agents.

Keywords: Broiler, hesperidin, antioxidant, anti-inflammatory

AH-15

RISK DYNAMICS OF CONQUEST BY MITES IN BUFFALO (*BUBALUS BUBALIS*) AT THE SMALLHOLDER FARMS OF DISTRICT TOBA TEK SINGH, PUNJAB PAKISTAN

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ABSTRACT

The aim of the present study was to explore the prevalence and potential risk factors associated with mite infestation in buffalo at the smallholder farms of district Toba Tek Singh, Punjab, Pakistan. A total of 318 out of 1234 buffalo in 77 small scaled herds were examined. The age of buffalo varied from three months to seven years. In all, 53 (16.66%) buffalo were recorded to be infested; 51

(16.35%) with *Psoroptes spp.* mites and two cases (0.31%) with *Chorioptes spp.* mites. Multivariate logistic regression was performed for significant risk factors at univariate analysis on both animal and herd levels. On the animal level, the prevalence of mites was affected by animal age (P<0.01; OR: 0.71; CI 95%: 0.441-1.11), season (P<0.01; OR: 1.20; CI 95%:0.541-1.15), indoor management (P<0.001; OR: 6.625; CI 95%:2.489 -17.631) and rearing with other animals (P<0.01; OR: 2.22; CI 95%:1.340 -7.132). However, on the herd level, the prevalence was affected by indoor rearing (P < 0.05; OR: 22.4; CI 95%:2.75-16.431), mixed rearing with other animal species (P<0.05; OR: 4.5; CI 95%:1.66-7.941), and season (P<0.01; OR: 2.3; CI 95%:0.575-2.426). Clinically, mild skin lesions with mild pruritus were significantly prevalent in buffalo with the infestation by *Psoroptes spp.* mites (P<0.001), where 33/51 cases showed mild lesions. Also, *psoroptic* mites had significant association with inappitence (P<0.001). The result of the present study indicates that *Psoroptes spp.* mites are the most prevalent in buffalo in the study district of Pakistan. Moreover, recognition of risk factors associated with mange mites in buffalo may enable the practitioner to establish the most appropriate control measures.

Keywords: *Psoroptes spp.* Buffalo, Punjab, Prevalence, *Chorioptes spp.*

AH-16

AN ELUCIDATION OF ECOEPIDEMIOLOGICAL ASPECTS OF ECTOPARASITES INFESTING THE CONTIGUOUS DOG POPULATION OF PUNJAB, PAKISTAN

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ABSTRACT

A cross-sectional survey was conducted to investigate the epidemiological aspects of ectoparasites in dog population of district Faisalabad, Punjab, Pakistan. The overall prevalence of ectoparasites in dogs of study area was recorded 56.75% (681/1200). Among various ectoparasites, fleas were found predominant (16.3%; 196/1200; P<0.05) in comparison with ticks (14.33%; 172/1200), lice (11.3%; 136/1200), flies (7.66%; 92/1200) and mites (7.0%; 85/1200). Among the identified species of ectoparasites, 5 were arachnids (*Rhipiephalus (R.) sanguineus, Hyalomma anatolicum anatolicum, R. microplus, Sarcoptes scabei* and *Demodex canis*) and 5 were insects (*Ctenocepahlides (Ct). canis, Ct. felis, Trichodectes canis, Linognathus setosus* and *Stomoxys calcitrans*). Age, sex and breed of host were not found associated (P>0.05) with the prevalence of ectoparasites. The prevalence of ectoparasites was found significantly higher in rural areas (61.83%) as compared to the urban areas (38.16%). According to site of infestation, highest rate was observed at ear (24%) followed in order by neck (17%), back (11%), abdomen (9%), foreleg (7%), hind leg (6%), shoulder (5%), genital area (5%) and tail (3%). Tehsil wise prevalence was found highest in Jaranawala (62.91%) followed in order by tehsil Faisalabad (59.58%), Jhumra (59.16%), Samundri (55.41%) and Tandlianwala (46.66%). Rate of infestation was found significantly highest in stray dogs (80.36%) in order followed by guard (63.69%), hunting (37.5%) and pet dogs (35.66%). In various season studied in the present survey, winter was with the highest prevalence of lice (18.66%; 56/300), fleas (11.66%; 35/300) and mites (13%; 39/300) while prevalence of ticks and flies was highest in summer (28%; 84/300) and spring seasons (17.66%; 53/300), respectively. In conclusion, dogs were found at high risk of ectoparasitism which may leads to serious skin problems in the study area.

Keywords: Prevalence, Risk factors, Dog, Ectoparasites, Faisalabad

AH-17

EPIDEMIOLOGY OF ECTOPARASITIC FAUNA OF EQUINE POPULATION IN FAISALABAD METROPOLITAN

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ABSTRACT

Equines are assumed to be the companions of humans and vital source of food, draught, amusement and transportation since centuries. Parasites are threats to the health and working ability of equines, making them less beneficial. Ectoparasites cause anemia, frequent rubbing/scratching, restlessness, inflammation, neoplasm, dull body coat, alopecia, depression and starvation. Some ectoparasites also act as vector for various viruses, rickettsia, bacteria, protozoa and helminths. This paper describes a cross-sectional study conducted in Faisalabad Metropolitan, from March 2012 to February 2013, with the objective to estimate the prevalence and potential risk factors of ectoparasites in equine population. Overall prevalence of ectoparasites was estimated as 34.42%. Flies were predominant (15.99%; $P<0.05$) as compared to ticks, mites and lice. Most common species of flies were from genus *Stomoxys*, *Tabanus*, *Musca*, and *Culicoides*. *Rhipicephalus*, *Boophilus* and *Hyalomma (ticks)*, *Haematopinus (lice)* and *Chorioptes (mites)* were found prevalent in the study population. Prevalence of ectoparasites was found statistically non-associated ($P>0.05$) with the sex and breed of host while associated ($P<0.05$) with the age; being higher in older animals. Highest rate of infestation was observed at back (24%) followed in order by neck, nose, hind limbs, abdomen, shoulder, forelimbs, congenital area and tail. Mules (36.01%) were most infected than Donkeys (33.47%) and Horses (33.93%). Winter was having highest prevalence of lice (10.85%) and mites (9%) while ticks and flies were highest in summer (24%) and spring (21%). To decrease the prevalence and influence of ectoparasites on equine population, applicable and planned control measures and extension amenity directing at awareness about the status and control of ectoparasites are needed.

Keywords: Prevalence, Risk factors, Equines, Ectoparasites, Faisalabad Metropolitan.

AH-18

PREVALENCE AND ASSOCIATED FACTORS OF BOVINE ANAPLASMOSIS IN DISTRICT KHANEWAL

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ABSTRACT

Anaplasmosis is an important blood parasitic disease of buffaloes and cattle endemic in tropical and subtropical countries of the world. *Anaplasma (A.) marginale* and *A. centrale* are the responsible pathogens for bovine anaplasmosis. In this study, a cross-sectional survey was conducted in cattle and buffaloes of District Khanewal in order to determine the epidemiology of bovine anaplasmosis through conventional optical microscopy of Giemsa-stained blood films. A total of 1536 cattle and buffaloes were examined with overall prevalence of bovine anaplasmosis as 4.17% (64/1536).

Association of bovine anaplasmosis with different factors was also studied using pre-designed questionnaire during the study period. The prevalence of anaplasmosis was higher in cattle than buffaloes, calves than adults, females than males, gathered than free and closed housing than semi-closed and open housing system. Within breeds cross-bred cattle was at highest risk followed in order by Sahiwal cattle and Nili Ravi buffalo. Summer season was found optimum for the disease followed in order by autumn, spring and winter. The collected information provides the first report of anaplasmosis in the bovine population of the study district. The data will not only be helpful for the dairy farmers to modulate farming practices but also for the policy and decision makers to control the nuisance in the livestock population of the district.

Keywords: Anaplasmosis; *Anaplasma marginale*, *Anaplasma centrale*; Khanewal; cattle; buffaloes

AH-19

EPIDEMIOLOGY AND ASSOCIATED RISK FACTORS OF GASTROINTESTINAL PARASITISM IN EQUINE POPULATION OF FAISALABAD METROPOLITAN

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ABSTRACT

Gastrointestinal (GI) parasitism pose a major threat to equine health which leads to various economical and health problems in managing equines. The helminths ova which are predominantly found in faeces of equines include: *Parascaris equorum*, *Anoplocephala spp.*, *Paranoplocepala mamillana*, *Oxyuris equi*, *Strogyloides westeri*, *Habronema spp.*, *Draschia megastoma*, *Dictyocaulus arnfieldi* while among protozoan cysts include those of *Giardia spp.* and *Eimeria leuckarti*. In the present study, a cross-sectional survey was conducted in equine population of Faisalabad from Sep. 2012- August 2013 in order to determine the epidemiology of GI parasitism and its associated risk factors including age, specie, sex, purpose of keeping and body scoring of equines. At the end, equines were brought to the mobile clinic of Brooke Hospital for Animals Faisalabad, and were screened for GI parasitism through standard protocols. Appropriate information regarding associated risk factors and clinical and physical parameters including temperature, respiration rate, pulse rate, anorexia, anemia, debility of infected and healthy animals, was recorded on questionnaire. Overall prevalence of GI parasites till June 2013 was recorded as 38.29%. These results of study provide the abundance of GI parasites in equine population of Faisalabad. Moreover, knowledge about associated risk factors helpful in providing a sustainable prevention and control of GI parasites for farmers according to its climatic conditions.

Keywords: Gastrointestinal parasitism; Equines; Faisalabad; Protozoan; Epidemiology

AH-20

COMPARATIVE ANTI-HAEMONCHOSIS EFFECT OF *CURCUMA LONGA, CITRULLUS COLOCYNTHIS* AND *PAGANUM HARMALA*

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ABSTRACT

The present experiment was designed to evaluate the anti-haemonchosis activity of herbal formulation (HF) comprising of aqueous extracts of *Curcuma longa* (rhizome), *Citrullus colocynthis* (fruit) and *Paganum harmala* (seed) individually as well as in combination. In vitro, eggs and adult of *Haemonchus contortus* were exposed to different concentrations of HF following the standard procedures of egg hatch test (EHT; 1.2 to 12000 ug ml $^{-1}$) and adult motility assay (AMA; 100-3.125 mg ml^{-1}), respectively. The reference drugs used in the study were oxfendazole (1.2 to 12000 ug ml^{-1}) and Levamisole (1.50 mg ml^{-1}) for EHT and AMA, respectively. In vivo, pre and post-treatment with dose concentration of (1 gm, 2 gm and 4 gm kg^{-1} body weight) for fecal egg counts were determined following standard fecal egg count reduction test in sheep naturally parasitized with mixed species of gastrointestinal nematodes. In EHT, LC_{50} values of HF and oxfendazole were 69.7543, 62.5321, 76.4326, 46.1243, 44.5671, 41.7831, 14.5431 and 0.0441 µg ml $^{-1}$, respectively. In AMA, 100% mortality of *H. contortus* was observed 4 hr post-exposure to 100 mg ml-1 concentrations of HF and 2 hr post-exposure to Levamisole. In vivo, maximum (98.6%) fecal egg count (EPG) reduction was recorded in sheep treated with HF @ 4 mg kg^{-1} body weight; whereas, 99.2% reduction in EPG was recorded in sheep treated with Levamisole @ 7.5 mg kg^{-1} body weight. A graded dose response was noted in all the tests used in the present study to evaluate the anthelmintic activity of HF. Therefore, HF seems to be promising as an anthelmintic for animals. Large scale trials on efficacy and safety, however, are recommended before the HF is considered for commercialization in crude form.

Keywords: Haemonchosis; *Curcuma longa*; *Citrullus colocynthis; Paganum harmala*

AH-21

POINT PREVALENCE OF GASTROINTESTINAL HELMINTHES IN BOVINE POPULATION OF PAROKA FARM, FAISALABAD, PAKISTAN

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ABSTRACT

One hundred and one faecal samples were examined for gastrointestinal helminth parasites in order to define the point prevalence in cattle and buffaloes of Paroka dairy farm, University of Agriculutre, Faisalabad, from January to June, 2012. The result of the faecal examination revealed the presence of eleven (11) gastrointestinal helminth parasites, namely; *Haemonchus contortus, Strongyloids spp., Oesophagostomum spp., Cooperia pectinita, Syngamus laryngeus, Trichuris spp.* and *Toxocara vitulorum* of nematodes, *Fasciola hepatica* and *Fasciola gigantica* in trematodes, *Secistocirrus digitatus* of cestodes and only *Eimeria spp.* of protozoa. Of the total examined

samples, 63 (62.37%) were positive using the floatation technique while 38 (37.62%) were positive for sedimentation technique. A statistical significance was found between these techniques ($p<0.005$). Among the prevalent spp. of GI parasites, *Eimeria spp.* (45.16%) was found highest while *Toxocara vitulorum* (0%) was least prevalent spp. Breed, age, body condition and pregnancy status of infected animals were found statistically ($p<0.005$) associated with the prevalence of GI parasitism. This study may provide baseline data for planning of control strategies of the prevalent parasites.

Keywords: Prevalence, GI Parasitsim, Faisalabad, Cattle, Buffaloes

AH-22

BREED RESISTANCE TO GASTROINTESTINAL PARASITISM IN DOMESTIC GOATS (*CAPRA HIRCUS*): A FOOD FOR THOUGHT

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ABSTRACT

Parasitic infections generally and gastrointestinal (GI) nematodes particularly is global health problem to domestic goats (*Capra hircus*) through lowering production and high cost of treatment. Countries like Pakistan, where goat keeping is a dominated rural enterprise is greatly influenced by GI nematodes. Most common and economically important nematodes which influence productivity of goats belong to family Trichostrongylidae viz: Haemonchus, Cooperia, Ostertagia, Oesophgostomum and Trichuris. Anthelmintics which are used for the control of GI parasite make such condition grave, if used inappropriately, due to the development of resistance. Although there are some alternate practices for the control of GI nematodes like ethno-veterinary practices, alternate grazing and integrated pest management but these have few limitations, too. Breed susceptibility to worm infection has been reported as an important tool for reducing abundance of worms in goat population. However, there is no such activity being done in the indigenous breeds of Pakistan to identify the candidate breeds of goats naturally resistant to GI nematodes. A project on the very topic has recently been initiated in the Department of Parasitology, University of Agriculture, Faisalabad to identify the resistant breeds specific to *Haemonchus contortus* worms in controlled environmental conditions. Theme of writing is to disseminate current knowledge regarding control practices to GI nematodes of goats with special emphasis to the breed selection programmes.

Keywords: *Capra hirus*, Nematodes, Resistance, Breeds, *Haemonchus contortus*

AH-23

AN UPDATE ON SMALL RUMINANT HAEMONCHOSIS IN PAKISTAN: FUTURE CHALLENGES FOR ITS CONTROL

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ABSTRACT

Among various helminths, nematodes have been proven for their economic significance in livestock and dairy population of the world. Among these, *Haemonchus contortus*, an abomasal worm, is by

far the most important parasite of small ruminantscausing a disease called haemonchosis. The disease is characterized by anemia, bad digestion/absorption syndromes, death in acute cases, and production losses in chronic cases. The frequency distribution of haemonchosis in livestock population of Pakistan has been reported ranging from 14 to 80 % with an average annual economic loss of 31.4 million. Several factors can influence the propagation the haemonchosis in Pakistan like geoclimatic conditions, poor farming practices, anthelmintic resistance, host endemicity, breed susceptibility, improper diagnosis, treatment failure and lack of awareness. Ethoveterinary practices, chemotherapy and alternate grazing are customary for the treatment of this nuisance in the livestock sector of Pakistan like many other developing countries. However, these practices have their own limitation too in addition to their success in control of the disease. The routine diagnostic approaches include: feacal examination and coproculture. However, field application of FAMACHA technique for selective treatment, use of copper oxide wire particles, resilient breed selection and use of molecular tools for diagnosis can pave way for control of haemonchosis in ruminant livestock. In view of above information, the purpose of this presentation is to disseminate and/or update knowledge about several aspects of host (small ruminants) parasite (*H. contortus*) relationship and various risk factors which may influence the efficiency of diagnostic and control methods under the indigenous small holder farming practices of Pakistan. This paper, provides useful short-term and long-term tools for minimizing the risk of disease in developing counties, generally and Pakistan specifically.

Keywords: Haemonchosis, *Haemonchus contortus*, small ruminants, control strategies

AH-24

UDDER ABNORMALITIES AND MORPHOLOGICAL TRAITS IN RELATION TO MASTITIS IN BEETAL GOATS

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ABSTRACT

The aim of present study was to determine the prevalence of udder abnormalities and its morphological traits along with their relation with mastitis. For this purpose, 100 lactating Beetal goats were selected. The study area was in and around the Faisalabad within a radius of 10 Km from the heart of city. Prevalence of udder abnormalities including udder oedema, extra teats, blind teats, asymmetrical udder, regressed udder, pendulous udder, imbalance teats, teat lesions were observed. A thorough physical examination consisting of visual observation and manual palpation of teats and udder was done to find abnormalities. To find subclinical mastitis, Surf Field Mastitis Test was performed at animal site. The data regarding teat length, teat end to floor distance, teat shape, udder shape, teat end shape, teat diameter and udder volume was collected. The data was analyzed by using the correlation techniques. Different udder abnormalities prevalence was 24%. Among udder abnormalities, the most prevalent was udder oedema (12%) followed by asymmetrical udder (7%), regressed udder (3%), pendulous udder (1%) and clinical mastitis (1%). Among teat abnormalities the teat lesions were the most prevalent (10%) followed by extra teats (5%), blind teats (4%) and imbalance teats (2%). The prevalence of subclinical mastitis was higher in bowl shape udder (91.6%), bottle shape teats (66.6%) and pointed teat end shape (63.4%). The prevalence of subclinical mastitis was 100% for all udder abnormalities. A weak negative correlation (r = -0.105)

was found between teat end to floor distance and mastitis severity. A weak positive correlation (r = 0.081) was found between teat length and subclinical mastitis severity. Similarly, a weak positive correlation was found regarding teat diameter (r = 0.117) and udder volume (r = 0.184) with mastitis. It is recommended that mastitis control at subclinical stage through proper management can lead to boost productivity of goats and profitability of farmers.

Keywords: Goats, udder abnormalities, morphological traits, mastitis

AH-25

DESCRIPTIVE EPIDEMIOLOGY OF MORTALITY IN CERTAIN CAPTIVE UNGULATES OF PAKISTAN

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ABSTRACT

Postmortem record of 217 captive ungulates including Black buck (n=31), Chinkara (n=20), Hog deer (n=116), Spotted deer (n=35), Red Deer n=(04) and Rusa deer (n=11) submitted to the Veterinary Research Institute, Lahore, Pakistan was analyzed to determine the primary cause of mortality in these animals. The submissions included temporal distribution from Government wildlife captive farms, zoo and private ownerships, over a three year period (2007-2009). The most common cause of death was found to be trauma (20.27%), followed by parasitic diseases (15.67%), bacterial diseases (11.98%), still births (9.21%), snakebites (2.76%), gut affections (2.30%), neoplasia (1.38%) and starvation (0.92%). The exact cause of death could not be determined in 77 of 217 animals. Pneumonia (8.29%) and tuberculosis (3.69%) were the most common bacterial diseases. Analyses for parasitic infestation revealed tapeworms to be highest (11.05%), followed by roundworms (8.29%) and hemoparasitism (5.07%) (babesiosis and theileriosis). Mortality rate in young ungulates was lower as compared to adults (32.26% and 67.74%). Gender wise data presented higher mortality in females (55.30%) compared to males (44.70%). In conclusion, highest mortality factor in captive ungulates was trauma, followed by parasitic and bacterial infestations/infections of tapeworms and pneumonia, respectively. Furthermore, necropsies provided substantial information on etiology of death and other related epidemiological aspects.

Keywords: Ungulates, epidemiology, mortality, gender, age

AH-26

ELISA BASED SEROSURVEILLANCE OF BOVINE FASCIOLIASIS IN DISTRICT SARGODHA

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ABSTRACT

Serological and coprological survey of bovines of district Sargodha was carried out. A total of 5580 fecal samples and 600 blood samples were collected from all six tehsils of district Sargodha. Sedimentation-floatation technique was adopted to identify Fasciola eggs in feces. Sera were screened for presence of antifasciola antibodies by indigenous DRG kit. The highest prevalence was found during month of December in both serological and coprological examination. Higher prevalence was found in Bhalwal, Sahiwal and Shahpur tehsils as compared to Sargodha, Kot-Momin and Silanwali tehsils. During coprological survey of bovines of district Sargodha, Fasciola eggs were identified in 1962 animals out of 5580 cattle and buffaloes. Significantly higher prevalence (χ^2=5.8399; P-value=0.0157; OR=0.563) was found in buffalo population as compared to cattle. Prevalence of *F. gigantica* was significantly higher (χ^2=70.6325; P-value= 0.0001) between the two species. DRG kit ELISA both have detected antifasciola antibodies in higher percentage in buffaloes (49.16% respectively) as compared to coprological examination (True prevalence= 39.33%). Similar results were recorded in cattle. Higher seroprevalence was determined as 39.36% as compared to 30.67% in coprological examination. Risk of fascioliasis was found to be negatively associated (OR=1.181; χ^2=105.6757; P-value <0.0001) with age categories being highest prevalence of fascioliasis in >2-4 years age group and then decreasing with advancement of age. Sex was found non-significantly associated with disease. Among management practices, higher prevalence was found in grazing group (χ^2=61.3443; P-value <0.0001), pond watered and river watered group (χ^2=89.7096; P-value <0.0001) as compared to stall feeding and tap watered group.

Keywords: Fascioliasis, serology, ELISA, bovine. Sargodha

AH-27

EVALUATION OF GARLIC EXTRACT, SODIUM NITRITE, SODIUM THIOSULFATE AND HYDROXOCOBALAMIN AGAINST PROLONGED ORAL CYANIDE EXPOSURE IN RABBITS

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ABSTRACT

The present study was aimed to compare the effectiveness of garlic extract, sodium nitrite (SNT), sodium thiosulfate (STS) and Hydroxocobalamin against oral cyanide exposure in rabbits. For this purpose 42 adult male rabbits were divided randomly into 7 groups of 6 animals viz. A, B, C, D, E,

F and G. Rabbits of group A were offered feed only and served as negative control, while the rabbits of group B received feed plus potassium cyanide (KCN) at 3 mg/kg orally and were kept as positive control. Animals in group C received feed, KCN and intraperitoneal injection (IP) of garlic extract at 500 mg/kg . Rabbits in group D were given feed, KCN and IP injection STS at 600 mg/kg . Members in group E received feed, KCN and IP injection of both garlic extract at 500 mg/kg and SNT at 20 mg/kg. Animals in group F were given feed, KCN and IP injection of both STS at 600 mg/kg and SNT at 20 mg/kg , while the rabbits in group G received feed, KCN and IP injection of hydroxocobalamin at 300mg/kg. The treatments were given to respective groups for 40 days. The efficacy of the antidotes was measured on the basis of changes in biochemical profile and histopathological lesions in different tissues of rabbits in each group. In this study, hydroxocobalamin was found to be a significantly more effective CN^{-} antidote than garlic, STS, SNT plus garlic extract, or SNT and STS, either alone or in combination. A combination of SNT and garlic extract was the second most effective CN^{-} antidote. The efficacy of garlic alone was significantly higher than STS alone or in combination with SNT. The efficacy of combined SNT and STS was superior to STS alone in treating rabbits with CN^{-} toxicity.

Keywords: Garlic Extract, Sodium Nitrite, Sodium Thiosulfate, Hydroxocobalamin, Cyanide, Rabbits

AH-28

EVALUATION OF FURAZOLIDONE, SULPHADIMIDINE AND AMPROLIUM TO TREAT COCCIDIOSIS IN GOATS UNDER FIELD CONDITIONS

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ABSTRACT

The aim of present study was to evaluate the efficacies of Furazolidone, Sulphadimidine and Amprolium to treat coccidiosis in goats under field conditions. Twenty four goats naturally infected with coccidiosis were randomly divided into four groups of 6 viz. A, B, C and D. A fifth group E comprised of 6 healthy goats. The goats in group A were treated orally with Furazolidone at 10 mg/kg/day for 7 days, whereas animals in group B were given oral Sulphadimidine at 100 mg/kg/day for 7 days. The members in group C were orally administered with Amprolium at 55 mg/kg/day for 7 days. Goats in groups D and E served as positive control and negative control, respectively. Oocyst per gram (OPG) of individual goat in each group was performed at day 0 (pre-treatment) and day 7, 14, 21 (post-treatment) using McMaster Technique. The efficacy of the drugs was determined on the basis of reduction in number of oocysts in feces. There was no significant difference ($P<0.05$) in OPG values of goats in all groups at day 0. At day 7, 14 and 21 the OPG values decreased significantly ($P>0.05$) in groups A, B and C compared to group D. The efficacy of Furazolidon, Sulphadimidine and Amproliun was 98.58, 98.03 and 99.55 percent, respectively at the end of the experiment (day 21). Statistically non-significant difference ($P<0.05$) was observed among three drugs at different days in goats. In conclusion, Furazolidon, Sulphadimidine and Amproliun are well-tolerated by goats and may be recommended to effectively treat coccidiosis in goats under field conditions.

Keywords: Furazolidone, Sulphadimidine, Amprolium, Coccidiosis, Goats

AH-29

HEMATOLOGICAL ALTERATIONS INDUCED IN GOATS BY COCCIDIOSIS AND THEIR REVERSAL WITH ANTICOCCIDIAL DRUGS

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ABSTRACT

This study describes the changes in blood parameters due to coccidiosis in goats and their reversal with anticoccidial drugs i.e. Furazolidone, Sulphadimidine and Amprolium. Goats naturally infected with coccidiosis were divided into groups A, B, C and D each having 6 animals. A fifth group E was formed comprising of 6 healthy goats. The goats in groups A, B and C were treated with Furazolidone, Sulphadimidine and Amprolium, respectively while the animals in groups C and D were positive control and negative control, respectively. Blood samples were drained from the jugular vein of goats in each group at day 0 (before treatment), and day 21(after treatment) for complete blood count. A significant decrease ($P<0.05$) in erythrocyte count, hemoglobin concentration, PCV, MCV, MCH, MCHC, lymphocytes, and monocytes count was observed in all

goats naturally infected with coccidiosis at day 0. On the other hand, white blood cell count was significantly ($P<0.05$) increased in infected animals at day 0. All the blood parameters were within normal range in uninfected animals (group E). After treatment at day 21, all the blood parameters in groups A, B and C reversed within normal range but not in group D animals where changes in blood parameters were more sever compared to day 0. It was concluded that coccidiosis had deleterious effect on hemogram in goats, and Furazolidone, Sulphadimidine and Amprolium are equally effective in reversing these harmful effects.

Keywords: Hematological Alterations, Goats, Coccidiosis, Anticoccidial Drugs

AH-30

ANALYSIS OF LIVER FUNCTIONAL INDICATORS WITH HIGH DOSAGE REGIME OF LONG ACTING OXYTETRACYCLINE IN GOAT SPECIE

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ABSTRACT

Six goats of mixed breed and sex were administered a high dosage regime of long acting oxytetracycline. The dose high was assessed for its biochemical effects. A dose of 30 mg/kg b.w. of long acting oxytetracycline was administered intramuscularly for the period of 07 days with the interval of 48 hours. The analysis of blood was carried out upto 148 hours after the administration of last dose of the drug. Oxytetracycline produces a significant effect on biochemical parameters in goat species and dose dependent effects were observed on functional indicators of liver (serum GPT, GOT, alkaline phosphatase, triglycerides and total protein). Increased alteration in GPT, GOT, alkaline phosphatase and serum triglycerides were observed where effect exhibited a decrease in total protein. The values were significantly altered at 48 to 120 hours which returned to baseline at 120 to 148 hours.

Keywords: Liver Function, Dosage Regime, Long Acting, Oxytetracycline, Goat

AH-31

SURVIVAL OF PROBIOTIC BACTERIA IN COMMERCIAL INFANT FOODS AND THEIR ANTIMICROBIAL ACTIVITY AGAINST FOOD BORNE PATHOGENS

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ABSTRACT

Probiotics are live microorganisms that, when administered in adequate numbers provide health benefits to the consumer. The present study was planned to investigate the survival of probiotics bacteria like *Lactobacillus acidophilus and Bifidobacterium bifidum* in powder milk and cereals used for infants. Isolation of micro-organisms was carried out by serial ten fold dilutions in PBS

solution using the pour plate technique. Lactobacillus acidophilus strains were propagated by using in de Man Rogosa-Sharpe (MRS) and Bifidobacterium species in Reinforced Colostridial Agar respectively under anaerobic conditions at 42°C. Typical cell morphology, colony characteristics and biochemical tests were used for identification of isolates. Isolates were tested for their antimicrobial activity by the application of Cross streak method, Agar well diffusion method and Disk diffusion method against the common food borne pathogenic bacteria like, *E.coli, Staphylococcs aureus, Salmonella species, Bacillus subtilus* and *B. cereus*. The realization that food has a role beyond of energy and body forming substances has shifted scientific investigations with growing interest in the research and development of functional foods. Data obtained by this research work can be applied for further scientific investigations of peculiar health benefits by probiotic micro-organisms in food supplements.

Keywords: Probiotic Bacteria, Commercial Infant Foods, Antimicrobial Activity, Food Borne Pathogens

AH-32

APPLICATIONS OF STEM CELLS THERAPY IN ANIMALS

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ABSTRACT

All the animals contain stem cells but the regeneration and repair capacity of animals is different. Stem cells can be classified on the basis of origin, potential of differentiation and cell surface markers. In addition to embryonic stem cells (ESCs), bone marrow derived mesenchymal stem cells (MSCs), circulating blood stem cells and umbilical cord blood stem cells are major source of stem cells for therapeutic purposes. Adipose derived MSCs have also proved to be rich and therapeutically important source of stem cells. There are different therapeutic applications for animals but with advancement in research in area of stem cell biology, it provides a better alternative to treat several diseases including life threatening diseases. Currently stem cells therapy is in use to treat orthopedic lesions, disc regeneration, osteoarthritis, repair of bone defects, cartilage defects, corneal stroma, tendon repair, ligament injury, liver injury, nerve regeneration etc. Stem cells therapy can provide treatment and cure to valuable animals like dogs, cats, racing horses etc. Now a day's extensive research work is going in area of stem cells research and in future it will be in use to treat broad spectrum of animals ranging including milk producing animals like goat, sheep, cow and buffalo.

Key words: Regeneration, Mesenchymal stem cells, Therapy, Treatment, Embryonic stem cells.

AH-33

EFFECT OF RECOMBINANT BOVINE SOMATOTROPIN ON BODY WEIGHT AND BIOCHEMICAL PARAMETERS OF LACTATING BEETAL GOATS

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ABSTRACT

The effect of recombinant bovine somatotropin (rbST) on weight gain and biochemical parameters in lactating Beetal goats was studied at Small Ruminant Training and Research Center, Ravi Campus, Pattoki, University of Veterinary and Animal Sciences Lahore, Pakistan. Fifteen goats were divided into three groups named A, B & C with five animals in each according to the lactation stage, parity and milk yield. Group A was used as control, while B & C groups were subcutaneously injected with 50 & 100 mg /week of rbST for 8 weeks respectively. Body weight (BW) of the does was not significantly affected by rbST treatment. Blood plasma samples were analyzed for Total protein (g/dl), Albumin (g/dl), Globulin (g/dl), Glucose (mg/dl), Urea (mg/dl), Creatinine (mg/dl), Total bilirubin (mg/dl) and Cholesterol (mg/dl). However statistically non-significant difference was observed among above parameters in all the three groups. It was concluded that 50 and 100 mg/wk doses of rbSt have no adverse effect on body weight and biochemical parameters in lactating Beetal goats.

Keywords: Recombinant Bovine Somatotropin, Body weight, Biochemical parameters, Beetal Goats.

AH-34

SERO-PREVELENCE OF BRUCELLOSIS IN DAIRY ANIMALS AT PRIVATE AND GOVERNMENT LIVE STOCK FARMS IN PUNJAB, PAKISTAN

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ABSTRACT

Serum samples were collected from 1224 animals maintained at well organized private livestock farms (n=8) and government livestock farms (n=5) in Punjab, Pakistan. Serum samples were processed through rose Bengal plate test (RBPT) for initial screening of serum samples for brucellosis. Then RBPT positive serum samples were processed through serum agglutination test (SAT) for confirmation of brucellosis. RBPT showed seroprevelence of brucellosis 12.90% and SAT confirmed the seroprevelence of brucellosis 7.76%. Seroprevelence of brucellosis was higher in female animals (n=788) through RBPT (19.92%) and SAT (12.05%) than in male animals (n=436) through RBPT (0.22%) and SAT (0%). Further statistical analysis showed that cattle (n=657) were more at risk for brucellosis than buffaloes (n=131), odd ratio (OR) = 4.73 with 95% confidence interval (CI) (2.27-9.86) ($p<0.0001$). Similarly animals (n=429) at well organized private livestock farms were showing more risk for brucellosis than animals (n=795) at government live stock farms, OR= 2.65 with 95% CI (1.73-4.05) ($p<0.0001$).

Key words*:* Brucellosis, Buffalo, Cattle, Seroprevelence

AH-35

ADULTICIDAL AND LARVICIDAL ACTIVITY OF *CASSIA FISTULA* AND *PIPER NIGRUM* AGAINST MALARIA VECTOR

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ABSTRACT

The current study was carried out to evaluate the activity of methanol extract of leaves of C. fistula and ripened fruits of P. nigrum against Anopheles mosquito. Among both of these plants, the methanolic extracts of Piper nigrum (black pepper) exhibited remarkable Adulticidal and Larvicidal potentials. The percentage mortalities were increased by gradual increase in extracts concentrations. Larvae were more susceptible to the methanolic pepper extracts than adults. Cassia fistula (golden shower) leaf extracts were also showed promising mosquitocidal efficacy against Anopheles stephensi. It is concluded that methanolic extracts of these plants Cassia fistula and Piper nigrum have high potential of Adulticidal and Larvicidal activities. So the extracts of these plants can be used as an alternative to the conventional insecticides for long lasting mosquito problems.

Key Words: Adulticidal, larvicidal, Cassia Fistula, Piper Nigrum, Anopheles, Malaria.

AH-36

IN VITRO EVALUATION OF MICROEMULSION CONTAINNING EXTRACT OF LAWSONIA INERMIS

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ABSTRACT

The objective of the present study is to develop an optimum microemulsion formulation of Lawsone, for transdermal delivery. This study also investigated the effects of surfactants and cosurfactants on the percutaneous delivery of Lawsone microemulsion. Oleic acid was selected as the oil phase, Tween 80 as surfactant and Ethanol as cosufactant of the microemulsion due to its good solubilizing capacity for the drug. The microemulsion area was identified by constructing pseudoternary phase diagrams with different surfactant-cosurfactant mixtures (Smix). 5% Lawsone microemulsion was prepared. Transdermal permeation of Lawsone microemulsion was determined in vitro using Franz diffusion cell. In vitro permeation profiles showed that incorporation of Lawsone in microemulsion increased the permeation rate as compared to the saturated aqueous solution. Based on these findings Tween 80 were chosen as surfactant and Ethanol as cosurfactant, respectively. The formulation passed thermodynamic stability tests were characterized for viscosity, pH and conductivity. In vitro skin permeation of these formulations was also determined. The

optimum microemulsion formulation comprised of 5% Lawsone, 5% Oleic acid, 95% Tween 80 and ethanol (1:1). The formulation was found to be non-irritant to the skin. These results indicate that the type of surfactant and cosurfactant affect both the phase behaviour and transdermal drug delivery ability of microemulsion; and the studied microemulsions are potential vehicles for improved transdermal delivery of Lawsone.

Keywords: Transdermal microemulsion, Lawsone, Surfactants, Cosurfactants.

AH-37

ULTRASONIC, GROSS AND HISTOPATHOLOGICAL STUDIES ON TESTES AND EPIDIDYMIDES OF RAMS WITH SPONTANEOUS LESIONS

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ABSTRACT

Investigative ultrasound is a simple, noninvasive and safe technique that allows tissue crossing point to be sensed and their shape and size described. In this study, ultrasonographic, gross pathological and histopathological examinations were made in adult rams with unstructured lesions of testes and epididymides. Five normal organs and 8 organs with spontaneous lesions were imaged ultrasonically using a B-mode, real time ultrasound scanner. Each organ was dissected and nature of the lesions and their contents were observed. Ultrasonically, testes of normal rams become visible quite homogeneous and moderately echogenic. Mediastinum testis was characterized by a centrally located hyperechoic line in longitudinal images and by a circular hyperechoic area positioned in the middle of the organ in transverse images. The epididymal head and body were less echogenic than the testis and were quite homogeneous; the epididymal tail was heterogeneous, but less echogenic than the testis. In 8 organs with abnormalities, various lesions included sperm granulomata in the epididymis, testicular degeneration with calcification, testicular abscesses and chronic epididymitis. In premature stages, sperm granuloma appeared as an anechoic mass with unclear border. Its histopathology indicated mild leukocytic infilteration. In progressive phase sperm granuloma revealed a mixture of anechoic and hyperechoic areas, encircled by a thick hyperechoic edging there; microscopically, it was appeared as extensive leukocytic proliferation. Organs with testicular abscesses also showed anechoic cavities with hyperechoic border and some hyperechoic areas which might be due to fibrosis. On histopathology, many neutrophils, macrophages, fibroblasts and calcium crystals were observed while testicular epithelium was severely degenerated in case of microlith and abscesses. During early stage of testicular degeneration, testicular parenchyma was homogeneous with reduced echogenicity; however in advance phase, testicular parenchyma had lost its homogeneous texture. Microscopic lesions of testes showed that semineferrous tubules were slightly degraded but in advance cases they were extremely degenerarted. In epididymitis, echogenicity of epididymal tail was increased, probably due to fibrosis of organ. In above lesion, microscopic examination indicated many inflammatory cells. It is concluded that diagnostic ultrasound may be used to correlate and confirm gross and microscopic lesions in the testis or the epididymis to establish standard diagnosis in different testicular problems and proved to be very useful technique in present and future.

Keywords: Ultrasound; Testes; Epididymis; Microscopic examination; Lesions; Rams

AH-38

COMPARATIVE STUDIES ON THE HISTOLOGY OF UTERINE HORNS IN NULLIPAROUS AND MULTIPAROUS TEDDY GOATS (CAPRA HIRCUS)

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ABSTRACT

Reproductive performance in small ruminants is most important because it can improve the number of offspring produced in a year. The information on the functional histology of the reproductive tract of the goat (*Capra hircus*) is rare in literature. The present project was designed to evaluate the effects of parity on histomorphometrical parameters of the uterine horns in teddy goats. Fourteen uteri were collected from local abattoir, belonging to seven nulliparous and seven multiparous clinically healthy teddy goats. Gross morphometry and weight of uterine horns was determined immediately after slaughtering. Uterine tissues were then subjected to paraffin tissue preparation technique to compare the uterine histology of two groups. Weight, length, width and thickness of uterine horns were significantly ($P<0.05$) higher in multiparous teddy goats (5.72±0.14g, 13.34±0.11 cm, 1.77±0.12cm, 0.52±0.05 cm) than those of nulliparous ones (3.49±0.07g, 11.32±0.088 cm, 1.60±0.10 cm, 0.37±0.06 cm). Endometrial thickness of right and left uterine horns of multiparous teddy goats (1072.46±23.89 and 917.16±26.5 µm) were significantly ($P<0.05$) higher than those of nulliparous goat uteri (962.5±36.5 and 857.8±25.1 um). Myometrial thickness of right and left uterine horns of multiparous teddy goats (579.7±12.6 and 440.7±20.8 µm) were significantly ($P<0.05$) higher than those of nulliparous goat uteri (482.5±12.1 and 480.5±31.4 um). Perimetrial thickness of right and left uterine horns of multiparous teddy goats (30.96±1.27and 33.78±2.87 um) were significantly ($P<0.05$) higher than those of nulliparous goat uteri (18.77±0.92 and 20.07±1.05 um). It is conceivable that parity does have a remarkable effect on the gross as well as microscopic structure of the uteri in teddy goats.

Keywords: Histology, Uterine Horns, Nulliparous, Multiparous, Teddy Goats, Capra Hircus

AH-39

USE OF DIFFERENT MEDICINAL PLANTS AS ETHNOVETERINARY PRACTICE IN RAWALAKOT, AZAD KASHMIR

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ABSTRACT

The aim of this study was to gather information about ethnoveterinary usage of different plants of Rawalakot valley of Azad Kashmir, Total 20 plants were reported to be used as ethnoveterinary practice in study area. According to the results *Achillea millefolium, Viburnum cotinifolium* were used as laxative, *Tagetes minuta, Bistorta amplexicaulis* and *Swertia petiolata* were used as antipyretic. *Berberis aristata* was used for the treatment of wounds, burns. *Gentiana decumbens* was used as appetizer. *Mentha longifolia* , *Prunella vulgaris* , *Berginia ciliate* were used as carminative.

Berberis lyceum, Cotoneaster microphyllus were used as astringent. *Potentilla nepalensis* was used to treat burns. *Viola odorata* had purgative, diuretic and expectorant properties. *Nepeta laevigata* was used to treat dysentery. *Bergenia ciliata* was used as antiseptic on wounds. antiseptic on wounds. *Conyza Canadensis* was used to treat urinary problems. *Mentha arvensis* was used as antiparasitic. *Quercus incana* was used to increase milk production. *Verbascum thapsus* was used to treat diarrhea.

Keywords: Medicinal Plants, Ethnoveterinary Practice, Rawalakot, Azad Kashmir.

AH-40

IRON FORTIFIED PASTEURIZED MILK: PHYSICO-CHEMICAL ATTRIBUTES AND EFFICACY AGAINST IRON DEFICIENCY ANEMIA IN SPRAGUE DAWLEY RATS

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ABSTRACT

Iron Deficiency Anemia (IDA) is a serious public health problem involving large number of population around the globe especially from the developing countries. In Pakistan, the iron deficiency is a crucial nutritional problem and almost one fifth of country's women are suffering. For community based management of IDA, Iron fortification in various food commodities are considered to be the best approach. Keeping in mind the importance of this issue, iron fortified pasteurized milk was prepared and its ability to reduce the IDA in Sprague Dawley rats was evaluated. Raw buffalo milk was fortified with $FeSO_4$ at a concentration of 0.0%, 0.04%, 0.06% and 0.08 % of milk solids with the addition of vitamin C (30 mg/100g of milk solids) followed by pasteurization at 75°C for 16sec. Physico-chemical and sensory attributes of all treatments were not significantly different from control with the exception of vitamin C and iron contents. The improvement of haemoglobin concentration in rats after consumption of fortified milk (0.06% of $FeSO_4$ or 23 mg of Fe/L) was found to be statistically significant as compared to control ($P \leq 0.05$) and iron fortified milk has increased the hemoglobin level of rats from 9.84 ±0.287 to 14.37±0.325 g/dL in 56 days. It can be concluded from this study that the iron fortification in pasteurized milk does not affect its sensory and physical characteristics and is helpful to improve IDA.

Key words: Pasteurized Milk, Iron fortification, Iron Deficiency Anemia

AH-41

PLANTS USED AS HYPOGLYCEMIC PROPERTIES IN PAKISTAN

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ABSTRACT

Diabetes mellitus is a metabolic disease in which an individual has high blood sugar either because the pancreas does not produce enough insulin, or because cells do not respond to the insulin that is produced. Globally, as of 2010, an estimated 285 million people had diabetes, with type 2 making up about 90% of the cases. Its incidence is increasing rapidly, and by 2030, this number is estimated to almost double. Diabetes mellitus occurs throughout the world. To treat diabetes mellitus many drugs are used but due to their prolong use they have side effects. As a result people tend to use many medicinal plants. Pakistan is prosperous in medicinally significant vegetation and has ancient herbal treatment methods. In Pakistan numerous plants were reported or used for hypoglycemic activity. Many of which are proven scientifically having hypoglycemic properties. Some of such plants included *Berberis aristata, Adhatoda vasica, Ficus bengalensis, Psidium guajava, Kickxia ramosissima, Vinca rosea, Dodonaea viscose, Cichorium intybus, Trigonella foenum-graecum, Eugenia jambolana, Morus alba, Momordica charantia, Syzygium cuminii, Taraxacum officinale, Ocimum album, Kickxia ramosissima. Cajanus cajan, Vigna sinensis, Olea ferruginea, Zizyphus jujube*

AH-42

THE BEHAVIORAL INTERACTION BETWEEN HUMAN AND MACAQUES: A CASE STUDY IN BOTANICAL GARDENS PENANG, MALAYSIA.

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ABSTRACT

The interaction between Human and macaques has been increased in last few decades that demonstrate the tremendous increase in the populations of both the specie. It has been found that the specie of macaque especially *Macaca fascicularis* are interrelated with human and their environment therefore *Macaca fascicularis* also get affected by human activities such as to disturb their behaviors. In turn, the primates re-emerge with an effective and high level reaction to human population. This paper demonstrates an overview of the interaction between human and monkey in Botanical Gardens Penang, Malaysia. The survey of behavioral study about the interaction between human and *Macaca fascicularis* has been observed from March 2012 until February 2013. A scan sampling method was used for the observation of behaviors between human and *Macaca fascicularis.* All the behaviors were found significant as $p<0.01$. The behavior of attacking were found in highest percentage such as 24% for *Macaca fascicularis* and feeding by human 27%, the second highest behavior was running 23% and running of human 25%, snatching found 18% and throwing food by human 21%, exploiting garbage 11% and gesture by human 9%, feeding 8%, playing 8%, eating 3%, grooming 3% and vocalization was found 2%. It is concluded that the behavior of *Macaca fascicularis* is insecure in the areas where human and macaques coexist. The management of respective locales is generally suggested to formulate practical strategies to avoid or decrease the interaction between human and Macaques.

Keywords: Behavioral Interaction, Human, Macaques, Botanical Gardens Penang, Malaysia

AH-43

A COMPARATIVE STUDY ON PREVALENCE OF COCCIDIAN PARASITES IN BROILER CHICKENS (*GALLUS GALLUSDOMESTICUS*), JAPANESE QUAIL (*COTURNIXCOTURNIX JAPONICA*)AND WILD PIGEON (*COLUMBA LIVIA*).

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ABSTRACT

Coccidiosis is a protozoan infection of mammals and birds caused by species belonging to two common Genera, Isospora and Eimeria. The infection results in diarrhea, enteritis and sometimes even mortality of animal. Present study was conducted to detect the prevalence of Coccidiosis in Broiler chickens (*Gallus gallusdomesticus*), Japanese quail (*Coturnixcoturnix japonica*)and wild pigeon (*Columba livia*). 300 fecal samples of each species were collected and examined from January 2010 to June 2010. Prevalence was detected by using three diagnostic techniques i.e., by direct smear method, Sedimentation technique and floatation technique. The mean prevalence of coccidiosis detected during the study period was 17%, 21% and 23% in Broiler chickens (*Gallus gallusdomesticus*), Japanese quail (*Coturnixcoturnix japonica*)and wild pigeon (*Columba livia*). Monthwise prevalence was also recorded to check the relationship of prevalence of coccidiosis with physical factors of environment such as temperature and relative humidity. The prevalence of infection increased with rise in temperature from January to June indicating a positive relationship, whereas, prevalence of coccidiosis in all three species of birds did not show any direct relationship with the relative humidity. Wild animals like pigeon may act as reservoir for the transmission of coccidiosis to chicken, Quail and other domestic and ornamental birds so their contact with the birds should be prevented.

Key words: Broiler chickens, Japanese quail, wild pigeon, coccidiosis,prevalence

AH-44

ASSESSMENT OF VARIOUS ESSENTIAL TRACE ELEMENTS IN DIFFERENT ORGANS IN SPECIES OF CAPRINE AND BOVINE FAMILIES

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ABSTRACT

Micronutrients play an important role in various metabolic processes and their deficiency or excess may disturb normal biochemical functions. The current study was designed with an aim at assessing the various trace elements in different organs for various species of caprine and bovine families. Samples (n=6) of muscle, liver and kidney were collected at random from six animals with each of the three species i.e. goat (1-4 year), cow (3-5 year) and buffalo (3-5 year). Significant difference ($P < 0.05$) of zinc level between muscle, liver and kidney was observed. Muscles had greater concentration of zinc (31.75 mg/kg ± 10.29), followed by liver (15.38 mg/kg ± 3.13), whereas in kidney the concentration of zinc was lowest (11.49 mg/kg ± 0.50). Liver had greater concentration

of iron (17.26 mg/kg ± 2.36), followed by kidney (40.18 mg/kg ± 14.07), whereas in muscle the concentration was lowest (25.97 mg/kg ± 4.29). Significant ($P < 0.05$) differences were observed in mean concentration of iron in goat, cow and buffalo liver. Iron concentration was significantly ($P<0.05$) high in buffalo muscle. In order to ensure an adequate amount of zinc and iron in the human diet, emphasis should be made on excellent sources as muscle, liver and kidney.

Keywords: Zinc, iron, bovine, ovine, trace metals

AH-45

BIOMETRIC OBSERVATIONS ON THE NORMAL LYMPH NODES AND SPLEEN OF BARBARI GOAT

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ABSTRACT

In the current study, we carried out the biometric evaluations of subscapular lymph nodes and spleen of the Barabri goats. For this purpose, sixty normal fresh lymph nodes and spleen each, 30 each from yound and adult were randomly collected from the slaughter house of Tandojam. According to their age, the animals were divided into two groups i.e. A (young 6-12 month)) and B (adult 13-24 month). The anatomical study indicated that mean weight, length, width and thickness of subscapular lymph nodes of young and adult goat was 2.07 gm. and 3.21 gm., 1.60 cm and 2.92 cm, 1.25 cm and 2.05 cm and 1.05 cm and 2.15 cm respectively .The mean weight, length, width and thickness of spleen in young and adult goat was 48.10 gm and 57.44 gm., 6.88 cm and 9.86 cm, 5.27 cm and 7.09 cm and 1.43 cm and 1.7 cm respectively. Our result demonstrated significant increase in the mean length, width, thickness and weight of the subscapular lymph node as well as in the spleen of the adult animals as compared to the young animals. It is conceived from the current study that the anatomical aspects of the subscapular lymph nodes and spleen of Barbari goat significantly increase with advancing age of the Barbari Goat.

Keywords: Biometric Observations, Lymph Nodes, Spleen, Barbari Goat

AH-46

MICROMETRICAL ASSESSMENT OF THE NORMAL LYMPH NODES AND SPLEEN OF BARBARI GOAT

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ABSTRACT

The aim of the present study was to assess histomorphologically, the normal subscapular lymph nodes and spleen of the Barabri goats. The experiments were conducted on sixty normal fresh lymph nodes and spleen each, 30 each from young and adult of different ages were randomly collected from the slaughter house of Tandojam. According to their age, the animals were divided into two groups i.e. A (young 6-12 month)) and B (adult 13-24 month).The micrometrical results indicated that the mean width of capsule and trabeculae of lymph nodes in young and adult goat was 45.77 µm and 57.48 µm and 49.31 µm and 62.08 µm respectively. The mean diameter of lymphatic

nodules in young and adult goat was 266.59 µm and 337.13 µm respectively. Similarly, the mean width of splenic capsule and trabeculae in young and adult goat was 144.04 µm and 152.17 µm and 109.38 µm and 111.44 µm respectively. The mean diameter of splenic nodules in young and adult goat was 579.47 µm and 582.47 µm. Also, significant increase was observed in the mean diameter of central artery of adult as compared to young. It is evident from the present study that age significantly affecte micrometrical aspects of the subscapular lymph nodes and spleen of Barbari goat.

Keywords: Micrometrical Assessment, Lymph Nodes, Spleen, Barbari Goat.

AH-47

PREVALENCE OF COMMON MASTITOGENS AND THEIR *IN-VITRO* ANTIBIOTIC SENSITIVITY TESTING IN CATTLE AND BUFFALOES

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ABSTRACT

This study was conducted in lactating cattle and buffaloes in tehsil Gojra, district Toba Tek Singh, Pakistan. The purpose of study was to isolate different types of microorganisms associated with mastitis and to see the effectiveness of different antibiotics against these isolates. Relative prevalence of *Staphylococcus aureus* was highest (44.44% and 53.33% in cattle and buffaloes, respectively) followed by *Streptococcus agalactiae* (22.22% and 26.67% in cattle and buffaloes, respectively*), Escherichia coli* (22.22% and 13.33 % in cattle and buffaloes, respectively*),* and *Streptococcus dysagalactiae* (11.11% and 6.67% in cattle and buffaloes, respectively*).* The results obtained showed that the average sensitivity of the isolates was in descending order to Enrofloxacin, Chloramphenicol, Gentamycin, Oxytetracycline and Amoxicillin.

Key words: mastitis, cattle, buffaloes, antibiotics, enrofloxacin.

AH-48

IDENTIFICATION OF SMALL MOLECULES AS PEPTIDE-LOADING ENHANCERS ONTO MHC II PROTEINS TO STIMULATE SPECIFIC-IMMUNE RESPONSES

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ABSTRACT

HLA-DR is a major histocompatibility complex (MHC) class II cell surface molecule that when complexes with its ligand, an antigenic peptide of (11-17) amino acids in length, interacts with T cell receptor which results in T cell activation to initiate specific-immune responses towards foreign pathogens. The MHC proteins antigenic peptide complexes at cell surface are necessarily required to activate T cells, however, most of the MHC molecules are present in their non-receptive conformation. It has been reported earlier by the group of Roetzschke et al., that certain small organic molecules can amplify immune responses by catalyzing the peptide-loading onto MHC class II molecules, HLA-DR, by making them available in their receptive conformation. In

continuation of searching effective peptide-loading enhancers, we initiated the screening of a library of 1200 small molecules that were selected on the basis of structure similarities with the adamantane-ethanol that has been reported as peptide-loading enhancer. To accomplish the objectives, we first set-up the initial steps for primary screening of the library by; i) expressing the two alleles of MHC class II molecules, HLA-DR1 and DR2, as soluble protein using Sf21 insect cells; ii) expressing the antigenic peptide HA306-318 (Hemagglutinin from human influenza virus) in E.coli expression system and; iii) producing monoclonal antibodies, anti-HLA-DR, L243 and LB3.1 using respective hybridomas. Additionally, in order to identify the small molecules' interactions with MHC molecules, various mutants of HLA-DR1 were also generated by site-directed mutagenesis with the help of data published as a result of computational studies by the group of Roetzschke et al., and Qasmi et al. In an initial attempt of primary screening for identification of peptide-loading enhancers, we have screened >200 small molecules by measuring the acceleration rate of peptide- loading onto HLA-DR1 and HLA-DR2 in DELFIA (Dissociation-Enhanced Lanthanide Fluorescent Immunoassay) assay model. As a result, some of the small molecules were identified as catalytic in enhancement of peptide-loading onto MHC molecules. These active hits were further evaluated for cytotoxicity before characterization of them through cellular studies. The stimulation of specific-immune responses via small molecules may offer them as effective adjuvant in vaccine development for the treatment of tumors or other relevant immune-pathological conditions.

AH-49

THERAPEUTIC EFFICACY OF ZINC AND COPPER ALONE AND IN COMBINATION WITH ENROFLOXACIN FOR THE TREATMENT OF SUB-CLINICAL MASTITIS IN DAIRY BUFFALOES

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ABSTRACT

The present study was designed to compare the efficacy of zinc (Zn) and copper (Cu) alone and in combination with enrofloxacin in the treatment of sub-clinical mastitis in dairy buffaloes. A total of 45 sub-clinically mastitic buffaloes were selected for this study on the basis of positive Surf Field Mastitis Test (SFMT). The buffaloes were randomly divided into five equal groups i.e. A thru E.Buffaloes in group A were supplemented orally withZnSO4 @ 1 g per animal per day for 14 days. The animals in Group B were treated with CuSO4 @ 1 g per animal per day for 14 day. Buffaloes in group C were injected intramuscularly with enrofloxacin (Inj. Encure-10TM, Nawan Laboratories Pvt. Limited, Karachi, Pakistan) @ 2.5 mg/kg B.W for 5 consecutive days.The animals in group D were administered with intramuscular injection of enrofloxacin@ 2.5 mg/kg B.W for 5 consecutive days along with the supplementation of ZnSO4 (1 g per day) and CuSO4 (1 g per day) for 14 days. Group E was kept as untreated control. Milk and blood samples were collected at day 0 (control), day 7 and day 14 post treatment. The milk samples were used for somatic cell count (SCC), SFMT, and bacteriological culturing while the blood samples were utilized for total leukocyte count (TLC), lymphocyte percentage, serum zinc and copper concentration measurement. Serum zinc and copper concentrations increased significantly ($P<0.01$) in their respective supplemented groupsat day 7 and

14 post treatment as compared to the control group (E). The group D (combination therapy group) showed significant (P<0.01) decrease in milk SCC at day 14 post treatment. A significant (P<0.01)increase in TLC and lymphocytes percentage at was noted in group D day 7 and 14 post treatment as compared to the control group (E).Percent cure rate on the basis of SFMT and bacteriological culturing was significantly higher in group D as compared to that in groups A, B and C. Quarter milk yield and total milk yield was significantly (P<0.01)improved in group D while other treated groups showed non-significant (P>0.05) improvement in milk at day 14 post treatment in comparison with that in control group (E) .In short, the combined administration of zinc sulphate, copper sulphate and enrofloxacin showed better efficacy than single therapy either with zinc sulphate, copper sulphate and enrofloxacin. While the zinc sulphate supplementation alone showed better efficacy as compared to copper sulphate and enrofloxacin alone in the treatment of sub-clinically mastitic buffaloes.

AH-50

OCCURRENCES AND TREATMENT STRATEGIES OF SCABIES IN ANIMALS AND MEN

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ABSTRACT

Ectoparasites play a fundamental role in health problems among animals and humans. Sarcoptes scabiei mites (cause of itching and irritation in all individuals) among the ectoparasites are playing a major role in causing heavy economic losses in term of milk and meat in animals. The following studies were conducted to investigate S. scabiei prevalence, in vitro and in vivo uses of Caparris decidua and Melia azedarach in comparison to ivermectin versus control in animals and humans. Study I- Prevalence of S. scabiei: In the present study 150 buffalo calves, 100 camels, 150 dogs, 150 goats, and 150 humans were examined clinically and microscopically at districts Dera Ismail khan, Bannu, Lakki Marwat, Tank, Karak, Kohat and to their adjacent tribal belt. The prevalence of scabies infestation exhibited epidemic nature in winter season (November to February). During the epidemiological survey the average prevalence across the year recorded was 8.72% in humans, 18.3% in dogs, 14.06% in camels, 7.3% in buffalo calves and 5.3% in goats. Scabies caused by S. scabiei mite can affect any area of the skin, but the lesion found were often most severe on the abdomen, chest, legs, and ears and especially on the pubic regions of studied animals and peoples. Study II- In Vitro and In Vivo study: Side wise presence of synthetic drug residues in plants and animals food products causing economic losses considered potentially hazardous to animal, human being and environment needs to assess the control methods whether biological or chemical in nature for its perfect use. Studies on the efficacy of some acaricides particularly derived from medicinal plants against S. scabiei mites in vivo and in vitro were carried out on experimental animals and were assessed in laboratory bioassays. For in vitro study 96 wells microtitration plates were used and tested the effects of different medicinal plants on adult scabies mite. In each assay 30 µL of 10, 20 and 30% methanolic extract concentrations of Caparris decidua, Melia azedarach and 30 µL of Methanol (control wells) were added into 96 wells microtitration plates and then were released 20 mites into each well in three replicates. All the wells were observed upto 72 hrs during incubation. The results were evaluated on the bases of activeness, lethargic movements or stagnant nature. The data showed that T. undulata was effective treatment for 80% mites mortalities followed by M.

azedarach with 75% mites mortalities. LC50 calculated values through probit analysis for M. azedarach with LC50=10.697 mg/100µL was highly effective followed C. decidua with LC50=11.869 mg/100µL. In vivo study 10 and 20% methanolic extract concentrations of C. decidua and M. azedarach and ivermectin at the dose rate of 0.2mg/kg b.wt s/c injection in comparison to control (Methyl alcohol) were used on 40 numbers each of buffalo calves, camels, dogs, goats and human on 1st, 7th, 14th and 28th day. Scabicidal affect on individuals was estimated through reduction in the lesion size, regrowth of hairs and reduced mites load. All the scabietic animals and humans were divided into eight groups each containing five individuals for therapeutic purpose. The groups were nominated as B1, C1, D1, G1, H1 for C. decidua., B2, C2, D2, G2, H2 for M. azedarach., B3, C3, D3, G3, H3 for ivermectin and B4, C4, D4, G4, H4 for control. After 28th day of topical use of methanolic extracts of medicinal plants cure rate: In (a) C. decidua group; ivermectin showed (84, 81, 83, 85, 81%)., 20% C. decidua exhibited (68, 76, 77, 73, 79%)., 10% C. decidua gave (43, 46, 42, 42, 51%); In (b) M. azedarach group; Ivermectin exhibited (84, 85, 85, 80, 83%)., 20% M. azedarach gave (75, 83, 78, 79, 79%)., 10% M. azedarach indicated (49, 49, 57, 42, 58%) and all the control groups did not showed any curing signs in buffalo calves, camels, dogs, goats and human respectively.

Key words: Epidemiology, Caparris decidua, Melia azedarach, ivermectin and camels

AH-51

BREED RESISTANCE TO GASTROINTESTINAL PARASITISM IN DOMESTIC GOATS (CAPRA HIRCUS): A FOOD FOR THOUGHT

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ABSTRACT

Parasitic infection generally and gastrointestinal (GI) nematodes particularly is global health problem to domestic goats (Capra hircus) through lowering production and high cost of treatment. Countries, like Pakistan where goats keeping is a dominated rural enterprise is greatly influence by GI nematodes. Most common and economically important nematode which influences productivity of goats belongs to family Trichostrongylidae viz: haemonchus, cooperia, ostertagia, oesophgostomum and trichuris. Anthelmintic which are used for the control of GI parasite makes such condition grave, if used inappropriately, due to the development of resistance. Although there are some alternate practices for the control GI nematodes like ethno-veterinary practices, alternate grazing and integrated pest management but these have few limitations, too. Breed susceptibility to worm infection has been reported as an important tool for reducing abundance of worm in goat population. However there is no such activity being done in the indigenous breeds of Pakistan to identify the candidate breeds of goats naturally resistant to GI nematodes. A project on the very topic has recently been initiated in the Department of Parasitology, University of Agriculture, Faisalabad to identify the resistant breeds specific to haemonchus contortus worm in controlled environmental conditions. There is, therefore, an urgent need for an appropriate and sustainable alternative control strategy, which must also be affordable to the small-scale producer. The most applicable strategy, in this side is to develop and explore goat breeds which are naturally resistant to

gastrointestinal nematodes and approach adapted in this part is appropriate for temperate and tropical breeds of goats. Theme of writing is to disseminate current knowledge regarding control practices to GI nematodes of goats with special reference to the breed selection programme.
Key words: Capra hircus, Nematodes, Resistance, Breeds, Haemonchus contortus

AH-52

FREQUENCY DISTRIBUTION OF FASCIOLOSIS IN THE DOMESTIC SHEEP (OVIS ARIES) POPULATION OF DISTRICT SARGODHA

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ABSTRACT
Fasciolosis, caused by members of genus Fasciola (Platyhelminthes: Trematoda) is the most common and economically important helminth infection of livestock. A cross-sectional survey was conducted to investigate the epidemiological aspects of fasciolosis in domestic sheep (Ovis aries) of district Sargodha, Punjab, Pakistan. Coprological examination of 2172 sheep was performed from all the six tehsils of district Sargodha during a year from October, 2011 to September, 2012; which revealed an overall prevalence of 31.72% (689/2172). Overall prevalence of Fasciola (F.) hepatica was 24.40% (530/2172) and F. gigantica 7.32% (159/2172) (χ^2=70.6325; P>0.01). Tehsil wise prevalence of disease was 39.62% in Bhalwal, 34.09% in Sargodha, 54.05% in Silawali, 32.56 % in Sahiwal, 27.91% in Shahpur and 33.82% in Kot momin tehsils was recorded. Monthly variation of fasciolosis was also observed and found highest in November (47.87%) and lowest in April (11.36%), Breed-wise distribution of fasciolosis was 46.32% in Kajli, 37.6% in Lohi and 7.9% in Thalli (χ^2=12.3196; P= 0.0064). Sex and age catogories were found significantly associated (P-value=0.001) with the risk of disease in sheep. The distribution of disease in young female, young male, adult female and adult male was 77.93%, 22.07%, 52.59%, and 47.41%. Association of various managemental practices with the epidemiology of ovine fasciolosis was also determined during this study. The results of this study may provide some useful data in GI parasite control in general and Fasciola control in sheep in specific in the study area.
Key words: Prevalence, Risk factors, Sheep, Small ruminants, Fasciolosis, Sargodha

AH-53

SERO-BIOCHEMICAL AND HISTOPATHOLOGICAL ALTERATIONS DUE TO PROLONG USE OF CEPHRADINE ON VARIOUS BODY TISSUES OF SPRAGUE-DAWLEY RATS

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ABSTRACT
In developing countries antibiotics are widely used as chemotherapeutic agents to treat various bacterial infections. Irrational and increased usage is believed to be associated with increased risk of

getting fatal breast cancer. Being relatively safer cephradine is one of the most commonly prescribed antibiotics by the medical practitioners in cephalosporin group of antibiotics. Carcinogenic potential of other antibiotic groups is well established but long-term studies have not been conducted on cephradine in particular to evaluate a similar potential. Presently, histopathological, biochemical and cytogenetic approaches were applied in this respect using laboratory rats as a model system. Adult female Sprague-Dawley rats (n=34) were divided into three experimental groups of ten rats in each. Group I received dose of cephradine (85mg/kg b.wt), Intra peritoneal route while group Π received dose (14 mg/kg b.wt) continuously for nine months on daily basis. Group Ш maintained in parallel received 0.9% saline and served as control. Rats were sacrificed at the end of experiment. Serum analysis revealed significant decreased ($p<0.05$) in ALP, AST and ALT concentrations with bilirubin levels remaining unaltered in the group Π. No change was observed in these parameters in group I. Histopathological examination demonstrated pronounced fibrous connective tissue proliferation, glandular atrophy, luminal blockage, desquamation of epithelial lining cells and increased eosinophil's infiltration in lamina properia of small intestine. In large intestine, besides increased eosinophilic infiltration narrowing of lumen was also evident. Hepatocytes showed marked destruction with densely stained nuclei with crescent shape (pyknosed).

AH-54

FASCIOLA HEPATICA INFESTATION IN BUFFALOS IN BAHAWALPUR DISTRICT OF PUNJAB, PAKISTAN

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ABSTRACT

A cross-sectional study was conducted to determine the prevalence of Fasciola hepatica in buffalos of Bahawalpur District, Pakistan from May, 2011 to April, 2012. Fasciolosis is a major parasitic disease of livestock and humans. Epidemiological data on fasciolosis were collected from buffaloes at livestock farms of Bahawalpur, Ahmadpur East, Hasilpur, Khairpur Tamewali and Yazman Tehsils of Bahawalpur District. When the data on seasonal prevalence were analyzed, it was observed that a higher prevalence of fasciolosis occurred during autumn, followed by spring and winter, while it was lowest during summer. There was no significant difference in the prevalence of fasciolosis between the five study sites that may be due to the same meteorological conditions in all the five study sites. In conclusion, this study highlight the importance of initiating a control program for fasciolosis based on regular treatment in the areas of Bahawalpur having relatively high prevalence of fasciolosis.

Key Words: Fasciolosis, Buffaloes, Bahawalpur, seasonal prevalence.

AH-55

BACTERIOLOGY OF SUB-CLINICAL MASTITIS IN DAIRY BUFFALOES MAINTAINED AT PRIVATE FARMS LOCATED IN URBAN AND PERI URBAN AREAS OF YAZMAN

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ABSTRACT

The present study was conducted at Yazman city, a tehsil of district Bahawalpur in Punjab province in order to determine the prevalence of common mastitogens in dairy animals. 1657 dairy animals (Cattle n=802, Buffalo n=855) were found to be positive for mastitis (clinical n=146, sub-clinical n=1511 out of 4871 buffaloes maintained at private farms in and around Yazman. Surf field mastitis test (SFMT) was used for diagnosis of sub-clinical mastitis. A total of 170 milk samples were collected from dairy animals suffering from clinical mastitis and 183 isolates of 8 bacterial species were recovered. The most prevalent bacteria was Staphylococcus aureus (49.73%), followed by Streptococcus agalactiae accounting for 21.31%, Streptococcus uberis (9.84%), Escherichia coli (7.10%), Staphylococcus epidermidis (4.92%), Coagulase negative Staphylococci spp. (3.28%), Bacillus spp. (2.73%), and Streptococcus dysgalactiae spp. (1.09%). Keeping in view the prevalence of contagious mastitogens, it is necessary to carry out appropriate treatment and control program through proper management.

Key Words: mastitogens, buffaloes, clinical mastitis, Yazman, prevalence

AH-56

MOLECULAR STUDY ON THE PREVALENCE OF RESPIRATORY *MYCOPLASMA* SPECIES IN SHEEP OF KHANOZAI, DISTRICT PISHIN, BALOCHISTAN

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ABSTRACT

Respiratory diseases of sheep are the major problem throughout the world as well as in Balochistan, Pakistan. Different *Mycoplasma* species cause pneumonia, mastitis and other diseases in sheep and inflict heavy economic loses throughout the Balochistan. The aim of present study was to highlight the prevalence of respiratory *Mycoplasma* species using nasal swab samples through Polymerase chain reaction (PCR) and further validation through restriction fragment length polymorphism (RFLP). In total 240 nasal samples were collected from randomly selected field sheep from Khanozai district, Pishin during 2011, It is worth mentioning that this study was first time conducted in Khanozai district Pishin, Balochistan, Pakistan. The PCR results indicated the highest prevalence of 7.5% for *Mycoplasma mycoides* cluster members, followed by 5.8% for *Mycoplasma mycoides* sub-cluster members, 5% for *Mp* and 1.25% for *Mcc*, while no prevalence of *Mccp* was observed.

The PCR results for the *Mycoplasma mycoides* sub-cluster organisms were further validated by the RFLP, with the yield of three fragments (230, 178, and 153bps) for *Mmc.* The use of PCR-RFLP was found promising in the rapid detection and validation of *Mycoplasma* species directly from the nasal swab samples of sheep.

AH-57

PREVALENCE OF ZOONOTIC DISEASES (TUBERCULOSIS AND BRUCELOSIS) IN ANIMALS OF QUETTA DISTRICT

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ABSTRACT

Brucellosis and Bovine Tuberculosis (TB) are a constraint to livestock production in Quetta. Bovine tuberculosis (TB) is a contagious neglected zoonosis of cattle that is prevalent but under-investigated in Quetta. Brucellosis is an infectious disease affecting mainly sexually mature animals and is caused by organisms of the genus *Brucella*. *Brucella abortus* is the specie that mainly affects cattle throughout the world, while *Brucella melitensis* affects mainly goats and sheep. The aim of this research was to determine the prevalence of brucellosis and Bovine tuberculosis in cattle, goats and sheep. The total size of sample was 500 animals. Amongst which 185(37%) were sheep, 180(36%) were goat, 109 (21.8%) were cow, 18(3.6%) were buffalo, 4(1.2%) were bull and 2 (1.2%) were calf. All the samples from the study area were tested for Brucella and Bovine tuberculosis. The apparent prevalence for *Brucella* found were as follows: 3(n=109) in cow, 2(n=185) in sheep, 2(n=18) in buffalo and 1 (n=180) in goat. There were no positive tests for Bovine tuberculosis. A more complete understanding of the costs of the disease and the costs and benefits of control measures would promote broader application of the most efficient and effective control measures, contributing to improved animal and human health, better livelihood outcomes for the poor and macroeconomic growth.

AH-58

A HISTOPATHOLOGICAL REPORT ON MULTIBACILLARY FORM OF NATURALLY OCCURRING PARATUBERCULOSIS INFECTION IN BUFFALOES

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ABSTRACT

Paratuberculosis is chronic enteritis of the domestic ruminants caused by *Mycobacterium avium* subsp. *paratuberculosis*. Post-mortem examination of twelve naturally infected (displaying disease associated gut lesions) adult buffaloes was performed to accomplish explorative histopathology. Tissue samples were collected specifically from the small intestine and associated lymphoid organs.

Histopathology revealed diffused multibacillary lesions, linked with significant granulomatous enteritis distressing different locations of the small intestine. These lesions were produced by the infiltration of epithelioid macrophages, lymphocytes and plasma cells. Ziehl-Neelsen staining of the affected tissues demonstrated, the foamy cytoplasm of the epithelioid macrophages containing large numbers of acid-fast bacilli. Multifocal granulomatous types of lesions were found in the ileal lymph nodes. The most conspicuous macroscopic finding was the thickening of the intestinal wall chiefly associated with microscopic changes of the mucosa and submucosa. Infection status was also confirmed by using ELISA in the study. Further investigations are required to emphasize the zoonotic role of *M. Avium* subsp. *paratuberculosis*.

Key words: Buffalo, Paratuberculosis, Histopathology, Small intestine, Lymph node

AH-59

SEDATIVE AND ANALGESIC EFFECTS OF XYLAZINE IN RABBITS

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ABSTRACT

An experimental study was carried out in nine rabbits to compare the sedative and analgesic effects and also to record some physiological effects of xylazine at three different intramuscular doses i.e. 6 mg/kg, 8 mg/kg and 10 mg/kg body weight. Higher doses produced immediate and deep sedation and more depression in pulse rate, respiratory rate and body temperature. Xylazine at 6 mg/kg produced medium sedation while 8 mg/kg and 10mg/kg of xylazine produced deep sedation in rabbits. As the skin analgesia was concerned, the maximum skin analgesia occurred at 13.22 ± 0.683 minutes with 10mg/kg body weight for the total duration of 56.55 ± 0.766 minutes and followed by 8mg/kg, 6mg/kg at 23.77 ± 0.795, 16.55 ± 0.530 minutes for the total duration of 35.11 ± 0.841, 15.88 ± 0.445 minutes respectively. Maximum significant decreased ($P<0.01$) occurred in pulse rate, respiratory rate and body temperature up to 45, 60 and 75 minutes with 6 mg/kg, 8 mg/kg and 10 mg/kg respectively. Body temperature had returned to base line at 75, 90 and 105 minutes with 6mg/kg, 8mg/kg and 10mg/kg of body weight respectively. Although some side effects such as salivation and tympany were observed after administration but these were transient and did not pose any serious problem at any stage during the experiment. All side effects had returned to normal at 120 minutes after administration. It is concluded that xylazine is a potent and safe drug for sedation in rabbits.

***Key words*:** Rabbit, Xylazine, sedation, analgesia, dose response, physiological effects.

ABSTRACTS

Dairy Science

DS-1

SERUM OXIDATIVE BIOMARKERS IN HOLSTEIN COWS AS INFLUENCED BY LATE PREGNANCY

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ABSTRACT

This study was designed to find the status of some important biomarkers in pregnant and non-pregnant Holstein cows by measuring total oxidant status (TOS), total antioxidant status (TAS), homocysteine, paraoxonase and ceruloplasmin in serum. Blood samples were taken from clinically healthy pregnant Holstein cows (n=10) during last trimester. Equal number of non-pregnant (n=10) cows were also selected from the same herd. Serum was analyzed for the determination of concentration of the studied parameters. It was revealed from the results that TOS, homocysteine and ceruloplasmin concentration were significantly higher ($P < 0.05$) in pregnant cows compared to non-pregnant. Paraoxonase activity was significantly lower ($P < 0.05$) in pregnant cows. There was no significant difference ($P > 0.05$) in TAS concentration in pregnant and non-pregnant cows. It was concluded from the study that internal homeostasis in terms of these biomarkers alters in late pregnant Holstein cows. Increased production of oxidants in late pregnancy has affected the concentration of TAS, homocysteine, paraoxonase and ceruloplasmin. Moreover, these measurements give complementary information about the metabolic status of pregnant cows.

Keywords: cows, biomarkers, pregnancy, oxidative stress, Holstein Friesian

DS-2

EFFECT OF DIFFERENT MILKING METHODS AND UDDER HYGIENE ON SOMATIC CELL COUNT AND MILK QUALITY IN DAIRY COWS

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ABSTRACT

A total of 108 milk samples were collected to study the relationship of somatic cell counts (SCC) with milking methods, udder hygiene and milk composition from 27 HF dairy cows having moderate milk yield, in mid lactation and early parity, at Khyber Pukhtunkhwa Agricultural University Peshawar dairy farm. All animals were randomly distributed into three categories on the basis of milking methods (Mm) including machine milking (MM); gentle hand milking (GH) and rough hand milking (RH). Each category was further subdivided into three groups on the basis of udder hygienic conditions. Upon visual contamination, the udder hygienic (UH) conditions were

categorized into good (G), moderate (M) and poor (P) udder hygiene, having three animals in each group. Milk sample of 10 ml were collected in sterilized glass bottles from each animal during 28 days of experiment with weekly interval. All samples were analyzed for SCC and milk composition i.e. milk fat%, solid-not-fats (SNF) and total solids (TS). Data obtained for SCC and milk composition of each sample was statistically analyzed using SAS (1997). Analysis of variance showed significant difference for SCC and SNF, influenced by udder hygiene and TS also affected by udder hygiene x milking method interaction (UH x Mm), whereas non significant differences (P> 0.05) were observed for all the studied traits. Means table showed maximum range of SCC in poor udder hygiene (554.16 millions per ml) followed by moderate (521.78) and good udder hygiene (470.37), where as for milking methods higher SCC was calculated in MM (548.14) followed by RH (474.79)and GH (523.37). Lowered trend was observed in SCC under good udder hygiene interactions and lowest SCC was found in good udder hygiene x gentle hand milking interaction (G x GH) (425.00). Regarding milk composition, maximum (4.42) fat% was observed in moderate udder hygiene, rough hand milking and within its interaction also; where as minimum (2.81) fat% was found in good udder hygiene, gentle hand milking and in its interaction. SNF were significantly affected by udder hygiene and showed maximum value of (10.13%) and minimum of (7.66%). For TS, interaction of udder hygiene with milking methods showed maximum value of 12.44% and minimum value of 8.19%. It is suggested that the association of somatic cell count may be used as an indicator of hygienic status of the farm and may be use as a tool for setting milk marketing standards.

Key words: Somatic cells, Milking methods, Udder hygiene, Milk composition.

DS-3

INFLUENCE OF MASTITIS SEVERITY ON MILK COMPOSITION IN BEETAL GOATS

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ABSTRACT

The aim of present study was to investigate the effect of subclinical mastitis on milk composition in Beetal goats. The study area was in and around the Faisalabad within a radius of 10 Km from the heart of city. The animals in first week of lactation were not included in this study due to possibility of false positive results. Does were screened for mastitis by using Surf Field Mastitis Test (SFMT). Mastitis severity was graded as –ve (negative); ± (traces); P1 (mild clumping); P2 (moderate clumping) and P3 (heavy clumping). According to severity, 50% milk samples were analyzed for fat, protein, lactose, solids not fat, total solids and acidity. As the severity increased the fat, lactose, solids not fat and total solids decreased in milk. Fat contents varied from 3.8-4.5%, being maximum in non mastitic milk and minimum in mastitic milk. However, fat% was maximum in negative (4.5%) and minimum in P3 (3.8%) levels. Lactose contents varied from 4.16-4.42%, being maximum in non-mastitic milk and minimum in mastitic milk. However, lactose% was maximum in negative (4.42%) and minimum in P3 (4.16%) levels. Similarly, solids not fat and total solids varied from 7.29-7.85% and 10.65-11.88%, respectively. Total solids were found highest in negative (11.88%) and lowest in P3 (10.65%) levels. Protein contents varied from 3.16-3.26%, being maximum in non-mastitic milk and minimum in mastitic milk. There was significant difference in milk protein contents between mastitic and non-mastitic milk but no significant change was found

due to severity. Effect of mastitis severity on acidity was non-significant but a slight increase in acidity was found with increase of severity. Results indicated that mastitis is one of the major diseases resulting in high economic losses in terms of reduction in milk quality in goats. It is recommended that raising/keeping goat flocks by adopting recommended management tools can increase the milk quality of goats and can minimize the economic losses.

Keywords: Goats, mastitis, Surf Field Mastitis Test, milk composition

DS-4

THE EFFECT OF FARM SIZE AND LOCALITY ON PRODUCTION PERFORMANCE IN SMALL AND MEDIUM DAIRY FARMERS

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ABSTRACT

In Pakistan small and medium farmers are the back bone of dairy industry. Almost 40 million families are engaged directly or indirectly in animal related business. The present study was planned to explore the production status of small and medium dairy farmers and their effects on cost of production to enhance farm income. For this purpose 60 farmer families engaged in animal production activities were interviewed using a pretested questionnaire in different rural areas of Gujranwala district Punjab, Pakistan. The farmers were divided in two groups as small farmers having 1-10 dairy animals and medium farmers having 11-50 dairy animals. Each group is further subdivided in two sub-groups as near road living within 5 km of road and away from road living more than 5 km of road. The selected farmers were asked the questions related to the herd profile of animals, objectives of keeping animals, feeding practices, production and reproduction records, income sources and profit range etc. The data thus obtained was arranged according to importance of different parameters. This data was used to draw valid information by using possible statistical techniques. Average number of animals kept by one farmer were 5.05, 5.33, 26.06 and 30 in small near road, small away from road, medium near road and medium away from road; respectively. The number of milking animals per farmer were 2.33, 1.86. 13.8 and 11.33; respectively. In SFG the average AFC, CI, SP and LL were 45-50, 22-24, 3-3.1 and 12-13 months; respectively. In MFG these parameters were 45-50, 16-18, 2.5-3.0 and 10-11 months; respectively. The milk was sold at the rate of Rs. 43 and 47/kg or 1740 and 1880/40kg in SFG and MFG; respectively. The revenue obtained from milk was Rs. 202.15, 186.41, 374.79 and 317.58/day for SNR, SAFR, MNR and MAFR; respectively. The per liter cost of milk was Rs. 46.85, 46.59, 34.27 and 38.81 in SNR, SAFR, MNR and MAFR; respectively. Thus the profit (net income/liter) in SFG were Rs.-2.85, -4.59/liter and in MFG were Rs.13.73 and 7.19/liter; respectively. Major constraint related to animals in SFG was high price of animals (60%) and in MFG was quality and price of animals both (43.33%). Unavailability of fertilizer in SFG (43.33%) and shortage of fertilizer (60%) in MFG was the main constraint of fodder. In SFG the high cost of concentrate (46.66%) and in MFG bad quality of concentrate was main constraint (53.33%) of concentrate. In SFG the shortage of fertilizer and high cost of concentrate were faced by 46.66% and 43.33% respondents; respectively. In MFG shortage of fertilizer and bad quality of concentrate were faced by 60% and 53.33% of respondents. Other factors that increase input cost of milk faced by SFG were availability of clean water, vet. Services, technical services and about government policies, CI, DP, AFC, low milk production, service period and services required per conception were 13.33%, 36.66%, 23.33%, 26.66%,

86.66%, 83.33%, 76.66%, 96.66%, 66.66% and 73.33%; respectively. Whilst, these factors for MFG were 3.33%, 30%, 50%, 26.66%, 70%, 66.66%, 63.33%, 90%, 56.66% and 60%; respectively. By increasing production performance and decreasing the constr aint in SFG the cost of milk production can be decreased in SFG.

Keywords: Farm Size, Locality, Production Performance, Dairy Farms

DS-5

PHYISCO-CHEMICAL PROPERTIES OF YOGHURT PREPARED FROM CONVENTIONAL AND PROBIOTIC CULTURES

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ABSTRACT

Conventional and probiotic yoghurts were manufactured with three types of starter cultures *Lactobacillus delbrueckii* ssp. *bulgaricus* and *Streptococcus thermophilus* (Y350B), *Lactobacillus acidophilus* (LA 3) and *Bifidobacterium bifidum* (SP 9). Physico-chemical (Fat, protein, total solid, acidity, pH and ash) and sensory (appearance, taste, color and overall acceptability) quality of yoghurts were compared during 21days of storage at 4^{o}C. Results showed that fat, pH and ash contents were continuously decreased while protein, total solids and acidity values increased in all treatments during storage period. Organoleptically probiotic yoghurt made with *Lactobacillus acidophilus* was found more acceptable as compared to conventional yoghurt.

Key Words: Probiotic, conventional, yoghurt, *Lactobacillus acidophilus*, *Bifidobacterium bifidum*, sensory evaluation.

DS-6

MINERALS AND ORGANIC ACID CONTENT IN BUFFALO MILK CHEDDAR CHEESE: A COMPARISON WITH COW

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ABSTRACT

Buffalo's milk is well-heeled with caseins, lactose, fat, magnesium, phosphorus and calcium as compared to cow and has tremendous prospects for development of dairy products. The study was aimed to assess the minerals and lactic acid content in Cheddar cheese manufactured from buffalo milk which is customarily prepared from cow milk. Buffalo and cow milks standardized at 4% fat level were used to prepare Cheddar cheese. Both samples were stored for ripening of 120 days at 6-8°C. Chemical composition and minerals contents were determined at one month intervals during ripening. Lactic acid concentration was estimated through high performance liquid chromatography after 2 and 4 months of ripening. The results revealed that cheese from buffalo milk had significantly higher level of fat, protein, ash, lactose and lactic acid contents as compared to that

prepared from cow milk. Sodium, calcium and potassium contents were also considerably higher in the cheese prepared from buffalo milk. During ripening, significant decrease in lactose and pH value, while increase in acidity and lactic acid contents was observed. However, ripening did not influence the minerals profile of the cheese. It was accomplished that buffalo milk Cheddar cheese is nutritionally superior to cow milk cheese.

Keywords: Cheddar cheese, Buffalo milk, Cow milk, Organic acid, Minerals

DS-7

YOGHURT QUALITY AS INFLUENCED BY SUPPLEMENTATION OF WHEY PROTEIN CONCENTRATE

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ABSTRACT

Yogurt is affluent in whey proteins having affirmative health effects. During pasteurization of yogurt mix, whey proteins are denatured that reduces its availability but improves quality. The study was designed with the objective to increase the whey protein content in yogurt. The whey protein concentrate (WPC) was added @ 3% in yogurt mix. Yoghurt mixes were prepared using 12.5% Non-fat dry milk (NFDM) and 9.5% NFDM and 3% WPC. Mixes were reconstituted and pasteurized at 90°C for 10 min and 65°C for 30 min, inoculated with *Streptococcus thermophilus* and *Lactobacillus bulgaricus* and incubated to have pH 4.5. The prepared yoghurt samples were stored at 4-6°C for 14 days and analyzed for physical and chemical characteristics with one week intervals. The addition of whey protein concentrate decreased the firmness and water holding capacity and increased the synersis of the yoghurt. Yogurt having pasteurization at 90°C for 10 min had more firmness and water holding capacity but less synersis as compared to the one having different pasteurization treatment apart from of WPC supplementation. During storage, water holding capacity and synersis increased but firmness changed non-significantly. It was concluded that supplementation of WPC slightly lessen the yogurt quality but increased the un-denatured whey proteins. However, as the higher pasteurization temperature denatures the whey proteins more, its combination with supplementation can produce yoghurt with quality distinction.

***Keywords*:** Yoghurt, whey proteins, firmness, synersis, water holding capacity.

DS-8

BODY MEASUREMENTS AS PARAMETERS FOR LIVE WEIGHT ESTIMATION OF ADULT SAHIWAL CATTLE

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ABSTRACT

Aim of the study was to study the relationship of heart girth, body length, height at withers and body condition scores with live weight and to derive prediction equations for estimation of live weight using these body measurements in adult Sahiwal cattle. Study was conducted at Livestock

Experimental Station (LES) Bahadurnagar, Okara, Pakistan. One hundred adult cattle of 3 – 8 years of age were randomly selected. All the animals were weighed on a mechanical scale and their body measurements including body length (BL), heart girth (HG) and height at withers (WH) were recorded. Body condition scoring (BCS) was performed using 1 – 5 point scale with 0.25 intervals. Data was subjected to simple and multiple linear regression analysis. With correlation coefficients (r)0.439, 0.916, 0.452 and 0.658 for BL HG WH and BCS, respectively the relationship between the individual independent variables with body weight (BW)washighly significant (P<0.001) in all cases. Simple linear regression between BW and HG and multiple linear regression of BW on two independent variables (BL and HG), three independent variables (BL, HG and BCS) and four independent variables (BL, HG, WH and BCS)were significant (P<0.05) with r2 values of 0.840, 0.860, 0.880 and 0.883, respectively.Results indicated that farmers who lack measuring scales to regularly evaluate BW of their animals can use simple body measurements in order to monitor growth, determine feed requirements, assess breeding age,estimatemarketing weight and cash value of their animals.

***Keywords*:** Body measurements, Live weight, Sahiwal cattle

DS-9

THE EFFECT OF FARM SIZE AND LOCALITY ON PRODUCTION PERFORMANCE IN SMALL AND MEDIUM DAIRY FARMERS IN GUJRANWALA, PAKISTAN

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ABSTRACT

Sixty dairy farmers were interviewed from different rural areas of Gujranwala district Punjab Pakistan. The farmers were divided in two groups (small having 1-10 and medium having 11-50 dairy animals. Each group was further subdivided location wise (living near or away the road link) In small farmer group (SFG) the average age at first calving, calving interval, service period and lactation length were 45-50, 22-24, 3-3.1 and 12-13 months; respectively. In medium farmer group (MFG) these parameters were 45-50, 16-18, 2.5-3.0 and 10-11 months; respectively. The per liter cost of milk was $ 0.47, 0.50, 0.34 and 0.39 in small near road, small away road, medium near road and medium away road; respectively. The profit/loss obtained from milk in small near road, small away road medium near road and medium away road farmers were $.-0.03, -0.04, 0.14 and 0.7/liter; respectively.

Keywords: Cost of production, small farmers, production

DS-10

COMPARATIVE STUDY ON PHYSIOCHEMICAL ATTRIBUTES OF DAIRY MILK TRADED FOR HUMAN CONSUMPTION IN RAWALPINDI

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ABSTRACT

The present study was conducted to assess the physicochemical attributes of dairy milk sold in Rawalpindi, Pakistan. Milk samples were procured from various sources i.e. Govt farm, private farm, hotel, canteen, non-refrigerated milk, chilled milk and UHT processed milk and analyzed for their physical features, including moisture, total solids, specific gravity, and titratable acidity and chemical components including total protein, fat, lactose and ash contents. The specific gravity of milk samples varied between 1.014 and 1.032. Titratable acidity of canteen milk was significantly lower compared to that of other sources. There was a significant difference in total solids and protein contents of milk samples collected from different sources. The fat contents of milk procured from Govt and private farms were significantly higher than other sources. The highest solid not fat content was found in milk obtained from private farm and the lowest in canteen milk. However, these contents did not meet the legal minimum standard of Pakistan Pure Food Rule for buffalo and cow milk. . These findings demand proper monitoring of milk throughout the marketing chain for the availability of safe and healthy milk to consumers.

Keywords: milk; quality; acidity; total solids; physicochemical

DS-11

EFFECTS OF BOILING ON THE QUALITATIVE AND QUANTITATIVE CHARACTERISTICS OF BUFFALO, COW AND MIXED MILK AT HOME LEVEL

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ABSTRACT

During thermal treatment, milk behaves like a composite and complex reaction system as many biochemical and physicochemical reactions occur in it at home level about which the consumers are completely unaware. Some of these modifications are critically important to impart desirable characteristics to dairy products but some are unfavorable as well. The objective of this study was to study the effects of boiling and simmering of milk at home level. To get this objective, firstly a survey on 225 houses in different colonies of Faisalabad city was conducted to define research parameters. According to the survey findings, 66.5% consumers use buffalo milk followed by 12.5% mixed, 11% cow and 10% unknown source of milk. 97% consumers boil milk for family use. Consumers immediately boil the milk (average 2 boiling) followed by several minutes simmering on stove (average 17 min) to have thick cream layer on it followed by slow cooling at normal temperature which cause important changes. Boiling of milk at home attain maximum temperature in the range of 99±2°C. Refrigerate the milk for preservation after boiling and reheating are the

common practices. 98% consumers found unsatisfied with the quality of milk. In this study, pure buffalo and cow milk along with mixed milk of both species (1:1) samples were analyzed for compositional, physicochemical, microbiological characteristics. 2.5 liters of milk took 10 min for first boiling. Further simmering of milk at 97±02 °C for 15 and 25 min, lost 200 and 400 mL of milk volume, respectively. Ethanol and phosphate stability of mixed milk was greater than cow and buffalo milk. Thermal and ethanol stability of all samples was increased by refrigeration followed by boiling. Acidity of milk increased while pH of milk decreased by boiling of milk. Freezing point of milk slightly decreased due to increase the concentration of soluble solids. Two boils of milk (at boiling point) found sufficient to destroy pathogenic microorganisms. Whiteness increased in buffalo and mixed milk after boiling while slightly increase in green color was also observed. NCN decreased by using high temperature for long time while NPN vice versa. Calorific value increased due to high concentration of its constituents. Refrigeration of milk maintains the same quality of milk for 24 hours after boiling. Boiling and simmering have significant effects on quality of milk at home level, two boiling are enough followed by rapid cooling and simmering must be avoided.

Key words: buffalo milk, cow milk, boiling, home level, physicochemical characteristics

DS-12

QUALITY EVALUATION OF RAW MILK SOLD IN BAHAWALPUR DISTRICT OF PUNJAB, PAKISTAN

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ABSTRACT

Present study was conducted to analyze the quality of milk sold in Bahawalpur district. A total of 100 samples (250 ml each) were taken from the Bahawalpur city, Yazman, Ahmedpur Sharqia, Hasil Pur, and Khairpur Tamewali (20 from each city). All the samples are investigated by standard laboratory procedures to evaluate the quality of milk in the months of May and June. A wide variation was observed in the quality of sold milk. Results show that specific gravity of milk is 1.0230-1.0330, pH 6.70-6.80, acidity 0.12-0.15, fat 3.3-5.2%, solid not fat 8.20-8.50, protein 3.0-3.330%, casein 2.42-2.70%, sodium 430-500mg/ml, lactose 3.8-5.3%, chloride 5-8mg/liter, and ash 0.78-0.9. Results show that quality of raw milk sold in Bahawalpur district is according to the standard parameters and fit for human consumption.

Key Words: Milk, Bahawalpur, Quality, Casein.

INFLUENCE OF ENVIRONMENTAL FACTORS ON VARIOUS PERFORMANCE TRAITS OF KAJLI SHEEP

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ABSTRACT

Pedigree and performance data of Kajli sheep collected during 1994 to 2010 at Livestock Experimental Station, Khushab (district) and from 1994 to 2010 at Livestock Experiment Station Khizarabad, district Sargodha were analyzed to know the influence of environmental factors on various performance traits of Kajli sheep. Results showed that birth weight (kg), weaning weight (kg), yearling weight (kg), pre weaning weight (gm) and greasy fleece weight (kg) were 4.13 ± 0.01, 18.70 ± 0.08, 37.52± 0.06, 142.34 0±.83 and 1.32 ± 0.00, respectively. Year of birth, type of birth, sex and flock influenced ($P<0.001$) birth weight and greasy fleece weight whilst season of birth showed no significant differences ($P>0.05$). In weaning weight and pre weaning average daily gain of Kajli sheep, year of birth, type of birth and flock showed influence ($P<0.05$) except sex ($P>0.05$). In yearling weight, all parameters showed effect ($P<0.05$) except type of birth and flock ($P>0.05$).

Key words: Kajli sheep, environmental factors, performance, traits, Punjab

ABSTRACTS

Feeding and Nutrition

FN-1

EFFECT OF VARYING LEVELS OF DIETARY NDF ON PRODUCTION PERFORMANCE OF EARLY LACTATING NILI RAVI BUFFALOES

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ABSTRACT

A study was conducted to determine the effect of varying levels of dietary NDF on voluntary feed intake, nutrient digestibility, milk production, composition and weight gain in Nili Ravi early lactating buffaloes at Buffalo Research Institute for 90 days. Five diets A, B, C, D and E containing different levels 23%, 28%, 33%, 38% and 43 % of NDF contents respectively were prepared. Significant ($P \leq 0.05$) difference in dry matter (DM) and nutrient intake was seen. Dry matter and crude protein intake were significantly ($P<0.001$) higher in the group C than A, B, D and E group. Intake of NDF and ADF were significantly ($P<0.001$) higher in the group E as compared to A, B, C and D. Highest digestibility of NDF was observed in the group C and less in the groups A, B, D. The 4% fat corrected milk (FCM) production was significantly ($P<0.001$) higher in the groups A, B and C as compared to D and E. The solid not fat and total solid contents of milk were significantly higher ($P<0.001$) in the group D and lower in the groups A, B, C and E. The milk protein and lactose contents were significantly ($P<0.001$) higher in the group D and less in groups A, B, C and E. Weight gain was significantly higher ($P<0.001$) in the group A as compared to rest of other groups. Overall results significantly implies the intake of DM and 4% FCM production was maximum the group C.

***Keywords*:** Nili Ravi buffaloes, NDF, ADF, voluntary intake, weight gain

FN-2

EFFECT OF DIETARY NEUTRAL DETERGENT FIBER CONTENTS ON NILI-RAVI BUFFALO PERFORMANCE

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ABSTRACT

In recent scientific approach the fiber contents of feed stuffs has been fractioned into acid detergent fiber (ADF) and neutral detergent fiber (NDF). NDF is more complete measure of total fiber since it measures all of the cellulose, lignin and hemicelluloses in the diet. Optimum level of NDF contents in ration is important not only in regulating voluntary intake but also may improve the milk production, milk composition, body weight change and dry matter intake and NDF digestibility. A

proportional forage increase in the diet decreases voluntary dry matter intake and high forage intake results in lower rumen digestibility. Hence fiber is considered to be the negative index of voluntary intake. In this respect many researchers concluded that there was a general decline in voluntary intake with increasing NDF concentration in the diets above 25 percent. However, in actating buffalo, increased dietary NDF may increase milk fat which increases profitability in buffalo. The dietary NDF less than 25 percent depresses milk fat and lactating buffalo fed diet containing above 28 percent NDF produced more milk with higher milk fat, and protein than those that consumed diets containing 32 percent NDF. It has been reported that at least 75 percent of the dietary NDF should be supplied through forages, since forage NDF digestibility has influence on feed intake, especially if feed intake is limited by the physical capacity of the rumen. Forages with high NDF digestibility resulted in higher DMI which in turn increase milk yield, fat corrected milk yield and body weight gain as compared with buffalos fed high dietary NDF. It is concluded that one percent increase in forage NDF digestibility is associated with 0.17 kg/day increase in DMI, 0.23 kg/day increase in milk yield and 0.25 kg/day increase in fat corrected milk yield. A linear relationship between the marginal increase in NDF digestibility and animal performance has been established.

***Keywords*:** Nili Ravi buffalo, acid detergent fiber, neutral detergent fiber

FN-3

BIOTECNOLOGICAL METHODS TO IMPROVE THE NUTRITIVE VALUE OF LOW QUALITY ROUGHAGES FOR NILI RAVI BUFFALO CALVES

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ABSTRACT

Raising buffalo male calves for fattening purpose in Pakistan is a challenge due to shortage of quality forages and high cost of compound feeds. Although abundant quantity of forages such as cereal straws is available, their utilization to fatten buffalo calves is limited due to their low digestibility and intake. The feeding value of cereal straws including wheat straw can be improved through various physical, chemical and biotechnological methods. Amongst these, biotechnological methods are drawing more attention being simple and environment friendly. These methods can use most appropriate microbes that are able to grow on moist substrates under aerobic conditions by Solid State Fermentation (SSF). The SSF is an advantageous method to degrade lignin in order to improve digestibility of highly lignified straws. The most important step to produce the quality fungal biomass by SSF is to optimize and standardize ionic concentration of their growing media and then evaluate fungal biomass by conducting laboratory and in vivo studies. It can improve the nutritive value of low quality forages by increasing their protein and essential amino acid contents. These SSF forages can be used as a feed to raise or fatten Nili Ravi Buffalo calves. However, the suitability of including SSF products in a complete diet must be assessed on a small scale before their routine use to fatten Nili Ravi buffalo calves. The SSF technology may offer a novel way of upgrading fibrous feeds at a farmer level in order to reduce feed cost and environmental pollution.

***Keywords*:** Wheat straw, solid state fermentation, Nili Ravi buffalo

FN-4

DRY MATTER ACCUMULATION AND LER DIFFER IN MAIZE AND BEAN WITH CHANGE IN CROP STAND "MONO-CROPPING VS. INTER-CROPPING" WITH AND WITHOUT COMPOST APPLICATION

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ABSTRACT

Field experiment was conducted to investigate drymatter accumulation and land equivalent ration (LER) response in maize (Zea mays L.) and common bean (Phaseolus spp.) when grown alone (mono cropping) and in various combinations (inter-cropping) with and without compost application. The experiment was laid out in randomized complete block design using three replications at the farmer field at Dargai, Malakand, during summer 2012. In case of common bean, plots applied with compost produced higher drymatter (4546 kg ha-1) than the plots without compost (4137 kg ha-1). Sole bean crop had higher drymatter (5804 kg ha-1) than the average of the mixed stands (4049 kg ha-1). Among the crop stands, the bean crop produced the highest drymatter of 4420 kg ha-1 in T3 (mixed stand) and 4219 kg ha-1 in T4 (two bean rows on each side of the four middle maize rows), while the lowest drymatter (3638 kg ha-1) was recorded in T5 (two maize rows on each side of four middle bean rows). In case of maize crop, the plots applied with compost also produced higher drymatter (5100 kg ha-1) than the plots without compost (4572 kg ha-1). The sole maize crop had higher drymatter (9286 kg ha-1) than the average of the mixed stands (3946 kg ha-1). Among the mixed stands, the maize crop produced the highest drymatter (4185 kg ha-1) in T6 (one alternate row of each crop) and T5 (3973 kg ha-1), while the lowest biological yield (3806 kg ha-1) was recorded in T2 (two alternate rows of each crop). The land equivalent ratio (LER) was more with compost than without compost. Growing maize and common bean in mixtures with compost had higher LER in T2 (1.14) and T4 (1.07) as compared with sole cropping (1.0). All other mixtures with compost and without compost had < 1.0 LER and should not be practiced due to its harmful association between the two crops in the study area. It was concluded from the experiment that application of compost could increase common bean and maize productivity when grown alone as sole crops or mixed with each other in T2.

Keywords: Dry matter accumulation, land equivalent ration, maize, bean, mono-cropping, inter-cropping, compost application

FN-5

PHOSPHORUS AND TILLAGE MANAGEMENT INFLUENCE DRY MATTER PARTITIONING AND YIELD IN MAIZE WITH AND WITHOUT MOISTURE STRESS CONDITION

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ABSTRACT

Field experiments were conducted to investigate effects of tillage depths (15, 30 and 45 cm) and phosphorus levels (0, 30, 60 and 90 kg P ha-1) on growth and yield of maize (cv. Azam) under

irrigated and un-irrigated conditions at the Agricultural Research Farm of The University of Agriculture Peshawar, during summer 2012. Each experiment was laid out in randomized complete block design with split plot arrangements using three replications. Tillage depths were used as main plots, while P levels as. Total dry weight per plant (TDWPP) was more with irrigation (334.13 g) than without irrigation (286.25 g). The TDWPP showed positive relationship with increase in tillage depths. The maximum tillage depths (45 cm) resulted in highest TDWPP (321.71 g), followed by 30 cm (307.01 g), whereas the lowest (301.84 g) was obtained with shallow depths (15 cm). The TDWPP also showed positive relationship with increase in P levels. The mean values of the plots with the higher P (90 kg ha-1) produced the highest TDWPP (355.54 g), followed by 329.79 g with 60 kg P ha-1, whereas the control (0 kg P ha-1) produced the lowest TDWPP (245.79 g). Irrigated field also had the highest grain yield (3621 kg ha-1) than without irrigation (2577 kg ha-1). The maximum tillage depths (45 cm) produced the highest grain yield (3323 kg ha-1), whereas the lowest yield (2894 kg ha-1) was obtained with shallow depths (15 cm). The highest P level (90 kg ha-1) gave the highest yield (3535 kg ha-1), whereas the control (0 kg P ha-1) had the lowest yield (2507 kg ha-1) in maize. It was concluded from the experiment that increasing tillage depths and P level improve growth, TDWPP, yield components and yield in maize under both irrigated and un-irrigated condition.

Keywords: Phosphorus, Tillage, Dry Matter Partitioning, Yield, Maize, Moisture Stress

FN-6

EFFECT OF DIFFERENT LEVELS OF ORGANIC ACID SUPPLEMENTATION ON MILK YIELD AND COMPOSITION OF HOLSTEIN FRIESIAN CATTLE DURING SUMMER STRESS

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ABSTRACT

The present study was conducted in The University of Agriculture Peshawar Dairy Farm. The experiment was carried out on Holstein Friesian Cattle cows of the same age and breed during mid lactation. Twelve (12) Holstein Friesian Cattle (3 to 4 years old, average body weight of 400± 50 Kg) were selected. These animals were divided into four groups, of three cows each. Organic acids mixtures of citric acid, phosphoric acid, lactic acid and copper Sulphate at ratio of 80:90:50:10 grams were solved at one liter distilled water such solution was prepared in the post graduate lab of Livestock Management department. Animal's i.e. groups A, B, and C were offered organic acids mixtures at the rate of 0.5,1, and1.5 ml per liter of drinking water respectively while the group D was maintained as control. The experiment was continued for 30 days with two weeks adaptation period. Study was conducted at the months of July and August 2012. The theme of the study was to observe the effect of different levels of organic acid on feed intake, milk yield and composition as well as to study the effect on Somatic cell count of milk, and blood hematology of Holstein Friesian cattle under summer stress. Highest feed intake ($P<0.05$) was recorded with organic acid treated group C followed by group B followed by group A and the lowest ($P<0.05$) was recorded with group D during thermal stress at temperature 32.380C and relative humidity 57.48 %. Maximum milk yield ($P<0.05$) was recorded with organic acid treated group C followed by group B followed by group A and the lower ($P<0.05$) was recorded with group D. The Ash content of milk of the HF

cows was not significantly increased by the use of organic acid during thermal stress. Utmost milk fat (P<0.05) was recorded with organic acid treated group C followed by group B followed by group A and lower (P<0.05) was recorded with group D. Highest protein content of milk (P<0.05) was recorded with organic acid treated group C followed by group B and group A and the lowest (P<0.05) was recorded with group D. Uppermost lactose content of milk was recorded with organic acid treated group C followed by group B followed by group A and the lowest was recorded with group D. Highest SNF content of milk (P<0.05) was recorded with organic acid treated group C followed by group B followed by group A and the lowest (P<0.05) was recorded with group D. Peak TS content of milk (P<0.05) was recorded with organic acid treated group C followed by group B followed by group A and the lowest (P<0.05) was recorded with group D. Maximum HB content of blood (P<0.05) was recorded with organic acid treated group C followed by group B followed by group A and the lowest (P<0.05) was recorded with group D. Highest PCV content of blood (P<0.05) was recorded with organic acid treated group C followed by group B followed by group A and the lowest (P<0.05) was recorded with group D. Lower SCC of milk (P<0.05) was recorded with organic acid treated group C followed by group B followed by group A and the highest (P<0.05) was recorded with group D during thermal stress. The use of organic acid is economical for the dairy cows during summer stress.

Keywords: Organic Acid Supplementation, Milk Yield, Composition, Holstein Friesian, Cattle, Summer, Stress

FN-7

EFFECTS OF ANISEED (PIMPINELLAANISUM) ON PRODUCTIVE PERFORMANCE, MILK COMPOSITION AND BLOOD METABOLITES OF DAMANI GOATS

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ABSTRACT

An experiment was carried out to evaluate the effect of different doses of aniseed on feed intake (FI), weight gain (WG), milk yield (MY) and milk composition of Damani goats at Livestock research and Development station, Dera Ismail Khan. A total of 20early lactating Damani goats (n=20) with homogenous characteristics were randomly grouped on the basis of three different concentration of aniseed viz. 1, 2 and 3.0g/kg body weight supplementation, whereas one group was assigned as control group. Data regarding FI, WG, MY and milk composition were recorded at weekly interval for 8 weeks. Milk composition was determined by method described by AOAC, 1990. Ed 2. Inc. Virginia, USA. Results showed highly significant effect (P<0.05) of aniseed on FI, WG, MY and milk composition except ash and Total Solid (TS). Aniseed supplementation @3g/kg body weight boost feed intake up to 1.55 kg/day, milk yield 410ml/day. There was significant increase in milk protein, lactose, and SNF while significant decrease in milk fat% was observed. Blood glucose and protein level increased with advancement in lactation days. Whereas, blood cholesterol and triglycerides level decreased with advancement in lactation. Increasing aniseed

supplementation significantly increased blood glucose and protein level, while decreased blood cholesterol and triglycerides level. Further studies on the immune aspect of the said plant may be conducted in animals and human.

***Keywords*:** Aniseed, blood metabolites, milk composition, Damani goats

FN-8

YIELD AND NUTRITIVE VALUE OF ALPINE PASTURE IN UPPER KAGHAN VALLEY, PAKISTAN

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ABSTRACT

Three major groups of alpine pasture (grasses, forbs and shrubs) from four locations (Basel, Jalkhad, Gittidas and Burawai) in high altitude upper Kaghan valley, Pakistan, harvested at three different intervals (July, August and September) were elucidated for herbage yield and nutritive value. Herbage yield was significantly higher (333kg/ha) ($P<0.001$) for grasses in Burawai than Basel and Gittidas but not significantly different from Jalkhad. Similar trend of higher yield of shrubs was found in Burawai ($P<0.05$), however, forbs yield remained similar in locations. Among the four locations, the total herbage yield was maximum in Burawai (1003 kg/ha) and was minimum in Basel and Gittidas. Herbage yield of grasses and forbs was higher ($P<0.01$) at 2nd harvest than others. Nevertheless, the total herbage yield was higher ($P<0.05$) at 2nd harvest as compared to 1st and 3rd harvest. Comparison of mean crude protein (CP) values among three herbage types indicated that CP was maximum in shrubs (14.8%) followed by forbs (13.6%) and lowest in grasses (12.3%). The CP content was higher in herbages at Basel at 1st harvest than 2nd and 3rd harvest. In vitro dry matter digestibility (IVDMD) of herbage was significantly higher ($P<0.001$) at Basel and Burawai followed by Gittidas and Jalkhad. Among three herbages IVDMD was significantly higher for shrubs (67.1%) than forbs (56.2%) and grasses (54.2%) ($P<0.001$). However the IVDMD of herbage was not affected due to harvesting intervals ($P>0.05$). Results demonstrated that variations in yield, CP content and IVDMD of herbage among four experimental sites were attributed to plant composition of the sward which showed different proportions of grasses, forbs and shrubs.

Keywords: Alpine pastures, crude protein, nutritive value, herbage yield, IVDMD

FN-9

ENHANCEMENT OF OLEIC ACID IN BUTTER OIL BY HIGH OLEIC FRACTION OF MORINGA OLEIFERA OIL THROUGH LIPASE-CATALYZED TRANSESTERIFICATION

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ABSTRACT

Oleic acid in butter oil (BO) was enhanced by the incorporation of high oleic acid fraction (HOF) of Moringa oleifera oil (MOO) through lipase (Rhizopus miehei) catalyzed- transesterification. HOF was incorporated into Butter oil (BO) through lipase-catalysed tranesterification at four different levels i.e. 95% BO + 5% HOF (HOF-5), 90% BO + 10% HOF (HOF-10), 85% BO + 15% HOF (HOF-15) and 80% BO + 20% HOF (HOF-20) and compared with a control; without HOF. The concentration of oleic acid in HOF increased from 71.55% to 81.25% with significant decline in

saturated fatty acids. 20% cholesterol reduced when HOF-20 was tranesterified with BO. Iodine value of HOF-20 was 9.64 points higher than the control. Melting point of all the blends increased as a function of transesterification and were at par with control (P>0.05). The free radical scavenging activity of HOF at 200µ-lighters was 76.88%, flavonoid content of HOF was 34.52 mg/100-grams and total antioxidant capacity was 38.25% as compared to BO, 5.11%. Peroxide value of butter oil enriched with HOF-20 was 1.38 (meq/kg) as compared to control 3.25 (meq/kg) after 90-days of storage. Induction period of HOF-20 was 4.7-hrs greater than the control. Most of the sensory characteristics of HOF-20 and control were not different from each other with no phase separation during storage period. The concentration of oleic acid in BO can be enhanced by the incorporation of HOF of MOO through lipase-catalysed tranesterification; with improved nutritional value, better oxidative stability and acceptable sensory characteristics.

***Keywords*:** Oleic acid, Moringa oleifera oil, Fractionation, Transesterification, Butter Oil

FN-10

EFFECT OF DECREASING SATURATED FATTY ACIDS AND CHOLESTEROL ON PHYSICO-CHEMICAL CHARACTERISTICS AND OXIDATIVE STABILITY OF BUTTER

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ABSTRACT

The combined effect of fatty acid modification and cholesterol reduction on physico-chemical characteristics and oxidative stability of butter was determined. Milk with lower contents of saturated fatty acids was obtained from our other study related to the feeding calcium salts of palm oil fatty acids to Sahiwal cows. Milk was passed through the cream separator, cream was treated with or without beta cyclodextrin (βCD) at five different concentrations (1, 2, 3, 4 and 5%; T1, T2, T3, T4 and T5). βCD treatment did not have any effect on the fatty acid composition of butter (P>0.05). 80% cholesterol was removed when cream was treated with 5% βCD. Composition of cream before and after βCD treatment was similar (P>0.05). Melting point and iodine value of WβCD was 31.2oC, 41.7 as compared to market butter 34.5oC, 36.5, respectively. Butters were stored at -18oC for 90 days, peroxide value and anisidine value of market butter, WβCD and βCD treated butter was not significantly different up to 1-month of storage at -18oC. The overall acceptability score of butter treated with 5% βCD (T5) was 7.4 which was more than 82% of the total score. Functional butter with lower contents of unsaturated fatty acids and cholesterol can be prepared by modifying the fatty acid composition through feeding calcium salts of fatty acids and βCD treatment, with reasonable acceptability and storage stability.

Keywords: Calcium salts of fatty acids, beta cyclodextrin, cholesterol, overall acceptability

FN-11

EFFECT OF FEEDING FREQUENCY AND PARTICLE SIZE OF FODDER ON THE PRODUCTION PERFORMANCE OF LACTATING COWS

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ABSTRACT

The effect of feeding frequency and fodder particle size on milk yield, composition, dry matter intake and nutrient digestibility among dairy cattle was studied. Fifteen Sahiwal cows with same parity and yield were randomly selected and divided into five groups (T1 to T5) comprising three animals each. Fodder was chopped into two particle sizes (C1= 20mm and C2= 40mm) and fed with two feeding frequencies (F1 = twice and F2 = thrice daily). Accordingly, there were four treatments; T1= C1F1 (small particle size with feeding twice a day), T2 = C1F2 (small particle size with feeding thrice a day), T3 = C2F1 (large particle size with feeding twice a day) and T4= C2F2 (large particle size with feeding thrice a day). All the five groups were allotted to respective treatments. Group T5 fed with unchopped fodder served as control. The duration of study was 13 weeks with first week as adaptation period for the new feeding regime and rest for experimentation in which feed and milk samples were collected. Dry matter intake (kg) was significantly higher ($P<0.05$) in T4 i.e., 11.04±0.05 however, T1 (10.70±0.1) and T3 (10.71±0.09) were statistically non-significant among each other but significant as compared to T5 (10.67±0.11) and T2 (10.64±0.07). Average daily milk yield (kg) was significantly higher ($P<0.05$) in T4 i.e., 6.30±0.06 and among other all treatments non-significant effect was observed. Fat percentage was significantly higher ($P<0.05$) for T3 (4.67±0.05). Protein, solids-not-fat and total solids percentage was significantly higher in T2 (3.18±0.06), T5 (7.62±0.04) and T3 (12.14±0.09), respectively. The digestibility for dry matter, crude fiber and lignin content did not vary significantly ($P>0.05$) among treatments. However, DM digestibility in T3 showed comparatively higher values than other treatments.

***Keywords*:** Feeding frequency, fodder particle size, milk yield, composition, DM intake, nutrient digestibility

FN-12

EFFECT OF MICROBIAL INOCULANT ON FERMENTATION CHARACTERISTICS AND NUTRITIVE VALUE OF CORN SILAGE

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ABSTRACT

In Pakistan, with population explosion & dairy industry commercialization, gap between demand and supply of green forage increased alarmingly. Under such constrained fresh fodder resources, silage is to be considered as a good alternative. In view of foregoing, present study was planned to assess the effects of a homofermentive microbial inoculant (BIOSTABIL WRAPS, a mixture of different homofermentive strians {*Enterococcus faecium* (BIO 34 DSM 3530) and *Lactobacillus plantrum* (IFA 96 DSM19457)} on the fermentation parameters and nutritive value of corn silage was evaluated under laboratory conditions. The whole corn plant were chopped of 1-2 inches and ensiled with various treatments in buckets under lab conditions (from May 2012 to August 2012).

The inoculant were applied at concentrations of $2x10^8$(T1), $4x10^8$ (T2) and $6x10^8$ (T3) cfu/ml and one negative control group (T0) having three replicates each. The trial was planned to open at 3, 7, 45 and 90th day of experiment to characterize the material, quick acidification, dry matter recovery, availability and stability of silage respectively. The temperature of the trial samples was 32.75±1.92 throughout the trial duration. Findings of present study revealed the inoculant with graded levels significantly (<0.05) affected the silage characteristics in terms of pH, acids, DM, protein and energy parameters. A rapid & significant reduction in pH even at third day of trial from 6.5 to 3.61 in the tests (T2 & T3) groups and remained consistent till 90th day of experiment when compared with control group. The levels of lactic acid, acetic acid and propionic acids were significantly (P<0.05) higher for treatment groups (i.e. T2 & T3) than the T1 & T0 groups and almost stabilized till 90 day of the trial. A consistency in improved dry matter contents were observed at 3rd, 7th and 90th day of trial for T2 and T3 test groups. As far as the crude protein contents are concerned, a non-significant reduction as observed in treatment groups. However, inoculant didn't affect crude ash, crude fat and crude fiber, NDF and ADF.Overall, inoculant shows nutritive stability and consistency of acid produced at $4x10^8$ and $6x10^8$ cfu/ml inclusion levels of inoculant.

***Keywords*:** corn silage, homofermentive, nutrition, acids profile

FN-13

BIOTECHNOLOGICAL METHODS TO IMPROVE THE NUTRITIVE VALUE OF WHEAT STRAW FOR NILI RAVI BUFFALO CALVES

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ABSTRACT

In tropical countries shortage of quality forages and high cost of compound feeds is a challenge to raise the buffalo male calves for fattening purpose. This situation has been a stimulus to improve the already abundant available low quality resources such as cereal straws (46%) for Nili ravi buffalo calves. However, if the feeding value of cereal straws including wheat straw is improved, their use as a feed component to raise buffalo calves as a potential source of animal protein for the growing human population is possible. Various methods e.g. physical, chemical and biotechnological are availalable to improve the nutritive value of wheat straw. Among them, Biotechnological treatments are being more popular now a day due to their simplicity, environment friendly and without hazards for animals. Biotechnological approaches e.g. use the microbes along with solid state fermentation technology e.g. to degrade lignin can be used as a novel method to improve digestibility of highly lignified wheat straw. But for proper use of this novel method, the most important step to produce the quality fungal biomass by SSF is to optimize and standardize ionic concentration of their growing media and then evaluate the fungal biomass by conducting laboratory and in vivo studies. The SSF can improve the nutritive value of low quality wheat straw by enrichment protein and essential amino acid contents specially lysine. These Biotechnological based improved wheat straw biomass can be used as a feed to fatten Nili Ravi Buffalo calves. However, the suitability of including biotechnological based products in a complete diet must be assessed on a small scale

before their routine use to fatten Nili Ravi buffalo calves. The biotechnological approaches along with SSF technology may offer a novel way of upgrading wheat straw at farmer level in order to reduce feed cost and environmental pollution.

Keywords: wheat straw, characteristics, utilization, fungi, ruminant

FN-14

GROWTH PERFORMANCE OF GROWING BUFFALO CALVES FED UREA-CORN STEEP LIQUOR TREATED CORN COBS

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ABSTRACT

A research project was planned to study the effect of feeding Corn Cobs treated with 4% urea plus 5% corn steep liquor on nutrient intake, weight gain and nutrient digestion in growing Nili-Ravi buffalo calves. Twenty male buffalo calves of similar age (365±20 days) and body weight (250+-20 KG) were divided into four groups (five calves in each group) according to completely randomized design. Four iso-caloric (ME 2.2Mcal/kg) and iso-nitrogenous (CP 13.0%) rations were formulated using NRC (2001) standards for energy and protein. Group-A (Control Group) was fed on ration-I containing 30% urea treated corncobs ensiled without CSL while remaining 70% portion was concentrate. And animals of groups B, C and D were fed on rations II, III & IV containing 30, 40 and 50% urea treated corncobs ensiled with CSL while remaining portion was completed with the concentrate. The project was lasted for 100 days. Growth rates recorded for the animals of groups A, B, C and D were 1.14, 1.16, 1.08 and 1.12 kg respectively. Statistically the difference was non-significant. Similarly feed conversion ratios of groups A, B, C and D were 6.47, 6.41, 7.01 and 6.56 respectively while profit margin calculated by the cost of feed consumed during the trial subtracting from sale price of Animals (live weight gained during the trial of each animal) were Rs. 1538/-, 2176/-, 1707/- and 2346/-. So the animals of group-D produced maximum profit and than group-B, group-C and group-A in term of economics. While group- B and group- A showed better result in term of FCR and growth rate. The result of this study showed that treated corncobs can be used in the feed of animals for fattening up to 50% successfully and more profit (in term of cheaper cost of ration) can be earned.

Keywords**: -** Corn Cobs, Urea, Corn Steep Liquor, Buffalo Calves.

FN-15

THE REPLACEMENT OF NON-LEGUMINOUS FODDER AND CONCENTRATE WITH LEGUMINOUS FODDER *(MEDICAGO SATIVA)* AND ITS EFFECT ON SAHIWAL HEIFERS PERFORMANCE

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ABSTRACT

The objective was to study the effect of substitution of *Medicago sativa* & *Avena sativa* hay for *Sorghum bicolor* supplemented with low level of concentrate in Sahiwal heifers during the summer

period. The study was lasted for four months (120 days). The 1st treatment (T_1) was composed of *Sorghum bicolor* (80%) and concentrate (20%), while T2 containing *Medicago sativa* (80%) and *Avana sativa* (20%) whereas, the T3 was comprised of 50% T_1 & 50% T_2. The group T_1 was found significantly ($P<0.05$) lower in DMI (2.6±0.28 kg/d), weight gain (0.226±0.19 $kg^{-1}d$) and digestibility of DM (60.40±4.73) as compared to other groups. The group T_3 showed significantly ($P<0.05$) higher DMI (3.08±0.44 kg-^{1}d). The results of the feeding trial showed significantly ($P<0.05$) higher DMI (3.56±0.28 $kg^{-1}d$), weight gain (0.647±0.19 kg-^{1}d) and DMD (69.42±3.19) in T_2 as compared T_1 in which significantly ($P<0.05$) lower in DMI (2.6±0.28 $kg^{-1}d$), weight gain (0.226±0.19 $kg^{-1}d$) and DMD (60.40±4.73) was observed. The group T_3 (50% T_1:50% T_2) consumed 3.08±0.44 kg-^{1}d DM which was significantly ($P<0.05$) higher than T_1 hence, had higher ($P<0.05$) weight gain (0.406±0.25 kg/d) than T_1 (0.226±0.19 $kg^{-1}d$). The average daily weight gain differed significantly ($P<0.05$) amongst all of the treatments. Treatment T_2 (0.647±0.19 kg-^{1}d) and T_3 (0.406±0.25 kg/d) were significantly higher in average daily weight gain as compared to T_1 (0.226±0.19 kg/d). T_3 (0.406±0.25 $kg^{-1}d$) also showed significantly ($P<0.05$) higher weight gain as compared to T_1 (0.226±0.19 $kg^{-1}d$). The average daily water intake in T_2 (8.17± 2.27 $lit^{-1}d$) and T_3 (7.70±2.27 $lit^{-1}d$) differed significantly ($P<0.05$) from T_1 (6.78±1.83 $lit^{-1}d$) in the feeding trial. The other nutrients intake i.e. CP, NDF, OM, and CF measured as kg per day on dry matter basis were significantly ($P<0.05$) different among all the treatments. Average daily crude protein intake was found 0.38±0.05 $kg^{1}d$ in T_1 while in T_2 and T_3 it was found 0.52±0.04 and 0.45±0.06 $kg^{-1}d$, respectively. OMI also differed significantly ($P<0.05$) amongst T_1 (2.28±0.30 kg^{-1} d), T_2 (3.06±0.28 $kg^{-1}d$), and T_3 (2.69±0.38 $kg^{-1}d$). NDF intake was significantly higher in T_1 (1.18±0.16 $kg^{-1}d$), as compared to T_2 (1.63±0.13), and T_3 (1.41±0.20 $kg^{-1}d$). Crude fiber intake in all the treatments were differed significantly ($P<0.05$) showing an increasing order of $T_2 > T_3 > T_1$ with the average values ($kg^{-1}d$) as 1.17±0.09, 1.14±0.164, 0.77±0.10 in the experiment, respectively. Digestibility coefficients of different treatments were high in treatment T_2 as compared to other treatments. Dry matter digestibility coefficient of T_2 (69.42±3.19) and T_3 (68.84±5.01) differed significantly ($P<0.05$) as compared to T_1 (60.40±4.73). Similarly digestibility coefficient for OM in treatment T_2 (67.19±7.14) and T_3 (68.5±8.33) were significantly ($P<0.05$) higher than T_1 (61.10±4.68). Crude protein digestibility in T_1, T_2, and T_3 were found as 60.91±2.36, 71.07±1.02, and 68.68±1.87, respectively. The highest crude protein digestibility was observed in T_2 followed by T_3. Crude fiber digestibility also followed the same trend as was in case of DM, CP and OM. The group on T_2 (52.30±0.60) and T_3 (51.34±1.14) differed significantly ($P<0.05$) in CF digestibility as compared to T_1 (47.40±0.90). The coefficient of digestibility for neutral detergent fiber was found significant among all the treatments in order of $T_2 > T_3 > T_1$ having values as 60.69±1.22, 53.99±1.56, and 49.38±0.35 in the digestibility trial. It was also found that T_1 (11.4±5.181) was significantly ($P<0.05$) higher in FCR value followed by, T_3 (7.53±6.309), and T_2 (5.69±1.337). T_2 showed better FCR as compared to other treatments hence proved to be the most economical treatment amongst all of treatments. T_3 was significantly ($P<0.05$) better than to T_1 in the trial for FCR. The economics of different treatments was calculated in rupees on the basis of DMI $cost^{-1}$kg average daily weight gain supported T_2 (90.97±19.91) as a significantly economical as compared to T_3 (111.33±21.15) and T_1 (153.51±37.57). It was concluded that *Medicago sativa* mixed with *Avena sativa* can successfully replace the *sorghum bicolor* supplemented with 20% concentrate on DM basis in heifer rearing program. Moreover, *Medicago sativa* mixed with *Avena sativa* was found the most economical treatment for standard weight gain in Sahiwal heifer production and can be used as economical feeding package in developing countries.

FN-16

EFFECT OF FEEDING SYSTEMS ON GROWTH PERFORMANCE AND BLOOD UREA CONCENTRATION OF BEETAL & TEDDY MALE KIDS

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ABSTRACT

A research plan was designed to study the effect of different feeding systems on post-weaning growth in Beetal and Teddy male young stocks. Fifteen male goat kids of each breed with the age of 5-6 months with an average weight of 18 and 10-13 kg, respectively were used in the study. The male kids were divided into 3 groups with control (C) on total grazing, grazing +100 gm concentrate/h/d (T1) and ad-lib TMR (70% concentrate + 30% straw, T2). Fifteen days was provided as adaptation period. All the experimental units were assigned to treatment group with 2 factor factorial (3×2) treatment arrangement under CRD design. The trial lasted for 90 days. The data for feed intake, average daily gain (ADG), and body measurements were collected. Statistical analysis showed that the treatment had significantly affected the ADG (P = 0.035) but the T1 and T2 were not different. Beetal kids had 44 gm/d ADG while Teddy gained as 25 gm/d. The T2 group gained at highest rate with 47 gm/d followed by 35 gm/d in T1 group. The blood urea was not affected by the treatments (P>0.05).

***Keywords*:** Beetal, Teddy, growth, ADG, and blood urea balance.

FN-17

EFFECT OF DIETARY PROTEIN LEVELS AND AGE OF FEEDING THE STARTER RATION ON THE GROWTH PERFORMANCE OF WEANED BEETAL KIDS

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ABSTRACT

The study was planned to find out the response of different protein levels of iso-caloric kids starter ration in different weaning age groups. The starter ration was used to help growing kid to maintain growth and also shifting to solid feed. Forty two Beetal kids of three weaning age groups i.e. (i) early weaned 30±10 days, (ii) medium weaning age with 60±10 days and (iii) standard weaning age group with 90±10 days were subjected to three protein levels i.e. 16%, 20% and 26% for six weeks including the two weeks of adjustment period. Treatment groups exposed to ad-libitum grower pellets (iso-caloric) while the control group were given fresh fodder only. The experimental units were assigned to treatments using 2 factor factorial (3×3) treatment plus control treatment design in individual stalls under completely randomized design (CRD). The data were collected about feed intake, weight gain, Klieber ratio and body measurements to know the response of treatment. The grower ration had significantly (P<0.05) improved the average daily gain, feed intake (P< 0.05) and klieber ratio (P< 0.05). While the height at rear legs were non-significantly (P>0.05) affected by treatments. The quadratic regression analysis showed that the 60 days age of weaning has best

response while the 20% protein levels had shown better average daily gain in this age group. The intake also followed the same trend and while rest of the parameters are under data processing and analyses.

***Keywords*:** Beetal, weaning age, starter ration, pellets, average daily gain, feed intake, Klieber ratio.

FN-18

EFFECT OF FEEDING LEVELS OF MINERAL AND VITAMINS ON PERFORMANCE OF LACTATING CATTLE AND BUFFALO

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ABSTRACT

A significant part of a complete dairy feeding program is the mineral-vitamin component. Physiologically, minerals are involved in reproduction, lactation, cow/calf health during pregnancy and cow recovery after calving and general herd health. Highly productive dairy animals have much greater needs for minerals and vitamins than low-producing. Concentrations of minerals and vitamins in feeds can be extremely variable. Dairy animals commonly need 3 vitamins and 17 mineral for their optimal productivity. Even the deficiency of any of these can result in health, reproduction and milk production problems. The antioxidant, vitamin E and carotene are beneficial in reducing mastitis. Vitamins (D, E, C and carotene) and minerals (Cu, Zn, and Se) are needed for enhanced immune response. Almost all the members of B.comlex group, C vitamin K_2 are synthesized in rumen but ruminant diet should contain sufficient cobalt for B_{12} synthesis. Vitamin A is neither synthesized in the body nor contributed by bacteria and it is the only vitamin, which may be deficient supply under many conditions. Therefore its supply seems to be critical. Vitamin E content of forage is highly variable and is effective in reducing gossypol toxicity. Generally it is assumed that the dairy animals with functional rumen do not develop deficiency. Different research reports suggest the need for supplemental biotin, thiamin and niacin for dairy cattle. Pre-partum anionic diets should be supplemented to avoid Milk fever. High phosphorus diets do not improve milk production or reproduction but there is environmental concern from use of excess P. Manganese has its role in ovulation and fertility of dairy animals. Grazing dairy animals should have access to high quality free-choice mineral mixtures. Mineral and Vitamin supplementation should especially be managed before the periods of increased trace mineral demand such as calving, joining, dry-off and growth.

Keywords: Mineral mixture, micro minerals, milk fever, macro minerals, milk yield

FN-19

IMPORTANCE OF WATER FOR BUFFALO PRODUCTION

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ABSTRACT

An adequate supply of fresh clean drinking water to buffaloes is of major concern to dairymen from physiological and production view point. Water requirement of buffalo is approximately 25–30% more than cattle under the same climatic conditions and it ranges 70-80 liters per kg live-weight. Provision of drinking water to buffaloes three-four times a day in summer and mostly twice a day in winter is in general farm practice. Wallowing or showering/splashing of water on body decreases heat stress with an initially restricted access to drinking water. Buffaloes should not be deprived of water longer than 12 hours, unless in transit. Buffaloes which are dehydrated will engorge themselves on reintroduction to water and deaths will result. Water requirements depends upon many factors including stock type, environmental factors, water quality, feed type and animal's physiological condition. Buffaloes used to drink salty water may need special consideration in management. The volume of salty water required is higher than for fresh water and if needed, they may gradually be changed to use fresh water. This article discusses water consumption of dairy buffaloes and from this discussion an indication of the possible consequences of different physiological changes can be obtained, and the need to change management practices assessed.

Key Words: Water requirement, dairying, wallowing, cattle, buffalo

FN-20

EFFECT OF WATERING FREQUENCY ON FEED INTAKE, MILK PRODUCTION AND COMPOSITION IN SAHIWAL CATTLE DURING SUMMER SEASON

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ABSTRACT

The study was carried out to investigate the effect of watering frequency on feed intake, milk production and composition in Sahiwal cattle during summer season. For this purpose, twelve lactating Sahiwal cows were selected in a completely randomized design with three treatments including: watering twice a day, watering thrice a day and watering *ad libitum* for group-G1, group-G2 and group-G3, respectively (four animals per group). Animals were housed individually for individual watering and feeding. Green fodder was offered *ad libitum* to cows of all treatment groups and concentrate was offered 2.0 kg per cow per day as a production allowance. Results showed that watering frequency had a significant ($P<0.001$) effect on water intake, dry matter intake, milk production and digestibility. The water intake in cows of group-G1, group-G2 and group-G3 was 37.09 liters, 40.20 liters and 40.68 liters, respectively. Dry matter intake in cows of

group-G1, group-G2 and group-G3 was 9.90 kg, 10.60 kg and 10.67 kg, respectively. Milk production in cows of group-G1, group-G2 and group-G3 was 6.41 liters, 7.52 liters and 7.46 liters, respectively. Dry matter digestibility in cows of group-G1, group-G2 and group-G3 was 73.37 %, 66.08 % and 69.74 %, respectively. The watering frequency had a non-significant effect on milk composition (fat, protein, lactose, solids not fat, total solids and specific gravity) in all treatment groups except ash. Watering frequency had a significant ($P<0.001$) effect on the percentage of ash, value for ash contents was 0.61 %, 0.71 % and 0.70 % in group-G1, group-G2 and group-G3, respectively. There was no change between initial and final live weight and body condition score in all treatment groups. Watering frequency had a non-significant effect on live-weight and body condition score. A significant ($P<0.001$) positive correlation was found between water intake and dry matter intake ($r = 0.177$) and milk production ($r = 0.6$). Similarly, a significant ($P<0.001$) positive correlation ($r = 0.242$) was found between thermal-heat index and water intake

***Keywords*:** watering frequency, feed intake, water intake, milk production, Sahiwal cows

FN-21

MULTIPURPOSE USE OF FODDER TREE AS GREEN FODDER FOR RUMINANT ANIMALS IN DRY SEASON AND TO CONTROL SOIL EROSION

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ABSTRACT

Traditionally fodder tree are grown around farm lands in northern part of Nepal. Saplings of fodder tree are planted in bound, raiser, bank of the cultivated lands, fallow and marginal lands. Green fodder from fodder tree are available from November to June when almost cultivated lands are fallow dry and other green fodder and forage are not available during that period. Fodder leaves are good source of protein, vitamins and minerals supplementation with straw based diets during winter and dry months. Among the farm animals, fodder tree are very good source of green fodder for stall fed goats, meat and dairy animals. There is no adverse effect on ruminant animal while feeding fodder tree leaves with rice or wheat straw on 1:2 ratio of fodder tree leaves and dry roughages (straw). however, some fodder tree contain little higher level of tannin (above 5 percent on dry matter basis) which bind protein and minerals and limit availability of nutrients to the animals but most of commonly grown fodder tree leaves contain moderate amount of tannin (below 5 percent) which also acts as bypass protein for ruminant animals and defense against insect and pest attack during dry season on plant. Some fodder tree have long root system which bind soil and protect against landslide in hilly areas for this purpose *Ficus lacor, Ficus cunea/semicordata, Ficus roxbourghi, Ficus benjamina* are examples which have long roots and have been planted around the farm lands to protect soil erosion and source of green fodder for ruminant animals during dry season.

Keywords: fodder tree, ruminant animals feeding, soil erosion.

FN-22

IMPACT OF CONCENTRATES WITH VARYING LEVEL OF METABOLIZEABLE ENERGY AND CRUDE PROTEIN ON GROWTH RATE AND NUTRIENT DIGESTIBILITIY IN MALE BUFFALO GROWING CALVES

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ABSTRACT

Twenty Nili Ravi buffalo male calves of 10 months age and weighing 100± 10 kg were used in a completely randomized design (CRD) to investigate the effect of varying levels of crude protein (CP) and metabolizalbe energy (ME) on growth rate and nutrient digestibility of male buffalo calves. Four experimental rations A, B , C and D were formulated with two levels of CP i.e. 16.0 and 18.0% along with two varying levels of ME i.e. 2.82 & 2.94 Mcal/kg. The animals were fed individually ad libitum intakes and all the standard managemental practices were followed. Feed intake (DM basis) kilograms per day and weight gain were higher in buffalo calves fed ration B & D containing 2.94 Mcal/kg, but the difference were non significant statistically among all the groups. However, the results of feed conversion efficiency were better in the animals of group A & C fed on rations containing 2.82 Mcal/kg ME levels. DMI digestibility were significantly higher in the animals fed on diet containing low level of protein other then higher protien level while CP and NDF digestibilities were almost same in all groups and difference were non significant statistically. It was proved that metabolizable energy requirement of Nili Ravi buffalo calves are higher than beef cattle as recommended by NRC (1996).

Keywords: Buffalo calves, growth rate, crude protein levels, metabolizable energy**.**

FN-23

NUTRITIONAL VALUE OF GROUNDNUT AS FODDER CROP AFFECTED BY DIFFERENT WEEDS IN DISTRICT KARAK

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ABSTRACT

A floristic study was conducted to highlight the major weed speies infesting groundnut (major fodder) in District Karak, Khyber Pakhtunkhwa during August 2011. The relative density of weeds of groundnut was determined using quadrate method. Fumaria indica ranked as the top scoring weed at Shaheedan having the Importance Value of 31.06. Similarly, Cynodon dactylon; the worst perennial grassy weed of the District attained the next highest Importance value (23.43) at Tabbi Khwa, emerged as the rare weed at Shaheedan and Kotakala and was altogether absent at these 2 locations of the studied sites. However, Cyperus rotundus ranking at the top in Sara Khwa (22.83) had a reasonable stand at all other locations depicting its widespread occurrence in groundnut in District Karak. The average Importance Value and ranking depicted Digera arvensis, Portulaca oleracae, Cynodon dactylon and Cyperus rotundus as the most important weeds of ground nut fields of the District Karak. Only judicious management of these species may enable the ground nut growers to harvest bumper yields of their crop as well get a better fodder for their animal.

FN-24

SCREENING AND CHARACTERIZATION OF PROBIOTIC LACTIC ACID BACTERIA FROM FERMENTED FOOD PRODUCTS

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ABSTRACT

Aim of the present study was to investigate the probiotic potential of Lactic acid bacteria (LAB) isolated from fermented foods from Xian, Chin. A total of 67 LAB including *Lactococcus lactis subsp. Lactis* (4), *Streptococcus thermophillus* (3) and *Lactobacillus spp*. (60), identified by 16S rDNA sequencing, were evaluated for their ability to grow at low pH, in simulated gastric juice (pH 2.0 and 2.5) and simulated intestinal juice (pH 8.0), resistance to different concentrations of bile, antimicrobial activity, adhesion to Caco-2 cells, and survival and retention in gastrointestinal tract of gonobiotic BALB/c mice after orogastric inoculation. Eight strains (NWP06, NWP08, NWP12, NWP13, NWP34, NWL17, NWL58 and NWL64) showed remarkable survival (≥80%) in simulated gastric juice (pH 2.5), simulated intestinal juice and ox-gall. While, only three strains NWP08, NWP13 and NWP58 were fairly tolerant (41.1%, 64.4% and 51.7%, respectively) to simulated gastric juice (pH 2). The NWP08, NWP12 and NWP58 also showed highest antimicrobial activity against human pathogens. NWP08 and NWP13 were highly adhesive to human Caco-2 cells *in vitro* (pH 4.5 and 7), while NWL58 showed moderate adhesion. Furthermore, NWP08, NWP13 and NWP58 were isolated in high numbers from BALB/c mice after 24 and 48 hours of oral adminstration. It is concluded that *Lactobacillus casei* NWP08, *Lactobacillus rhamnosus* NWP13 and *Lactobacillus parabuchneri* NWP58 have probiotic potential and can be incorporated in functional dairy products after further investigations.

Keywords: Probiotic, *Lactobacillus*, fermented foods, antimicrobial activity, Caco-2 cells

FN-25

STUDIES ON INFESTATION OF MAIZE STEM BORER, *CHILO PARTELLUS* (SWINHOE) IN MAIZE STUBBLES AND STALKS

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ABSTRACT

The research was conducted to record the infestation of maize stem borer (MSB) in maize stubbles and stalks in two maize cultivars i.e. local white and hybrid in three different locations (Ghondo, Palo and Baddar villages) in Mardan Division. During the active season, highest MSB infestation (33.3%) in stubbles was recorded on hybrid at Palo and lowest (15%) on local white and hybrid at Ghowndo and Baddar respectively. Highest (17.7%) hibernating MSB larvae infestation was recorded on hybrid at Palo and lowest (1.0%) at Baddar on both cultivars while in stalks hibernating larval infestation recorded at Ghowndo ranged from3 to 10%), at Palo ranged from 2 to 9% and at Baddar village it ranged from 1 to 9 %.

Key words: Maize stem borer, *Chilo partellus* (Swinhoe), stubbles and stalks.

FN-26

NUTRITIONAL EVALUATION OF THREE MAIZE (*ZEA MAYS*) VARIETIES HARVESTED AT EARLY AND LATE STAGE OF MATURITY

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ABSTRACT

Nutritional evaluation of three maize (*Zea mays*) varieties (Sa2000, Gl2000 and Sa2001) harvested at early (40 d) and late (60 d) stages of maturity was done in rumen cannulated *Nili Ravi* buffalo bulls in a completely randomized design with 3 × 2 factorial arrangements of treatments. Samples of maize varieties harvested at different stages of maturity were chopped and ground to 2mm size for chemical analyses, after drying. Maize, regardless variety, harvested at early stage had higher crude protein (CP) contents compared to those harvested at late stage. *In situ* dry matter (DM) and neutral detergent fiber (NDF) digestion kinetics of the varieties were determined in ruminally cannulated bulls. The DM and NDF degradability, rate and extent of DM and NDF disappearance decreased in maize variety harvested at late stage than those harvested at early stage. However, effect of varieties did not show any effect on *in situ* DM and NDF disappearance, but it declined with maturity of the plant. Lag time for DM and NDF was shorter ($p<0.05$) in early harvest varieties than late ones. Study revealed that maize verities harvested at 40 days of maturity had higher CP contents and better *in situ* DM and NDF digestion kinetics in bulls.

Key words: Maize Fodder, Harvest stage, Digestion kinetics, Buffalo bulls

FN-27

RESPONSE OF GROWING MALE GOATS TO GRADUALLY INCREASED DIETARY CONCENTRATION OF SODIUM BICARBONATE UNDER TROPICAL ENVIRONMENT

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ABSTRACT

Response of growing male goats receiving gradually increased concentration of sodium bicarbonate was evaluated on nutrient intake, digestibility, nitrogen balance and weight gain in growing male goats under tropical field situation in a complete randomized block design for a period of three months. Sixty growing goats of 10-12 months of age with almost similar weight were divided into five groups, 12 per group. Five isonitrogenous and isoenergetic diets were formulated and randomly allocated to five groups of goats. The control diet (C) contained zero $NaHCO_3$, while 4SB, 8SB, 12SB and 16SB diets contained 0.4, 0.8, 1.2 and 1.6% $NaHCO_3$, respectively. Diets were randomly allotted to five groups. An increase in nutrient intake was recorded with increasing dietary $NaHCO_3$ level while the reverse was true for nutrient digestibility. Goats fed the 12SB and 16SB diets had

higher nitrogen retention than those fed the C and 4SB diets. Goats fed 14SB and 16SB diets gained more weight than those fed the C and 4SB diets. Outcome of the present findings suggested increased nutrient intake, nitrogen retention and weight gain in growing goats fed diet containing 1.2% $NaHCO_3$.

FN-28

EXISTING FEEDING STRATEGIES AND NUTRITIONAL STATUS OF LACTATING BUFFALO AND CATTLE MANAGED BY (PERI-) URBAN DAIRY FARMERS IN FAISALABAD, PAKISTAN

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ABSTRACT

Peri-urban dairy production has been growing constantly during the past decades and continues to gain importance; about 5% of Pakistan's milk comes from urban and 15% from peri-urban producers. A study was conducted in Faisalabad, third-largest city of Pakistan (>2 million inhabitants). Using a structured and pretested questionnaire, interviews with 145 peri-urban (4 to 9.4 km from city centre) milk-producing households (HH) were carried out from August until October 2009 to explore this important production system. Mostly, farmers were feeding their animals in the morning and in the evening at milking time, using green fodder crops (95.2%), wheat straw (91.7%) and concentrates (87.6%; industrial by-products); mineral mixtures were only fed by 8 HH. There was no difference in feeding of cattle and buffalo. Animals were fed a fixed amount of concentrates without taking into account the species (buffalo vs. cattle) and as well their current milk production. This leads to nutrient undersupply in highly productive animals and to nutrient oversupply in low producers especially during late lactation. Hence, the farmers are to be advised for group feeding of their dairy animals according to production level for getting optimum productivity and profitability.

Key Words: Buffalo; cattle; feeding management; milk production, peri-urban

FN-29

EFFECT OF SOAKING AND NAOH TREATMENT ON RICE HUSK FOR NELI-RAVI BUFFALOWS

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ABSTRACT

A study was conducted to determine the nutritional profile, before and after treatments of rice husk and their voluntary feed intake and digestibility. The data obtained was statistically analyzed by using completely randomized design (CRD). For the purpose rice husk was soaked (T2) in water (1:10;w/v)for three days and ensiled with 5% NaOH (T3) for a month while the untreated rice husk portion remained controlled (T1). Results showed that reduction in silica and lignin contents in case

of T3 and followed by T2 as compared to untreated rice husk. NDF, hemicelluloses and ADF contents were reduced while ash contents were increased in case of T3 , however no significant differences in T2 and T1 were observed while there was no significant difference ($P<0.05$) in EE,CP and celluloses among the treatments. Buffalo bull was used for determining the *in situ* dry matter digestibility technique for 24 and 48 hours incubation respectively. T3(14.47±1.16) having highest dry matter digestibility as compared to T2(9.76±1.16) and T1(9.41±0.68) in case of 24hours incubation, while for 48 hours incubation there was no significant difference among treatments. Feeding trail was conducted for a month on Twelve non lactating Nili Ravi buffalo randomly divided in three groups A, B and C (4 animal in each) with similar body condition score and weight. Three total mixed rations (TMR) based untreated (TMR-A), Soaked (TMR-B) and NaOH treated rice husk (TMR-C) were prepared. The buffalo fed TMR-C (13.09) showed ($P<0.05$) highest feed intake as compared to TMR-B (10.69) and TMR-A (9.66kgDM/animal/d). The *in vivo* digestibility co-efficient for DM,CP, CF and EE measured by total collection method and indicated that TMR-C and TMR-B were significantly ($P<0.05$) better digestible as compared to TMR-A ration.

Key words: Ricehusk, soaking, NaOH, digestibility, TMR, buffalo

2nd INTERNATIONAL WORKSHOP ON DAIRY SCIENCE PARK
(November 18-20, 2013)
Venue: The University of Agriculture, Peshawar-25120, Pakistan
http://aup.edu.pk/dairy-science-park2013.php

ABSTRACTS
Reproduction and Genetics

RG-1

ESTIMATION OF BODY WEIGHT FROM DIFFERENT MORPHOMETRIC MEASUREMENTS IN KAJLI LAMBS OF PAKISTAN

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ABSTRACT

The present study was conducted at Livestock Experiment Station Khizrabad (Sargodha). Data were collected on 214 lambs of different age groups. Out of this 109 and 105 were females and males respectively. The animals were divided in to three age groups i.e. 0-3, 4-6 and 7-9 months, respectively. Three body measurements (withers height, body length and heart girth) were taken to calculate the weight of the each animal. Results depicted that body measurements varied with increasing the age of animals. In male lambs, the highest correlation (r^2) was observed between body weight and heart girth (r^2 =0.86), (r^2 =0.91) at 0-3 and 4-6 months of age, while in females the highest correlation was observed between body weight & heart girth (r^2 =0.79) at 0-3 months and body weight & body length (r^2 =0.80) at 4-6 months, respectively. It showed that the correlation between body weight and body measurements were positive and significant (P<0.05) for Kajli lambs. The regression analysis showed that live weight and body measurements had linear relationship (P-value = 0.0001, 0.0001 and 0.0001) at 0-3 month of age. During present investigation male were found heavier (P<0.05) and longer (P<0.05) than female in first two age groups. Similarly in first age groups the height at wither were higher in male than those of females (0.19 inch). In male kajli lambs the value of coefficient of determination (R^2) for weight estimation was higher for body length and height at wither (74.2%) at 4-6 month, while in female the higher value of R^2 was observed between height at wither and heart girth (89.0%) at 4-6 month of age. It was concluded that body weight of Kajli lambs can be estimated in field using morphometric measurements taken with a tape.

***Keywords*:** lambs, body, height, wither, heart, girth, weight.

RG-2

ADAPTATION UNDER OPTIMUM, STRESS AND DIVERSE ENVIRONMENTS; A REFLECTION FROM EVOLUTION FOR PLANT AND ANIMAL BREEDERS

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ABSTRACT

The cost and benefits of adaptation to stress environment, diverse environments and optimal environmental conditions in nature has been thoroughly debated among evolutionists, ecologists and

conservationists. Understanding of the consequences of this adaptation is of utmost importance to breeders to decide under which conditions to carry out selection. However, the implication of this adaptation to the animal and plant breeding is rare, which will be discussed in the present work. The breeders are interested to attain some desired genetic gain through selection of a part of a given heterogeneous population. The selection under optimal conditions for a given livestock/crop management scenario would result in selection of genotypes with the maximum potential to that management scenarios. However, these genotypes would be mal adapted to the conditions other than the optimal ones, particular to the stress environment. In contrast, selection under stress environments would result in selection of genotypes with higher performance under stress conditions, but these may not be the most promising genotypes of the population. Another option would be to carryout selection under diverse environments in order to exploit the phenotypic plasticity available in the population in response to environmental heterogeneity. The implications of these selection conditions are discussed in a special reference to plant and animal breeding, while its consequences are discussed in relation to the role of genotype and environment in the productivity of plant varieties and animal breeds.

***Keywords*:** Adaptation, Stress, Diverse Environments, Evolution, Plant, Animal Breeders

RG-3

PREGNANCY DIAGNOSIS IN DAIRY ANIMALS THROUGH INHIBITION OF SEED GERMINATION

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ABSTRACT

Seed germination control was used as a new strategy to examine pregnancy status of cattle, buffalos, sheep and goats at Military Dairy Farms, Pakistan. Thirty animals from each specie, 15 inseminated and fifteen dry animals were selected as test animals. Twenty five ml urine was collected early in the morning from all experimental animals in sterilized labeled plastic bottles and was shifted to laboratory for further analyses. Samples were diluted with distilled water at rate of 1:4 and 1:8. Corn seed was used for this study to determine the pregnancy through PUNYAKOTI test. Seed germination rate and associated shoot length was measured and compared with controlled samples from non pregnant animals on day fifth post insemination. Pregnancy was confirmed per Rectal in cattle / buffalos, and by Ultrasonography in sheep / Goat and 40-60 days post insemination and post mating. The data were statistically analyzed through one way ANOVA. Data regarding pregnancy diagnosis in buffaloes through inhibition of seed germination and shoot length of Maize seeds differed significantly and 78.57% of pregnancy was confirmed by rectal palpation. Urine dilutions 1:4 was found better for pregnancy diagnosis through inhibition of seed germination and shoot length of maize seed as compared to 1:8 urine dilutions. Similarly, for detection of pregnancy in cow was confirmed 92.30 % by the rectal palpation after significant inhibition of seed germination and shoot length. Pregnancy in goats and sheep were 60% and 66.66 % respectively confirmed by Ultrasonography technique after 100 % result of PUNYAKOTI Test at 1:4 dilutions. It was concluded that 1:4 dilutions of urine for pregnancy diagnosis through inhibition of seed germination was better than 1:8 dilutions in all animal species but it was especially suitable for the pregnancy detection in cow, in which detection rate was 92.30%.

***Keywords*:** Pregnancy diagnosis, PUNYAKOTI Test, Seed germination, Shoot length, Urine

RG-4

SEMEN TRAITS, SEMINAL PLASMA ANTIOXIDANT ENZYMES AND TRACE MINERALS AS INFLUENCED BY DIFFERENT LEVELS OF DIETARY VITAMIN E IN BEETAL BUCKS

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ABSTRACT

This study was conducted to find the effect of different levels of vitamin E on the semen traits and seminal plasma enzymes and trace minerals of Beetal bucks. Sixteen mature bucks of similar body weight at the age of about one year were randomly divided into four groups, which were labeled as group 1, 2, 3 and 4 and were supplemented with 0, 200, 400 and 800 IU/animal/day vitamin E respectively for three months. At the end of the experiment, semen samples were collected and evaluated for semen volume, sperm concentration, sperm motility and dead sperm percentage. Seminal plasma was separated by centrifugation (700 × g) to find the concentration of superoxide dismutase (SOD), glutathione peroxidase (GPx), aspartate aminotransferase (AST), alanine aminotransferse (ALT) and trace minerals (Zn, Cu, Mn and Fe). The result revealed that compared to control, group 3 showed significantly higher ($P<0.05$) semen volume and sperm motility and decreased dead sperm percentage. Similarly, the concentration of SOD, GPx and trace minerals (Zn, Cu and Mn) increased significantly ($P<0.05$) in the same group. The level of AST decreased in group 3 without any change on the concentration of ALT. From the present study, it was concluded that vitamin E at the rate of 400 IU/buck/day is an optimum dose level which has a positive effect on the semen quality and seminal plasma antioxidant enzymes and trace minerals.

***Keywords*:** Beetal bucks, vitamin E, semen traits, seminal plasma enzymes, trace minerals

RG-5

BLOOD METABOLITES AND HORMONAL PROFILES IN DAIRY COWS DURING ESTRUS CYCLE IN JALALABAD AFGHANISTAN

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ABSTRACT

The study was aimed to investigate the productivity and fertility status of the crossbred and Watani (local) cows in Jalalabad and role of blood metabolites in reproductive cyclicity. This research comprised of two experiments. (1) a total of 100 dairy cows were selected in five zones comprising city, north, west, south and east of Jalalabad. Fifty crossbred cows (French Friesian x Watani) and 50 Watani cows were selected. In the second experiment 15 crossbred and 15 Watani cows were selected. Each animal was studied for one estrus cycle and animals were selected from 5 zones comprising City, North, West, South and East. Blood samples were collected (10 ml) for blood metabolites and hormonal profiles on day 1, 4 and 17th of the estrus cycle and analysed through UV/Vis spectrophotometer and hormonal profiles through ELISA using Humareader. Statistical software of SPSS-10 was used for data analysis. Means were compared through analysis of variance. Lactation status, fertility indicators and nutritional status were recorded for each animal

during estrus day. The experiment continued for six weeks. T test was applied for determining difference between breeds. Analysis of variance was applied for means comparison among zones. The concentrate intake in crossbred cows was 2.00 ± 0.20 ranging from 1.63 to 2.42 kg day^{-1}, while in Watani cows the values were 2.20 ± 0.21, 1.80 and 3.30 kg day^{-1}, respectively. The milk production for crossbred cows was 7.64 ± 0.14 ranging from 7.28 to 8.00 kg day^{-1}, while in Watani cows the values were 3.75 ± 0.49, 2.00 and 4.88 kg day^{-1}, respectively. Mucus discharge in crossbred cows was 2.00 ± 0.22 (1.50 to 2.50 scales) against 2.45 ± 0.19 in Watani cows. Standing for mounting in crossbred cows was higher (0.43 ± 0.86) than Watani cows (0.26 ± 0.09; scale 0 to 4), Triglycerides varied from 100.94±2.79 to 117.52±5.77 mg/dl (P=0.024) with significant effect of estrus days but no affect of region. Serum glucose in crossbred cows was 67.18±1.50 mg/dl while in Watani cows were 65.20±1.33. Protein was 7.62±0.11 in crossbred cows and 6.99±0.13 g/dl in Watani. The respective values were 110.69±3.43 and 104.03±3.40 mg/dl for triglycerides. Progesterone concentrations were 0.581±0.076 ng/ml and 0.569±0.09 ng/ml and LH was 28.41±3.31 and 24.20±2.64 ng/ml in the two breeds. All the blood metabolites and hormonal concentrations were not different among regions however triglycerides showed a constant increase during the succeeding phases while glucose manifested an opposite pattern during the estrus cycle. The level of glucose in the city animals was higher (69.21±2.37 mg/dl, (P=0.127) followed by north, west south and esast. Progesterone concentration increased on day 4th and declined on 17th day while LH showed a consistent increase during the period. This study suggests that breeding of the local Watani cows with French Frisian semen resulted in production of crossbred cows with 103.73% increase in milk yield. Watani cows manifested prominent estrous symptoms through mucus discharge while crossbred cows through standing for mounting. The crossbred cows showed higher concentrations of blood glucose, triglycerides, proteins, progesterone and LH hormones, reflecting higher metabolic activities than the local Watani cows.

***Keywords*:** Blood Metabolites, Hormonal Profiles, Dairy Cows, Estrus Cycle, Afghanistan

RG-6

EFFECT OF THERMAL STRESS ON PHYSIOLOGICAL AND REPRODUCTIVE PARAMETERS IN *BOS INDICUS*, CROSS-BRED AND *BOS TAURUS* DAIRY COWS – A PRELIMINARY STUDY

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ABSTRACT

Fertility of the dairy cattle can be severely affected when exposed to elevated ambient temperatures. This study was conducted to assess physiological and reproductive changes, in relation to heat stress in different dairy cattle breeds. A total of thirty six (Nine dairy cows from each breed of Sahiwal, Achai, Cross-bred and Pure-exotic) lactating dairy cows were selected. Sampling was conducted when the cows were in the di-estrus phase of the estrus cycle at 18°C (thermoneutral temperature), 32°C (transition period) and 42°C (thermal stress) in February, April and June respectively. Serum progesterone, cortisol and glucose levels was determined. Daily milk yield (DMY) and body condition score (BCS) were recorded. The pure-bred dairy cows showed the highest mean DMY followed by cross-bred, Sahiwal and Achai at temperature 18 °C, 32 °C and 42 °C. Breed had greater effect on DMY and BCS. Physiological parameters (rectal temperature, respiratory rate and pulse rate) were monitored. A significant increase in all the physiological parameters was observed

in all dairy cows after exposure to 32°C and 42°C as compared to 18°C. The intensity of changes of all physiological parameters was higher in pure-bred animals than in the crossbred and local dairy cows. Blood glucose level was significantly (p= 0.014) affected by breed. The two local breeds expressed little changes in glucose level as compared to crossbred and pure-bred breeds (p= 0.014). Similarly increasing temperature also has significant effect on glucose concentration with more susceptibility of pure-exotic than other breeds, probably due to non-utilization in the milk synthesis. Both breed and temperature has significant (p< 0.001) effect on cortisol level. Cortisol level increases significantly (p< 0.001) with ambient temperature. All the breeds showed almost similar level of cortisol at 18 °C, however as the ambient temperature increases from 18 C to 32 C and 42C, there is remarkable increase in cortisol level of cross and pure-bred cattle. Ambient temperature affected progesterone level while breed has no affect. As the ambient temperature increased from 18 °C to 32 °C and 42 °C, the progesterone level started to decrease in all breeds. Sahiwal and Achai had slightly lower progesterone level at 18 °C and 32 °C than cross and pure-bred dairy cows. However significant decrease was observed in progesterone level at 42 °C. Daily milk yield and progesterone level are negatively correlated with ambient temperature. Glucose and cortisol levels were positively correlated with each other and negatively with Progesterone. It can be concluded from this experiment that heat stress was prominently manifested in exotic breeds. Increasing temperature raised glucose concentrations in exotic than breeds. Cortisol increased with heat stress, more prominently in crossbred and purebred cows and decreased serum progesterone concentrations. Serum progesterone levels related negatively with ambient temperature.

***Keywords*:** Thermal stress; physiological; reproductive; *Bos indicus*; cross-bred; *Bos Taurus*; dairy cows; stress; cortisol; progesterone; metabolites; glucose

RG-7

CHANGES IN BLOOD METABOLITES DURING THE ESTROUS CYCLE IN DAIRY COWS AT DISTRICT CHARSADDA

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ABSTRACT

The improved genetic status alters metabolic priorities of the body in favor of milk yield, compromising fertility under tropical conditions. To explore this issue 10 Holstein Friesian (HF), 10 Jersey, 10 Achai and 10 F1 (HF x Sahiwal) cows were selected at Dairy Farm Harichand, Pakistan and were monitored for 5 months for blood metabolites and clinical status. Sixty five percent cows reestablished estrus while 35 % remained anestrous. 80 % of HF showed estrus followed by 70 % Jersey and F1 cows. In Achai only 40 % were cyclic. Blood glucose and daily milk yield (DMY) significantly affected post partum estrus (P<0.01) while blood protein and triglycerides did not affect it. The blood glucose levels were lower (39.93 ± 3.14 mg/dl) two months before and increased (49.63 ± 2.47 mg/dl) towards estrus commencement and then declined. Anoestrus cows were deficient in blood glucose (35.74 ± 1.57 mg/dl). The study suggests that the anestrous cows were deficient in blood glucose concentrations. Higher blood glucose and total protein supported reproductive cyclicity in Jersey while higher triglycerides in Achai lowered fertility. In crossbred cows, the rising levels during pre estrus period indicated greater adaptability to the local environment.

***Keywords*:** Dairy cows, fertility, estrus, blood metabolites, reproduction, crossbred.

RG-8

EFFECTS OF EXOGENOUS OXYTOCIN ON MILK PRODUCTION, COMPOSITION, REPRODUCTIVE HEALTH AND ITS RESIDUAL EFFECTS IN RUMINANTS – A REVIEW

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ABSTRACT

Oxytocin is a hormone released from the posterior pituitary gland. It causes the contraction of the myoepithelial cells around alveoli and small ducts of the mammary gland. The discovery of oxytocin and its role in the neuro-hormonal milk ejection process, allowed for managing the milking process with an exogenous hormone. Oxytocin increases milk yield, it increases milk production may not be caused by removal of residual milk but by increased gland output of milk. Its receptor blockage causes inhibition of milk ejection. It also improves the persistency of lactation. Intramuscular OT injection causes a long increase of OT blood levels and prolonged myoepithelial and alveolar contraction thus it increases the milk yield. Along with this exogenous oxytocin have effects on milk composition especially for fat, protein, lactose and mineral concentrations. It influences the mammary metabolism and cell maintenance in addition to its well-established physiologic role in milk ejection reflex. Effect of oxytocin is not manifested through an effect on cell remodeling. Different reproductive anomalies like follicular ovarian cyst, carpus-luteum cyst, anestrous, delayed age at puberty, abortions, difficult births (dystocia), dead fetuses, retention of placenta and repeated estrus cycles was observed effects of oxytocin administration. Oxytocin whether secreted endogenously or administered exogenously, produces the desired effects within minutes and is metabolized rapidly into inactive products. If at all oxytocin is secreted in the milk and is ingested along with milk, it is degraded by the gut enzymes and cannot reach blood circulation in biologically active form so there seems to be no harm in consuming milk from oxytocin-treated animals.

***Keywords*:** Oxytocin, milk production, milk composition, reproductive health, residual effects

RG-9

STUDIES ON LIBIDO AND SERUM TESTOSTERONE CONCENTRATION OF CHOLISTANI AI BULLS UNDER STRESS FREE AND STRESSFUL SEASONS

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ABSTRACT

The study was executed with a specific objective to assess baseline data on libido indices (reaction time, libido index and time lapsed between two ejaculates) and serum testosterone concentration of Cholistani AI bulls (n=06) being reared at SPU, Karaniwala, Bahawalpur, Pakistan. Furthermore, influence was noticed on these parameters of stress free and stressful seasons. Four seasons of 2

months duration each were defined as i) stress free autumn (October-November), ii) stressful winter (December-January), stressful dry summer (May-June) and iv) stressful wet summer (July-August). The overall mean (±SEM) values for Reaction Time, libido index and Time Lapsed between Two Ejaculates in the present study were 4.5±1.10 min, 3.48±0.03 and 4.61±0.30 min, respectively. Non-significant (P>0.05) differences were found in all the parameters during four seasons. The overall mean value for serum testosterone concentration was 5.81±0.32ng/mL with no influence of seasons on it. In a nutshell, the Cholistani AI bulls maintain their serum testosterone concentration at a constant level during stress free and stressful seasons, hence keeping their libido indices constant, too. This is indicative of the fact that this breed has an innate ability of being well adapted to the harsh, hot desert climate. This adaptability, in turn, helps them maintain their reproductive abilities at optimum levels even in stressful seasons. This preliminary study envisages for a broader study both on fresh and post thaw seminal indices adjunct with fertility trial in this neglected indigenous cattle breed of Pakistan.

***Keywords*:** Cholistan, stress, libido, reproductive indices

RG-10

STUDY ON MICRO AND MACROSCOPIC CHARACTERISTICS OF KUNDHI BUFFALO SEMEN

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ABSTRACT

Study was conducted to assess the micro and macroscopic characteristic Kundhi buffalo bull semen. Macroscopic characteristic like Volume, colour, Ph, and microscopic characteristics like sperm concentration, mass activity, progressive linear motility (PLM), normal morphological characteristics and percentage of membrane intact cells were checked. It was observed that all the ejaculates were creamy white in colour. The mean (±SEM) mass activity, volume, pH, progressive linear motility (PLM), sperm concentration, normal morphological characteristics and percentage of membrane intact cells were. +++, 2.25 ± 0.01 ml, 6.10 ± 0.007, 69 ± 0.34%, 1542 ± 9.20x10^6, 79 ± 1.37%, 55.56 ± 1.37% respectively. No significant difference (P>0.05) was observed between the bulls for the parameters recorded except normal morphological percentages and percentage of membrane intact cells where a significant difference (P<0.05) was observed between the bulls. It was concluded that the macro and microscopic characteristics were similar in all bull and there was no any significant variation between the bulls except normal morphological percentages and percentages of membrane intact cells. Semen of Kundhi buffalo bulls maintained reasonably good score of parameters to be considered for cryopreservation and A.I programme.

***Keywords*:** buffalo, bull, semen, pre freezing evaluation

RG-11

MORPHOMETRIC EVALUATION OF CORPUS LUTEUM AND OVARY DURING ESTROUS IN NILI-RAVI BUFFALO THROUGH ULTRASONOGRAPHY IN SPRING AND DRY HOT SEASONS

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ABSTRACT

This study was conducted on ten Nili-Ravi buffaloes to elucidate the influence of season on the morphometric values of corpus luteum and ovary through ultrasonography in spring (February to April) and dry hot (May to June) seasons on alternate days during the entire length of estrous cycle in the same animals. A total of 10 ml of blood sample was taken from each animal and plasma was then harvested and stored at -20 °C for progesterone concentrations through ELISA technique. The results of this study revealed that the mean morphometric values of length and width of ovary and the diameter and area of corpus luteum were higher in spring than those in dry hot seasons. A highly significant effect ($P<0.01$) was found on the length and width of ovaries and a non-significant effect on the diameter and a highly significant effect ($P<0.01$) on the area of corpus luteum was observed between the two seasons (spring versus dry hot). The mean value of plasma progesterone concentration ± SEM in ng/ml was 3.02±0.17 and 2.60±0.18 during the spring and dry hot seasons, respectively. The influence of seasons on plasma progesterone concentrations was significant ($P<0.05$). The traditional method of rectal palpation for detection of corpus luteum and ovary results in heavy economic losses. Due to silent estrous of buffaloes, most of the animals are misdiagnosed by rectal palpation. It was concluded that the size of corpus luteum and ovary along with plasma progesterone levels changed between the two seasons and these parameters could be effectively employed to detect the true anestrous animals for improvement in milk production. Adoption of transrectal ultrasonography in buffalo breeding can overcome the problem of misdiagnosis of actual size and presence of corpus luteum, especially during dry hot season.

Keywords: buffaloes, morphometry, corpus luteum and ovary, plasma progesterone, season

RG-12

CYP11B1 POLYMORPHISMS IN SAHIWAL CATTLE BREED OF PAKISTAN

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ABSTRACT

Cytochrome P450, family 11, subfamily b, polypeptide 1 (CYP11B1) gene is located at chromosome 14, consists of eight introns and nine exons. This gene provides instructions for making an enzyme called 11β-hydroxylase that catalyzes both the 11β and 18-hydroxylation of corticosteroids in bovine. In some species, the CYP11B1 gene has developed into distinct isoforms,

whereas in pig, sheep and cattle functional unity is conserved. Keeping in view the importance of this gene, a research work was planned to identify the polymorphism in Sahiwal cattle breed of Pakistan. Total 18 Single Nucleotide Polymorphisms were identified in exonic and intronic region of this gene. This is a first report toward genetic screening of CYP11B1 gene at molecular level in Pakistani cattle. The present study will provide a better selection of this candidate gene. It will further help us in developing association of SNPs in cattle population.

***Keywords*:** CYP11B1, Polymorphisms, Sahiwal Cattle, Breed. Pakistan

RG-13

IDENTIFICATION OF SINGLE NUCLEOTIDE POLYMORPHISM IN POU1F1 GENE IN PAKISTANI CATTLE

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ABSTRACT

Pit-Oct-Unc Domain, Class 1, Transcription Factor 1 *(POU1F1)* is a member of the tissue-specific POU homeobox transcription factor family that is found in all mammals. POU1F1 encodes a pituitary-specific transcription factor which is involved in pituitary development and regulating the hormone expression in animals. In present study POU1F1 gene was screened for polymorphic sites in Sahiwal cattle. Samples from Sahiwal cattle breeds were sequenced of the POU1F1 by using different sets of primers. A total 15 polymorphic sites in Sahiwal cattle were identified from these sequences. These were confirmed at population level by sequencing further samples of sahiwal breed. Out of these 15 SNPs of Sahiwal cattle, 12 were in intronic region and 3 were in exonic. The sequences of the amplified POU1F1 gene fragments were aligned with the help of BLAST for SNPs identification. This is a first report toward genetic screening of POU1F1 gene at molecular level in Sahiwal cattle of Pakistan. No work has been reported on this gene in Sahiwal cattle. In this study we identified a new set of SNP (Single Nucleotide Polymorphism) useful for association studies.

***Keywords*:** Polymorphism, POU1F1 Gene, Cattle, Pakistan

RG-14

A STUDY ON RELATIONSHIPS AMONG AGE, BODY WEIGHT, ORCHIDOMETRY AND SEMEN QUALITY IN ADULT CHOLISTANI AI BULLS

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ABSTRACT

The present study was designed to 1) assess preliminary non-invasive, readily measurable reproductive attributes of Cholistani breeding bulls (n=06) such as age, body weight (BW) and orchidometric parameters viz. scrotal circumference (SC), scrotal skin fold thickness (SSFT), average testicular length (Avg L), average testicular width (Avg W), and paired testicular volume

(PTV); 2) assess the baseline semen attributes such as volume (mL), mass motility (Score 1-5), individual motility (%), sperm count (million/mL), viability (%), morpohology (%) and acrosome integrity (%); and 3) determine relationship among dependent and independent variables mentioned in objective 1 and 2.. The overall means for age, BW, SC, SSFT, Avg L, Avg W, and PTV for these bulls were 92.83±28.15 months, 520.±42.31 kg, 36.02±2.25 cm, 1.10±0.15cm, 16.91±0.70 cm, 7.05±0.35 cm, and 874.37±137.07 cm^3, respectively. Similarly, the overall means for semen volume, mass motility, individual motility, sperm count, viability, normal morphology and acrosome integrity were 4.46±1.65mL, 1.95±0.25, 63.46±4.91%, 903.22±182.04 million/mL, 85.35±2.29%, 85.66±2.51% and 84.74±2.62%, respectively. The results of correlation analysis amongst the independent variables revealed positive correlations between BW:Avg L (r=0.920), SC:Avg W (r=0.922) and SC:PTV (r=0.957) at P<0.01; and between BW:PTV (r=0.856) and Avg W:PTV (r=0.851) at P<0.05. The inter relationship between independent and dependent variables showed maximum correlation of age with other semen attributes. The results of this study clearly demonstrate the reproductive indices of Cholistani breeding bulls are at par with those of Sahiwal bulls. Furthermore, the orchidometric measurements along with age and body weight are still reliable and readily measurable indicators of reproductive potential of breeding bulls.

***Keywords*:** Cholistan, orchidometry, paired testicular volume

RG-15

STUDIES ON HAEMATOCHEMICAL PROFILE OF CHOLISTANI AI BULLS UNDER STRESS FREE AND STRESSFUL SEASONS

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ABSTRACT

An effort was made through the present study to highlight a formerly neglected indigenous Zebu cattle breed of Pakistan- Cholistani- being reared by the nomadic herders of Cholistan desert, Pakistan. Specific objectives of the present study were to ascertain baseline data on haematochemical profile and to assess their variation under stress free and stressful seasons in adult Cholistani service bulls (n=06) being reared at semen Production Unit (SPU), Karaniwala, Bahawalpur, Pakistan (Cholistan Desert). To determine the variation, 4 periods of 2 months each were defined as a stress free season (October-November), a stressful cold season (December-January) and two stressful summer seasons *i.e.* dry summer (May-June) and wet summer (July-August). Blood collection was carried out bi-monthly during the study period and a total of 16 blood/blood serum samples were collected per animal (24 samples per season). Amongst the red blood cell values, only haemoglobin (Hb) revealed a significant (P<0.05) effect of season, being lower in stressful winter season and higher in the remaining three seasons. Amongst the white blood cell values, Total Leukocytic Count (TLC) was found to be significantly higher (P<0.05) in dry summer owing to an increase in lymphocytes/neutophil ratio, eosinophils and monocytes. Serum chemistry analyses revealed that Na^+ was significantly higher (P<0.05) and K+ was significantly lower (P<0.05) in stress free season. Cholesterol was significantly higher (P<0.05) in winter, whereas glucose was higher in dry summer. The present study revealed that the Cholistani breeding bulls had an amazing tendency to maintain most of their haematochemical parameters at a near

constant level during stress free or stressful times which is suggestive of their adaptability under harsh stressful climates without showing any signs of stress.

***Keywords*:** Cholistan; indigenous cattle; haematochemical profile; adaptability

RG-16

PHYLOGENETIC AND GENETIC DIVERSITY ANALYSIS OF SAHIWAL AND CHOLISTANI DAIRY CATTLE BREEDS OF PAKISTAN BASED ON MITOCHONDRIAL D-LOOP REGION

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ABSTRACT

Geographical history indicates that Near East and the Indus Valley are among the domestication centers for cattle. The mitochondrial displacement loop (D-loop) region in native dairy cattle breeds (*Bos indicus*) of Pakistan were studied to get more insight of genetic diversity and origin. Sequences of the mitochondrial D-loop region (910bp) were analyzed in 50 individuals, 25 each of Sahiwal and Cholistani. The sequences of mtD-loop region showed high polymorphism, as expected, with 32 SNPs in Sahiwal and 20 in Cholistani (46 transitions, 4 transversions and 2 insertions) showing clear bias towards transition. Over all 12 and 8 haplotypes were identified in the both breeds respectively. All haplotypes were rich in CT contents. The neighbor joining phylogenetic tree of these two breeds with other cattle breeds of the world (*Bos taurus* and *Bos indicus*) already reported on GenBank was constructed using MEGA5.1. The Phylogenetic pattern also supported the idea of separate domestication of Pakistani cattle in Indus valley. This report from Pakistan on mitochondrial D-loop region showed genetic diversity and genetic relatedness of Pakistani cattle with other cattle breeds in the region that contributed to understand the origin and domestication of cattle.

***Keywords*:** Sahiwal and Cholistani Cattle, Mitochondrial D-loop, Polymorphism, Genetic diversity, Phylogenetics

RG-17

LACK OF POLYMORPHISM IN PITUITARY-SPECIFIC TRANSCRIPTION FACTOR 1 (PIT-1) GENE IN AZAKHALE BUFFALO

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ABSTRACT

Pituitary specific transcription factor regulates growth hormone (GH) and prolactin (PRL) genes in the anterior pituitary. In present study, Pit-1|Hinf1 was screened in 44 Azakhale buffalo through polymerase chain reaction and restriction fragment length polymorphism (PCR-RFLP) technique. All selected animals showed lack of polymorphism. Thus, results of this study indicate that a comprehensive screening is required to identify this important milk and meat related gene in Azakhale buffalo for marker assisted breeding programmes in Pakistan.

***Key* word**: Buffalo, Pituitary-specific transcription factor 1 gene, marker assisted selection

RG-18

USE OF LATEST GENOMIC TECHNIQUES FOR EFFICIENT ANIMAL PRODUCTION IN PAKISTAN

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ABSTRACT

Large and small ruminants are major contributor of agriculture GDP in Pakistan providing milk, meat, skins, hides, bio fuel, and work force to millions of people in the country. There is dire need to use the attest molecular biology and biotechnological approaches to explore the hidden potential of our indigenous animals to get maximum benefit of their superior and unique genetic makeup. In most of the developing countries including Pakistan where the accurate animal production records are lacking the latest biotechnological tools like whole genome sequencing using high throughput technologies, genome wide association studies, genotyping by sequencing, epigenetic studies, microRNAs expression profiling, microarray technology, nutrigenetics and nutrigenomics and assisted reproductive technologies along with relevant bioinformatics tools can be used to improve the production and health of indigenous animals with comparatively high certainty in comparatively shorter period of time. In Pakistan we started applying such techniques on different livestock species and have done some work that resulted in useful and unique information that can be used efficiently to enhance the animal productivity in future.

***Keyword*:** Livestock species, molecular biology, biotechnology techniques, bioinformatics, efficient animal production

RG-19

SEARCHING FOR VARIANTS IN EXONIC REGIONS OF PEROXISOME PROLIFERATOR ACTIVATED RECEPTOR GAMMA CO-ACTIVATOR 1 ALPHA GENE IN PAKISTANI SAHIWAL CATTLE

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ABSTRACT

Genetic variants play an important role as DNA markers in many fields of animal breeding. A major objective of Genetic variants studies is to find markers that can be applied for marker assisted selection of animals. The abundance of SNPs in the genome makes them a powerful tool for genetic studies. Peroxisome proliferator activated receptor gamma co-activator 1 alpha gene, also known as PCG1A gene, is an important as it has a key function in activating a variety of transcription factors regulating energy homeostasis and nuclear hormone receptors. It is also involved in thermogenesis, oxidative metabolism, gluconeogenesis and adipogenesis. The protein encoded by this gene is a transcriptional co activator that regulates the genes involved in energy metabolism. The gene is organized into 13 exons consisting of 6261 bp and is expressed at different levels in a large number of tissues. Because of its chromosomal position in QTL region and its physiological function, the gene was discussed as a positional and functional candidate gene for QTL studies. Fifty EDTA

blood samples were obtained from Govt. Livestock farm. DNA was isolated using a standard procedure. Eleven primer pairs were developed for PCR reactions covering all exonic regions using Primer3 software. All PCR reactions were performed with DNA, primer (forward and reverse) and Taq polymerase, according to the manufacturer's protocol. Sequencing of the PCR product was done with BigDye Terminator Sequencing Kit on an ABI Prism 3130 Genetic Analyzer, according to the manufacturer's instructions, while sequences were analyzed using Chromas. Fifteen variants in exonic regions of peroxisome proliferator activated receptor gamma co-activator 1 alpha gene were identified. Change in nucleotide, Genetic code, Amino Acid, Synonymous/ non synonymous and nature of amino acid of identified variants were also studies. Our results suggest that identified variants in exonic regions of peroxisome proliferator activated receptor gamma co-activator 1 alpha gene can be used for further association studies of different productive and reproductive traits in cattle.

***Keywords*:** Variants, Exonic Regions, Peroxisome Proliferator, Activated Receptor, Gamma Co-Activator 1 Alpha Gene, Sahiwal Cattle, Pakistan

RG-20

DETECTION OF SNPS IN BOVINE SCD GENE IN PAKISTANI CATTLE

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ABSTRACT

Stearoyl CoA desaturase (SCD) gene encodes an iron containing lipogenic enzyme which played an essential role in milk production traits in bovine. The bovine SCD gene is located on chromosome 26q21 affecting yield of milk, fat and protein in cattle and considered as an excellent candidate gene for QTL analysis. Gene is 17Kb in length comprising 5 introns and 6 exons. The open reading frame consists of 1,080 nucleotides which encode 359 amino acids. The enzyme encoded by SCD is also important for the expression of milk somatic cells in bovine mammary gland. Keeping in view the importance of gene, present study was conducted for the detection of single nucleotide polymorphism (SNPs) in sahiwal cattle breed of Pakistan. The animals of given breed which are genetically unrelated with typical phenotypic characters were selected for blood sampling. Inorganic method of DNA extraction was used to extract genomic DNA. Six pair of primer were designed with Primer3 web Program to amplify all exons and their partial flanking intronic sequences based on the reference sequence of the bovine SCD gene (GenBank accession no. AY241932). PCR was carried out for primers amplification. After the amplification, amplicons were precipitated and sequenced by Sanger Chain Termination method. The sequencing results were analyzed with help of Bioedit Software. Five SNPs were identified in sahiwal cattle population. Allelic, genotypic frequency and allele distribution of identified SNPs were calculated. The exonic SNP with their corresponding change in condon and amino acid showed that identified SNP is responsible for change in amino acid from methionine to leucine.

***Kewords*:** SNPS, Bovine, SCD Gene, Pakistan, Cattle

RG-21

GENETIC AND PHENOTYPIC TRENDS FOR POSTWEANING TRAITS OF BUCHI SHEEP IN PAKISTAN

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ABSTRACT

Genetic trends were constructed for post-weaning traits in the Buchi sheep breed. Performance records of 3928 animals maintained at Livestock Experiment Station, Jugaitpir District Bahawalpur, Pakistan were used for the current study. Individual direct breeding values were derived for each trait by using the animal solutions generated from the output by single trait analysis in ASREML computer software. A complete animal model and BLUP procedure was used for this purpose. Means ± SE for post-weaning traits viz; weight adjusted at the age of 180, 270, and 365 days were 16.58 ± 0.04 kg, 22.62 ± 0.05 kg, and 33.78 ± 0.07 kg, respectively. Mean ± SE for estimated breeding values were: 0.00938 ± 0.005 kg weight adjusted at 180 days of age, 0.0115 ± 0.009 kg for weight adjusted at 270 days of age and 0.996 ± 0.009 kg for weight adjusted at 365 days of age. Wide fluctuations among means of estimated breeding values were observed. The overall genetic trends were static and remained oscillating around the x-axis with no net genetic change for any growth trait. Likewise, phenotypic trend also showed no specific trend for all the growth traits and remained fluctuating throughout the study period. Investigation here concluded that no directional selection was practiced at any level during the study period and suggested that the future parents must be selected on EBVS of the growth traits for genetic improvement in this Buchi flock.

***Keywords*:** Buchi sheep, Breeding value, Postweaning, Genetic Trends

RG-22

ENVIRONMENTAL FACTORS AFFECTING SOME LINEAR TYPE TRAITS IN NILI RAVI BUFFALOES

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ABSTRACT

The objective of the current study was to introduce linear scoring system in Nili Ravi buffaloes and to evaluate environmental factors affecting them including herd, stage of lactation, parity, season of scoring and age of the buffalo at classification. Nili Ravi buffalo herds maintained at 5 institutional herds in Punjab and some private breeders were utilized in this study. The International Committee for Animal Recording (ICAR, 2007) guidelines for conformational recording of dairy cattle were followed. Milking buffaloes (437) were scored on scale of 1-9 and a total of 1180 records were generated in 2 years. Average score for stature, chest width, body depth, angularity, rump angle and rump width, were 5.07±1.35, 5.23±2.35, 5.41±1.49, 5.76±0.98, 6.73±1.53 and 4.91±1.85,

respectively. A highly significant effect of herd was observed on all of the linear type traits. Effect of stage of lactation was found to be highly significant for chest width, rump angle and rump width. Parity was observed as a highly significant source of variation only for stature and body depth. A highly significant effect of season of scoring was observed on chest width, angularity and rump angle. Significant linear effect of age of the buffalo at scoring was seen on stature and body depth. Most of the phenotypic studies on Nili Ravi breed are limited to recording only few body measurements. In order to explore physical features of this breed, linear scoring system needs to be adopted. However, some of the linear scores developed for dairy cattle breeds do not fit for this breed and harmonization of certain trait definitions is needed for the linear score system for this breed. Initiation of conformation recording in public and private sector and use of selective and planned breeding will be helpful to bring uniformity in body features of Nili Ravi buffaloes. Differences among herds for most of the traits suggest that performance can be improved by exploiting genetic potential.

Keywords: Nili Ravi buffalo, Linear type traits, Environment, Herd, Season, Parity

RG-23

ANGIOGENESIS IN THE CORPUS LUTEUM OF NILI-RAVI BUFFALO (BUBALUS BUBALIS) DURING ESTROUS CYCLE

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ABSTRACT

The present study was conducted to evaluate the morphological and vascular changes of corpus luteum in relation to functional status of reproductive system in Nili-Ravi buffalo (*Bubalus bubalis*). Blood samples and ovaries of 150 adult Nili-Ravi buffaloes were collected from the local abattoir of Faisalabad city. Out of the total, only 24 samples from cyclic animals were selected for this study. The stages of estrous cycle were determined by gross evaluation of the ovaries for the presence of follicles and corpora lutea. After the morphometry of both ovaries, corpora lutea were enucleated and fixed in 10% phosphate buffered formalin solution. Luteal tissues were processed by routine paraffin tissue technique and stained with Hematoxylin and Eosin and Periodic acid-schiff (PAS) technique. Vascular density was determined in these sections by the semi-automated image analysis system. Plasma progesterone concentration was determined by radioimmune assay (RIA). Mean weight of corpus luteum was 1.23±0.22, 3.15±0.10, 2.25±0.32 and 1.89±0.31g during the metestrous, early diestrous, late diestrous and proestrous/estrous, respectively. Mean vascular density (mean number of vessels per 10 microscopic fields at 400x) in corpus luteum was 6.33±0.99, 18.00±0.86, 11.50±0.76 and 2.83±0.60 during the metestrous, early diestrous, late diestrous and proestrous/estrous, respectively. Strongly positive correlation ($r=0.936$, $p<0.05$) was ascertained between plasma progesterone and vascular density. In conclusion, morphological appearance of ovary, corpus luteum, vascular density of corpus luteum and plasma progesterone concentration are positively correlated and can be used to determine the stages of estrous cycle in buffaloes.

***Keywords*:** Morphometry, angiogenesis, corpus luteum, estrous cycle, buffalo

RG-24

EFFECTS OF DIFFERENT THAWING TIMES AND TEMPERATURES USED BY LOCAL VETERINARIANS, ON POST-THAW QUALITY OF BUFFALO BULL SPERMATOZOA: ESTABLISHMENT OF A NOVLE THAWING METHOD TO IMPROVE SEMEN QUALITY

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ABSTRACT

Thawing procedure is as important as freezing procedure in term of its impact on sperm survival during semen cryopreservation. Present study was designed to develop the best practical method of semen thawing which could be cheap, feasible and easily applied in field for AI technicians at farmer's doorsteps. For this purpose three bulls of similar age group were selected kept at Semen Production Unit, Qadirabad. Semen was collected with the help of artificial vagina (42°C), after initial assessment, qualifying ejaculates (>0.5 ml volume, >60% motility, >0.5 × 109 sperm ⁄ ml concentration) were cryopreserved following standard protocol of semen cryopreservation. Two experiments were designed for this study. In experiment 1, frozen semen was thawed in the following procedures: Protocol I: 4ºC - 5°C for 35 min; ice cubes thawing for 30 and 60 min, Protocol II: 35ºC for 12 sec; 37°C for 15, 20, 30 and 45 sec, Protocol III: 50ºC for 15 sec; 60°C for 8 sec and 70ºC for 7 sec, Protocol IV. Experiment II was designed to evaluate the effect of incubation period of straws on cryopreserved Nili Ravi buffalo bull semen. For this purpose, 22 straws were thawed in water bath at 37^0C and without cutting straws were incubated in water bath at 37^0C then after every 1 hour 2 straws were assessed for semen quality up till 10 hours. Both experiments were repeated three times with each bull. Results of experiment 1 suggested that sperm progressive motility, plasma membrane integrity, acrosome integrity and normality was higher ($P<0.05$) in protocol II (moderate thawing) whereas in experiment 2 there was no significant difference in quality of cryopreserved semen thawed at different hours. In conclusion, moderate thawing better resist the freezing process and incubation period didn't affect semen quality so we can recommend farmers to carry straws in thermos water, maintained at 37^0C at farmer's doorstep for artificial insemination instead of carrying liquid nitrogen container.

Keywords: thawing procedures, temperature, buffalo semen, extender, and cryopreservation.

RG-25

COMPARATIVE EFFICACY OF DIFFERENT CRYOPROTECTANTS FOR DEEP FREEZING OF BUFFALO BULL SEMEN

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ABSTRACT

The different cryoprotectants are commonly used to reduce the chances of sperm damage during freezing of semen. To investigate the comparative efficacy of three glycerol extenders A, B and C with 7% glycerol, anhydrous glycerol 5% and 7% respectively was studied on sperm morphological abnormalities during the freezing technique of buffalo bull semen at semen production unit Quadrabad. The bulls were divided into two groups on the basis of age. In group 1 animal were selected from 3 to 5 years of age and in group 2 above from 5 years of age. The motility of spermatozoa of extended semen in three extenders A, B and C were 62.71±3.61, 66.67±6.20 and 73.84±8.40 respectively for group 1. For group 2 motility percentage after extension 64.79± 5.41, 71.88±7.34, 80.0± 8.60 respectively in extenders A, B and C. Motility percentages after thawing in three extenders A, B and C were 46.88 ± 7.27, 54.69±7.85 and 61.24± 9.64 for three extenders respectively for group1. For group 2 the motility percentage after thawing in three extenders A, B and C were 48.13± 5.27, 57.19±7.85 and 64.38± 9.64 for three extenders respectively. The morphological abnormalities for group 1in extender A,B and C averaged 4.56 ±1.20, 5.17 ±1.20 and 6.56 ±1.20 while in group 2 in extenders A,B and C it averaged 4.39 ±1.20, 5.33 ±1.33 and 6.44 ±1.29,respectively. Absolute index of livability for three extenders A, B and C averaged 136.83±35.27, 149.06±36.18 and 170.61±32.16 respectively for group 1. For group 2 values livability for three extenders A, B and C were 125.61±25.27, 128.06±19.64 and 146.83±24.46 respectively. It was concluded that the extender C (containing 7 % anhydrous glycerol) showed best results in terms of motility after extension, after thawing, livability at 37c, followed by extender B(containing 5 % anhydrous glycerol) and extender A (containing 7% glycerol)

Key Words: glycerol, bull and semen

RG-26

EFFECT OF SOYABEAN BASED EXTENDERS ON SPERM PARAMETERS OF HOLSTEIN-FRIESIAN BULL DURING LIQUID STORAGE AT 4ºC

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ABSTRACT

Animal origin egg yolk extender has been associated with microbial contamination and interference with microscopic examination. Therefore, replacement of such extender with plant origin compound is inevitable without compromising the desired qualities of an ideal extender. In the current experiment, we compared the effect of soy-based extender (25% and 50%) of five adult Holstein Friesian bulls semen preserved at 4ºC for 24 hours with conventional egg yolk (control) and synthetic extender (AND). Semen quality was assessed by measuring liveability, individual motility and membrane integrity after 24 h of extended semen preserved at 4ºC. The results indicated that liveability, motility of sperm and membrane integrity decreased significantly ($P<0.05$) in soya 50% extender. The results of sperm liveability, individual motility and membrane integrity in 25% soya

extender were comparable with the control. Therefore, we concluded that 25% soya milk can be used as a substitute of egg yolk-based extender for bull semen stored at 4ºC preservation.
Keywords: Semen, Extenders, Soybean, Egg yolk

RG-27

INFLUENCE OF DIETARY ZINC ON SEMEN TRAITS AND SEMINAL PLASMA ANTIOXIDANT ENZYMES AND TRACE MINERALS OF BEETAL BUCKS

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ABSTRACT

Zinc is a potent antioxidant and plays a key role in scavenging free radicals. We hypothesized that supplementation of Zn would alleviate the oxidative damage which is linked with poor sperm quality. Sixteen bucks of similar age (16 months) and body weight (41 kg) were randomly divided into four groups viz., 1, 2, 3 and 4 supplemented with zinc sulphate at the rate of 0, 50, 100 and 200 mg/buck/day, respectively for three months. At the end of the experiment, semen samples were collected and evaluated. Seminal plasma was separated to find the concentration of superoxide dismutase (SOD), glutathione peroxidase (GPx), aspartate aminotransferase (AST), alanine aminotransferse (ALT) and trace minerals (Zn, Cu, Mn and Fe). The results revealed that semen volume and sperm motility increased significantly in supplemented groups compared to the control. SOD and GPx increased significantly in group 3 with no effect on AST and ALT. Among seminal plasma trace elements, significant increase in Zn concentration was observed in group 3 with no effect on the rest of the elements. From the present results, we concluded that zinc sulphate at the rate of 100 mg/buck/day improved semen traits and seminal plasma antioxidant capacity in Beetal bucks.
Keywords: Beetal, Zinc, Semen, Antioxidant

RG-28

HYPO OSMOTIC SWELLING TEST AS SCREENING FOR EVALUATION OF BULL SEMEN

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ABSTRACT

The hypo osmotic swelling test is a simple laboratory test which is used for the assessment of functional integrity of sperm membrane. It is based on the principle of osmotic differences. When the sperm are put in hypo osmotic solution, water moves within cell membrane and swelling of membrane will take place. If the membrane is already damaged then there will be no swelling of membrane. The percentage of swollen spermatozoa is the measure of intact membrane. The semen of bull is evaluated on the basis of conventional parameters like motility, morphology and livability. To evaluate the semen on the basis of functional integrity, Fresh semen collected from 4 bulls was subjected to the hypo osmotic swelling (HOS) test in order to determine if the results could be correlated with conventional semen evaluation parameters. A total of 20 pooled samples (each

comprising two consecutive ejaculates) from each bull were collected. Each semen sample was separated into two parts. One fraction was used for the evaluation of semen by usual method, while the other part was subjected to hypo-osmotic swelling test by using 150 mOsm/L sodium citrate and fructose solutions. The mean sperm positive to HOS test was 85.25% in Sahiwal cow bull semen, 70.12% was in Frisian semen and 60.5 % in crossbred semen. On the statistical analysis of the data there was a significant ($P<0.05$) positive correlation between progressive motility, morphologically normal spermatozoa, sperm viability and percentage of HOS test positive spermatozoa for four bulls. It was proved that HOS test could be a screening test for routine evaluation of semen which is used for artificial insemination.

Key words: Hypo-osmotic swelling, Bull and Semen.RG-29

EFFECT OF GENETIC FACTORS ON VARIOUS PERFORMANCE TRAITS OF KAJLI SHEEP

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ABSTRACT

Pedigree and performance data of Kajli sheep collected during 1994 to 2010 at Livestock Experimental Stations Khushab and Khizarabad, Punjab were analyzed to know the effect of genetic factors on various performance traits of Kajli sheep. The heritability estimates of birth weight, weaning weight, yearling weight, pre weaning weight and greasy fleece weight in Kajli sheep were 0.05 ± 0.019, 0.069 ± 0.016, 0.015± 0.020, 0.056± 0.016 and 0.170 ± 0.060, respectively. The estimated breeding values (EBVs) for Khizerabad farm were -0.205 to 0.164 kgs in males and -0.149 to 0.180 kgs in females (birth weight); -1.029 to 1.822 kgs in males and -1.205 to 1.555 kgs in females (weaning weight); . -0.152 to 0.285 in males and -0.159 to 0.224 in females (yearling weight); -0.194 to 0.212 gms in males and -0.174 to 2.00 gms in females (pre weaning daily gain); -0.247 to 0.708 kgs in males and -0.429 to 0.575 kgs in females (greasy fleece weight). The EBVs for Khushab farm were from -0.157 to 0.173 kgs in males and -0.148 to 0.145 kgs in females (birth weight); -1.478 to 0.284 kgs in males and -0.976 to 1.923 kgs in females (weaning weight); -0.198 to 0.176 kg in males and -0.166 to 0.170 kg in females (yearling weight); -0.281 to 0.195 gms in males and -0.205 to 0.148 gms in females (pre weaning daily gain); -0.380 to 0.706 kgs in males and -0.267 to 0.590 kgs in females (greasy fleece weight). The estimated breeding values for sire in Khizerabad farm for birth weight, weaning weight, yearling weight, pre weaning daily gain and greasy fleece weight were ranged from -0.169 to 0.164 kgs, -1.029 to 1.694 kgs, -0.151 to 0.285 kgs, -0.190 to 0.212 gms, and -0.146 to 0.520 kgs, respectively. These values for sire in Khushab farm; for birth weight, weaning weight, yearling weight, pre weaning daily gain and greasy fleece weight ranged from -0.157 to 0.173 kgs, -1.478 to 2.846 kgs, -0.198 to 0.176 kgs, -0.281 to 0.195 gms and -0.335 to 0.706 kgs respectively.**Key words:** Kajli sheep, heritability, breeding values, performance, traits, Punjab

RG-30

EFFECT OF BULL EXPOSURE ON POST PARTUM REPRODUCTIVE EFFICIENCY IN CHOLISTANI CATTLE

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ABSTRACT

The present study was conducted with the objective determine the effect of bull exposure on postpartum resumption of ovarian activity, first behavioral estrus and conception rate in Cholistani cattle. A total of 24 Cholistani cattle kept at Shadabad Cooperative Livestock Farms Cholistan during September (2012) to January (2013) were divided into two groups. Bull exposed (BE) cows (n = 18) were exposed to mature bull throughout the study period whereas bull not exposed (BNE) cows (n = 6) were not exposed to any bull. Both groups were kept under similar feeding and managemental conditions. The mean interval from calving to resumption of ovarian activity was 39.75 ± 3.19 days in BE and 49.75 ± 2.75 days in BNE animals. The mean interval from calving to first behavioral estrus was 46.93 ± 0.48 days in BE and 57.5 ± 1.29 days in BNE animals. There was significant difference between BE and BNE cows for interval from calving to resumption of ovarian activity and interval from calving to first behavioral estrus. During the study period, more cows from BE group (16/18 = 88.88%) showed behavioral estrus as compared to BNE group (4/6 = 66.66%). The conception rate in BE and BNE cows were 66.66% and 33.33%, respectively. The difference being significant between two groups (BE and BNE). It was concluded that, cows exposed to presence of bulls at early postpartum periods showed reduced intervals from calving to resumption of ovarian activity, first behavioral estrus and resumed cyclicity earlier.

Key Words: bull exposure, reproductive efficiency, cholistani cattle

RG-31

INFLUENCE OF DIFFERENT BREEDING SEASONS ON HISTIMORPHOMETRICAL PARAMETERS, IMMUNE FUNCTION AND HORMONAL PROFILE IN GUINEA FOWL (*Numida meleagris*)

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ABSTRACT

Seasonal changes in day length generally called photoperiod is considered to have a major role in control of variations of immune function and reproductive system of birds. The influence of photoperiod has been extensively studied in avian class however such reports are not available in Guinea fowl (*Numida meleagris*). Histomorphometrical changes in bursa and testes, immune parameters like total leukocyte count and lymphocyte count and serum testosterone level of Guinea

fowl are compared in different breeding seasons such as full breeding season (summer), low breeding season (autumn) and non-breeding season (winter). A total of 10 tissue samples of bursa and testes were collected from 10 mature male guinea fowls of 6-8 months age, having average live body weight of 1 kg, in each season. Histomorphometrical parameters were measured using vernier caliper. Tissues were stained with HE and Image J® software was used for histometry. Blood samples were taken from jugular vein for the estimation of total leukocyte, lymphocyte count and serum testosterone. Statistical analysis revealed that breeding seasons affected all morphological parameters of bursa of Fabricius including weight, length, width, thickness and circumference. These parameters were found significantly ($P<0.01$) higher during the non-breeding season which showed a gradual but significant rise in full breeding season through low breeding season. In contrast, all morphological parameters showed a reverse but significantly ($P<0.01$) different values in each season. Amongst histometrical parametrs diameter of seminiferous tubules of testes showed significantly ($P<0.01$) different values during all breeding seasons. The highest values were in full breeding season. Immune parameters exhibited a significantly ($P<0.01$) higher value during the non-breeding season with a significantly ($P<0.01$) declining trend during the low breeding and full breeding seasons. Serum testosterone levels were also found significantly ($P<0.01$) different in all breeding seasons. Increase in ecofactors (temperature and rainfall) was positively correlated with the increase in the serum testosterone. Testosterone had a negative correlation ($r= -0.865$) with immune function parameters while positive correlation with testicular activities ($r=0.892$). It has been suggested that enhanced testicular activity during the full breeding season increased the steroid hormone synthesis resulting in the immune suppression and decreased testicular functions during the non-breeding season causing elevation in immune parameters which assist the survival of tropical birds in the hard climatic conditions.

Key words: Histomorphometry, immune function, testosterone, breeding seasons, Guinea Fowl

MDT-1

DETECTION OF CHEMICAL ADULTERANTS IN MILK AT VARIOUS SALE POINTS OF DISTRICT PESHAWER

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ABSTRACT

This study was conducted in Dairy Technology Laboratory Khyber Pakhtunkhwa Agricultural University Peshawar during summer season 2012 to find out different chemical adulterants in Milk samples from different sale points located in Hayat Abad (S1), University campus (S2) Board bazar (S3),Saddar (S4), and Khyber bazar (S5) in district Peshawar, Milk samples were collected in sterilized bottles and were transported immediately to Dairy Technology laboratory.Milk adulteration was determined by Milk Adulterant test (M.A.T) kit. Result showed that no chemical adulterants were found in milk samples collected from university campus and Hayat abad. Milk samples collected from Khyber bazar showed percentage of positive samples for neutralizers (8%) and for urea (1 %). Similarly milk samples collected from Board bazar showed 2%, 1%, and 7% positive sample of chemical adulterants for urea, skim milk powder and neutralizer respectively. Milk samples collected from sadder showed positive sample for neutralizers (3%). The result showed that the milk sold at various sale points of Peshawar extensively put neutralizers and urea in milk during summer as preservatives.

***Keywords*:** Milk, Adultration, Chemical, Peshawar, Pakistan

MDT-2

COMPOSITIONAL CHANGES IN SUBCLINICALLY MASTITIC MILK OF COWS AND BUFFALOES AND THEIR SENSITIVITY TO DIFFERENT DIAGNOSTIC TESTS

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ABSTRACT

This paper reports the effect of sub-clinical mastitis on milk composition in cows and buffaloes and sensitivity and feasibility of three different diagnostic tests in local environment of Pakistan. The experimental animals were selected from private farms in Khyber Pakhtunkhwa, province of Pakistan. Milk samples from 600 dairy animals including 340 cows and 260 buffaloes were tested for sub-clinical mastitis by White Side Test (WST), White Side + Dye Test (WS+DT) and Surf Test (ST) to compute cost, time taken by each test, and its ranking for adoptability, interpretability and

sensitivity. In addition, all milk samples were processed for isolation and identification of mastitis causing bacteria. Milk fat, protein, lactose and ash were determined by Ultrasonic Milk Analyzer. Milk protein, fat and lactose contents significantly decreased due to mastitis in both species. The ash contents were not much affected in both the species. Among different tests used for diagnosis of sub clinical mastitis, ST was more effective than WST and WS+DT in term of availability, adoptability and cost, followed by WST and WS+DT. Time taken by the three tests was equal. It was also observed that added dye (WS+DT) had no better outcome effect than WST and Surf Test. Among the isolates, Staphylococcus aureus showed the highest 46.25 frequency, followed by Streptococcus agalactiea (22.1%), E.coli (11%), Staphylococcus epidermis (9.15), Streptococcus dysagalactiae (3.25%) and bacillus spp (8.25%) in cows. In case of buffaloes, Staphylococcus aureus (44.45%), Streptococcus agalactiea (14.41%), E. coli (5.35%), bacillus spp (14.18%), Staphylococcus epidermidis (8.28%) and Streptococcus dysagalactiae (3.33%) were isolated.

***Keywords*:** Sub Clinical Mastitis, Milk contents, cows and buffaloes

MDT-3

USE OF BUFFALO MILK IN MOZZARELLA CHEESE MAKING: A COMPARISON WITH COWS' MILK

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ABSTRACT

Mozzarella cheese is very popular product among other dairy products. It is consumed directly and indirectly for the manufacturing of other food products like pizza topping and salad dressing. It has great commercial value in national and international market. Buffalo milk contains 16-20% milk solids which are most suitable for cheese making. There is no need to increase to total solids using ultrafiltration technique. It also contains 40-60% more protein, fat and calcium as compared to cows' milk. The higher amount of these chemical components results in higher rennet curd quality and cheese yield. In addition to above, Pakistan has 60-70% buffalo milk of total annual milk production. It is an additional benefit for Mozzarella cheese making due to availability of raw material at cheaper rates. Buffalo Mozzarella cheese has great space in international market due to higher demands which is increasing day by day.

Buffalo Mozzarella cheese made from whole pasteurized milk (unhomogenized). The buffalo milk is rennet coagulated with the addition of thermophilic lactic bacterial cultures at the incubation temperature of 39˚C. The curd samples were cut by using specially designed Mozzarella cheese cutter into small pieces (10-12mm) after 45 minutes of rennet addition. Then samples healed for 10 minutes at same temperature. After whey drainage, curd samples were minced, stretched, cooked, cooled and vacuum packed. Mozzarella cheese made from buffalo is more delicious and attractive as compared to cows' milk. The functional properties and sensory attributes are much better in buffalo Mozzarella cheese than cows' Mozzarella. The cheese yield is also higher in buffalo Mozzarella cheese when compared to cows' milk. This gave lower product cost and greater economic value. The export of this food product can increase the foreign revenue in Pakistan.

Keywords; Buffalo, Mozzarella cheese, cows', cheese yield

MDT-4

COMPARISON OF RHEOLOGY AND MICROSTRUCTURE OF MOZZARELLA TYPE CURD MADE FROM BUFFALO AND COWS' MILK

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ABSTRACT

Mozzarella curds were made from buffalo and cows' milk at the gelation temperature of 39°C using pH 6.5. The curd formation and development process was monitered using small amplitude oscillation rheometry (SOAR) and large deformation properties of both types of milk. The dynamic moduli (G', G") values were found to be higher in the buffalo curd than in the cows' curd after 90 minutes coagulation. The loss tangent however was found to be lower in buffalo curd than that observed for the cows' curd (0.42 and 0.48 respectively). The yield stress was also measured 95 minutes after the enzyme addition, and a higher value was observed in buffalo curd when compared to cows' curd. The cryo-SEM micrographs showed that curd structure appeared to be more "dense" and less porous in buffalo curd than cows' curd. The ionic and soluble calcium contents were found to be similar in all milk samples studied. The total and casein bound calcium were higher in buffalo milk than in cows' milk. Casein micelles and fat globule size was found to be different in the both types of milk. Gel strength and fracture forces was found to be higher in the resultant buffalo curd than for curds made from cows' milk. Differences in the rheology and microstructure observed between the buffalo and the cows' curd appear to result from the differences in casein composition and overall micelle structure, rather than casein concentration alone.

***Keywords*:** mozzarella curd, rheology, microstructure, buffalo, cows

MDT-5

EXPLOITATION OF FRESH WATER RESOURCES RESULTS IN THE DECLINE OF FRESH WATER MEAT IN PAKISTAN

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ABSTRACT

The Keenjhar Lake, constitute the important source of drinking water to approximately 200.000 hundred thousands of people of Karachi city, recreation and fish, etc. polluted through three sources viz municipal wastewater, industrial effluent and agricultural runoff through drainage configuration. It is worth to note here that the lake which is the main source of water supply to Karachi and parts of Thatta is a protected site under an international convention and provincial government rules. But there is absence in coordination between different departments that has led to an increase in pollution, loss of biodiversity and deterioration of the quality of water in Keenjhar Lake. The lake had a rich flora of submerged, floating and emergent aquatic plants and it was also rich in fish in the past but pollution destroyed the lake in every respects. Three years recent studies on pollution in the lake, have shown that the wetland, a Ramsar site and wildlife sanctuary, is being critically contaminated by increasing sewage discharged from the Nooriabad industrial zone. Aquatic fresh water resources of food, which were the cheapest source of proteins and nutrients, in which fish

were one of its main components, are now a days at high risk. Thousands of fish were killed due to this pollution and meat of the fish become toxic due accumulation of non-essential and essential metal and other contaminates. It was observed that fish lose its weight and length and observed rapid death as compared to two last year's collection. It is responsibility of the state that take strong action and safe the lack from pollution to safe the fresh water meat reservoir's for local as well as national and internationals peoples for export.

Key words: Keenjhar Lake, fish, pollution, meat

MDT-6

MICROBIOLOGICAL ASSESSMENT OF YOGHURT PREPARED FROM LACTOBACILLUS ACIDOPHILUS, BIFIDOBACTERIUM BIFIDUM AND CONVENTIONAL CULTURE

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ABSTRACT

Yoghurts were manufactured with three types of starter cultures Lactobacillus acidophilus, Bifidobacterium bifidum and mixture of Lactobacillus delbrueckii ssp. bulgaricus and Streptococcus thermophilus (conventional culture). Total plate count, coliform count, L. acidophilus and B. bifidum count of yoghurts were evaluated during 21days of storage at 4oC. Results showed that highest microbial count was observed in T1 made from conventional culture and Lactobacillus acidophilus. All treatments contain <10 coliform. Total viable count of L. acidophilus and Bifidobacterium bifidum bacteria decreased after 7 days of storage due to increase in acidity but it was still within acceptable range (>106).

Keywords: Probiotic, coliform, yoghurt, Lactobacillus acidophilus, Bifidobacterium bifidum, total plate count.

MDT-7

FEEDING MANAGEMENT OF DAIRY COWS FOR IMPROVING CARDIO-PROTECTIVE QUALITIES OF MILK

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ABSTRACT

The ruminants milk contains a higher proportions of saturated fatty acid (SFA), which is a risk factor related to cardiovascular disease. The mono and polyunsaturated fatty acid (MUFA, PUFAs), decreasing the risk of heart disease, are low in milk fat. The crossbred cows have been a major source of milk for human consumption. This study was conducted to investigate the effect of protected palm fats feeding on milk fatty acids profiles of crossbred cows. A total of 15 of Crossbred and 15 of Holstein Friesian cows were selected and protected palm fats were supplemented as: PF-0, PF-25, PF-50, PF-100 and; PF-150; the number representing the quantity (g)

of fats/day. Milk sample were collected, analyzed and the study continued for 8 weeks. SFA was significantly (P<0.05) decreased from 70.80 to 67.45 g/100g while MUFA and PUFA increased with the increasing supplementation. It appears that hypercholestermic properties of the milk were reduced and cardio-protective properties were enhanced by feeding protected palm fats. It was also associated with increased milk yield and progesterone level reflecting better fertility and productivity. In early lactation 150 g/day palm protected fat may be supplemented for maximum yield, better reproductive performance and healthier milk.

***Keywords*:** Hypercholestermic; cardio-protective; milk; dairy; nutrition; cattle; diet

MDT-8

FATTY ACID COMPOSITION AND STABILITY OF OLEIN FRACTIONS OF BUFFALO BUTTER OIL

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ABSTRACT

The oxidative stability of low melting fractions (LMF) of buffalo butter oil at ambient temperature was investigated. Olein fractions from buffalo butter oil were obtained by dry fractionation technique at three different temperatures i.e. 25^{o}C (OL-25) 15^{o}C (OL-15) and 10^{o}C (OL-10). LMF were preserved in PET bottles, stored at ambient temperature for 3-months and compared with parent milk fat (PMF). Fatty acids composition of LMF were significantly (P<0.05) different from the PMF. The concentration of medium chain fatty acids decreased from 48.79% to 36.71% which was 24.76% less than PMF. Average concentration of C18:1 and C18:2 in OL-25, OL-15 and OL-10 were 7.73, 14.26 and 28.94% higher than PMF. Peroxide value and anisidine value of OL-10 after 90-days of storage was 2.22 (meq/kg) and 27.85 as compared to PMF 0.54 (meq/kg) and 14.85, respectively. The concentration of conjugated dienes in OL-10 was increased from 0.39 to 5.75 after 90-days of storage period. The induction period of all the LMF was significantly (P<0.05) less than PMF. The polymer content of OL-10 after three heating cycles at180^{o}C for 8-hrs increased by17.21% as compared to 7.4% in PMF. The results of this study suggest that LMF of buffalo butter oil possess many healthful attributes and long term storage at ambient temperature is not suitable from quality and shelf life viewpoints.

***Keywords*:** Fractionation, low melting fractions, oxidative stability, peroxide value, polymer content

MDT-9

EFFECT OF DATE PALM EXTRACT ON OXIDATIVE STABILITY OF BUTTER WITH MODIFIED FATTY ACID COMPOSITION

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ABSTRACT

Antioxidant potential of ethanolic date palm (*Phoenix dactylifera*) extract for the stabilization of butter with modified fatty acid composition was investigated. Butter was obtained from our other study related to the enhancement of unsaturated fatty acids in milk by feeding calcium salts of

soybean oil to cows. Butter was supplemented with date palm extract at three different concentrations i.e., 100, 200 and 300 ppm (T_1, T_2 and T_3) compared with a control; without date palm extract. Addition of date palm extract all three levels did not have any negative effect on the composition of butter. The total phenolic content of ethanolic date palm extract was 4.65% on dry matter basis. Free radical scavenging and nitric oxide inhibition activity was 91 and 58%, respectively. The concentration of C18:1 and C18:2 in T_3 dropped by 0.56 and 5.5% as compared to control 3.12 and 51% after 4 months of storage. The addition of 300 ppm date palm extract improved the induction period of butter by 3.58 hours. The peroxide value of supplemented butter in the accelerated oxidation chamber was significantly less than the control. Anisidine value and conjuagated dienes were significantly higher in the control. Sensory characteristics of butter supplemented with date palm extract up to 300 ppm were not different from the control ($P>0.05$). The overall acceptability score of T_3 was 7.9 out of 9 (total score). The results of this study suggest that butter with modified fatty acid composition can be stabilized with by supplementing with date palm extract up to 300 ppm with acceptable sensory characteristics.

***Keywords*:** Butter, modified fatty acid composition, date palm extract, oxidative stability, peroxide value, induction period

MDT-10

TWO NOVEL SINGLE NUCLEOTIDE POLYMORPHISMS IN PROMOTER OF *CD4* GENE ARE ASSOCIATED WITH FAT% IN CHINESE HOLSTEIN CATTLE

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ABSTRACT

Cluster of differentiation 4 (*CD4*) plays essential role in the immune response of pathogen-induced mastitis in dairy cattle and an influx of activated *CD4*+T lymphocytes in the mammary gland is a typical characteristic of mastitis. Our recent association study of single nucleotide polymorphism (SNPs) in *CD4* gene has revealed significant effect of some of the SNPs in this gene with somatic cell count (SCC). *CD4* is known for its role in immunity and inflammation condition but little is known about its effects on production traits. Therefore, the present study was designed to determine SNPs in promoter region of *CD4* and to analyze their effects on mastitis indicator (SCC, SCS and some serum cytokines) and production traits (Protein%, Fat% and Lactose%). Two novel SNPs (SNP1 T104010732C and SNP2 G104010822A) were identified in promoter region of *CD4* by pool DNA sequencing, which were then screened in 258 Chinese Holstein cattle by SNaPshot technique. Fixed model was used to analyze the effects of SNPs, parity, herd, year and season of birth on the above mentioned traits by general linear model (GLM) procedure of SAS 9.1.3. Both the SNPs were significantly associated with fat% ($P<0.05$). Cows with homozygous wild genotypes showed highest fat% in both the SNPs and were significantly different with the heterozygous genotypes. The dominant effect of SNP1 was found significant on SCC. These results suggested that beside immunity, *CD4* might have role in production traits as well. The SNPs identified in present study in

CD4 gene might be potential genetic markers for selecting cows with improved fat%. In addition, we propose further studies on these SNPs using larger population size and functional research.

Keywords**:** *CD4*, association study, single nucleotide polymorphism, production traits

MDT-11

PHYSICO-CHEMICAL AND SENSORIAL QUALITY OF BUFFALO MEAT

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ABSTRACT

This study was conducted to determine the physical, chemical and sensory properties of meat. Thirty samples of Longissimus dorsi muscle of buffalo with age group of ≤ 1.5y (group A), >1.5 to 2y (group B) and >2y (group C), respectively were taken. pH values of Longissimus dorsi muscle of buffalo among group A, B and C (5.81 ± 0.02, 5.87 ± 0.02 and 5.80 ± 0.02, respectively) were found to be non-significant. pH was found to be slightly acidic in meat samples. Water holding capacity was found to be lower due to the age and fat contents (69.42 ± 0.30%, 68.45 ± 0.49% and 65.99 ± 0.37%, respectively) with significant difference (P<0.05) among three age groups of animals. Cooking loss percentages were 64.19± 0.79%, 59.78± 0.65%and 56.59± 1.36%, respectively with significant results (P<0.05). Drip loss percentage varied b/w three groups (93.84 ± 0.98%, 96.34 ± 0.43% and 94.44 ± 0.45%, respectively) with significant results (P<0.05). Moisture contents in three different groups were 77.21± 0.18%, 75.76± 0.12%and 72.98± 0.30%, respectively, and were found to be higher in group A as compared to group C with intermediate value of group B showing significant result. In group A, B and C protein was present 15.97± 0.40%, 17.06± 0.29% and 18.59± 0.36%, respectively representing a very significant result among three groups (P<0.05). Fat percentage among three groups of buffalo meat showed that there is a significant difference among them on the basis of their age differences representing 2.59± 0.05%, 3.15± 0.08%and 3.79± 0.12%, respectively. Ash percentages were found to be within normal values showing non-significant result at the level of P>0.05 (0.92 ± 0.05%, 0.95 ± 0.06% and 0.89 ± 0.06%, respectively). In group A, B and C, sensory scores for color were 3.46 ± 0.07, 3.44 ± 0.10 and 3.54 ± 0.10, respectively. Scores for flavor were 3.64 ± 0.07, 3.58 ± 0.10 and 3.42 ± 0.11, respectively and for juiciness were 3.60 ± 0.09, 3.54 ± 0.09 and 3.58 ± 0.10, respectively. Similarly, score given by the panel of judges for tenderness were 3.56±0.08, 3.46±0.09 and 3.60±0.11, respectively and for over all palatability were 3.54 ± 0.09, 3.68 ± 0.09 and 3.58 ± 0.10, respectively revealing non-significant results (P>0.05).

Keywords: Buffalo, Longissimus dorsi muscle, Meat, Physio-Chemical Properties

MDT-12

AVAILABILITY OF E-RESOURCES FOR GOAT RESEARCH IN PAKISTAN

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ABSTRACT

The objective of the study was to investigate accessibility and use of e-resources for goat research in Pakistan. In the past decade there have been clearly significant moves from paper-based to electronic access to information and knowledge in science. It applies to provision and use of the livestock related information more specifically in electronic format. A survey was conducted to investigate the accessibility and use of e-resources in Pakistan. Questionnaires were designed and in person interviews were conducted and observations were used in collection of the data. All of the researchers were research students mainly related to animal production. A total of 30 respondents participated in the study. The study revealed that livestock research institutes in Pakistan had inadequate e-resources for their researchers. It was concluded that most livestock researchers were not aware of most of the e-resources available in the country hence they could not access and use them effectively in their research work. The researchers recommended for improvement of internet connectivity to enable efficient information searching from the internet. It was also recommended that the substantial investment made in providing the required infrastructure and training to use the e-resources, programmes and digital libraries can have a positive impact on the quality of teaching and research in the near future.

Keywords: e-Resources, Developing countries, Pakistan, Extention and training

MDT-13

PHYSICO-CHEMICAL AND SENSORY CHARACTERISTICS OF FETA CHEESE MADE FROM SHEEP MILK BLENDS

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ABSTRACT

The objective of this study was to develop Feta cheeses by using different concentrations of sheep milk with goat, cow and buffalo milk. The Feta cheeses were prepared by blends i.e. T_0 (100% sheep milk), T_1 (sheep milk 50% and goat milk 50%), T_2 (sheep milk 50% and cow milk 50%), T_3 (sheep milk 50% and buffalo milk 50%), T_4 (sheep milk 50%, goat milk 25% and cow milk 25%), T_5 (sheep milk 50%, goat milk 25% and buffalo milk 25%) and T_6 (sheep milk 50%, cow milk 25% and buffalo milk 25%). Samples were stored for 60 days of ripening. Cheese samples were analyzed for fat, protein, ash, moisture, pH, acidity and sensorial attributes (texture, taste, flavor and overall acceptability) at 15 days intervals. Treatment T_3 had a higher fat content while highest protein contents were observed in cheese from pure sheep milk. Ash and moisture content of Feta cheese shows increased and decreased trend in all treatments. The lowest pH value was observed in treatment T_1. Acidity shows increasing trend in all treatments during ripening. Treatments T_3 and T_6 received higher scores for body-texture, flavor and overall acceptability than cheeses from other milk blends.

***Keywords*:** Feta cheese, Sheep milk, Milk blends.

MDT-14

EFFECT OF MILK FAT AND TRANSETERIFIED PALM OLEIN BLENDS ON PHYSICAL AND CHEMICAL CHARACTERISTICS OF ICE CREAM

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ABSTRACT

Milk fat possesses the highest concentration of hypercholesterolemic fatty acids among all the dietary lipids. The increased incidences of mortalities from cardiovascular diseases have led to a large number of strategies for the replacement of milk fat in value added dairy and dairy products. Partial/ complete replacement of milk fat with vegetable oils and fats have a negative effect on melting characteristics and induction of large number of undesirable saturated fatty acids in ice cream. To minimize the troubles of lack of functional properties and health concerns associated with vegetable fats in the ice cream, palm olein was transeterified to increase the melting point and solid fat content, the effect on physical and chemical characteristics of the ice cream was investigated. Milk fat was replaced with transeterified palm olein at different levels i.e. T_0 (100% Milk Fat) which served as control, T_1 (75% milk fat and 25% transeterified palm olein) T_2 (50% milk fat and 50% transeterified palm olein) and T_3 (25% milk fat and 75% transeterified palm olein). Other ingredients were same as in control. Addition of transeterified palm olein up to T_2 level improved the melting resistant of the ice cream with no effect on pH, acidity, fat, protein and ash content, flavor and melting scores and total score.

***Keywords*:** transeterified palm olein, melting time, ice cream, whippingability

MDT-15

PHYSICOCHEMICAL PROPERTIES AND YIELD ASSESSMENT OF PROTEIN ISOLATE MADE FROM BUFFALO AND COWS' MILK

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ABSTRACT

The objective of this study was to investigate the physicochemical properties and yield assessment of milk protein isolate made from buffalo and cows' milk. Buffalo milk contains 40 % more casein and calcium when compared with cows' milk. Due to higher amount of these chemical components, buffalo based milk protein isolate have higher yield and better physicochemical properties than cows' based milk protein isolate. Milk protein isolate has better nutrition than traditional milk protein isolate because it consisted of 80 % micellar casein and 20 % whey as is naturally-occurring in milk. Casein forms globules within the stomach and slowly releases the amino acids which help to continuously promote satiety and positive nitrogen balance for lengthy period of time between meals. This is the superior type of isolated micellar casein because it contains very important bioactive peptides which lost during traditional extraction process. It is easily digestible because it is practically free of lactose. It is concluded that buffalo based milk protein isolate is commercially feasible due to the higher yield and better recovery. It also contains higher amount of calcium which is very important for the lactating mothers and infants.

Keywords: buffalo, cows, milk protein isolate, casein, calcium, yield, nutrition

MDT-15

FLEECE PRODUCTION AND WOOL QUALITY CHARACTERISTICS OF FOUR GENOTYPES OF SHEEP IN AZAD JAMMU & KASHMIR

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ABSTRACT

The study was carried out on wool samples randomly collected at the time of shearing from various flocks of sheep breeds kept at their respective home tracts in Azad Jammu & Kashmir. Wool samples of about 60 grams were collected from randomly selected 100 adult animals (two teeth), before shearing, reared traditionally in various flocks of each breed. The analysis of variance revealed that data for all wool characteristics was showing significant differences ($P<0.05$) between and within genotypes. Least squares means for greasy wool yield were 3.09±0.75, 2.73±0.41, 2.56±0.48 and 1.84±0.73 kg for Kali, Poonchi, Kail and Pahari genotypes, respectively. The least squares means for clean yield percent was highest in Poonchi (91.52±6.58%) and lowest in Pahari (81.29±9.15%), however, the value were 87.31±7.74 and 88.30±9.42% in Kail and Kali genotypes, respectively. The order of fineness was 25.44±3.89 micron for Pahari, 26.92±2.91 micron for Poonchi, 28.52±2.81 micron for Kail and 32.60±4.78 micron. The least squares means for staples length were 5.75±1.06, 6.24±1.76, 4.13±1.65 and 6.15 ±0.88 cm for Kail, Kali, Pahari and Poonchi genotypes, respectively. However, least squares means for wool bulk was 21.12±2.28 cm3/gm in Kail, 19.34±1.71 cm3/gm in Kali, 21.94±2.21 cm3/gm in Pahari and 20.29±1.89 cm3/gm in Poonchi sheep. It is concluded that wool obtained from AJK sheep genotypes is comparable with the national and international breeds of sheep. Moreover, improvement in wool quality and quantity, as well as mutton, may be achieved through selective breeding after establishing nucleus flocks of each native genotype in their respective home tracts.

***Keywords*:** Wool, sheep genotypes, AJK.

MDT-17

PRODUCTION AND EVALUATION OF MILK POWDER AT LABORATORY SCALE LEVEL THROUGH ROLLER–DRYING SYSTEMS

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ABSTRACT

For the present study cow milk (25Kg) was collected from the randomly selected areas of Tandojam, and after receiving of milk, it was thoroughly mixed with plunger and sample (250ml) was taken for the analysis. Thereafter 10Kg of milk was taken for the production of WMP, and rest was skimmed through cream separator for the production of SMP. Moisture content in whole milk powder (WPM) was in a range between 2.00 to 6.80% and it varied in between 3.50 to 5.00% in SMP. Moisture content (mean 4.68 ± 0.06%) was slightly higher in skim milk powder than that of whole milk powder (mean 3.68 ± 0.68%), but were statistically, (analysis of variance, ANOVA) non significant ($P>0.05$). The fat content in WMP was found to be in a range between 25.95 to 29.34%

(mean 27.15 ± 0.50%), and in SMP it varied between 1.25 to 1.66% (mean 1.44 ± 0.06%). Fat content in liquid whole milk was recorded as 30.18 ± 0.61(DMB) which significantly (P< 0.01) decreased to 27.15% (DMB) in WMP. Incase of liquid skimmed milk (1.75±0.30%, DMB), drying effect was not significant (P> 0.05), only a slight decrease in fat content (1.44± 0.06%, DMB) of SMP was found.The protein content in WMP appeared in a range between 23.96% to 29.98% and it was in between 32.64 to 38.57% in SMP. The average protein content (36.51 ± 0.96%) in skimmed milk powder was remarkably higher than that of WMP (26.85 ± 0.86%) and were statistically different (P<0.05) from one another. The concentration of protein content of cow milk was decreased, when it was dried into WMP (i.e. from 29.60 ± 1.44 to 26.85 ± 0.87; DMB), but this decrease in protein content was statistically non significant (P>0.05). A remarkable effect (P<0.05) of roller – drying on protein content was observed when skimmed cow milk was dried into SMP (*i.e* from 42.45 ± 1.46%; DMB to 36.51 ± 0.97%; DMB). Lactose content in WMP varied between 35.62 to 44.76% with an average of 39.25 ±1.44%, DMB and in SMP it was in a range between 52.39 to 57.48%, DMB (mean, 48.45 ± 1.58%; DMB. The differences in the means of different types of milk powders were statistically significant (P<0.05). The effect of roller-drying on lactose content of whole cow milk and/or skimmed cow milk was found to be significant (P<0.05).

***Keywords*:** Skim milk, Lactose, Roller drying, Whole milk

MDT-18

PRODUCTION AND EVALUATION OF MILK POWDER AT LABORATORY SCALE LEVEL THROUGH ROLLER–DRYING SYSTEMS

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ABSTRACT

For the present study cow milk (25Kg) was collected from the randomly selected areas of Tandojam, and after receiving of milk, it was thoroughly mixed with plunger and sample (250ml) was taken for the analysis. Thereafter 10Kg of milk was taken for the production of WMP, and rest was skimmed through cream separator for the production of SMP. Moisture content in whole milk powder (WPM) was in a range between 2.00 to 6.80% and it varied in between 3.50 to 5.00% in SMP. Moisture content (mean 4.68 ± 0.06%) was slightly higher in skim milk powder than that of whole milk powder (mean 3.68 ± 0.68%), but were statistically, (analysis of variance, ANOVA) non significant (P>0.05). The fat content in WMP was found to be in a range between 25.95 to 29.34% (mean 27.15 ± 0.50%), and in SMP it varied between 1.25 to 1.66% (mean 1.44 ± 0.06%). Fat content in liquid whole milk was recorded as 30.18 ± 0.61(DMB) which significantly (P< 0.01) decreased to 27.15% (DMB) in WMP. Incase of liquid skimmed milk (1.75±0.30%, DMB), drying effect was not significant (P> 0.05), only a slight decrease in fat content (1.44± 0.06%, DMB) of SMP was found.The protein content in WMP appeared in a range between 23.96% to 29.98% and it was in between 32.64 to 38.57% in SMP. The average protein content (36.51 ± 0.96%) in skimmed milk powder was remarkably higher than that of WMP (26.85 ± 0.86%) and were statistically different (P<0.05) from one another. The concentration of protein content of cow milk was decreased, when it was dried into WMP (i.e. from 29.60 ± 1.44 to 26.85 ± 0.87; DMB), but this decrease in protein content was statistically non significant (P>0.05). A remarkable effect (P<0.05) of roller – drying on protein content was observed when skimmed cow milk was dried into SMP (*i.e*

from 42.45 ± 1.46%; DMB to 36.51 ± 0.97%; DMB). Lactose content in WMP varied between 35.62 to 44.76% with an average of 39.25 ±1.44%, DMB and in SMP it was in a range between 52.39 to 57.48%, DMB (mean, 48.45 ± 1.58%; DMB. The differences in the means of different types of milk powders were statistically significant ($P<0.05$). The effect of roller-drying on lactose content of whole cow milk and/or skimmed cow milk was found to be significant ($P<0.05$).

Key Words: Skim milk, Lactose, Roller drying, Whole milk

MDT-19

VALUE ADDITION OF INDUSTRIAL CHEESE WHEY THROUGH RICOTTA CHEESE DEVELOPMENT

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ABSTRACT

Ricotta is high moisture, soft Italian cheese that has traditionally been prepared by heating cheese whey (by product of cheese manufacturing) as a blend with milk. The objectives of this study were to develop ricotta cheese as value added product from industrial cheese whey and to study its compositional and physicochemical characteristic as function of storage time. Ricotta cheese was developed from industrial cheese whey and milk blend in ratio of 9:1. Citric acid (0.014 $g.L^{-1}$ of blend) and heat treatment (90-95°C for 20-30 minutes) were applied to attain maximum coagulation of proteins. Physico-chemical and compositional characteristic of ricotta cheese were analyzed during storage of 1 month on weekly basis. The pH of ricotta cheese was decreased from 6.40 to 5.16 whereas acidity increased from 0.54% to 0.84%. Moisture contents decreased from 44.1% to 43.4%, fat content increased form 31% to 33%, total protein increased from 21.4% to 22.1%, whereas NCN decreased from 14.3% to 11.1% and NPN increased from 1.2% to 3.5%. The ash content increased from 2.7% to 2.9% and TPC increased from 650 $cfu.g^{-1}$ to 3374 $cfu.g^{-1}$ whereas lactose decreased from 3.2% to 2.5%. Conclusively, ricotta cheese was successfully developed by using cheese industry waste with interesting physico-chemical characteristics as a first attempt in Pakistan.

Key words: cheese whey, whey-milk blend, ricotta cheese, physicochemical characteristics

MDT-20

USE OF DAIRY PRODUCTS IN AGRICULTURE PRODUCTION

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ABSTRACT

Whey is an industrial dairy by-product bearing a significant amount of organic substances like protein. It is also a rich source of minerals and vitamins. The present study was designed to record the effect of Whey in the soil devoid of nutrients content. For this purpose, different doses of Whey were applied calcareous soil of Konya, Turkey. The growth parameters, micro- and macro-minerals of the plant were analysed. The mycorrhizal colonization was also determined. From the findings of the present study, it can be concluded that the addition of Whey imparts a positive effect in the wheat growth particularly in the calcareous soil. ***Keywords:*** Whey, mycorrhiza, wheat, soil

PS-1

REPLACEMENT OF SOYBEAN MEAL WITH YEAST SINGLE CELL PROTEIN IN BROILER RATION: EFFECT ON PERFORMANCE AND ECONOMICS

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ABSTRACT

Protein is an important nutrient in broiler ration affecting growth and profitability in poultry operation. Alternative protein sources are needed to be investigated for sustainable farming. Single cell protein was evaluated to replace soybean meal in broiler ration. Broiler overall performance and their comparative economics was assessed. One hundred and twenty chicks were grouped (n=4); YSCP-0, YSCP-3.5, YSCP-7.0 and YSCP-10.5 to which were added yeast single cell protein (YSCP) at the level of 0, 3.5, 7.0 and 10.5 g/Kg feed, respectively. This addition was associated concurrently with removal of same quantity of soybean meal from the respective rations. Each group had 3 replicates of 10 chicks each. The trial was continued for 35 days after a week of adaptation period. Overall body weight gain was significantly increased with an increasing replacement levels of YSCP ($P<0.05$). Maximum body weight gain (1721.7±17.04) was recorded in group YSCP-10.5. Feed intake was not affected by YSCP. Feed conversion ratio was significantly ($P<0.05$) improved by YSCP in broiler chicks. Better FCR was found for the group YSCP-10.5 (1.98±0.06) followed by YSCP-7.0 (2.03±0.04) and YSCP-3.5 (2.06±0.02). Dressing percentage and weight of giblets was not affected in all the groups. Lower mortality was recorded in YSCP treated groups as compared to control. Mean feed cost per chick was significantly higher in control group as compared to YSCP treated groups. Gross return (Rupees) per chick was higher in group YSCP-10.5 (232.4±0.64) followed by YSCP-7.0 (226.3±3.86), YSCP-3.5 (227.6±5.04) and YSCP-0 (214.4±3.48). Significantly ($P<0.05$) lowest income over feed cost was recorded for the control group, while same for all treated groups. It was concluded that replacement of soybean meal with yeast single cell protein up to 10.5g/Kg feed will improve body weight gain (8.3%), FCR (12.78%), gross return and income over feed cost (29.21%) in broiler chicks.

Keywords: Soybean meal, yeast, single cell protein, performance, economics, broiler.

PS-2

SEMEN QUALITY OF LOCAL AND EXOTIC ROOSTERS (GALLUS GALLUS DOMESTICUS) DURING EXTREMES OF SUMMERS SUPPLEMENTED WITH ASCORBIC ACID AND ELECTROLYTES (EC-COOL®)

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ABSTRACT

Poultry exhibit reduced fertility under the warm, stressful environment of tropical regions. Antioxidants may counter balance stress and improve semen quality. The objective of the present study was to determine the effect of vitamin C and electrolyte supplementation on semen quality in exotic and local roosters submitted to different semen collection frequencies. The study was conducted at Peshawar, Pakistan during July, 2011 when ambient temperatures ranged from 38 to 44oC. All roosters were reared in floor pens having free access to drinking water. The effects of vitamin C/electrolytes supplementation (0, 1, and 2 ml/L in drinking water), breed (Cobb-500, Starbro, and local), and semen collection frequency (daily, every other day, and every third day) were determined using 243 roosters in a 3 x 3 x 3 factorial design (n = 9/group). Vitamin C/electrolytes supplement consisted of 60 g ascorbic acid, 9.5 g sodium citrate, 3.9 g sodium chloride, and 1.5 g potassium chloride per liter of solution. The supplement was added to the drinking water during a pre-experimental (two weeks) and the experimental period (three weeks). Semen was collected using the cloacal rubbing method during the experimental period. Semen volume and sperm concentration (Hemocytometer), motility (Microscopic observation 40X), viability (Eosin-nigrosin stain), and morphology were evaluated. Overall means from results obtained during the experimental period were calculated and used for analysis. There were vitamin C/electrolytes supplementation effects ($P < 0.05$) on sperm concentration, motility, and viability; all these parameters were greater in roosters receiving 1 mL (4.6 x 109 sperm/mL, 53.7%, and 53.6%, respectively) or 2 mL of supplementation (4.6 x 109 sperm/mL, 54.9 %, and 55.2 %, respectively) when compared to controls receiving no supplementation (4.3 x 109 sperm/mL, 48.6 %, and 46.8 %, respectively). There were breed effects ($P < 0.05$) on semen volume and sperm concentration, motility, and viability. Semen volume was less in local roosters (0.146 mL) than in Cobb-500 and Starbro roosters (0.306 and 0.284 mL, respectively). However, sperm concentration, motility, and viability were greater in local roosters (5.98 x 109 sperm/mL, 76.8 %, and 74.4 %, respectively) than in Cobb-500 (4.11 x 109 sperm/mL, 40.1 %, and 40.7 %, respectively) and Starbro roosters (3.33 x 109 sperm/mL, 40.4 %, and 40.8 %, respectively). There were no significant supplementation or breed effects on sperm morphology and no collection frequency or interaction effects on any of the semen quality parameters evaluated. In conclusion, vitamin C/electrolyte supplementation improved semen quality in poultry under thermal stress and semen quality was better in local than in exotic poultry breeds under these circumstances.

***Keywords*;** Antioxidants, Breed, Semen quality, Stress, Thermal.

PS-3

PREVALENCE AND IDENTIFICATION OF EIMERIA SPECIES IN BROILER BIRDS OF DISTRICT MIRPUR, AZAD JAMMU & KASHMIR

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ABSTRACT

Broiler farming is an important sector of meat industry which is highly affected by parasitic diseases; especially protozoan diseases like coccidiosis caused by the members of genus Eimeria.

The present study was conducted with the objectives of determining the period prevalence (January 2011 to December 2011) of *Eimeria spp*. in broilers population of District Mirpur, Azad Jammu and Kashmir. A total of 1000 morbid birds were collected from 50 broiler farms and transported to the Department of Pathobiology, Faculty of Veterinary and Animal Sciences, Rawalakot, Azad Jammu and Kashmir. Out of 1000 screened birds, 189, 234, 345, 232 indicated pale comb, cyanotic membrane, bloody drooping, ruffled feathers and lethargic respectively. The collected birds were subjected to the post-mortem examination followed by detailed parasitological examination using mucosal scrapings, concentration flotation technique and histopathology. The overall prevalence of *Eimeria spp.* in broiler birds was 22% (220/1000) and highest prevalence observed was 11% in the month of March and April followed by 10% in the month of November and December respectively. Post mortem findings of the gastrointestinal tract revealed involvement of caecal region indicating *Eimeria tenella* infection. The results of present study provide probably the first report of broiler chicken coccidiosis in the region. Therefore, a wide-scaled, randomized surveillance is recommended to be planned in order to determine the associated risk factors which can positively influence the risk of coccidiosis in the study area.

***Keywords*:** Broiler, Coccidiosis, Prevalence, *Eimeria tenella*, Mirpur, Azad Kashmir

PS-4

EFFECT OF DIFFERENT LEVELS OF VITAMIN E ON THE PERFORMANCE TRAITS, SERUM ANTIOXIDANT ENZYMES AND TRACE MINERALS IN JAPANESE QUAIL (*COTURNIX COTURNIX JAPANICA*)

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ABSTRACT

Imbalance between reactive oxygen species and antioxidant causes poor performance in birds reared for meat. This study was conducted to investigate the performance traits, antioxidant enzymes and trace minerals in Japanese quail under the influence of feeding vitamin E supplementation. A total of 180 day old male Japanese quail (*Coturnix coturnix japanica*) were purchased from open market and were maintained at the poultry shed for a period of 42 days. After a week of adaptation, the chicks were weighed and randomly divided into four groups, which were labeled as A, B, C and D and supplemented with 0, 50, 100 and 150 IU/kg vitamin E in the diet. Each group was further divided into three replicates having 15 chicks per replicate. Body weight (BW, g) and feed consumption by replicate were determined weekly for all birds. Average daily gain (ADG, g/day), average daily feed intake (ADFI, g/day), and feed conversion ratio (FCR, g/g) were then calculated at the end of the experiment. At the end of the experiment, blood was taken by cervical dislocation from two birds per replicate randomly and serum was separated by centrifugation. The result revealed that BW, ADG, ADFI and FCR did not vary between the groups. Average serum concentration of GPx and SOD were significantly high in birds supplemented with 150 mg/kg of vitamin E in the feed. No significant difference in AST concentration was found between control and treated groups. However, ALT concentration decreased significantly in group D received 150 mg/kg of vitamin E in the feed. Among the trace minerals, Zn increased significantly without affecting Cu and Mn. The present results suggest that vitamin E at the level of 150 IU/kg of feed improved the blood antioxidant status without affecting the performance traits.

***Keywords*:** Vit. E, antioxidants, minerals, quails

PS-5

PEDIGREE BASED SELECTION FOR HIGHER THREE WEEK BODY WEIGHT IN JAPANESE QUAIL. 1. EFFECT ON GROWTH PERFORMANCE

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ABSTRACT

The experiment was conducted at Avian Research and Training (ART) Centre, University of Veterinary and Animal Sciences, Lahore, in order to study the possible changes in overall body weight of Japanese quail as a response to fully pedigreed selection for higher three week body weight. A base population of 1080 day-old quail chicks was procured from the hatchery at ART center. These chicks were equally divided into two groups (S and R) having 60 replicates each comprising 9 birds. At the age of 21 days, every single bird was weighed and in group S, only 20 males and 60 females having the highest body weight were selected to be the parents of next generation, while, in group R, 20 males and 60 females were randomly picked avoiding any selection and reared further to be the parents of next generation. At the age of 14 weeks, the eggs from these birds were set in the hatchery to get next generation (02) chicks. The same selection procedure was adopted in G2 and G3 with a little variation in number of chicks. Statistical analysis of data with the help of SAS 9.1 in RCBD factorial arrangements and the comparison of means using DMR test depicted significant improvement in three week body weight of all three subsequent generations selected for higher body weight. Significantly ($P<0.05$) higher body weight was observed for selected ones (S) than those of random-bred control (RBC) group. Mortality rate was found to be significantly ($P<0.05$) lower in birds of each generation for selected group in comparison to the random-breds'.

***Keywords*:-** Japanese quail, selection, body weight, mortality

PS-6

PEDIGREE BASED SELECTION FOR HIGHER THREE WEEK BODY WEIGHT IN JAPANESE QUAILS. 2. EFFECT ON EGG QUALITY TRAITS

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ABSTRACT

The aim of the study was to compare egg quality traits of three generations of Japanese quail being selected for higher body weight at Avian Research and Training (ART) Centre, University of Veterinary and Animal Sciences, Lahore, Pakistan. Birds were divided in two groups; selected (60 females and 20 males having highest body weight at the age of 21 days) and random-bred control (60 females and 20 males picked randomly at the age of 21 days) in each generation. At the age of 14 weeks, three eggs were collected separately from each hen and subjected to egg quality analysis. Data were collected regarding egg weight, shell thickness, Haugh unit value and yolk index. Data were analyzed using GLM (General Linear Model) procedures in RCBD factorial arrangements using SAS 9.1. Means were compared using DMR (Duncan's Multiple Range) test. Significant ($P<0.05$) differences were observed in egg weight, shell thickness, Haugh unit and yolk index. Egg weight improved significantly with the advancement of generations in selected group and remained stagnant in case of random-bred group, while, yolk index decreased significantly with the advancement in generations in both groups. Significantly lower egg shell thickness was observed in random-bred group in generation 3. Haugh unit value showed significant variation in each generation but it was not possible to find any increasing or decreasing trend.

***Keywords*:-** Selection, higher body weight, egg weight, shell thickness, yolk index and Haugh unit

PS-7

GROWTH PERFORMANCE AND ECONOMIC EFFICIENCY INFLUENCED BY DIFFERENT HOUSING ZONES IN SEXED BROILERS

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ABSTRACT

The present study was undertaken to examine the growth performance and economic efficiency of sexed broilers (360 of each sex), replicated six times, maintained in environmentally controlled broiler house and were subjected to three house zones (evaporative cooling pad, central and exhaust fans). All birds in this experiment were maintained on 4 phase feeding regimes i.e. 0-10, 11-20, 21-34, 35-42 days, with CP levels of 21, 20, 18 and 17%, respectively. Weekly data on growth performance parameters were recorded and were analyzed using Completely Randomized design. The comparison of means was made using DMR test. Results showed that male broilers gained significantly ($P<0.05$) more body weight as compared to female, while, the overall means of all the other parameters differed non-significantly in both sexes. Significantly ($P<0.05$) higher feed intake, bodyweight, feed efficiency, production number, point spread, performance index, uniformity, better FCR and low mortality were observed in the birds which were reared in pad zone. The birds of this zone also fetched more profit as compared to the other house zones.

Keywords: broiler, house zones, sex, growth performance, economics

PS-8

CHANGES IN BODY MEASUREMENTS OF SEXED BROILERS REARED IN DIFFERENT HOUSING ZONES

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ABSTRACT

A trial was conducted to evaluate the effect of three different house zones on various body measurements in sexed broiler. A total of 720 Hubbard sexed broilers (360 of each sex) were reared in three different zones (evaporative cooling pad, central and exhaust fans) of environmentally controlled broiler house during summer season. Each treatment was replicated 6 times. All birds in this experiment were maintained on 4 phase feeding regimes i.e. 0-10, 11-20, 21-34, 35-42 days, with CP levels of 21, 20, 18 and 17%, respectively. Weekly data regarding keel length, shank length, head diameter, bird length, body mass index, drum stick length, wing span, breast width and shank diameter of either sex were recorded. The data thus collected were analyzed using Completely Randomized design and comparison of means was made using DMR test. Significantly higher ($P<0.05$) bird length and body mass index was observed in those birds which were reared in evaporative cooling pad zone while non-significant ($P>0.05$) effect of different house zone was recorded on bird length, body weight, body mass index, beak length, head diameter, breast width, keel length, drumstick length, drumstick diameter, shank length, shank diameter and wing span. Sexes also showed non-significant effect on these parameters.

***Keywords*:** broiler, housing zones, body measurements, sexes

PS-9

EFFECT OF DIFFERENT INITIAL CHICK BODY WEIGHT CATEGORIES ON DRESSING PERCENTAGE, GIBLET WEIGHT, ABDOMINAL FAT, THIGH AND BREAST YIELDS IN BROILERS

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ABSTRACT

Four hundred and eighty, day-old, commercial (Hubbard) broiler chicks divided into 4 initial chick body weight categories i.e., small (31-34g), medium (35-38g), A (39-42g) and A^{+}(43-46g) were reared in an environmentally controlled broiler house under standard conditions of temperature, humidity and ventilation. The birds were fed in 4-phases containing the same metabolizable energy (2800Kcal/kg) and different crude protein levels at different phases. The experiment was conducted according to Completely Randomized Design (CRD). At the end of trial, 12 birds per treatment group were randomly picked up and slaughtered to collect the data regarding dressing percentage, carcass characteristics and relative weight of organs. The means were compared using Duncan's Multiple Range (DMR) test. The chicks from A^{+}(43-46g) body weight categories showed significantly ($P>0.05$) higher gizzard weight (empty), abdominal fat yield, and leg quarter yield as compared to the other chick categories, while, Post slaughter weight, dressing percentage, spleen weight, lungs weight and breast meat yield was not significantly ($P>0.05$) affected by different initial chick weight categories.

Keywords: initial chick weight, broiler, dressing percentage, giblet weight

PS-10

A COMPARISON OF SOME SLAUGHTER PARAMETERS AMONG FOUR CLOSE-BRED STOCKS OF JAPANESE QUAIL

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ABSTRACT

Present study was conducted to compare some slaughter parameters among four close-bred stocks (CBS) of Japanese quail i.e., Major (M), Kaleem (K), Saadat (S) and Zahid (Z) at Avian Research and Training (ART) Centre, UVAS, Lahore. A total of 108 quails having 27 birds from each CBS were slaughtered at the age of 20 weeks. Data were recorded regarding body, carcass weight (g), dressing, liver, gizzard, heart and giblet weight %, intestinal length (cm) and intestinal weight %. Statistical analysis according to Completely Randomized Design through one-way ANOVA technique for further interpretation GLM procedure were used and comparison of mean by using Duncan's Multiple Range test with the help of SAS 9.1 revealed significant differences among four CBS. Significant differences were observed in weight of body and carcass, dressing, liver weight % and intestinal length (cm). However, gizzard, giblet and intestinal weight % remained non-significant in this experiment.

***Keywords*:** Comparative study, CBS, Japanese quail, Slaughter Parameters

PS-11

EVALUATION OF SOME MORPHOLOGICAL PARAMETERS AMONG FOUR CLOSE-BRED STOCKS OF JAPANESE QUAIL

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ABSTRACT

The aim of study was to evaluate some morphological parameters among four close-bred stocks (CBS) of Japanese quail i.e., Major (M), Kaleem (K), Saadat (S) and Zahid (Z) at Avian Research and Training Centre, UVAS Lahore. For this, 108 Japanese quail having 27 birds from each CBS were subjected to body measurements. Data were recorded regarding bird's keel, shank and drumstick length (cm), wing spread (cm), breast width (cm) and shank & drumstick circumference (cm). Statistical analysis according to Completely Randomized Design through one-way ANOVA technique and comparison of mean using Duncan's Multiple Range test with the help ofSAS 9.1 revealed significant differences among four CBS. Significant differences were observed regarding length of body and shank, wing spread and drumstick circumferences whereas keel and drumstick length, breast width and shank circumference remained non-significant.

Keywords:- Comparative study, CBS, Japanese quail, Body measurements

PS-12

HEALTH MANAGEMENT OF POULTRY FLOCKS

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ABSTRACT

Poultry is main source of animal protein in the form of eggs and meat to the general masses in Pakistan. Bad health in poultry flocks results in increased mortality, morbidity, economic losses and decreased production. Poultry birds are commonly encountered with bacterial, viral, fungal and parasitic diseases and other nutritional deficiencies. Among the viral diseases, Newcastle disease (ND), Infectious Bursal Disease (IBD), Hydro-pericardium Syndrome (HPS), Avian Influenza (AI) and Infectious Bronchitis (IB) are cause of high mortality and morbidity in poultry flocks. The common bacterial diseases of poultry flocks include Fowl cholera, Salmonellosis, Fowl typhoid and Infectious coryza. The fungal diseases of poultry like Aspergillosis are due to eating of contaminated feed. The internal parasites of poultry include round worms and tape worms. The external parasites include lice, ticks and fleas. The nutritional deficiencies of poultry flocks cause retarded growth along with decrease egg production in poultry birds. The lack of modern farm management practices are major reasons for bad health of poultry in developing countries. For maximum production from poultry birds the birds should be raised under hygienic conditions. Through adopting efficient health management practices the diseases can be prevented in poultry flocks and the mortality and morbidity can be decreased in poultry birds and maximum production of eggs and poultry meat can be obtained from poultry flocks.

***Keywords*:** Poultry, diseases, management, prevention, control.

PS-13

COMPARATIVE EVALUATION OF POST-PEAK PRODUCTION PERFORMANCE PARAMETERS AND EGG GEOMETRY OF FOUR VARIETIES OF ASEELS IN THREE DIFFERENT PRODUCTION CYCLES AFTER INDUCED MOLTING

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ABSTRACT

The present study was conducted on productive performance and egg geometry of indigenous chickens to evaluate the post-peak performance three at different production cycles after induced molt with the objectives to pave the way for improvement in these varieties into sustainable income in favour of the small-scale urban, semi-urban and rural households in the study areas. A total of 96 birds from 4 varieties of Aseel (Mushki, Lakha, Mianwali and Peshawari) X 3 production cycles (3^{rd}, 4^{th} and 5^{th}) X 8 replicates (individual bird/ replicate) were evaluated during Post –peak phase after induced molting for production performance and egg geometry . The data thus collected were analyzed by ANOVA for a completely randomized design, using GLM procedure of SAS 9.1. Results of the present study revealed that significant difference ($p<0.01$), were found among the cycles (3^{rd},4^{th} and 5^{th}) for weekly body weight , egg Production , FCR/dozen and FCR/kg mass ,feed Intake and total egg mass with highest values were observed in 3^{rd} production cycle also differed

significantly between the 4th and 5th cycle except for body weight and egg weight which were found to be non-significant between 4th and 5th cycle .Non-significant difference were found in weekly body weight, egg production%, FCR, FCR/dozen eggs, FCR/egg mass and total egg mass, and significant for egg weight ($p<0.01$) and feed intake ($p<0.05$) among the varieties, highest egg weight were observed in Mushki variety and feed intake in Lakha variety, also differed significantly among Lakha, Peshawari, Mianwali for both egg weight feed intake. Egg geometry parameters (surface area, shape index and egg volume) were found non-significant for both varieties and cycles.

Keywords:- Post-peak, molting, varieties, cycles,

PS-14

BIOCHEMICAL PROFILE AND IMMUNE RESPONSE OF BROILERS, REARED ON CAGE VS FLOOR SYSTEMS FED ON VARIOUS LEVELS OF MANNONOLIGOSACCHARIDE (MOS)

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ABSTRACT

A total of 1440 day-old broiler chicks were reared on 4 different rearing systems, ie. Floor, Cage, Floor/ Cage and Cage/ Floor, after dividing the chicks randomly and equally in 4 major groups of 360 chicks. Chicks in all the rearing systems were fed at four levels of MOS (400gm, 600 gm and 800 g per 1000 kg of feed). At 42 days of age 2 birds from each replicate were randomly picked up and slaughtered by Halal Muslim method to collect the blood to observe immune response against New Castle disease and biochemical profile (glucose, cholesterol, urea, total protein and albumin). The data were analyzed using CRD in factorial arrangements and means were compared through Duncan Multiple Range test which revealed that antibody titer against Newcastle disease was significantly ($p<0.05$) higher in birds reared at floor as compared to the other rearing systems while glucose level in the blood serum was significantly higher ($p<0.05$) in birds which were kept in cages throughout their life while cholesterol, urea ,albumin and total protein was not influenced by different rearing systems. Different MOS levels did not put any impact on these parameters.

Keywords: MOS, rearing system, broiler, immune response, biochemical profile

PS-15

EFFECT OF CAGE-EXCHANGE-FLOOR REARING SYSTEM ON GROWTH PERFORMANCE AND CARCASS CHARACTERISTICS, OF SEXED BROILERS FED AT DIFFERENT LEVELS OF MOS (*MANNAN OLIGOSACCHARIDE*)

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ABSTRACT

Present study was planned to evaluate the effect of Cage-Exchange-Floor rearing system on growth performance, carcass characteristics of sexed and straight-run broilers fed at different levels of Mannan Oligosaccharide (Control, 400g/ton, 600g/ton, 800g/ton). 720 day old commercial Hubbard broiler chicks were purchased from the local market and divided into 72 replicates each having 10

chicks. 36 replicate in cages and 36 on the floor with separation of male and female. After 21 days it was reciprocal. Weekly data on feed intake, body weight, FCR and carcass characteristics (dressed weight, breast yield, thigh yield, giblet weight, keel length, shank length) were recorded after slaughtering 2 birds per replicate. The data thus collected were analyzed using CRD in factorial arrangements and means were compared through Duncan Multiple Range test. Significantly higher ($P<0.05$) body weight and improved FCR was recorded in male birds fed at 600g/ton of feed than female birds having floor rearing system and overall lower mortality rate. All the slaughtering characteristics remained unaffected at different MOS levels but heart weight was slightly more in male broiler moved from floor to cage.

Keyword: Rearing system, MOS, growth performance, carcass characteristics, sex

PS-16

EFFECT OF DIFFERENT FEED RESTRICTION REGIMES ON GROWTH PERFORMANCE AND ECONOMICAPPRAISAL OF 4 CLOSED BRED STOCKS OF JAPANESE QUAILS REARED DURING SUMMER

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ABSTRACT

The present study was conducted to examine the growth performance and economic efficiency involving 3200, 10-days old Japanese quail chicks (*Coturnixcoturnix Japonica*). Comparative performance of four close bred stocks (Major- Imported, Kaleem- Local-1, Sadaat- Local -2 and Zahid- Local-3) allocated to four different feed restriction regimes were studied. The chicks were fed *ad-libitum* for the first 10 days and then subjected to a 28 days experimental trial. Each treatment was replicated five times. The birds in 1st group were fed *ad-libitum* throughout the experimental period, while, those in group 2nd were provided 1 hour feeding and 3-hours off. Those in groups 3rd and 4th were allotted 2-hours feeding and 2- hours off and 3-hours feeding and 1- hour off, respectively. All the experimental birds were provided the same quail starter feed containing 20.30 percent crude protein with 1.3 percent lysine level throughout the experimental period. At 2nd week of experiment sexing was practiced with in the treatment, male and female birds were sexed separately by individually observing their breast color. Weekly data on growth performance parameters were recorded and analyzed using ANOVA technique under Completely Randomized Design in factorial arrangement. The comparison of means was made using DMR test. Significantly more feed intake and folds of increase in body weight were observed in female broiler quails than those of males. Maximum feed intake was observed in *ad-libitum* group followed by 4th (3hrs-feed-1hr-off), 3rd (2hrs-feed-2hrs-off) and 2nd (1hrs-feed-3hr-off) group. Body weight gain expressed none-significant difference among treatments. Best FCR leading to maximum profit margin was observed in 2ndgroup with 1hr-feed-3hrs-off. However, close bred stocks did not show any significant difference on growth parameters.

Keywords: Feed restriction, Growth performance, Economic, CBS, Japanese quails

PS-17

EFFECT OF ZINC SUPPLEMENTATION ON BODY AND ORGAN WEIGHTS, CERTAIN SERUM BIOCHEMICAL AND ENDOCRINOLOGICAL MARKERS OF SPENT LAYERS

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ABSTRACT

Zinc is the most important micronutrient and enhances overall body performance of the laying hens. Three hundred commercial white leg horn birds of 67 week age were procured from market and the laying hens were supplemented with ZnO (3g/kg) for consecutive three weeks after acclimatization. Body and organs weight of all the spent layers was recorded at the time of each sampling. Serum cholesterol, HDL-cholesterol, LDL-cholesterol, triglycerides, alanine transaminase (ALT), aspartate transaminase (AST), triiodothyronine (T_3), thyroxine (T_4) and cortisol were studied in the spent layers before and after zinc supplementation. The body and organs weight did decrease significantly in the spent layer supplemented with dietary zinc oxide as compared to the birds before zinc supplementation. Serum total cholesterol, HDL-cholesterol, LDL-cholesterol and triglycerides concentration did decrease significantly in the birds after supplementation of ZnO in the diet. The enzymatic activity of ALT and AST significantly increased after zinc supplementation as compared to the birds before supplementation. In the spent layers supplemented with dietary ZnO, triiodothyronine (T_3) concentration was decreased significantly while thyroxine (T_4) and cortisol concentration increased significantly as compared to the spent layers before supplementation. In conclusion, no consistant effects of Zn supplementation were found on body and organ weights, certain serum biochemical and endocrinological markers of spent layers.

***Keywords*:** Spent layers; ZnO, T_3, T_4, ALT, AST

PS-18

PRE-PEAK AND PEAK PRODUCTION PERFORMANCE AND EGG QUALITY OF FOUR DIFFERENT VARIETIES OF ASEEL AT THREE DIFFERENT AGES AFTER INDUCED MOLTING

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ABSTRACT

The present study was conducted to evaluate production performance in two different production phases i.e., pre-peak and peak phase after induced molting of four different varieties of native Aseel chicken at three different ages. 84 adult Aseel chickens from four varieties i.e. Lakha, Mushki, Peshawari and Mianwali and three age groups A (110 weeks), B (140 weeks) and C (175 weeks) being replicated seven time with one bird per replicate were kept for 10 weeks (4 weeks for pre-peak and 6 weeks for peak phase) to evaluate production performance and egg quality. The data thus collected from both of the phases of study were analyzed under Randomized Complete Block Design (RCBD) through SAS 9.1. Comparison among treatment means were made through

Duncan's Multiple Range (DMR) test. Results showed overall production performance better in peak production phase than that of pre-peak. Regarding varieties, Mushki variety showed better production efficiency followed by Lakha, Mianwali and Peshawari varieties. As far as age groups are concerned, 1st age group showed overall better production performance except egg weight which was significantly higher in third age group. As far as egg quality was concerned non-significant differences were observed for most of the egg quality parameters between production phases except shell thickness which was significantly better in peak production phase. Regarding varieties, mushki variety showed better shell thickness, haugh unit score and yolk index while albumen pH and yolk pH showed non-significant differences among these varieties. Furthermore, significantly higher shell thickness, haugh unit score, yolk index, and shell % in third age group while yolk and albumen pH showed non-significant differences in these age groups.

***Keywords*:** Pre-Peak, Peak Production, Egg Quality, Aseel, Ages, Molting

PS-19

EFFECT OF MANNAN OLIGOSACCHARIDE SUPPLEMENTATION ON CARCASS, CUT UP, AND GIBLETS YIELD IN SEXED BROILERS

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ABSTRACT

Mannan oligosaccharides are being used as a replacement of antibiotic growth promoters worldwide now a day. The present trial focused on effect of different levels of mannan oligosaccharide (MOS) supplementation on meat yield and sensory properties. 96 broilers were randomly picked from a flock of 240 birds divided in two sexes fed diets supplemented with 4 levels (0 %, 4 %, 6 %, and 8 %) of Bio-MOS (Alltech Inc.) replicated three times with 10 birds in each replicate. The data were collected for carcass, cut up (Breast, Thigh, Drumstick, Fillet, wings, and ribs and back), and giblets yield (neck, liver, gizzard, heart). The data were analyzed with analysis of variance (ANOVA) in factorial arrangement using SAS 9.3. The means were compared using Duncan's Multiple Range test. Results showed significant decrease in abdominal fat (%) and dressing (%) with increase in MOS levels. However, non-significant differences were observed for dressing (%) among different MOS levels. Females showed better dressing (%) and lower abdominal fat (%) than that of males. However, other parameters were neither affected by MOS nor by sex. Furthermore, dressing (%) was observed to be decreased with MOS supplementation only in males while abdominal fat (%) significantly decreased in both males and females. While, at different MOS levels neck, thigh, ribs and back, and abdominal fat (%) showed significant differences. Thus it can be concluded from the present study that MOS can be used in broiler diets to obtain lean meat with slight compromise in dressing (%).

***Keywords*:** Cut-up, mannan oligosaccharide, sensory evaluation, and sex

PS-20

CARCASS, CUT-UP AND GIBLETS YIELD IN SEXED BROILERS MAINTAINED UNDER FLOOR AND CAGE AND THEIR MUTUAL TRANSFER SYSTEM

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ABSTRACT

The aim of the present study was to compare different broiler rearing systems for carcass cut-up yield in sexed broilers. In the present study, 96 sexed broilers grown on 4 rearing systems (Floor, Cage, floor-cage and cage-floor) were used to study carcass, cut up, and giblets yield (%). The birds were arranged according to Completely Randomized Design and the data were analyzed using ANOVA technique in factorial arrangement. The means were compared using Duncan's Multiple Range (DMR) test. Results showed significantly higher neck (%), drumstick (%), tender loin fillets (%), and wings (%) in birds kept on floor. Whereas, ribs and back (%) was found to be better in birds kept entirely in cages and in those shifted to cages after 21 days. The dressing (%) was found to be better only in floor reared females than males. However, giblets (%) and breast meat (%) were neither affected by rearing system nor by sexes. Hence the present study concludes that floor rearing system have better cut up yield for most of the organs.

***Keywords*:** Rearing system, Sex, Yield, Mutual transfer

PS-21

PRODUCTION PERFORMANCE AND EGG QUALITY OF LAYING HENS FED DIFFERENT DIETARY LEVELS OF GROWTH PROMOTER UNDER TROPICAL CONDITIONS

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ABSTRACT

Enzymes are used mainly to achieve consistency in performance and to alleviate the negative effects of non-starch polysaccharides cell wall by lowering gut viscosity and improving nutrient digestibility resulting in improved performance and egg quality. The present research was conducted to study the response of laying hens to enzymatic growth promoters on egg production, feed consumption, feed conversion ratio, egg weight and egg quality. 20 weeks old, hundred laying birds (Hy-line brown) were divided into four groups of 25 birds each. The birds were assigned to the basal control diet or the basal diet supplemented with 250, 500 and or 750 mg/kg of Amecozyme 2X. The results indicated those birds between 24-28 weeks and 28- 32 weeks old showed improvements in egg production % and egg mass with increasing Acozyme 2x supplementation. However with the birds between 24 to 28 weeks old the lowest feed conversion ratio (1.77) was recorded with diet containing 750 mg/kg enzyme. The egg shell % was increased with increasing Amecozyme supplementation to diets. The diets given to the birds had no significant effects on egg index, yolk index, shell strength, shell thickness and Haugh Unit of the experimental birds. It is concluded that addition of Acozyme to layer diets as feed additives on a week 24 to 28 had improved egg production, feed conversion, egg mass and egg quality. Future research is needed to determine the optimal dietary inclusion level and the exact mode of action of the examined feed additive.

***Keywords*:** Production Performance, Egg Quality, Hens, Feeding, Growth Promoters

PS-22

ISOLATION AND IDENTIFICATION OF BACTERIAL ISOLATES FROM POULTRY LITTER

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ABSTRACT

Bacteriological study was conducted on poultry litter samples collected from different broiler and layer farms surrounding the areas of Rawalakot, Azad Kashmir. A total of 66 samples, 33 of rice husk, 21 of wooden bran and 12 of sand samples were randomly collected for study of the 66 samples, 36 (54.54%) were found positive for bacterial contaminations, where as 30 (45.46%) revealed no bacterial contamination. The bacterial species identified were; *Escherichia coli, Listeria monocytogenes, Pseudomonas aeroginosa, Salmonella arizonae* and *Staphylococcus aureus.* Of the 33 samples of rice husk 30 (30.30%) were detected as contaminated with bacterial species, where as 10 (15.15%) and 6 (9.09%) of wooden bran and sand samples, respectively revealed bacterial growth. The bacterial contamination dominated in rice husk of 20 (30.30%) followed by wooden bran and sand samples, 10 (15.15%) and 6(9.09%) respectively. A relatively higher percentage; 50.0, 100, 66.67, 42.85, and 60.00% of *Escherichia coli, Listeria monocytogenes, Pseudomonas aeroginosa, Salmonella arizonae* and *Staphylococcus aureus,* respectively were determined in rice husk samples, where as lower percentage, 27.78 and 14.28% of *E. coli* and *Salmonella arizonae,* respectively were obtained in sand samples. Eight different antibiotics were used to record the susceptibility of each isolate. *Escherichia coli* and *Listeria monocytogenes* were recognized highly sensitive to chloramphenical and gentamycin, *Pseudomonas aeroginosa* and *Staphylococcus aureus* were observed highly sensitive to sulphamethoxazole and tetracycline while *Salmonella arizonae* showed moderate susceptibility to ampicillin and neomycin drugs. Over all drug sensitivity revealed resistance or moderate susceptibility of the isolates to multiple antibiotics.

***Keywords*:** Litter, Susceptibility, Antibiotics, Bacterial isolates.

PS-23

VARIATIONS OF GONADAL STRUCTURES AND FUNCTIONS OF MALE JAPANESE QUAIL (*COTURNIX JAPONICA*) IN DIFFERENT BREEDING SEASONS OF PUNJAB, PAKISTAN

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ABSTRACT

Quail farming has attained much intention in our country to meet the increasing demand of meat and egg production. The reproductive status of birds is of prime importance for better production which is interrelated to hormonal profile and modulated by the seasonal variations. This study was conducted on the gonadal structures of 60 adult male Japanese quails (*Coturnix japonica)* over a year. The blood from each bird was subjected to extract serum and used for serum testosterone measurement by RIA technique. The macroscopic and microscopic dimensions of right and left gonads (testes) were measured. The results revealed a clear variation of testicular weight, volume, length, width, thickness, circumference and seminiferous tubule diameter and the thickness and composition of the germinal epithelium over the year. The testicular weight, volume, length, width, thickness, circumference and seminiferous tubule diameter were significantly ($P<0.01$) highest during peak breeding season (June –July). In contrast all gross parameters and seminiferous tubule diameter were significantly ($P<0.01$) decreased during low breeding (Sept.-Oct.) and non breeding season (Jan.-Feb). There was no significant ($P>0.05$) difference of all gross anatomical parameters observed between right and left testis of all season. There is a significantly high ($P<0.01$) concentration of serum testosterone recorded during peak breeding, decrease during low breeding and very low during non breeding season**.** In addition, testosterone has positive correlation with all morphological and histomorphometric parameters of gonads. There was a clear influence of different seasons on serum testosterone concentrations as the environmental parameters, such as temperature and rainfall were positively correlated with the in serum testosterone concentrations, but there was a negative correlation between the relative humidity and serum testosterone concentrations. It can be concluded from these findings that seasonal changes influenced the gonads (testis) along with serum testosterone level. Moreover, as a tropical avian species, maximum sexual activity of this bird under favorable environmental conditions coincided with the high gonadal steroid level, and vice versa.

***Keywords*:** Japanese quail, Serum testosterone, Testes, Seminiferous tubule

PS-24

EFFECT OF LOCALLY ISOLATED LACTOBACILLI PROBIOTIC BACTERIA ON BROILER PERFORMANCE

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ABSTRACT

The present study was conducted to determine the effect of three locally isolated *Lactobacilli* species on the performance of broiler chicken. A total of 240 broiler chicks (day-old) were divided into 8 groups of 30 chicks each with 5 replicates. Six groups were administered isolated *Lactobacilli* in three dose rates and by two routes. In addition, one group was administered commercial probiotics and another one group was maintained as control. Evaluation was done for the determination of effect on different performance parameters under experimental conditions. The chicks of experimental group, which was given *Lactobacilli* at dose rate $1x10^8$ CFU/ kg body weight

through drinking water, showed significantly (P<0.05) higher body weight, less feed consumption and decreased feed conversion ratio. Significantly, higher counts of *Lactobacilli* and lower count of *E. coli* were recorded in the intestinal contents of this group than other treated and control group. The study showed that these locally isolated *Lactobacillus* species had better effect as probiotics on the performance of broiler chicks.

Key Words: Probiotics, Lactic acid bacteria, Live weight, FCR, Viable faecal bacteria

PS-25

COMPARATIVE EFFECT OF DIFFERENT GROWTH PROMOTERS ON PERFORMANCE, GROSS MEASUREMENTS OF MAJOR ORGANS AND INTESTINAL HISTOMORPHOMETRY IN BROILERS

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ABSTRACT

A trial was conducted on day old chicks (n=160) to evaluate the effects of different growth promoters (antibiotic, prebiotic and probiotic) on broiler performance, gross measurements of major organs and intestinal histomorphometric variables including intraepithelial lymphocytes and total goblet cells count. All the chicks were randomly divided into four groups (n=40 in each group). Group 1 served as control whereas Group 2, 3 and 4 were subjected dietary treatments for 5 weeks; Group 2-basal diet supplemented with antibiotic, 0.04% zinc bacitracin (ZnB), Group 3-basal diet supplemented with prebiotic, 0.1% mannan oligosaccharides (MOS) and Group 4-basal diet supplemented with probiotic, 0.1% lactobacillus based probiotic (LBP). Body weight (BW) and feed conversion ratio (FCR) were recorded weekly. Duodenum, jejunum, ileum and caecum histology was analyzed at day 35. BW and FCR were significantly increased (P<0.05) by the dietary supplementation of MOS and LBP compared with the control and ZnB fed broilers. No significant difference was observed (P>0.05) on absolute liver, gizzard and small intestinal weight among all groups. The weight of spleen tended to be greater (P<0.05) in the LBP supplemented group compared to all dietary treatments. The large intestine weight was greater (P<0.05) for MOS fed birds compared to control. Dietary supplementations of LBP and MOS numerically increased (P>0.05) the intestinal lengths. Furthermore, dietary treatments influenced the histomorphological measurements. MOS and LBP supplements group increased (P<0.05) the villus height and villus surface area in duodenum, jejunum, ileum and ZnB fed birds had shorter villi in both duodenum and ileum. However, jejunum villus surface area remained unaffected. Duodenum villus width was greater (P<0.05) among MOS fed birds compared to control. Ileal crypt depth was decreased (P<0.05) in LBP treatment group whereas, muscularis mucosa and muscularis externa thickness were reduced in ileum in ZnB supplemented group compared with the control. In ileum, lamina propria thickness was greater (P<0.05) in MOS treatment group compared with all other dietary treatments. Goblet cells counts were significantly higher (P<0.05) in LBP fed birds in duodenum and ileum and in MOS supplemented birds in jejunum and caecum compared to all dietary treatments. Intraepithelial lymphocytes were higher (P<0.05) in both jejunum and ileum among

birds fed LBP supplemented diet compared to all other treatment groups. Overall results demonstrated that MOS and LBP can be used as growth promoters as an alternative to antibiotic to enhance the broiler production performance.

PS-26

COMPARISON OF HISTOLOGICAL ALTERATIONS IN INTESTINAL MUCOSA AND MORPHOMETERY OF DIFFERENT ORGANS IN TWO STRAINS OF BROILER UNDER SELECTED DIETARY CONDITIONS

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ABSTRACT

In present study the effect of organic acid on intestinal mucosa and morphometery of different organs of two strains of broiler were studied. 100 birds of each strain were taken and divided into further two groups. Organic acid was added to commercially available feed as 1gm per kg ratio and offered to the one selected groups of each strains of broiler birds. To compare the effect histo-morphometric parameters were taken of 21 and 42 days old broiler. All standard operating procedures were adopted during sampling, morphometric measurements and tissue processing technique. Total 300 samples of duodenum, jejunum and ilium were taken for histological studies. All villi were selected according to standard selection criteria of villus height. The results of intestinal histology of small intestine and morphometeric studies of different organs of broiler showed that organic acids mixed diet was significantly ($P<0.05$) better than the commercial diet but there no significant difference between two strain of broiler commercially available in Pakistan.

Key words: Broiler, Organic acids, Intestinal histology, Histomorphometric studies.

PS-27

EFFICACY OF OIL BASED NEW CASTLE DISEASE (MUKTESWAR STRAIN) VACCINE AGAINST PREVAILING VIRULENT VIRUS STRAIN OF POULTRY IN PAKISTAN

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ABSTRACT

Newcastle disease at present is one of the leading viral threat to commercial as well as backyard poultry inflicting heavy mortality and economic losses in Pakistan. Efficacy of Oil-based inactivated Newcastle disease (ND) vaccine was determined against the prevailing velogenic strain. Freeze dried seed virus after reconstitution in PBS was passaged in to 9 days embryonated chicken eggs for allanto-amniotic fluid. Vaccine was prepared by mixing one part of inactivated antigen with three parts of the montanide oil. The vaccine was evaluated for its safety, stability and immunogenicity both in vitro as well as in vivo conditions. One hundred and twenty five day old broilers birds were

divided in 5 equal groups i.e., A to E. The birds of different groups were vaccinated with experimentally prepared vaccine alone and in combination with live ND virus (Mukteswar) at different age by using different dose rates and routes of administration. The anti-NDV antibody titer of all groups was determined on day 14, 21, 28, 35 and 42 post-vaccination. All the birds were challenged with velogenic field strain. The challenged survivor birds were bled on 42nd day of age to ascertain vaccinal response. 100% protection was observed in group B birds (challenged intramuscularly with experimental vaccine along with live Mukteswar strain vaccine through intra-ocular route) which suggested that simultaneous use of both live and killed oil-based vaccines at day 7th of age will be helpful in prevention against disease out breaks. In A, C and D groups 90 % protection was attained due to experimental prepared vaccine. Hence, oil-base ND vaccine containing Mukteswar strain gave remarkable protective antibody titers to resist the field virus to produce the clinical disease. Therefore, from the findings of present study it can be concluded that oil based vaccine can instigate better immunity in early age in broiler chicks.

PS-28

PREVALENCE OF *SALMONELLA ENTERITIDIS* IN HATCHERIES AND BROILER RETAIL OUTLETS IN RAWALPINDI

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ABSTRACT

Salmonellosis is food borne zoonotic bacterial disease which remains an important public health problem worldwide, particularly in the developing countries. Almost all types of food items are contaminated by salmonellosis. Poultry eggs and meat are nutritious food items as they consist of protein, phosphorous and important vitamins and minerals. The present study was conducted to investigate the prevalence of *Salmonella enteritidis* in hatcheries and broiler retail outlets in Rawalpindi. A total of 1257 samples were collected including egg shell (n=345), egg contents (n=174), egg storing trays (n=354) and broiler meat samples (n=384). A sterile cotton swab was used for swabbing of samples from egg shell surface and egg storing trays while 25 gram meat samples were collected randomly from hatcheries and broiler retail outlets of Rawalpindi. Tetrathionate broth and Hektoen enteric agar were used for culturing of *Salmonella. Salmonella enteritidis* was confirmed by multiplex PCR using specific primers. Overall, prevalence of *Salmonella enteritidis* was 37.10 % in eggshells (n=128), 21.83% in egg contents (n=38) and 34.74 % in egg storing trays (n=123). Ninety seven (25.26%) broiler meat samples were positive for *Salmonella enteritidis.* The findings of high prevalence of *Salmonella* pathogens among egg and meat demand effective means of preventing the transmission of *Salmonella* via food to consumers.

Key words: food borne, zoonotic, eggs, hatcheries, egg storing trays

PS-29

SERUM BIOCHEMISTRY, LIVER AND GUT HISTOMORPHOLOGY OF JAPANESE QUAILS (*COTURNIX COTURNIX JAPONICA*) SUPPLEMENTED WITH ORGANIC ACID BLEND (ACIFLEX®)

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ABSTRACT

Organic acid (OA) are generally consider as a safe alternative to antibiotic and therefore, most member state of European Union (EU) have approved their use. Present study investigated the outcome of OA blend on modulating liver, renal physiology and the intestinal integrity of Japanese quail (*Coturnix coturnix japonica*). Results of the present study reveal that serum Alanine aminotransaminase (ALT), Aspartate aminotransaminase (AST) showed a significantly lower value in quail supplemented OA-1, OA-2 and OA-3 as compare to the values noted in OA-0 group. Similarly, serum urea and creatinine values were significantly lower in the treated groups as compare to the untreated quails. OA supplementation in the drinking water of quail significantly improved the histo-morphology of liver and gut. The height of villi was higher in the groups given organic acid in the drinking water as compared to the quails given plain drinking water. The quails given plain drinking water showed vaculation in the hepatocytes while this change was lower in the birds given organic acid mixed water. Hepatocytes showed foamy appearance of cytoplasm with normal sinusoidal spaces. The findings of the present study suggested that addition of organic acids in the drinking water improve overall health and performance of the quails in all doses.

Keywords: Organic acid; ALT; AST; Urea; Critinine; Quail

PS-30

FEEDING VALUE OF EXTRUDED HATCHERY WASTE MEAL AND ITS IMPACT ON EGG PRODUCTION AND QUALITY IN LAYING HENS

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ABSTRACT

Hatchery wastes can potentially be used as highly nutritious, low-cost poultry feed ingredient if processed scientifically. The aim of present study was to examine the feeding value of extruded hatchery waste meal (HWM) and its influence on egg production and egg quality in laying hens. In the first study hatchery wastes were collected, oven dried (60 °C), grounded, and extruded for 30 seconds at 115-155 ^{o}C. After extrusion the nutrient profile of the hatchery waste was determined. In second study, 250 single combs White Leg horn (Babcock) layers were randomly allocated to five dietary treatments; containing 0, 2, 4, 6 and 8 % extruded HWM of the commercial laying hen ration. Each dietary treatment was replicated five times with 10 birds per replicate. Egg production was recorded and quality was determined using standard scientific protocols. Dietary treatments had no effect on egg production and egg quality except in group-D that had numerically higher egg production. These findings reflect that extruded HWM can be added in laying hen ration without compromising egg production performance and quality. However, further research is needed to assess higher inclusion of extruded HWM in laying at different stages of egg production.

Key Words: Hatchery wastes, extrusion, laying hens, egg production & quality

PS-31

COMPARATIVE EFFICACY OF THREE NEWCASTLE DISEASE VACCINE STRAIN IN LAYERS

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ABSTRACT

Present study on the evaluation of Newcastle Disease vaccines was conducted in the Poultry farm The University of Agriculture Peshawar. Total 96 layer birds in production were purchased from the local market. Commercial layers ration @ 120 g per bird provided to all birds during the whole experimental period. The study was continued for a period of 6 weeks with one week adaptation period. Before starting the experiment all the birds were screened by HI test and diseased birds were culled. The birds showing nonspecific antibody titers (≤2) in HI were selected. The birds were divided into four major groups i.e. group LS, AV, MK, and Cont i.e. vaccinated with lasota (Hilton Company) VG/GA (Avinue Marial Company) Mukhtaswar (Veterinary Research Institute Peshawar) and control respectively. All the mentioned ND vaccines were purchased from farm and were administered to the birds at dose of 0.5cc subcutaneously wing. The antibody titer was determined by hemagglutination inhibition (HI) test. 1 ml Blood samples were collected for the determination of antibody titer. Blood and eggs samples were collected on the day of vaccination and with week interval post vaccination till day 42. Significant difference was found among all vaccinated groups as compared to control. Significantly higher immune response was observed in group that was vaccinated with Mukhteswar strain vaccine against the Newcastle disease. Among all the vaccines of different strains, it was found that after primary vaccination chickens of the group vaccinated with Mukhtaswar strain vitamin E+selinium produced higher immune response than the chickens of other groups vaccinated with lasota or Avineue strains. Mukhtaswar vaccine showed high response towards transmission from body to eggs. As time elapsed the titer of all vaccine gradually decreases. Birds vaccinated with Mukhtaswar+vitminE+Selinium vaccine showed significantly increase in antibody. The results showed that pullets vaccinated with Mukhtaswar+Vitamin E+Selinium vaccine was observed to have higher egg production as compared to other vaccinated and control groups. It was concluded from the present study that Mukhtaswar vaccine either individually or with supplementation significantly increase the immune response and no effect on egg production.

PS-32

FEED ENZYMES ALTERED SORGHUM NUTRIENT DIGESTIBILITY OF SORGHUM BIOASSAY DIET

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ABSTRACT

Sorghum due to presence of various antinutritional factors possesses reduced nutritive value for broiler birds. Microbial feed enzymes were examined to enhance the digestibility of sorghum nutrients by broilers at day-42. Sixty three birds, 35-day-old, were randomly allotted to three replicated (n=3) groups. Bioassay diets (n=3) in mash form with sorghum as sole source of protein (918 g/kg) with celite as an indigestible marker were prepared; a control and to others xylanase (4000 U/g) and phytase (10000 FTU/g) were added. All birds were offered these bioassay diets ad libitum from day 35 to 42 days of age. Bird were euthanized intracardially using sodium pentobarbitone injection (5ml/bird) and contents of the lower half of the ileum were collected and

freeze dried. Approved standard scientific lab procedures were used to measure ileal nitrogen (Dumas combustion method) and gross energy (bomb calorimeter) of feed, ileal digesta and faeces. Digestibility coefficients and AME was measured. Phytase improved significantly ileal protein digestibility (0.80), IDE (14.32 MJ/Kg DM) and apparent metabolisable energy (AME) (14.90 MJ/kg DM). Xylanase also enhanced ileal digestible energy (IDE) (13.92 MJ/kg DM) and AME (14.40 MJ/kg DM) but did not significantly improved ileal protein digestibility (IPD). It was revealed from present research findings that microbial feed enzymes possesses the potentials to target certain antinutritional factors of sorghum to enhance its nutritive value for broiler birds at day-42.

Keyword: sorghum, broiler, digestibility, AME

PS-33

SUPPLEMENTATION OF ZINC AND VITAMIN C IN HEAT STRESSED BROILERS

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ABSTRACT

Heat stress is a major threat to the broiler industry in tropical regions, causing huge mortality during summer season. The study examined the efficacy of Zinc and vitamin-C in reducing heat stress of broiler chicks. One hundred and sixty, day-old broiler birds were randomly allotted to four dietary treatments (A, B, C and D) replicated 4 times (10 birds/replicate). Treatment A was control and other were either supplemented Zn (60 mg kg^{-1}, B), vitamin-C (300 mg kg^{-1}, C) and Zn + vitamin-C (D). All birds were reared on deep litter system and had ad libitum access to feed and water. Heat stress was induced during the finisher phase by increasing house temperature to 40 ^{0}C from 7:00 am to 7:00 pm. Antibody titer was determined using heamagglutination inhibition (HI) and ELISA tests. Blood samples were collected from birds in all groups and smears were prepared to count blood leukocytes. Birds in treatment-D had better ($p<0.05$) body weight gain and FCR to other dietary treatments and lower feed intake in control treatment. No significant difference was seen in the antibody titer against Newcastle disease (ND), Infectious Bursal disease (IBD), and Infectious Bronchitis (IB) of treated groups and was lowest ($p<0.05$) in treatment-A. Total leukocyte count (TLC) was significantly reduced however, neutrophil, eosinophil, lymphocyte and monocyte numbers were increased in control group. Difference in the count of these cells among treated groups was non significant. Significantly high mortality was observed in control group with apparent symptoms of dehydration. It can be obtained from these findings that strategic dietary supplementation of Zinc and vitamin-C can effectively be used to alleviate the adverse effects of heat stress in meat type chickens. Further research is however warranted to investigate the effect of these feed additives at different levels and strains of broilers.

Keywords Antibody titer. Broilers. Heat stress. Vitamin C. Zinc.

2nd INTERNATIONAL WORKSHOP ON DAIRY SCIENCE PARK
(November 18-20, 2013)
Venue: The University of Agriculture, Peshawar-25120, Pakistan
http://aup.edu.pk/dairy-science-park2013.php
ABSTRACTS
4g. Enterprneur Development, Quality Control and Ethics

EQE-1

ECONOMICS ANALYSES OF THE SHEEP ENTERPRISES IN KARAPINAR COUNTRY IN KONYA

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ABSTRACT

Sheep are very efficient domestic animals breaded for different purposes such as sources of meat, milk, leather and wool. Sheep provide very important source of meat in some countries while milk or wool in others. In last 30 years, breeding and milk production of sheep have dropped as 1% and 31%, respectively in Turkey. Beside this, sheep breeding has still great importance in Konya-Karapınar province of Middle Anatolia Region. In present study, situation and incomes of sheep farms and problems in this sector were first researched then; some recommendations to improve incomes of farms were developed. The labor potential of the farms was found as 4.08 man power unit, MPU, with yearly average of 629.64 male business days, MBD. Of this, 56.08 % has been used by sheep activities. The average amount per farm was 181.32 ha in examined farms. The average passive capital of farms was 201.024,62 TL, real capital of 96.60% and 3.40% of depts. Gross production value, GPV, was calculated as 57.840 TL and 47.61% of total has been obtained from sheep farms. Average gross income was found as 57.915,23 TL. On the average of the studied farms, net return was 5.338,70 TL and found negative in farms kept 25-150 sheep. The reason might be that sheep breeding is sub-activity in research farms. The transfer speed of capital in farm averages was 3.69 years. In studied farms, insufficient usage of labor potential resulted in increase of foreign labor usages and reduction in farm incomes. In farms especially breaded lower than 151 sheep, income has observed very low and has thought that they will not able to continue to those activity in near future. Last 10 years period, cattle breeders have been financially supported by agricultural policies of government, therefore, it is suggested that similar supports should also be performed by government for sheep producers.

Keywords: sheep breeding, sheep farms economy, sheep breeding in Konya-Karapınar.

EQE-2

RABBIT FARMING AND ITS SCOPE IN KHYBER PAKHTUNKWA, PAKISTAN

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ABSTRACT

A study was undertaken to document the status of rabbit farming system in Khyber Pakhtunkhwa (KP). The Province was divided into seven regions, from which data were captured using a structured questionnaire. The survey revealed that proper details about indigenous rabbit breeds were not found in the province. Six rabbit varieties were identified on the basis of body coat and eye color. The varieties available in different regions of KP were Black & White (36.84 %), White (20.84 %), White Bay (20. %), Black (12.28 %), Gray (5.7 %) and Bay (4.28%) out of sample the population. Average live weights for different varieties were Black & White (1.68 kg), White (1.47 kg), White Bay (1.76 kg), Black (1.70 kg), Gray (1.59 kg) and Bay (1.50 kg). Mean litter sizes found for different varieties were Black & White (5.69±0.25), White (5.32±0.33), White Bay (5.45±0.34), Black (5.37±0.44), Gray (5.20±0.61) and Bay (5.13±0.60). Mean annual kindling for different varieties were Black & White (7.48±0.14), White (7.24±0.23), White Bay (7.32±0.24), Black (7.44±0.23), Gray (6.90±0.35) and Bay (6.80±0.41). People rearing rabbits in Kacha & covered houses of Southern region (39.66±1.33), Central region (22.00±1.00) and Northern region (23.50±0.50). Kacha housing system was found in Southern region (9.66±1.76), Central region (7.00±4.00) and Northern region (10.00±2.00). Rabbit made tunnels were used in Southern region (0.67±0.66), Central region (21.00±5.00) and Northern region (16.50±2.50). Pre weaning, post weaning and adult percent survival rate were found in Southern region (94.36±0.46, 83.66±0.63 and 85.86±0.67), Central region (84.35±0.74, 57.40±0.89 and 64.95±1.00) and Northern region (84.90±0.82, 59.65±0.99 and 69.70±0.84) respectively. People rearing rabbits for meat purpose were found in Southern region (36.66 %), Central region (24 %) and Northern region (24 %). Rabbits kept for family assistance were found in Southern region (28 %), Central region (19 %) and Northern region (17 %) respectively. Pet farming was found as Southern region (8.66 %), Central region (25 %) and Northern region (27 %) respectively. Rabbits were accepted for meat purposes in southern regions (42.66 %), central region (33 %) and northern regions (33 %). Traditional (24.57 %) and religious (2.28 %) myths about rabbit meat were also found in some community of the province. Present study concluded that scope of rabbit as meat animal exists in the province and improvement in rabbit management could efficiently improve its production and utilization.

***Keywords*:** Indigenous, rabbit, farming system, Khyber Pakhtunkhwa, profit

EQE-3

SUSTAINABLITY OF SMALL HOLDING FARMER Vs EMERGING COMMERCIAL DAIRY AND POULTRY FARMING – AN ANALYSIS INTO THE RURAL MICRO ECONOMY OF PAKISTAN AND AFGHANISTAN

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ABSTRACT

A increasing trend of shifting from traditional to commercial/intenstive livestock and poultry production in the entire world and more recently in developing countries like Pakistan is generally seen as a step forward towards attaining food security for nations. Being intensive in its nature, commercial animal food production through environmentally controlled housing, feeding, management and health care of exotic breeds yields more efficient results with more financial returns. However, this phenomenon on one side makes it possible to provide ample and cost effective animal protein and strengthens to cause of animal food security but on the other hand, increasingly resulting into monopolization of this sector into few hands. Most serious concerns in the regard are that the small holders in poultry industry have completely been wiped out of the market whereas the similar trend is being promoted by the Government policies and opportunist investors who have no strategic association for any profession except for huge profits. Emerging dairy sector is now prospering on the import of exotic Holstein Friesian and Jersey cows and housing them in controlled housing for optimum production. By now an estimated 40,000 exotic cows have been imported to establish corporate or commercial level dairy farms which is worth of about 80 million USD importation alongside importing equipment, health care products and machinery amounting to similar amount every year. Apart from that, the importation of exotic semen for crossbreeding has not only burdened our economy for the last 40 years but it has also played a havoc to the genetic fabric of our local/indigenous/desi cows and purebred dairy breeds by diluting their fitness and adaptability to our local environment. Indiscriminate crossbreeding in the past and its ongoing acceptance for high milk yield is playing a positive role for short term however, its longterm agro-ecological ill effects on local biodiversity, environment, climatic change, social and economic implications across 70% rural folk and 55 million small holders are not being considered as yet as to how these changes are transforming and complicating our society as a whole. This review is a part of awareness campaign which all of us should promote to clearly separate the two domains viz; conservation and genetic improvement of local/desi and purebred cattle with no mixing of blood any more either in case of desi or purebred cows, before we as a nation are not able to assess the scale of indigenous genetic diversity loss through next generation genome analyses.

***Keywords*:** Sustainablity, Small Holding Farmer, Emerging Commercial, Dairy, Poultry, Farming, Rural, Microeconomy, Pakistan, Afghanistan

EQE-4

ESTABLISHING THE MODERN DAIRY VALUE CHAIN IN PAKISTAN; TOOL FOR PRO POOR FARMER DEVELOPMENT

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ABSTRACT

Livestock is central to livelihood of the rural poor in the country and is considered a more secure source of income for the small farmers and landless poor; and, is a source of employment generation at the rural level. It also helps to reduce income variability, especially in cases of crop failure due to a variety of causes and can play an important role in poverty alleviation by uplifting the socioeconomic condition of Pakistan's rural masses. Milk and meat are the major produce of the livestock farmer. Pakistan is the 4th largest milk producing country in the world with annual milk production of 47.951 million ton (Economic survey of Pakistan 2011-12). Adding the value to milk and converting the milk into value added products will decrease the losses of milk which are 15 % (Economic survey of Pakistan 2011-12) during transportation which can be even high during summer season when the temperature is very high. There is lack of cold storage facility of milk with the poor farmers moreover they are not trained enough technically to add value to milk and convert it into value added healthy dairy products like yoghurt (flavoured), butter, desi ghee and cheese. There is a need for the value chain development for the dairy products produced from the farmer to the end consumer.Value chain development in return will increase the income of the farmer. It also opens the new avenues of research to explore further in product development. Poor farmers and the end consumers of the product are the major stakeholder who want to see the change happening. Value chain development benefits the easy delivery of the product from the farmer to the retailer and the end consumer. Value added dairy products benefit the consumer in improving their health status. Decrease in the losses of milk with increase in the sale volume of value added dairy products along with the income and profit of the farmers will be the key performance indicator of the success. Sustained farmer approach towards value chain development and bridging up the gap of farmer community with retail market will in turn improve the livelihood of the poor farmer due to this change.

Keywords: Modern, Dairy, Value Chain, Pakistan, Poverty, Development

EQE-5

PROSPECTS OF LIVESTOCK PRODUCTION AND ITS ROLE IN POVERTY ALLEVIATION IN PAKISTAN

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ABSTRACT

Livestock is seen as having a key role in poverty alleviation as majority of the poor in developing countries live in the rural areas and that food prices are a major determinant of the real income of both rural and urban poor. Livestock play a vital role in rural livelihood, employment and poverty relief. In Pakistan, livestock sector has seen a growth of around 5 % in the last decade. However, growth slowed down to 2.6 % in 2003-04 and 2.3 % in 2004-05 but it has risen again to 8 % during the year 2005-06. Livestock has its share in value-addition of agricultural economy and has increased from 29 (1990-91) to 50 (2005-06) %., as compared to the share of crop sector that had declined from 65 to 47 % in the same years. About 30-35 million rural population of the country is engaged for their livelihood and derives 30-40 % of their income from livestock raising. The people of Pakistan have inherited traditions of rearing dairy animals and it has remained a complementary activity to crop production. The livestock farming in Pakistan has failed to attract its due importance from the policy makers. Livestock farming provides an important complimentary with food grain

production for small farmers. Animal dung is the main source of fuel for cooking and an excellent manure to maintain soil fertility, while crop residues, otherwise mostly going waste are saleable at remunerative prices to livestock farms for feeding dairy animals, and thus enhance economic return for crop production. Despite the importance of dairying in the economy of Pakistan, especially for the livelihoods of resource-poor farmers and landless laborers, government policy toward this sector has suffered from the lack of a clear and strong thrust and focus. To a great extent national policy makers and development groups have not recognized or exploited the potential contribution the livestock sector can make to poverty reduction, despite the large share of the poor depending on livestock as part of their livelihood and the increasing demand for meat and dairy products in developing countries like Pakistan. This Working Paper concludes with recommendations for improving the best use of this important sub sector for poverty alleviation.

***Keywords*:** Poverty, livestock, hunger, dairy farming, employment

EQE-6

ETHICAL SUPPORT REQUIED FOR EXPORT OF HALAL MEAT FROM KHYBER PAKHTUNKHWA

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Abstract

Human beings have many requirements in their lives including food, clothes and house. Food is important for their health and growth. Food stuff is available on the Earth and we can get it in form of plants, vegetable, fruits, and in form of meat and milk of halal animals. The food for consumption by a Muslim consumer must qualify the biological and spiritual requirements. Of course the Halal food must also qualify the nutritional parameters as a human diet which will provide energy and other substrates for all body functions, normal health and growth of the people. The Qur'an and Hadith have provided detailed guidelines on various aspects of halal food. Understanding the Qur'an and Hadith is difficult for a common Muslim; hence the Fuqahaa come for extracting guidelines from such sources to be practiced by common Muslims. Again the common Muslim gets little access to such information and face confusion in selecting Halal food for consumption by them and their families in the non-Muslim societies. The halal meat from cattle has been mentioned with interpretation of the cattle. The meat has been chosen especially without vegetables, fruits, and other food items, because the Muslims and Jews are more cautious about meat and slaughtering procedures. The present study is aimed at extracting verses from the Qur'an related to Halal food in order to analyze the rhetorical analysis, because the Qur'an is a book which is closely related to human life and it has many orders related to Halal food, so if human at upon its orders he will get success in this world and the hereafter both, and if he works contrary to its orders, he will lose in this world and the hereafter. He should understand an accurate concept, so it's our struggle to understand it and act upon its teachings, because it is an Arabic quotation that (**الذي علم و عمل به فَلَمَع**) means a person who gets knowledge and act upon it, he shines; he achieves success. The developments in global Halal industry will be reviewed and the role of Pakistan and especially Dairy Science Park will be highlighted.

Keywords: Halal, ethics, meat, export, Muslim, livestock, abattoir, market

ANTIBIOTIC RESIDUES IN COMMERCIAL POULTRY MEAT AND EGGS

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ABSTRACT

Antibiotic residues in poultry products are still a potential threat to human health in most parts of the developing world. In depth knowledge of the presence of antibiotic residues would be beneficial to safeguard human health. Present study was undertaken to test the presence of antibiotic residues in poultry products in Peshawar city of Pakistan. One hundred samples of fresh (n=50) and frozen (n=50) poultry products from liver, thigh and breast muscle were randomly collected and analyzed. Positive samples were isolated using well diffusion method and tested for the presence of penicillin, ciprofloxacin, amoxicillin and Colistin sulphat residues using Thin Layer Chromatography (TLC). More than half of fresh (53.3%) and frozen samples (42.2%) were confirmed positive for antibiotic residues. Concentration of antibiotic residues was higher in liver and thigh region compared to breast muscles. Among different antibiotics, the presence of penicillin was greater followed by amoxicillin in different meat products tested. Randomly collected eggs (n=100) have shown that more than half of the eggs (60%) were positive for presence of antibiotic residues. Albumins of the eggs were detected to accumulate higher (70%) antibiotic residues compared to yolk. This depict that most of the meat and egg produced in this region was highly contaminated with drug residues and needs serious attention and concrete measures are needed to minimize the incidence and level of drug residues to protect human health.

Keywords: Antibiotics residues, poultry meat, eggs

EQE-9

QUALITY AND ADULTERATION ASPECTS OF MILK SOLD IN DIFFERENT AREAS OF FAISALABAD

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ABSTRACT

The study was conducted to analyze the chemical composition, hygienic status, and the extent adulteration with adulterants being used by the persons involved in milk marketing. For this purpose 144 milk samples were collected from 3 localities (rural, peri-urban and urban) situated around Faisalabad. Thirty six samples were taken from each locality within four weeks (12 samples per week). Analyses were done in dairy laboratory, Department of Livestock Management, University of Agriculture, Faisalabad by using standard procedures and techniques. The results for the physical examination on the basis of locality, the general appearance, odour and colour were non-significant while consistency (Watery: 4.2, 25.0 and 41.7; Normal: 95.8, 75.0 and 58.3) and sedimentation (Sediments present: 16.7, 41.7 and 43.8%) were significant (P=0.001, <0.05) but time had non-significant effect for all parameter. The results for chemical composition on the basis of locality, the fat (4.83, 3.88 and 3.53%), protein (3.65, 3.21 and 2.97%), lactose (5.33, 4.71 and 4.29%), SNF (9.78, 8.62 and 7.79%) and TS % (14.59, 12.51 and 11.29) were significant; freezing point (-0.518, 0.416 and -0.412 °C) and specific gravity (1.0269, 1.0242 and 1.0227) (P<0.001, P<0.05) were also significant while time had non-significant effect for all. The results for hygienic status of milk samples on the basis of locality, the methylene blue reduction time (2.271, 2.146 and 1.896 hours) and somatic cell count were significant (P<0.001) and acidity was not significant while results for the effect of time, acidity (0.187, 0.170, 0.216 and 0.146) and somatic cell count (61625, 65563 and 47531) were significant (P<0.001) while methylene blue reduction time was non-significant. The results for milk adulteration of urea (4.2, 20.8 and 27.1%), carbonate (0.0, 6.3 and 12.5%) and water (9.6, 17.5 and 24.3%) were significant (P<0.01, <0.05, and <0.001) while adulteration of starch, H_2O_2, detergent, sorbitol, QAC, boric acid, cane sugar, sodium chloride, formalin, and hypochlorite were non-significant. Milk samples collected from rural areas were found satisfactory as compared to the urban and peri-urban areas on the basis of quality.

***Keywords*:** Milk, Adulteration, Chemical and hygienic quality, Faisalabad

EQE-10

PREVALENCE OF AFLATOXINS AND OCHRATOXIN A IN IMPORTED PET FOOD

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ABSTRACT

Pets particularly cat and dog are referred as companion animal due to strong relationship with human. Pet food is a plant or animal material intended for consumption by pets. The leading exporters of pet food are France, USA and Netherland while the leading importers are Japan, Germany and UK in the world. Pakistan is a recent importer on the list and is importing small quantities of pet food mainly cat and dog food. Feeds are blended from various raw materials and

additives. These blends are formulated according to the specific requirements of the target animals. Pet food comprising carbohydrates, lipids, proteins, organic acids, vitamins and minerals make an ideal substrate for fungal growth resulting into mycotoxins production. Data regarding scenario of mycotoxins contamination in pet food in Pakistan is missing. In view of foregoing, present study was planned to assess the prevalence of mycotoxins in cat and dog imported food. For this a total of five hundred and ten (n=510) commercially available pet (i.e. cat and dog) food samples were collected from various cities of country. The samples were then analyzed for AFS and OTA by high performance thin layer chromatography. The findings of present study revealed that 180 samples (54.54%) of cat food were contaminated for AFB_1 with a mean of 7.25 ppb (range 0.1-9.0 ppb). Thirty (9.09%) samples were found positive for AFB_2 and none of these tainted with AFG_1 and AFG_2. Moreover, incidence of OTA in cat food was detected in ninety (27.27%) samples with mean of 8.56ppb (range 3-16ppb). Forty-five (25.01%) dog food samples were contaminated with a mean of 4.95ppb (range 1.50-12 ppb). However, no dog food sample was found positive for AFB_2, AFG_1 and AFG_2. A 16.66 % (n=30) dog food sample showed the presence of OTA ranging from 0.5 to 20ppb (mean 5.65ppb). As far as the co-contamination is concerned, sixty (18.18%) cat food and fifteen (8.33%) dog food samples were concurrently tainted with AFS and OTA. Although, mean levels of AFS and OTA in pet food were found below the regulatory limits as defined by European Union (EC, 2006) i.e. 20ppb and 10ppb respectively. However, co-occurrence of mycotoxins even at safe levels in pet food is proven to have adverse health effects.
Key Words: Aflatoxin, Ochratoxin, pet food

EQE-11

EFFECT OF VARIOUS CONCENTRATIONS OF HYDROGEN PEROXIDE ON CHEMICAL AND MICROBIOLOGICAL QUALITY OF RAW BUFFALO MILK

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ABSTRACT

Milk being perishable food requires special handling prior to further processing. Pakistan due to its harsh climatic conditions people are using different methods for its preservation i.e. using different chemicals, additives and antibiotics to enhance the keeping quality of milk. Present study was planned to investigate the various concentration of hydrogen peroxide in raw buffalo milk and its effect on chemical and microbiological quality of milk. Raw buffalo milk samples were collected from Dairy Animal Training and Research Centre, University of Veterinary and Animal Sciences, Ravi campus, Pattoki. Fifty samples of raw buffalo milk (1000 ml each) were collected to study the nutritional composition and microbiological quality of the milk after adding hydrogen peroxide. Hydrogen peroxide of different concentrations i.e. 0.025%, 0.05%, 0.075% and 0.1% were used in this study. There was no significant change in the result regarding various nutritional composition of raw buffalo milk after adding the various concentrations of hydrogen peroxide. There is a slight change in the lactose percentage during 48 hours storage of milk at different temperature. Statistically the change which occurred in lactose during storage is significant whereas overall decrease in Solid Not Fat is non significant. Mean value of TPC of raw buffalo milk treated with

different concentrations of hydrogen peroxide storage at the three different temperatures indicated that at 10ºC TPC was less as compared to TPC of control i.e. 1.195 x 10^7. The effect of H_2O_2 on the quality of the milk is negligible as compared to the losses suffered without it. The hydrogen peroxide definitely has its effect as a preservative. The use of preservative in milk is common in countries where ambient temperature remains quite high. Our study suggests that the concentration of 0.05% to 0.1% hydrogen peroxide is significant for the preservation of raw milk.

***Keywords*:** Hydrogen Peroxide, Chemical, Microbiological, Quality, Raw, Buffalo Milk

EQE-12

IN VITRO QUALITY ASSESSMENT OF COMMERCIALLY AVAILABLE BRANDS OF DICLOFENAC SODIUM TABLETS

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ABSTRACT

The aim of this work was to assess the quality of commercially available brands of diclofenac sodium tablets, and to study correlation between drug quality and its price. These brands were manufactured by different pharmaceutical companies of Pakistan. All brands contained similar quantity of active ingredient (50 mg or 25 mg diclofenac sodium / tablet, label claim) but they were different in their retail prices. The quality was assessed by high performance liquid chromatography (HPLC), British Pharmacopeia (BP) and United State Pharmacopeia (USP) specified quality control tests for solid dosage forms. The disintegration, weight uniformity, friability and hardness of the tablets were tested according to the BP methods, while the dissolution test was performed according to the method specified by USP. The HPLC method used was validated using the European Agency (EMEA) Q2R1 guidelines. The HPLC method developed in this study has shown to be suitable for the isolation, identification and quantification of diclofenac sodium in the different brands of enteric-coated tablets investigated. The HPLC method was characterized by good linearity, system suitability, precision and accuracy. All brands tested were shown to contain diclofenac sodium within the pharmacopoeial specifications (100 ± 10%). Similarly no statistically significant difference (p>0.05) were observed in the tested brands for other quality control tests, hence, all brands meet the required specifications and were of satisfactory quality. No correlation between the brand's quality and its price was observed. This study and similar studies on more brands in the future will help the Pakistani officials in planning their strategy for the control of drug prices in Pakistan.

Keywords: In Vitro, Quality Assessment, Commercial, Diclofenac Sodium, Tablets

EQE-13

RITUAL HALAL SLAUGHTER, ANIMAL WELFARE, MEAT SCIENCE - KNOWLEDGE GAPS

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ABSTRACT

The presentation is about the scientific & technological aspects of Halal rituality and animal welfare as well as the discussions held with some leading religious scholars of the world on the subject. The presentation identifies scientific & technological opportunities to improve the procedures in the light of the practicing religious beliefs and the modern scientific developments. The study may also assists the international Halal trade for adopting strategies to cope with the current and the emerging future scenarios in the Halal sector. Islamic code of animal welfare provides care, mercy and kindness towards animals at all times and more so at slaughter. However, it is not being followed in letter and spirit in most Muslim countries. Important religious basics of Halal slaughter comprise of cutting neck of a healthy live animal, from the front with a long sharp knife while making the religious invocation. Irrespective of science it is a firm belief held by Muslims that only Halal slaughter causes no or less pain and leads to maximum bleed out at slaughter to give safe & healthy meat. There is said to be international trade of about US$750 billions in Halal food and another 2.5 trillion in non-food products. Intervention of pre-slaughter stunning in Halal slaughter and issues like stress and pain, concept of pre-slaughter injury to animal, comparative bleed-outs and ensured reversible stunning require pertinent & focused future research attention. It is desirable that the research aspects should emphasize concern for religious respect, objectivity and ritual credibility. It is not the Islamic code on animal welfare rather the ignoring of it by Muslim societies, the cause of some undue sufferings to animals and giving rise to the controversies in the Western world. Under the developing International Halal Food Rules, the 56 member block of OIC countries, it has been stressed to strictly follow animal welfare & implicate simple science and technology procedures in Halal slaughter. Improving restraint methods, neck cutting techniques & training etc. would positively affect meat quality, workers safety and eliminate most of the ongoing animal miseries. Important spirit of the religious code under Halal slaughter is that animal welfare should override commercial considerations.

EQE-14

DRUG RESIDUES IN CATTLE AND BUFALO MEAT IN PESHAWAR

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ABSTRACT

Antibiotic residues in beef are potential threat to human health in many developing countries such as Pakistan.In depth knowledge on the presence and quantification of antibiotic residues would be

beneficial to safeguard human health. The present study was conducted to analyze the level of antibiotic residues in cattle and buffaloe meat.Samples from 40 slaughtered cows and buffaloes were randomlycollected. From each animal samples were collected from liver, kidney and thigh muscles. Positive samples were identified by microbial bioassay and werefurther analyzed for the commonly used antibiotics: penicillin, streptomycin, enrofloxacin and oxytetracycline using Thin Layer Chromatography.Microbial bioassay test results revealed that overall 21% of the meat samples had detectable antibiotic residues. Buffalo meat had higher (23.3%) antibiotic residues than cattle (18.8%). Within the body parts, the highest (24%) numbers of positive samples for antibiotic residues were observed in liver, followed by kidney (21.1%) and thigh muscles (17.5%). Thin layer chromatography technique showed that enrofloxacin (35.6%) and oxytetracycline (32.7%) was the predominant antibiotic, whereaspenicillin and penicillin plus streptomycin were found in 4.3% and 12.1% of the samples, respectively. Analysis of beef samples in Peshawar indicated that meat is highly contaminated with antibiotic residues and needs serious attention and concrete measures to minimize the incidence and level of antibiotic residues to protect human health.

Key words: Antibiotic residues, Beef, Microbial bioassay and Thin layer chromatography

EQE-15

TURNING TO ITS REAL TASK; CAMEL MILK IS APPEALING DESIRABILITY EVEN IN NON-CAMEL WORLD

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ABSTRACT

Dromedary Camel was originally domesticated for its milk in dry and deserted lands of the world. This unique animal proved its worth to the given task for hundreds of years and defeated hunger in harsh climatic conditions. Later on, its original task was steadily replaced by its use in armies and wars. The selection for its work power and walking ability traits were prioritized which led to comparatively lower yield of milk and more masculine body. A back to future trend is very true for the dromedary camel as milk yield is once again the trait of choice. There are many reasons for this phenomenon, i.e. higher demand in the non-camel world (Western countries), high demand for milk in rich Golf countries and its importance as a natural pharmacy. Many new thrusts have been initiated at global level like 'healing with camel milk', 'what took you so long' 'love camel milk', 'Alnasama chocolate', Caravan Cheese, and 'camel milk qulfi' are few examples. Pakistan being the home of almost 1 million camels can promote camel as a true milch animal; hence many tasks and challenges can be addressed with the help of this unique animal of its kind. Policy level change, more research on its lactation traits, and involvement of the camel herders at all stages can promote camel in its true sense. The country policy makers should appreciate camel's milk potential and promote it both for national health and income and should look in the matter of indiscriminate flow of worthwhile camel genetic resources to Arabian Peninsula.

Key Words: Dromedary Camel, Camel Milk, Camel Genetic Resources, Pakistan, and Lactation

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237	Major Sayed Mujahid Hussain	NTI	Plate 12, Ist floor satellite shopping center 6th road Rawalpindi.	-
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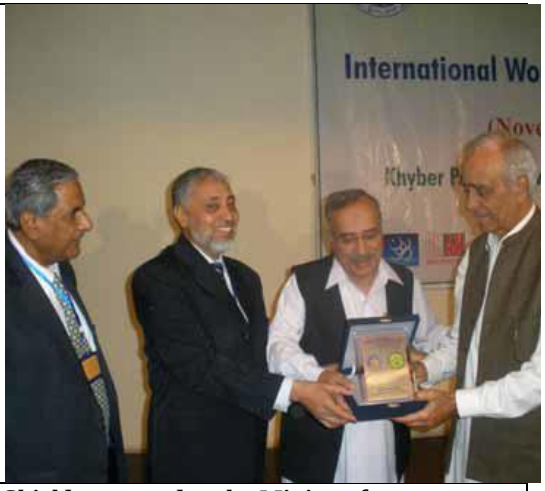
PICTORIAL REVIEW OF DSP-2011

National Anthem



Shield presented to the Minister for Agriculture

Semen Production Lab AUP

ICI Pakistan Ltd

Feed Tech lab AU Peshawar

Alltech Pakistan

Inter-Cooperation Pakistan

Romer Lab, Nasim Traders Rawalpindi

Quails flock of Poultry Sci. Department, AUP

Dairy Tech Lab UAP