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2018-2019

उ.प्र. पं. दीनदयाल उपाध्याय पशु चिकित्सा विज्ञान विश्वविद्यालय एवं गो अनुसंधान संस्थान, मथुरा–281001 (उ.प्र.)

U.P. Pandit Deen Dayal Upadhyaya Pashu-Chikitsa
Vigyan Vishwavidyalaya Evam Go Anusandhan Sansthan
(DUVASU), Mathura-281001 (U.P.)

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FOREWORD

With great pleasure and satisfaction, I present the 2018-19 Annual Report of U.P. Pandit Deen Dayal Upadhayaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go Anusandhan Sansthan (DUVASU) as a mark of yet another outstanding chapter in the chronicles of the University. The report highlights the teaching, research and extension activities as well as achievements of students and faculty of the University. Mandate of the University is to address basic and applied issues related to animal health and production along with human resource development and overall improvement of socio-economic status of farmers and livestock owners.

For any Institution, strengthening and development of infrastructure is the basic prerequisite for keeping pace with its sister institutions and global competitiveness. A state of the art University Auditorium has been constructed with the financial assistance from Indian Council of Agriculture Research. Several infrastructure development projects were sanctioned by the government under Rashtriya Krishi Vikas Yojna (RKVY) for developing state of the art laboratories and other facilities. Projects sponsored by ICAR are running successfully and a new project was also sanctioned by DBT. Existing hostels were renovated to ensure better facilities and comfort to students. Various literary, cultural and sports activities were organized throughout the year for overall personality development of the students. Many cleanliness and plantation drives were carried out throughout the year with the help of students, teachers and University staff to make the "Campus Clean and Green".

I am immensely happy to know that our students brought laurels to the University by winning many national level competitions and also teachers that were adorned with several prestigious awards and academic accomplishments at national and international level including foreign travels. Publication of nearly 120 research articles in national and international peer reviewed journals reflects the quality of research work being undertaken at the University. Directorate of extension with the support of faculty of Veterinary College and KVK organized several trainings for knowledge upgradation of farmers, field veterinarians and para-veterinary staff. Successful organization of ICAR sponsored winter school and short term course have been of great use not only to participants but also show-casing and projecting the University at National level.

I express my sincere thanks and gratitude to Government of Uttar Pradesh, RKVY, UPCAR, ICAR, New Delhi and Government of India for adequate financial support to the University. The support has helped us in improving the infrastructural facilities and strengthening of teaching, research and extension activities along with disease diagnosis, treatment of diseased animals and undertaking animal welfare activities.

I am extremely thankful to Principal Secretary to Hon'ble Governor and Principal Secretary, Animal Husbandry, Govt. of Uttar Pradesh for their support in overall development of this Institution. I take this opportunity to acknowledge the support of all the University Officers, Heads and Incharges of departments, teaching fraternity, technical, non-technical, administrative, supportive staff and students for their dedication towards their work and discipline. Their everlasting hard work, sincerity and cooperation helped us in achieving the set targets, objectives and mandates.

The efforts made by the "Editorial Committee" to bring out this Annual Report depicting various activities and achievements of the University are worth applauding. I congratulate and thank all of them for their hard work.

(G.K. Singh)

प्राक्कथन

मैं अत्यंत खुशी और संतुष्टि के साथ, उ.प्र. पंडित दीन दयाल उपाध्याय पशु चिकित्सा विज्ञान विश्वविद्यालय एवं गो अनुसन्धान संस्थान (DUVASU) के कालक्रम में एक और उत्ककृष्ट अध्याय को 2018-19 वार्षिक रिपोर्ट के रूप में प्रस्तुत करता हूँ। रिपोर्ट में शिक्षण, अनुसंधान और प्रसार गतिविधियों के साथ-साथ विश्वविद्यालय के छात्रों और शिक्षकों की उपलब्धियों पर प्रकाश डाला गया है। विश्वविद्यालय का उद्देश्य मानव संसाधन विकास और किसानों एवं पशुधन मालिकों की सामाजिक-आर्थिक स्थिति के समग्र सुधार के साथ-साथ पशु स्वास्थ्य और उत्पादन से संबंधित बुनियादी और अनुप्रयुक्त मुद्दों पर ध्यान देना है।

किसी भी संस्थान के लिए, बुनियादी ढांचे को मजबूत और विकसित करना, अन्य संस्थानों और वैश्विक प्रतिस्पर्धा के साथ तालमेल रखने के लिए आवश्यक है। भारतीय कृषि अनुसंधान परिषद की वित्तीय सहायता से विश्वविद्यालय में अत्याधुनिक कला सभागार बनाया गया है। सरकार द्वारा कला प्रयोगशालाओं और अन्य सुविधाओं के विकास के लिए राष्ट्रीय कृषि विकास योजना (आर के वी वाई) के तहत कई बुनियादी विकास परियोजनाओं को मंजूरी दी गई थी। भा.कृ.अ.प. द्वारा प्रायोजित परियोजनाएं सफलतापूर्वक चल रही हैं और डी बी टी द्वारा एक नई परियोजना को भी मंजूरी दी गई। मौजूदा छात्रावासों को छात्रों को बेहतर सुविधा और आराम प्रदान करने के लिए पुनर्निर्मित किया गया । छात्रों के समग्र व्यक्तित्व विकास के लिए पूरे वर्ष विभिन्न साहित्यिक, सांस्कृतिक और खेल गतिविधियों का आयोजन किया गया। ''क्लीन एंड ग्रीन कैम्पस'' बनाने के लिए छात्रों, शिक्षकों और विश्वविद्यालय के कर्मचारियों की मदद से पूरे साल कई सफाई और वृक्षारोपण अभियान चलाए गए।

मुझे यह जानकर बेहद खुशी हुई कि हमारे छात्रों ने कई राष्ट्रीय स्तर की प्रतियोगिताओं को जीतकर विश्वविद्यालय का परचम लहराया । विश्वविद्यालय के शिक्षकों को राष्ट्रीय और अंतर्राष्ट्रीय स्तर पर कई प्रतिष्ठित पुरस्कारों और अकादमिक उपलब्धियों से सम्मानित किया गया, जिनमें विदेश यात्राएं भी शामिल थीं। राष्ट्रीय और अंतर्राष्ट्रीय पत्रिकाओं में लगभग 120 शोध लेखों का प्रकाशन, विश्वविद्यालय में किए जा रहे शोध कार्यों की गुणवत्ता को दर्शाता है। पशु चिकित्सा महाविद्यालय और के वी के के सहयोग से प्रसार निदेशालय ने किसानों, क्षेत्र के पशु चिकित्सकों और पैरा-पशु चिकित्सा कर्मचारियों के ज्ञान उन्नयन के लिए कई प्रशिक्षण आयोजित किए। भा.कृ.अ.प. प्रायोजित शीतकालीन स्कूल और अल्पावधि पाठ्यक्रम का सफल आयोजन न केवल प्रतिभागियों के लिए लाभदायक रहा बल्कि राष्ट्रीय स्तर पर विश्वविद्यालय के सामर्थ्य को भी प्रदर्शित करने में सफल रहा।

मैं विश्वविद्यालय की ओर से पर्याप्त वित्तीय सहायता के लिए उत्तर प्रदेश सरकार, आर के वी वाई, यू पी सी ए आर, भा.कृ.अ.प., नई दिल्ली और भारत सरकार के प्रति आभार व्यक्त करता हूँ। वित्तीय सहायता ने हमें ढांचागत सुविधाओं में सुधार और शिक्षण, अनुसंधान और प्रसार गतिविधियों के साथ-साथ रोग निदान, रोगग्रस्त पशुओं के उपचार और पशु कल्याण गतिविधियों को बढ़ाने में मदद की है।

मैं इस संस्था के समग्र विकास में माननीय राज्यपाल के प्रमुख सचिव और पशुपालन, उत्तर प्रदेश सरकार के प्रमुख सचिव के समर्थन के लिए के लिए बहुत आभारी हूँ। मैं इस अवसर पर विश्वविद्यालय के सभी अधिकारियों, विभागाध्यक्षों / प्रभारियों, तकनीकी, गैर-तकनीकी, प्रशासनिक, सहायक कर्मचारियों और छात्रों को उनके काम और अनुशासन के प्रति समर्पण के लिए सराहना करता हूँ। उनकी निरंतर मेहनत, ईमानदारी और सहयोग ने हमें निर्धारित लक्ष्यों, उद्देश्यों और जनादेशों को प्राप्त करने में मदद की।

विश्वविद्यालय की विभिन्न गतिविधियों और उपलब्धियों को दर्शाती इस वार्षिक रिपोर्ट को सामने लाने के लिए 'संपादकीय समिति' द्वारा किए गए प्रयास सराहनीय हैं। मैं उन सभी को उनकी कड़ी मेहनत के लिए बधाई और धन्यवाद देता हूँ।

(जी. के. सिंह)

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EXECUTIVE SUMMARY

TEACHING

- During 2018-19, College of Veterinary Science and Animal Husbandry admitted 95 students in B.V.Sc. & A.H programme out of which 32.63% were girls. In M.V.Sc. and Ph.D. programmes, 41 and 07 students, respectively, were admitted.
- 10 students received their Ph.D. and 17 their M.V.Sc. degree and 39 students their B.V.Sc. & A.H. degree from College of Veterinary Sciences and A.H.
- During the year, College of Biotechnology admitted 24 and 05 students to B.Sc. Biotechnology and B.Sc. Industrial Microbiology programmes respectively and 04, 02 and 21 students received their Ph.D., M.Sc. and B.Sc. degrees, respectively from College of Biotechnology.
- During 2018-19, 27 and 18 students were admitted to Diploma in Veterinary Pharmacy (DVP) and Diploma in Livestock Extension (DLE) programmes, respectively and 42 and 27 students completed their DLP and DLE programmes, respectively. Three months Internship Programme for 157 students of Diploma in Veterinary Pharmacy students of 2013, 2014, 2015 and 2016 batches was also organized.
- Teaching Veterinary Clinical Complex (TVCC) is well equipped with modern facilities which include small and large animal operation theatres, ICU for pets, imagining diagnostic unit, small animal dentistry unit, operating microscope, laproscopic surgery unit, orthopaedic surgery instruments, eye surgery instruments, diathermy, multiparameter monitor, coloured Doppler, USG machine and flexible laparoscopy, oxygenators, nebulizers and general unit for large and small animals. During the year under report, TVCC handled 13,926 clinical cases and this number was more than that of previous year (13,533 cases). Out of these cases, 4826 were of large ruminants, 1113 of small ruminants, 6317 pets (dogs and cats), 65 pigs, 829 equines and 776 were wild animals and others. Total revenue generated by TVCC during this period was Rs. 7,91,725/-.
- Disease diagnostic laboratory of TVCC is equipped with semi-automatic blood and biochemistry analyzer, urine analyzer, electrolyte analyzer and slide based dry chemistry analyzer. During 2018-19, laboratory processed a total 2458 samples comprising of 2167 blood samples for various blood parameters, 12 serum samples for biochemical analysis, 30 milk and urine samples for culture sensitivity and histopathology tests and generated a revenue of Rs. 1,89,730/-.
- During the year under report, clinical services were also provided by faculty members and post graduate students at farmer's doorstep through clinical camps organized at Deen Dayal Upadhyaya Dham, Farah and certain villages of Mathura district.
- Breeder farm, layer farm and hatchery established under Experiential Learning programme of ICAR in Poultry Science Department served as model for U.G., P.G. and Ph.D. teaching and also for internship students of B.V.Sc. & A.H. degree programme. Students were provided hands on training in poultry farming and entrepreneurship. Students were trained in various farm activities like feeding, watering, hatchery operations and management. 'Entrepreneurial training on poultry production' was conducted for B.V.Sc. & A.H. 2nd Year students. The total revenue generated from experiential learning unit was Rs. 5,99,182/- during financial year 2018-19.
- Experiential Learning Programme on “Milk & meat processing and livestock products manufacturing” in Department of Livestock

Products Technology imparted practical training on preparation of different milk and meat products to undergraduate and post-graduate students. During the reporting period, 7486.5 liters milk was processed to produce 1066.54 kg Paneer and 121.40 kg Khoa. Value added meat products like meat nuggets, meat patties and meat pickle were also prepared.

- Library implemented KOHA Library open source software through which database and bar coding of 2500 books have been completed.
- Feed production and processing project under Department of Animal Nutrition has a feed processing unit including Urea molasses mineral block unit that provides hands-on-training to students to formulate compounded feed as per the nutritional requirement of livestock. Feed and UMMB produced in these units is available to our university farm and also to farmers and Goshalas during Kisan melas and farmers training programmes. This year, from departmental sale of mineral mixture (DUMIN), university generated arevenue of Rs 4.2 lacs.

RESEARCH

- During the reporting year, 19 externally funded projects were running in various departments of College of Veterinary Science and Animal Husbandry. Out of these, ICAR funded 04 projects, 12 projects were funded by RKVY, 01 project by DAHD & AF, GOI, 01 by Department of Biotechnology (DBT), GOI and 01 project by private industry.
- During 2018-19, 10 Ph.D. and 17 M.V.Sc. theses in Veterinary and Animal Sciences subjects and 04 PhD and 02 M.Sc. theses in Biotechnology were submitted.
- During the year under report, University published 120 research publications.

EXTENSION

- During 2018-19, Directorate of Extension with technical assistance of faculty of College of Veterinary Science and Animal Husbandry organized six on campus trainings, seventeen visits of farmers, animal owners and others in Pashu Gyan Chaupal. Through these trainings and visits, 64 Veterinary Officers and 215 farmers/ livestock owners were trained and exposed to latest managemental and entrepreneurial skills.
- Training manuals, leaflets and popular articles in the form of booklets were developed by Directorate of Extension for the benefit of farmers and animal owners.
- Consultation services were provided to large number of farmers about animal husbandry and poultry farming practices.
- Department of Veterinary and Animal Husbandry Extension conducted five trainings for 115 Veterinary Officers and two trainings for 60 farmers/livestock owners during the reporting period and exhibited latest technologies in animal husbandry practices at four different events.
- During the year, 120 trainings were conducted by KVK scientists for 3089 participants. Out of these, 97 trainings were for farmers/ farm women, 12 for rural youth, 10 for extension functionaries and one vocational training for women through which 2322 farmers/farm women, 287 rural youth, 455 extension functionaries and 25 women were trained.
- To demonstrate the production potential of various proven technologies, the frontline demonstrations on farmers field were conducted for 434 farmers and livestock owners.
- To demonstrate the suitability of technology under local environment and farming system, on Farm Trials were conducted by KVK Scientists on new varieties of Paddy PB-22, Brinjal (Kashi Sandesh), effect of micro nutrition on yield during Kharif 2018 and also new varieties of Mustard, Onion, Tomato and also Chabroo birds.

- Gosthies, Diagnostic visits, Kisan Melas and Kisan Samman Diwas were organized for improving connectivity with farmers. During the year, Soil and Water Testing Laboratory of KVK analyzed 685 soil and 54 water samples and the results with recommendation for balanced fertilization and watering were provided to 442 beneficiaries.

UNIVERSITY FARMS

- During 2018-19, total milk production at LFC was 2, 28, 854.00 liters, out of which, cow milk was 1,88,739.00 liters and buffalo milk was 40,115.00 liters. The average milk production was 627.00 liters per day.
- Poultry farm of the Veterinary College maintained variety of species and breeds including layers, Chabro, Aseel Peela, Kadaknath, Naked neck, Japanese quail, Turkey, Guinea fowl and Emu. During FY 2018-19, the farm generated a revenue of Rs. 7,66,707/- from sale of different birds and eggs.
- Total production (mustard, wheat, oats, barley, paddy, sesame and berseem) at Madhuri Kund farm of the University was 11170 quintals. Total revenue generated through sale of total produce was Rs. 75.43 lacs.
- During FY 18-19, total seed production (wheat – HD 3086) of fodder research section of the Unit was 324.40 quintals. Total revenue generated by the unit was Rs. 2.43 lacs.
- Fodder farm of LFC produced 18283.04 quintals green fodder, 180.10 quintal of wheat straw, 26.80 quintals of oats grain/seed and 168.72 quintal of barley grain/seed during this period.
- During the reporting period, KVK Farm produced 856.50 quintals of breeder seed worth Rs. 2,740,800/-. In addition, Rs. 9,983/- and Rs. 9230/- were also generated by KVK through sale of 33244 planting materials and 3296 kg vermicompost, respectively.

HUMAN RESOURCE DEVELOPMENT

- One ICAR-sponsored Short Course on "Genomic and Proteomic Approaches for Elucidation of Environmental Pollutants-induced Health Hazards and Quality Assurance for Food of Animal Origin" was organised by Department of Veterinary Pharmacology & Toxicology, College of Veterinary Science and Animal Husbandry, DUVASU, Mathura (Oct. 25 – Nov. 3, 2018).
- Department of Veterinary Anatomy, College of Veterinary Science and Animal Husbandry, DUVASU, Mathura organized ICAR sponsored 21 days Winter School on "Applications of Advanced Anatomical Techniques in Disease Diagnosis and Animal Health" (Nov. 14 – Dec. 04, 2018).
- Numerous faculty members of College of Veterinary Science and Animal Husbandry participated in international and national trainings/workshops and seminars/ symposiums and conferences.

STUDENTS' WELFARE

- During 2018-19, 30 and 17 cadets appeared in "B" and "C" Certificate examination, respectively. While, 20 students participated in Army Attachment Camp at RVC Centre and College Meerut Cantt and 25 students participated in CATC camp-40 at Surajbhan Saraswati Vidya Mandir Inter College, Sikrapur, Khurja. All registered cadets participated in "SWACHHTA HE SEWA" and "SWACHHTA PAKHWADA".
- Second year B.V.Sc.&A.H. students, Cadet Sonam Kumari represented Uttar Pradesh Directorate in Republic Day Parade, 2019 at New Delhi and Cadet Simran Josan participated in ATT TRG of NCC Girl Cadets (SW) to Army Hospitals.
- Literary and Cultural festival was organized by students from COVS and AH, COB and Institute of Para Veterinary Sciences. During this, events like drawing and painting, collage making, clay modeling, essay writing, rangoli, poster making, songs,

debate, declamation, general knowledge quiz, antakshari and extempore speech competitions were held.

- 35 students (24 boys and 11 girls) of 4th Year B.V.Sc & A.H. went on South India Educational Tour from 26th June 2018 to 10th July 2018.
- 17th Annual Sports Meet of the University was organized on 25th–26th February 2019. Inter-class competition and individual in-door and out-door games like table tennis, badminton, volleyball, chess, kho-kho, kabaddi, hockey, cricket, races, jumps, javelin throw shot put and cycling races were organized.
- During 2018-19, students of the University actively participated and excelled in various national/inter-university competitions and events such as 19th All India Inter Agricultural Universities sports competition organized by Punjab Agricultural University (PAU) from 02-05 January, 2019, National level Inter-University Debate Competition held from 14th -15th January, 2019 organized by GB Pant University of Agriculture and Technology, Pantnagar, AGRIUNIFEST - 2018-19 organized at Sardarkrushinagar Dantiwada Agriculture University, Sardarkrushinagar, Banaskantha, Gujarat from 03-07 February, 2019 and All India Inter Veterinary Colleges Badminton and Table Tennis Tournament and All India Professional Quiz Competition organized by GB Pant University of Agriculture and Technology, Pantnagar from 14th to 16th March 2019.
- DUVASU Premier League (DPL)-2018 cricket matches were held from 16th September 2018 to 21st October 2018 in which twelve teams comprising of students, teachers and staff. Non-teaching staff team (White bombers) won the 3rd DUVASU Premier League (DPL) trophy by beating PG team (White Hawks).
- To foster and reinforce dedication, unity and integrity among students, 142nd birthday of Sardar Vallabhbhai Patel, the 'Iron Man of India', was celebrated on 31st Oct. 2018 with the organization of 'Run for Unity'.
- One student of M.V.Sc. and four student of B.V.Sc.&A.H. received Merit Scholarship.
- 06 students of B.V.Sc. & A.H. and 15 M. V. Sc. students got National Talent Scholarship provided by Indian Council of Agricultural Research (ICAR), New Delhi.

OTHER HIGHLIGHTS AND ACTIVITIES

- University conducted the Pre-Veterinary Test-2018 on 20th May 2018, Pre-Diploma Entrance Examination-2018 on 08th July, 2018 and Postgraduate (M.V.Sc. and Ph.D.) Entrance Examination-2018 on 15th July, 2018. Selected candidates were admitted to different degree and diploma programmes in the College of Veterinary Science & Animal Husbandry and Institute of Para Veterinary Sciences for 2018-19 session.
- Oath taking ceremony of B.V.Sc.&A.H. students batch 2013 was organized on 19th July 2018 and the outgoing students were sworn the oath to utilize their professional knowledge with dignity and follow the principles of veterinary medical ethics. "Chaudhary Charan Singh Smriti Pratibha Puraskar" by Kisan Trust was awarded to the two topper students of the batch; namely Jitendra Singh Gandhar and Prabha Sharma.
- University library organized a book exhibition of various subjects related to Veterinary Science and Biotechnology in the campus on 06th December, 2018 which was attended by large number of students and faculty members of the University.
- Newly admitted students in the degree programmes of B.V.Sc. & A.H. and B.Sc. Biotechnology and Diploma programme of Para Veterinary Sciences were warmly welcomed by 2nd year students of respective Institutes along with senior students, faculty and staff members.
- DUVASU celebrated its foundation day on 25th October, 2018. Celebrations concluded with prize distribution to winners of the literary, cultural and fine arts competitions by Chief Guest and officers of the University.

- 8th convocation of DUVASU, Mathura was held on 31st August, 2018. Convocation function was presided over by Hon'ble Governor of Uttar Pradesh and Chancellor of U.P. Pt. Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go Anusandhan Sansthan, Mathura, Shri Ram Naik ji. Prof. D.P. Singh, Chairman, University Grants Commission graced the auspicious occasion as chief guest and Prof. S. P. Baghel, Hon'ble State Minister, Animal Husbandry, Minor Irrigation and Fisheries was Guest of Honor.
- University celebrated Ambedkar Jayanti, World Veterinary Day, Independence Day, Pt. Deen Dayal Upadhyaya birthday, Gandhi Jayanti, Republic Day, International Yoga Day and Basant Panchmi with great enthusiasm.

AWARDS AND HONOUR / ACHIEVEMENTS

- Dr. Rajneesh Sirohi received BRICPL Emerging Scientist Award at International Conference on Agriculture, Allied & Applied Sciences (ICAAAS-2018) at Jawahar Lal Nehru University (JNU) Convention Centre, New Mehrauli Road, New Delhi.
- Dr. Vikas Pathak became Member of Scientific Panel for 'Meat and Meat Products including Poultry for Food Safety and Standards Authority of India (FSSAI), Ministry of Health & Family Welfare, Government of India and was nominated by Export Inspection Agency, Ministry of Commerce & Industry, Government of India for Inter Departmental Panel (IDP) visit of M/S Mahan Milk Foods Ltd., Hathras.
- Dr. Shyama N Prabhu received Dr. C.M. Singh award for best research article during XXXV Annual conference of Indian Association of Veterinary Pathologists, IX annual meeting of IAVP and National Symposium on "Recent advances in Veterinary Pathology and disease diagnosis for sustainable Livestock and Poultry production" organized by COVSc & AH., Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, Gujarat.
- Dr. Vikas Pathak got selected as Vice President and Dr. Meena Goswami Awasthi as Executive Member of Indian Meat Science Association at IMSCAON-VIII held at West Bengal University of Animal and Fisheries Sciences (WBUAFS), Kolkata.
- Dr. Abhinov Verma received IAVA Young Scientist Award and Dr. K.L. Suri Award at XXXIII Annual Convention of IAVA held at Aizwal.
- Dr. Vijay Pandey won gold medal for Online NPTEL Certification course organized by Indian Institute of Technology, Kanpur under the project of NPTEL in association with NASSCOM funded by Ministry of Human Resource Development, Government of India.
- Dr. Rashmi Singh and Dr. Vinod Kumar Singh got Reviewer Excellence Award from Indian Journal of Animal Research
- Dr. Ruchi Tiwari was selected as Brand Ambassador for Bentham Science Publisher.
- Dr. Mukesh Srivastava became Vice President of the "Society of Central Small Animal Veterinary Association", Agra, and Executive General Secretary of "Society of Veterinary Internal and Preventive Medicine-VIPM", Mathura, U.P.
- Dr. Shankar Kumar Singh became Member of Executive Council (Central Region Secretary) of Indian Society for Veterinary Medicine (ISVM).
- Dr. Madhu Tiwari and Dr. S.P. Singh received appreciation letters from ICAR sponsored Summer School on "Production and post-production interventions to increase returns from livestock enterprises- A step towards doubling farmers' income" organized by Division of Livestock Production and Management, F.V.Sc.&A.H., SKAUST-K, Srinagar.
- Dr. Amitav Bhattacharyya, Dr. Abhinov Verma, Dr. Brijesh Yadav, Dr. Mukesh

Srivastava, Dr. Ashish Srivastava, Dr. Shankar Kumar Singh and Dr. Meena Goswami Awasthi got best poster/paper awards at various conferences/symposiums.

- Dr. Neeraj Kumar Gangwar and Dr Yajuvendra Singh were specialists at Pashu Arogya Mela and evaluation committees for National Kamdhenu and Gopal Ratna Awards by DADF, GOI, New Delhi, respectively.

FINANCE AND BUDGET

- During 2018-19, University received Rs. 4238 lacs and Rs. 1209.32 lacs under salary and contingency heads, respectively from Govt. of U.P.
- Indian Council of Agricultural Research, New Delhi granted Rs. 293.37 lacs as development grant.
- During the year, total receipt generated by the University was Rs. 309.22 lacs.

ESTATE AND MAINTENANCE ORGANIZATION

- During the financial year 2018-19, University received sum of Rs 119.99 lacs from ICAR under Developmental Grant which was utilized for roof replacement and renovation works in the main building, construction of parking sheds near main building, renovation work in laboratories of Physiology and Pathology, iron doors in almirah at Deen Dayal Hostel, kharanja, drain and railing work near cow shed at LFC.
- University also received Rs. 262.61 lacs as government aid for construction of parking shed near Pasture Department, bathroom in Clerk type Quarters, CC parking and drain work in VIP, 100 meter boundary wall, additional toilets in Sarjojini Hostel, kharanja work near semen lab at LFC, boundary wall near goat shed, bull shed, semen lab and granite work in Teachers Home Cum Guest House and Nehru Hostel house etc.

RIGHT TO INFORMATION ACT

- In compliance of the order of Govt. of Uttar Pradesh and provision of RTI Act, 2005, PIO received 35 applications out of which 27 applications were cleared and 8 are under consideration.

कार्यकारी सारांश

पाठयक्रम

- पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय, जैव प्रौद्योगिकी महाविद्यालय एवं पैरा वैटरिनरी विज्ञान संस्थान अपने शैक्षणिक सत्र नियमित रुप से चला रहे हैं।
- वर्ष 2018–19 के दौरान 95 विद्यार्थियों ने पशु चिकित्सा विज्ञान एवं पशुपालन स्नातक कार्यक्रम में प्रवेश प्राप्त किया जिसमें 32.63 प्रतिशत छात्रायें हैं। पशु चिकित्सा विज्ञान स्नातकोत्तर तथा विद्या वाचस्पति कार्यक्रम में क्रमशः 41 और 07 विद्यार्थियों ने प्रवेश प्राप्त किया। इसी सत्र में पशु चिकित्सा विज्ञान स्नातकोत्तर तथा विद्या वाचस्पति के क्रमशः 17 और 10 विद्यार्थियों ने पशु चिकित्सा एवं पशुविज्ञान के विभिन्न विषयों में उपाधि प्राप्त की, साथ ही 39 विद्यार्थियों ने पशु चिकित्सा विज्ञान एवं पशुपालन स्नातक की उपाधि प्राप्त की।
- वर्ष 2018–19 में जैव प्रोद्यौगिकी महाविद्यालय में 24 विद्यार्थियों ने जैव प्रोद्यौगिकी स्नातक कार्यक्रम तथा 05 विद्यार्थियों ने औद्योगिकी सूक्ष्म जीव विज्ञान स्नातक कार्यक्रम में प्रवेश प्राप्त किया। इसी सत्र में जैव प्रोद्यौगिकी में 04, 02 एवं 21 विद्यार्थियों ने क्रमशः विद्या वाचस्पति, स्नातकोत्तर एवं स्नातक की उपाधि प्राप्त की।
- वर्ष 2018–19 में वैटरिनरी फार्मेसी एवं पशुधन प्रसार में डिप्लोमा के लिए क्रमशः 27 और 18 ने विद्यार्थियों ने प्रवेश लिया जबकि 42 तथा 27 विद्यार्थियों ने वैटरिनरी फार्मासिस्ट डिप्लोमा तथा पशुधन प्रसार में डिप्लोमा प्राप्त किया। इसी दौरान बैच 2013, 2014, 2015 तथा 2016 के डिप्लोमा वैटरिनरी फार्मेसी के 157 विद्यार्थियों ने तीन माह के इंटर्नशिप कार्यक्रम को पूर्ण किया ।
- टी. वी. सी. सी. सभी आधुनिक रोग निदान की सुविधाओं से सुसज्जित है तथा इसमें छोटे तथा बड़े पशुओं के लिए शल्य क्रिया हेतु कमरा, पालतू पशुओं के लिए आई. सी. यू., एक्स–रे व अल्ट्रासाउन्ड यूनिट, दन्त चिकित्सा यूनिट, शल्य अणुविक्षण यंत्र, लैपरोस्कोपिक शल्य क्रिया यूनिट, आर्थोपेडिक शल्य क्रिया यूनिट, नेत्र शल्य क्रिया यूनिट हेतु उपकरण तथा नेबुलाईजर की सुविद्या उपलब्ध है। वर्ष 2018–19 के दौरान 13,926 रोगी पशुओं का उपचार किया गया जिनमें से 4826 बड़े रोमन्थी पशु, 1113 छोटे रोमन्थी पशु, 829 अश्व प्रजाति के पशु, 6317 पालतू पशु कुत्ता–बिल्ली, 65 सूकर तथा 776 अन्य पशु शामिल थे। इन सेवाओं से टी.वी.सी.सी. को रू. 7,91,725.00 का राजस्व प्राप्त हुआ।
- टी. वी. सी. सी. की रोग निदान प्रयोगशाला अर्धस्वचालित ब्लड एनालाइजर, बायोकेमिकल एनालाइजर, यूरिन एनालाइजर उपकरणों से सुसज्जित है। वर्ष 2018–19 में 2458 नमूनों का परीक्षण किया गया, जिनमें 2167 नमूने सामान्य खून जाँच, 12 नमूने बायोकेमिकल एनालिसिस तथा 30 नमूने मूत्र एवं दूग्ध के जाँचे गए। इन सेवाऐं से रू.1,89,730 का राजस्व प्राप्त हुआ ।
- वर्ष 2018–19 में पशुचिकित्सा संकाय के शिक्षकों एवं स्नातकोत्तर विद्यार्थियों के द्वारा पशुओं के लिऐ मथुरा जिले के दीनदयाल उपाध्याय, फरह तथा अन्य गांवों में चिकित्सा शिविरों का आयोजन किया गया ।
- पोल्ट्री विभाग के प्रायोगिक प्रशिक्षण यूनिट स्थित पोल्ट्री ब्रीडिंग फार्म, लेयर फार्म तथा हेचरी द्वारा स्नातकोत्तर तथा स्नातक छात्रों को मुर्गी पालन एवं प्रबन्धन व अण्डे सेवन सम्बन्धित विषयों का व्यवहारिक ज्ञान प्रदान करने में महत्वपूर्ण भूमिका निभाई गई। वर्ष 2018–19 में प्रायोगिक प्रशिक्षण यूनिट द्वारा विश्वविद्यालय को 5,99,182/–रूपयों का राजस्व प्राप्त हुआ।
- पशुधन उत्पाद प्रौद्योगिकी विभाग द्वारा संचालित प्रयोगिक प्रशिक्षक कार्यक्रम के अन्तर्गत स्नातक एवं स्नातकोत्तर विद्यार्थियों को दुग्ध प्रसंस्करण एवं दुग्ध निर्मित उत्पाद तथा मॉस निर्मित उत्पादों को बनाने हेतु प्रशिक्षण दिया गया। इस सत्र में 7486.5 लीटर दूध को 1066.54 किलो पनीर एवं 121.40 किलो खोआ में प्रसंस्करित किया गया । विभिन्न मूल संवर्धित मॉस उत्पाद जैसे चिकिन नगेट, चिकिन पेटिज, मीट अचार इत्यादि भी बनाये गये।
- विश्वविद्यालय पुस्तकालय द्वारा KOHA Library open source software कार्यन्वित किया गया

जिससे 2500 पुस्तकों का डाटा बेस एवं बारकोडिंग की गयी।

- पशुपोषण विभाग में चलाए जा रहे फीड उत्पादन एवं प्रसंस्करण परियोजना के अन्तर्गत फीड प्रसंस्करण इकाई तथा यूरिया मोलासिस खनिज ईट इकाई द्वारा विद्यार्थियों को पशुधन के लिऐ संतुलित आहार बनाने का प्रशिक्षण दिया जाता है। इन इकाईयों द्वारा बनाये गये फीड एवं ईटें (यू.एम.एम.बी.) विश्वविद्यालय में उपलब्ध हैं साथ ही इन्हें किसानों एवं गौशालाओं को भी किसान मेले तथा कृषक प्रशिक्षण कार्यक्रम में उपलब्ध कराया जाता है। इस वर्ष विभाग द्वारा खनिज मिश्रण को बेच कर 4.2 लाख रूपये का राजस्व प्राप्त किया ।

अनुसंधान

- विश्वविद्यालय के पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय के विभिन्न विभागों में 19 बाह्य वित्त पोषित परियोजनायें चल रही हैं जिसमें से 04 भारतीय कृषि अनुसंधान परिषद् द्वारा, 02 भारत सरकार के अनुदान द्वारा, 12 राष्ट्रीय कृषि विकास योजना द्वारा तथा 01 एंन्ध्रि इनोवेशन प्रा.लि. हैदराबाद द्वारा पोषित है।
- विभिन्न विभागों में की जाने वाले अनुसंधान पर 10 पी. एच.डी., 17 एम.वी.एससी. एवं 02 एम.एससी. और 04 पी.एच.डी. जैव प्रोद्यौगिकी के शोधग्रंथ पूर्ण किए गए।
- वर्ष 2018-19 में विश्वविद्यालय द्वारा 120 शोध पत्र प्रकाशित किये गये।

प्रसार

- वर्ष 2018-19 में प्रसार निदेशालय ने पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय के सहयोग से विश्वविद्यालय के प्रागंण में 06 प्रशिक्षण तथा पशु ज्ञान चौपाल में 17 भ्रमण किसानों, पशुपालकों एवं अन्य के लिये आयोजित किए। इन प्रशिक्षण कार्यक्रमों द्वारा लगभग 215 किसान एवं 64 पशु चिकित्सक लाभान्वित हुए।
- पशुचिकित्सा एवं पशुपालन प्रसार विभाग द्वारा 115 पशुचिकित्सों के लिऐ 05 प्रशिक्षण एवं 60 पशुपालकों के लिए 02 प्रशिक्षण कराये गये । साथ ही 04 विभिन्न कार्यक्रमों में पशुपालन की नवीनतम तकनीकियाँ प्रदर्शित की गयीं ।
- कृषि विज्ञान केंद्र द्वारा आयोजित कुल 120 प्रशिक्षण में 3089 लोगों ने प्रतिभाग किया जिनमें क्रमशः 97 प्रशिक्षण 2322 पुरुष/महिला कृषकों के लिए, 12 प्रशिक्षण 287 ग्रामीण युवकों के लिए, 10 प्रशिक्षण 455 प्रसार कार्यकर्ताओं के लिए एवं 01 व्यवसायिक प्रशिक्षण 25 महिलाओं के लिए आयोजित किए गये।
- लगभग 434 कृषकों एवं पशुपालकों के ईलाकों में उत्पादन क्षमता बढ़ाने वाली विभिन्न सिद्ध तकनीकियों को प्रदर्शित किया गया।
- स्थानीय पर्यावरण एवं कृषि व्यवस्थाओं में नवीन प्रौद्योगिकी की उपयुक्ता की जाँच के सन्दर्भ में धान पी. बी. 22, बैगन (काशी संदेश), सरसों, प्याज, टमाटर तथा चाबरो मुर्गी के नवीन नस्लों की जाँच की गयी एवं खरीफ 2018 की उपज पर सूक्ष्म पोषक तत्वों के प्रभाव को परखा गया।
- किसानों से जुड़े रहने के लिए गोष्ठियाँ, नैदानिक भ्रमण, किसान मेला तथा किसान सम्मान दिवस आयोजित किये गये। इस वर्ष में 685 मृदा एवं 54 जल के नमूनों की जाँच मृदा एवं जल जाँच प्रयोगशाला में की गयी, जिनकी रिर्पोट के आधार पर 442 लाभार्थियों को संतुलित खाद एवं पानी डालने की क्रिया बताई गयी ।

विश्वविद्यालय प्रक्षेत्र

- एल.एफ.सी. के डी.डी.डी. फार्म पर 2,28,854.00 लीटर दुग्ध का उत्पादन हुआ।
- महाविद्यालय के कुक्कुट फार्म पर विभिन्न प्रजातियों की मुर्गियों जैसे चाबरो, असील, कड़कनाथ, नेक्ड नेक, जापानी तीतर, टर्की, गिन्नी फॉऊल, ऐमू का पालन किया जा रहा है। इनके अण्डों, चूजों तथा कुक्कुट इत्यादि की बिक्री से कुल 7,66,707.00 रूपयों का राजस्व प्राप्त हुआ।
- माधुरी कुण्ड फार्म में 11,166.85 क्विंटल अनाज एवं 3.15 क्विंटल बरसीम का उत्पादन किया गया जिनकी बिक्री से रु. 7,54,3750.00 का राजस्व प्राप्त हुआ।
- चरागाह एवं चारा शोध अनुभाग द्वारा वर्ष 2018-19 में

चारे, दाने तथा भूसे के उत्पादन से रु. 2,43,315.00 का राजस्व प्राप्त हुआ।

- एल.एफ.सी. फार्म द्वारा 18,283.04 क्विंटल हरा चारा, 180.10 क्विंटल गेहू का भूसा, 26.80 क्विंटल जई बीज एवं 168.72 क्विंटल जौ बीज उत्पादित किया।
- इस वर्ष कृषि विज्ञान केन्द्र द्वारा 856.50 क्विंटल ब्रीडरसीड, जिनका मुल्य रु. 27,40,800.00 का उत्पादन किया गया। साथ ही 33244 पौधों व 3296 किलो वर्मिकॉम्पोस्ट की बिक्री से क्रमश: रु. 9983.00 व रु. 9230.00 का राजस्व प्राप्त हुआ।

मानव संसाधन विकास

- पशु चिकित्सा भैषज्य एवं विष विज्ञान विभाग द्वारा भा.कृ.अ.प. प्रायोजित 10 द्विवसीय लघु कोर्स ''वातावरणीय प्रदूषण प्रेरित स्वास्थ्य हानि एवं पशुजन्य खाद्य की गुणवत्ता भरोसा के सन्दर्भ में जीनोमिक व प्रोटिश्वमिक दृष्टिकोण'' का आयोजन 25 अक्टूबर -03 नवम्बर, 2018 को किया गया।
- पशु चिकित्सा शरीर रचना विभाग द्वारा भा.कृ.अ.प. प्रायोजित 21 द्विवसीय शीतकालीन प्रशिक्षण ''रोगनिदान व पशु स्वास्थ्य के लिए उन्नत संरचनात्मक तकनीकियों का उपयोग'' का आयोजन 14 नवम्बर - 04 दिसम्बर, 2018 को किया गया।
- पशु चिकित्सा संकाय के विभिन्न शिक्षकों द्वारा देश/विदेश के अनेक प्रशिक्षण / कार्यशालाओं/ संगोष्ठियों / विचार गोष्ठियों / सम्मेलनों में भाग लिया गया ।

छात्र कल्याण

- वर्ष 2018-19 में 25 विद्यार्थियों ने सूरजभान सरस्वती विद्या मंदिर इंटर कॉलेज, सीकरपुर, खुर्जा में आयोजित एन.सी.सी. के CATC कैंप 40 शिविर में एवं 20 विद्यार्थियों ने आर.वी.सी. सेंटर व कॉलेज, मेरठ छावनी के आर्मी अटॅचमेंट कैंप में भाग लिया। 30 छात्रों ने 'B' सर्टीफिकेट तथा 17 छात्रों ने 'C' सर्टीफिकेट हेतु परीक्षा दी। सभी पंजीकृत कैडेट ने 'स्वच्छता ही सेवा' एवं 'स्वच्छता पखवाड़ा' में भाग लिया। पशु चिकित्सा संकाय की द्वितीय वर्ष की छात्रा कैडेट सोनम कुमारी ने नई दिल्ली में आयोजित गणतंन्त्र दिवस की परेड में उत्तर प्रदेश निदेशालय का प्रतिनिधित्व किया एवं कैडेट सिमरन जोसन सेना अस्पताल में NCC कन्या कैडेट के ATT TRG में प्रतिभाग किया ।
- वर्ष 2018-19 में साहित्यिक एवं सांस्कृतिक कार्यक्रमों का आयोजन हुआ, जिसमें पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय, जैव प्रौद्योगिकी महाविद्यालय एवं डिप्लोमा के छात्रों ने भाग लिया।
- चतुर्थ बी.वी.एससी. एण्ड ए.एच. के 35 विद्यार्थी दिनांक 26 जून, 2018 से 10 जुलाई, 2018 तक दक्षिण भारत शैक्षणिक भ्रमण पर गये।
- 25 से 26 फ़रवरी 2019 को 17वाँ वार्षिक खेल-कूद प्रतियोगिता आयोजित की गई जिसमें टेबल टेनिस, बैडमिंटन, वॉलीबॉल, शतरंज, खो-खो, कबड्डी, हॉकी, क्रिकेट, दौड़-कूद, जेवलिन, शॉर्ट पुट एवं साइकल रेस शामिल थे ।
- वर्ष 2018-19 में विश्वविद्यालय विद्यार्थियों ने विभिन्न राष्ट्रीय/अंतर विश्वविद्यालय प्रतियोगिताओं में भाग लिया जैसे की 02-05 जनवरी, 2019 में पंजाब कृषि विश्वविद्यालय द्वारा आयोजित उन्नीसवां अखिल भारतीय अंतर कृषि विश्वविद्यालीय खेल प्रतियोगिता, 14-15 जनवरी, 2019 में गोविंद बल्लभ पंत कृषि एवं प्रोद्योगिकी विश्वविद्यालय, पंतनगर द्वारा आयोजित राष्ट्रीय अंतर विश्वविद्यालीय वाद-विवाद प्रतियोगिता, 03-07 फ़रवरी, 2019 में सरदार कुशीनगर दांतीवाड़ा कृषि विश्वविद्यालय द्वारा आयोजित एग्रीयूनीफेस्ट 2018-19 तथा 14-16 मार्च, 2019 में गोविंद बल्लभ पंत कृषि एवं प्रोद्योगिकी विश्वविद्यालय, पंतनगर द्वारा आयोजित अखिल भारतीय अंतर पशुचिकित्सा महाविद्यालय बैडमिंटन एवं टेबल-टेनिस प्रतियोगिता व अखिल भारतीय व्यवसायिक सामान्य ज्ञान प्रतियोगिता।
- दुवासु प्रीमियर लीग-2018 (16 सितंबर - 21 अक्टूबर, 2018) में विद्यार्थियों, शिक्षिकों व गैर-शिक्षक कर्मचारियों की 12 टोलियों ने भाग लिया गैर-शिक्षक कर्मचारियों की टोली ने तीसरा दुवासू प्रीमियर लीग स्नातकोत्तर विद्यार्थियों की टोली को हरा कर जीता ।

- विद्यार्थियों में समर्पण, एकता और अखंडता की भावना को जागृत व सुदृढ़ करने के लिए सरदार वल्लभभाई पटेल की 142 वी वर्षगाँठ के उपलक्ष्य पर 31 अक्टूबर, 2018 को एकता के लिए दौड़ आयोजित की गयी ।
- 04 बी.वी.एससी. एण्ड ए.एच. के एवं 01 एम.वी. एससी. के छात्रों ने प्रतिभा छात्रवृत्ति प्राप्त की।
- 06 बी.वी.एससी. एण्ड ए.एच. के एवं 15 एम.वी. एससी. के छात्रों ने भारतीय कृषि अनुसंधान परिषद्, नई दिल्ली द्वारा आयोजित राष्ट्रीय प्रतिभा छात्रवृत्ति प्राप्त की।

अन्य झलकियाँ एवं कार्यकलाप

- विश्वविद्यालय द्वारा प्री वेटनरी परीक्षा–2018, 20 मई 2018 को आयोजित की गई, जबकि प्री– डिप्लोमा प्रवेश परीक्षा–2018 तथा स्नातकोत्तर (एम.वी.एससी. तथा पी.एच.डी.) प्रवेश परीक्षा –2018 क्रमशः 8 जुलाई 2018 तथा 15 जुलाई 2018 को आयोजित की गई। चयनित छात्राओं ने पशुचिकित्सा विज्ञान एवं पशुपालन महाविद्यालय तथा पेरा–पशुचिकित्सा विज्ञान संस्थान के विभिन्न डिग्री एवं डिप्लोमा कार्यक्रम में सत्र 2018–19 में प्रवेश लिया।
- 2013 बैच के बी.वी.एससी. एण्ड ए.एच. छात्रों का शपथ ग्रहण समारोह 19 जुलाई 2018 को आयोजित किया गया तथा इस कार्यक्रम में विद्यार्थियों को अपने पशुचिकित्सा विज्ञान के नीतिपूर्ण सिद्धान्तों को गरिमामय तरीके से निभाने की शपथ दिलाई गई। किसान ट्रस्ट द्वारा दो मेधावी छात्रों, जितेन्द्र सिंह गन्धार तथा प्रभा शर्मा को चौधरी चरन सिंह स्मृति प्रतिभा पुरस्कार भी दिया गया।
- विश्वविद्यालय पुस्तकालय द्वारा परिसर में पशुचिकित्सा विज्ञान एवं जैव प्रौघोगिकी से सम्बन्धित पुस्तक प्रदर्शनी 06 दिसम्वर 2018 को लगाई गई, जिसमें विश्वविद्यालय के शिक्षकों एवं छात्रों ने प्रतिभाग किया।
- पशुचिकित्सा विज्ञान एवं पशु पालन स्नातक, जैव प्रौद्योगिकी स्नातक तथा पेरा–पशुचिकित्सा विज्ञान डिप्लोमा कार्यक्रम में नव चयनित छात्रों का द्वितीय वर्ष के विधार्थियों द्वारा स्वागत किया गया।
- दुवासू ने 25 अक्टूबर 2018 को विभिन्न साँस्कृतिक कार्यक्रमों द्वारा अपना स्थापना दिवस मनाया। इस कार्यक्रम का समापन मुख्य अतिथि तथा विश्वविद्यालय के उच्च अधिकारियों द्वारा साहित्यिक, सांस्कृतिक एवं कला प्रतियोगिताओं के विजेताओं को पुरस्कृत करके किया गया।
- दुवासू मथुरा का आठवाँ दीक्षान्त समारोह 31 अगस्त 2018 को आयोजित किया गया। इस कार्यक्रम की अध्यक्षता उ.प्र. के माननीय राज्यपाल व विश्वविद्यालय के कुलाधिपति श्री राम नाईक जी द्वारा की गई। इस कार्यक्रम में विश्वविद्यालय अनुदान आयोग के अध्यक्ष प्रो. डी.पी. सिंह मुख्य अतिथि थे एवं माननीय राज्य मंत्री, पशुधन, लघु सिंचाई व मत्स्य विभाग, प्रो. एस.पी. बघेल विशिष्ट अतिथि थे।
- विश्वविद्यालय द्वारा पूरे उत्साह से अम्बेडकर जयन्ती, विश्व पशुचिकित्सा दिवस, स्वतंत्रता दिवस, पं. दीन दयाल उपाध्याय जयन्ती, गांधी जयन्ती, गणतंन्त्र दिवस, अंतर्राष्ट्रीय योग दिवस एवं बसंत पंचमी मनाई गयी।

पुरस्कार एवं सम्मान

- डा. रजनीश सिरोही को ICAAAS-2018 द्वारा BRICPL उभरते हुए वैज्ञानिक पुरस्कार से सम्मानित किया गया ।
- डा. विकास पाठक को स्वास्थ्य एवं परिवार कल्याण मंत्रालय, भारत सरकार के अंतर्गत भारत की खाद्य सुरक्षा और मानक प्राधिकरण द्वारा माँस, माँस उत्पाद एवं कुक्कुट के सन्दर्भ में वैज्ञानिक समिति का सदस्य बनाया गया तथा निर्यात निरीक्षण एजेंसी, वाणिज्य एवं उद्योग मंत्रालय, भारत सरकार द्वारा महान दुग्ध खाद्य लिमिटेड, हाथरस में अंतर विभागीय समिति के तहत निरीक्षण के लिए नामित किया गया ।
- डा. श्यामा प्रभु को सरदार कुशीनगर में आयोजित 35वें वार्षिक भारतीय पशु चिकित्सा वि त वैज्ञानिक संघ द्वारा उत्कृष्ट शोध पत्र प्रकाशित करने हेतु डा. सी. एम. सिंह पुरस्कार से सम्मानित किया गया ।
- डा. विकास पाठक एवं डा. मीना गोस्वामी अवस्थी इण्डियन मीट साइंस एसोशिऐशन के क्रमशः उपाध्यक्ष एवं कार्यकारी निकाय सदस्य IMSCAON-VIII कोलकाता में चयनित हुए।

- डा. अभिनव वर्मा को आइजोल में आयोजित 33वें वार्षिक IAVA अधिवेशन द्वारा IAVA युवा वैज्ञानिक पुरस्कार एवं डा. के. एल. सूरी पुरस्कार से सम्मानित किया गया ।
- डा. विजय पांडे को मानव संसाधन विकास मंत्रालय, भारत सरकार द्वारा पोषित भारतीय प्रोद्योगिकी संस्थान, कानपुर एवं NASSCOM के अंतर्गत NPTEL परियोजना द्वारा आयोजित ऑनलाइन NPTEL प्रमाणपत्र कोर्स हेतु स्वर्ण पदक से सम्मानित किया गया।
- डा. रश्मि सिंह एवं डा. विनोद कुमार सिंह को भारतीय पशु शोध पत्रिका द्वारा उत्कृष्ट आलोचक पुरस्कार से सम्मानित किया गया ।
- डा. रूचि तिवारी को बेंथम विज्ञान प्रकाशक द्वारा ब्रांड राजदूत बनाया गया ।
- डा. मुकेश श्रीवास्तव को केंद्रीय लघु पशुचिकित्सक संघ, आगरा की व्यावसायिक संस्था का उपाध्यक्ष एवं VIPM, मथुरा की व्यावसायिक संस्था का कार्यकारी महासचिव बनाया गया ।
- डा. शंकर कुमार सिंह को ISVM के कार्यकारी परिषद् का सदस्य बनाया गया ।
- डा. मधु तिवारी एवं डा. एस. पी. सिंह को श्रीनगर, कश्मीर में आयोजित भा.कृ.अ.प. प्रायोजित 21 द्विवसीय ग्रीष्मकालीन प्रशिक्षण में प्रशंसा पत्र दिया गया
- डा. अमिताव भट्टाचार्य, डा. अभिनव वर्मा, डा. बृजेश यादव, डा. मुकेश श्रीवास्तव, डा. आशीष श्रीवास्तव, डा. शंकर कुमार सिंह एवं डा. मीना गोस्वामी अवस्थी को विभिन्न सम्मेलनों/संगोष्ठियों में उत्कृष्ट पेपर/पोस्टर के लिए सम्मानित किया गया ।
- डा. नीरज गंगवार एवं डा. याजुवेंद्र सिंह क्रमशः पशु आरोग्य मेला एवं मूल्यांकन समिति, राष्ट्रीय कामधेनु व गोपाल रत्न पुरस्कार, पशुपालन, दुग्ध व मत्स्य विभाग, भारत सरकार, नई दिल्ली में विशेषज्ञ के तौर पर योगदान दिया ।

निर्माण एवं अनुरक्षण

- सत्र 2018-19 में भारतीय कृषि अनुसंधान परिषद् विकास अनुदान द्वारा विभिन्न मदों में विश्वविद्यालय को रू. 119.99 लाख की धनराशि प्राप्त हुई। यह मद मुख्य भवन के छत पुनर्निमाण एवं मरम्मत, मुख्य भवन के समीप पार्किंग शेड के निर्माण, शरीर विज्ञान विभाग एवं विकृति विज्ञान विभाग के प्रयोगशालाओं के पुनर्निमाण, दीनदयाल छात्रावास की अलमारियों में लोहे के द्वार लगाने हेतु, खड़जें, नालियों एवं एल.एफ.सी. में शेड के समीप रैलिंग बनवाने में व्यय किया गया ।
- सरकारी सहायता द्वारा प्राप्त 262.61 लाख रूपये विश्वविद्यालय द्वारा चारागाह विभाग के समीप पार्किंग शेड, गैर शैक्षणिक आवासों में स्नानघर, विशिष्ट अतिथि गृह में CC पार्किंग व नालियों का निर्माण, 100 मीटर बाहय दीवार, सरोजनी छात्रावास में अतिरिक्त शौचालयों का निर्माण, एल.एफ.सी. में वीर्य प्रयोगशाला के निकट खड़ंजा बिछवाना, बकरा-बकरी शैडों की बाह्य दीवारों तथा टीचर्स होम कम गेस्ट हाउस एवं नेहरू छात्रावास में ग्रेनाइट लगाने इत्यादि हेतु उपयोग किया गया ।

वित्त एवं बजट

- वर्ष 2018-19 में विश्वविद्यालय को वेतन मद में रू. 4238 लाख एवं कंटीजैन्सी मद में रू. 1209.32 लाख उ.प्र. सरकार द्वारा प्राप्त हुआ।
- भारतीय कृषि अनुसंधान परिषद्, नई दिल्ली द्वारा रु. 293.37 लाख की वित्तीय सहायता विकास एवं सुदृढ़ीकरण के लिए प्रदान की गई।
- इस वर्ष विश्वविद्यालय को कुल रु. 309.22 लाख राजस्व की प्राप्ति हुई।

जनसूचना अधिकार

- उत्तर प्रदेश सरकार के निर्देशों तथा आर. टी. आई. एक्ट 2005 के अनुपालन के क्रम में 35 प्रार्थना पत्र प्राप्त हुए, जिनमें से 27 का निस्तारण किया गया तथा 08 विचाराधीन हैं।

MISSION

University was established by U.P. Govt. in 2001 with the basic objective of imparting quality veterinary and allied education, undertake need-based and basic research, integrate education and research and offer efficient extension services for the farmers and livestock owners.

VISION

- Produce competent and skilled human resource in the field of animal health and production and allied sectors who are socially sensitive and responsible professionals;
- Undertake region-based, need-based and basic research for improving animal health and productivity adopting modern technology;
- Validate indigenous traditional knowledge (ITK) on scientific basis;
- Provide efficient extension services at the doorstep of poor and marginal farmers and livestock owners and motivating them to adopt animal husbandry, poultry, fishery and related vocations as an engine of economic growth and social empowerment ;
- Social empowerment of women to become "knowledgeable stake holders" and giving them economic identity;
- Interface Industry and stakeholders in the newer perspectives of open global market;
- Ensure enhanced production from rural and urban livestock through effective disease surveillance and diagnosis, health care and vaccination programmes;
- Empower rural youth for self-employment adopting integrated farming practices.

MANDATE

University is the premier Veterinary and Animal Science Institution and is known for quality education and research on various aspects of animal health including disease diagnosis and providing advisory and extension services through scientific knowledge and expertise for:

- Strengthening hands on training of students with special emphasis on capacity building;
- Providing opportunity to faculty and staff to improve their scientific and working capacity and capability to make the University a vibrant organization;
- Undertaking need-based, applied and basic research;
- Bringing livestock owners, poor and marginal farmers and rural women to the Center of Technology Information System and catalyze them for continuous improvement in production and productivity of their livestock and economy;
- Collaborate with State Agriculture and Animal Husbandry functionaries, SAU's, Indian Council of Agricultural Research Institutes related to animal health and production, Livestock Industry and NGO's in an attempt to develop resurgent, sustainable, profit oriented market based production system for livestock, poultry, fishery and allied sectors.

CHALLENGES

Concept of integrated farming which includes agriculture, livestock, poultry and fishery has been recognized as "high power engine" for sustainable agricultural and rural economy. Therefore, to translate the idea into reality, it is imperative:

- To produce Veterinarians and other technocrats related to animal health and allied sectors who become "Job providers" not the "Job seekers";
- To substantially improve the faculty strength to a level which not only commensurates with the minimum requirements as per the specifications of Veterinary Council of India for under-graduate teaching; but also to meet the growing demand of faculty for PG teaching.
- To improve laboratory facilities for imparting quality education including training of post-graduate and doctoral degree programme students in an attempt to make them capable enough to meet the current and emerging challenges;
- To re-establish and achieve at par research excellence through optimized internal and external research fund support from the State and Central Govt. agencies;
- To muster sufficient financial support in conformity to what a Veterinary University needs under resurgent economy and global education and trade scenario.

Challenges enumerated above have to be faced through concerted efforts of University Academia with full support from Government of U.P., ICAR and Central Government. .

UNIVERSITY TARGETS

- Revamp teaching programmes and "Teaching Methodologies", set up e-learning class-rooms, introduce net-based "virtual class-rooms" and promote e-teaching and learning;
- Set up "State of the Art" Instructional Livestock Farms, Demonstration Units, Veterinary Clinical Complex, Disease Investigation and Research Laboratories;.
- To achieve at least 15 per cent increase per annum in the number of University graduate and postgraduate students qualifying for national competitive examinations;
- To produce competent and skilled clinicians, entrepreneurs and livestock business managers and team leaders;
- Faculty up-gradation, filling vacant teaching posts and creating faculty positions in newer proposed faculties in the University;
- Encourage faculty members to garner more financial assistance from outside agencies through externally funded research projects and support atleast one University funded research project in each department to give impetus to research;
- As per University Act, to obtain state support for generating trained and competent human resource in fisheries, biotechnology, livestock products technologies and industry and business management through designated colleges/faculties;
- To augment University financial resource and refurbish infrastructure.

INTRODUCTION

Govt. of Uttar Pradesh established U.P. Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishvavidayalaya Evam Go Anusandhan Sansthan, Mathura, first of its kind in the state and fourth in the country, vide Act 27 of 2001 on 25.10.2001 with erstwhile U.P. College of Veterinary Science and A.H., Mathura as its main constituent college with all its movable and immovable assets including land and buildings of Veterinary College, residential complex, hostels, dairy farm and agriculture land. University is having 782.34 acres prime land in Mathura, and another agriculture farm of around 1400 acres at Madhurikund, about 25 Km from the main campus.

Government permitted the University to start College of Biotechnology under self–finance scheme. Accordingly, University started College of Biotechnology from the academic session 2010-11. During 2009, in an endeavor to augment research and extension activities, Directorate of Research and Directorate of Extension were established to coordinate research and extension activities respectively. The Act of University envisaged of opening of three more colleges, namely- College of Fisheries, College of Livestock Products Technology and College of Animal Industries and Business Management. However, these are yet to be started.

ORGANIZATIONAL SET-UP

The organizational set-up of the University (Flow Chart 1) is almost in conformity with other State Agricultural, Veterinary and Academic Universities. Various bodies and authorities of the University exercise their powers at various levels to coordinate and regulate administration, education, research and extension activities.

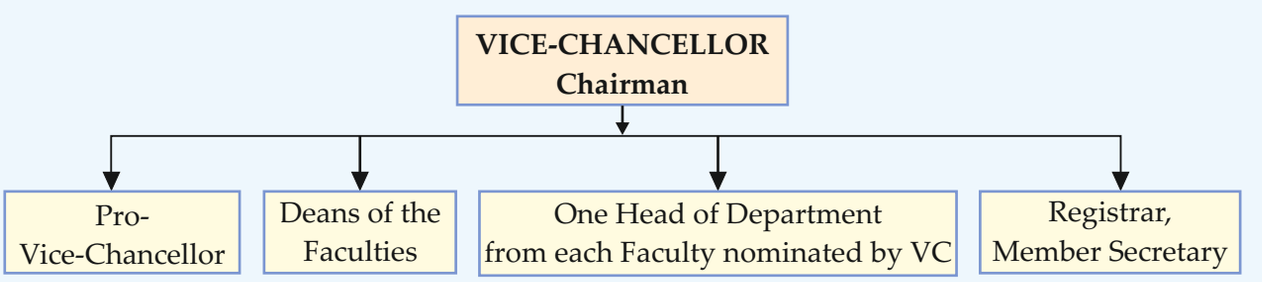
A. AUTHORITIES OF THE UNIVERSITY

1. Executive Council

Executive Council (EC) of the University is the main executive body empowered to monitor, supervise and control the affairs of University. Vice Chancellor is the Chairman of EC and other members of the EC are Principal Secretary Animal Husbandry, Principal Secretary Finance, Principal Secretary Higher Education, Govt. of U.P., Director of Animal Husbandry U.P., one reputed Industrialist nominated by Govt. of U.P., two eminent Veterinarians nominated by the Chancellor on the recommendation of UP Govt., two livestock farmers/breeders nominated by U.P. Govt. and one social worker nominated by Govt. of U.P.

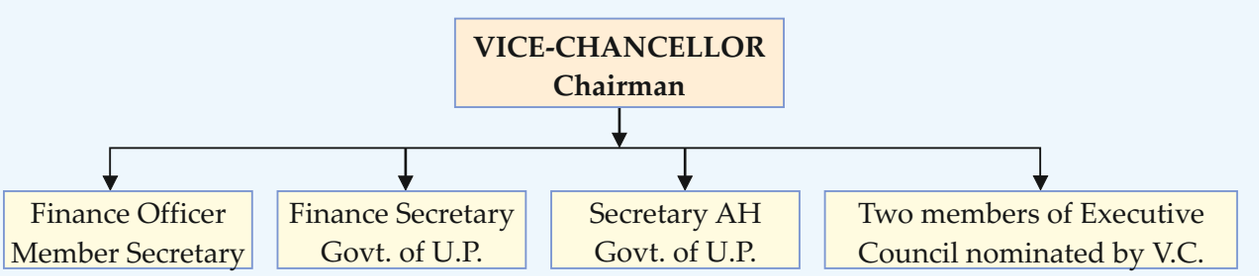
2. Academic Council

Academic Council of the University is the principal academic body which controls and frames all the academic regulations and is responsible for maintenance of standards of instruction, education and examination in the University. The flow chart of Academic Council composition is presented below:



3. Finance Committee

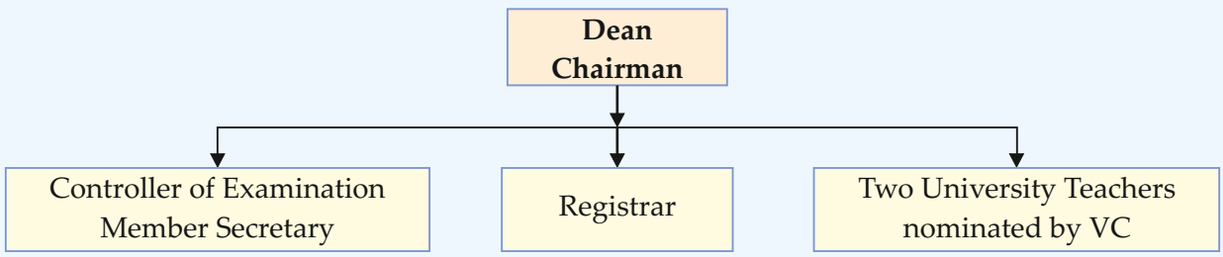
Finance Committee of the University advises the Executive Council on matters relating to administration of property and funds of the University. The flow chart of Finance Committee composition is presented below:



4. Examination Committee

Examination Committee of the University coordinates and supervises all the examinations of the University including Pre Veterinary Test (PVT), appointment of examiners, tabulation and moderation

of results and make recommendations to the Academic Council for improvement in examination system. The flow chart of the composition of the Examination Committee is presented below:

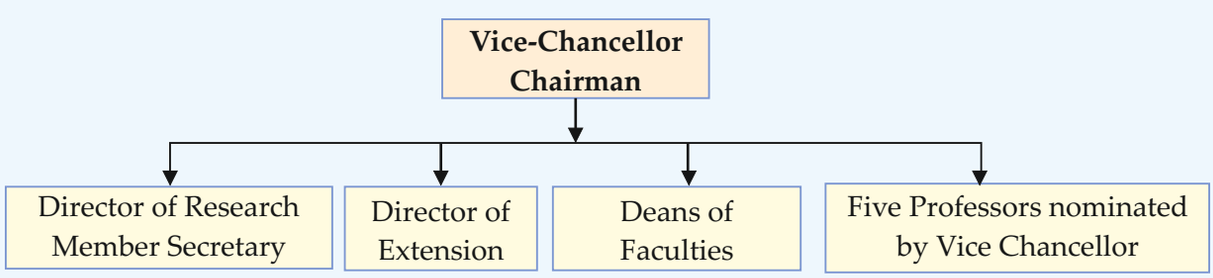


5. Board of Faculty

Board of Faculty is for framing the curricula for undergraduate and post graduate programmes and to make recommendations to the Academic Council for the establishment of new departments, abolition / subdivision / or otherwise reconstitution of the existing departments. Dean of the Faculty is the Ex-Officio Chairman of Board of Faculty, and Faculty Secretary is elected on the basis of consensus amongst the faculty members. All Professors, Associate Professors and Assistant Professors of the faculty are the members of Board of Faculty.

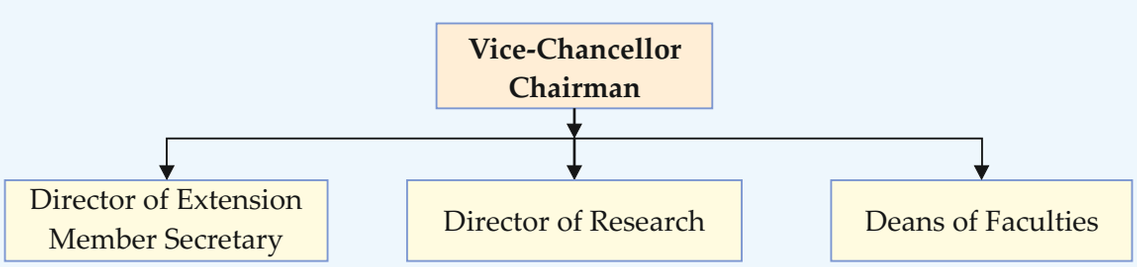
6. Research Advisory Committee

Research Advisory Committee is the policy making body on research activities of the University with Vice Chancellor as its Chairman and Director of Research as the Member Secretary. The set up of this Committee is shown below:



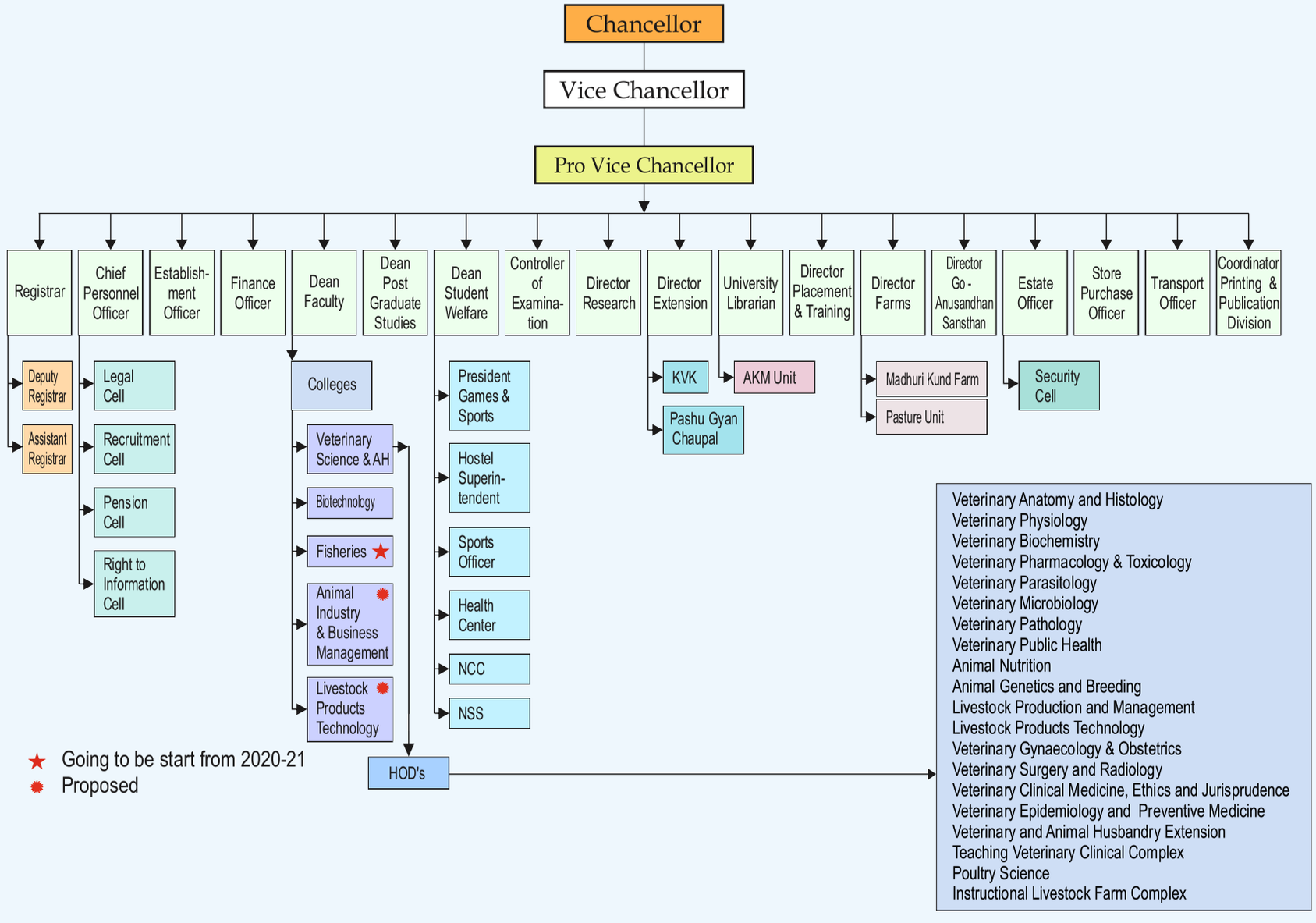
7. Extension Advisory Committee

Extension Advisory Committee is the policy making body on extension activities of the University with Vice Chancellor as its Chairman and Director of Extension as the Member Secretary. The set-up of this committee is as shown here:



Organizational Structure

U.P. Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalya Evam Go-Anusandhan Sansthan (DUVASU), Mathura



B. Organizational Meetings

Executive Council

S. No.	Meeting No.	Date	Venue
1	32nd	15-05-2018	DUVASU, Mathura
2	33rd	30-08-2018	DUVASU, Mathura
3	34th	28-12-2018	DUVASU, Mathura
4	35th	16-02-2019	DUVASU, Mathura

Academic Council

S. No.	Meeting No.	Date	Venue
1.	68th	08-05-2018	DUVASU, Mathura
2.	69th	18-06-2018	DUVASU, Mathura
3.	70th	08-08-2018	DUVASU, Mathura
4.	71st	20-08-2018	DUVASU, Mathura
5.	72nd	24-12-2018	DUVASU, Mathura
6.	73rd	19-03-2018	DUVASU, Mathura

C. Officers of the University

S.No.	Designation / Post	Name of Officer	Date From	Date To
1	Chancellor	Hon'ble Shri Ram Naik Ji, Governor of U.P.		
2	Vice Chancellor	Prof. K.M.L. Pathak	Mar. 03, 2016	Mar. 02, 2019
		Prof. G.K. Singh	Mar. 02, 2019	Continuing
3	Registrar	Prof. P.K. Shukla	Jul. 05, 2016	Continuing
4	Deputy Registrar	Dr. Brijesh Yadav	Jun. 21, 2014	Continuing
5	Finance Officer	Shri. Mukesh Jain	Jun. 22, 2015	Jun. 01, 2018
		Shri Sushil Kumar	Jun. 02, 2018	Continuing
6	Controller of Examination	Prof. Daya Shanker	Aug. 29, 2012	Continuing
7	Dean, C.V.Sc. & A.H.	Prof. Satish K. Garg	Jun. 30, 2009	Continuing
8	Dean, College of Biotechnology	Prof. Rajesh Nigam	Feb. 05, 2013	Continuing
9	Dean, PGS	Prof. P.K. Shukla	Jan. 15, 2013	Continuing
10	Dean, Student Welfare	Prof. M.M. Farooqui	Dec. 05, 2016	Nov. 13, 2018
		Prof. Vikas Pathak	Nov. 14, 2018	Continuing
11	Director of Clinics	Prof. R.P. Pandey	Sep. 18, 2010	Continuing
12	Director of Research	Prof. Atul Saxena	Nov. 24, 2009	Continuing
13	Director Extension	Prof. Sarvajeet Yadav	Nov. 24, 2009	Continuing
14	Director Gau-Anusandhan	Prof. Vikas Pathak	Jan. 03, 2018	Continuing
15	Director of Farms	Prof. Ajay Prakash	May 20, 2015	Continuing
16	University Librarian	Dr. Sanjay Purohit	Nov. 26, 2016	Continuing

TEACHING

Presently in the University, two colleges - College of Veterinary Science and Animal Husbandry and College of Biotechnology are running their degree programmes. The Diploma programmes are going on in the Institute of Paraveterinary Sciences.

A. COLLEGE OF VETERINARY SCIENCE AND ANIMAL HUSBANDRY

College of Veterinary Science and Animal Husbandry was established in 1947 with the aim to generate qualified and well trained veterinarians and address veterinary health and animal husbandry issues in the state, undertake research and ensure the extension services. Later in 2001, it became the main constituent College of the Veterinary University. The College is running three degree programmes, namely- Bachelor of Veterinary Science and Animal Husbandry (B.V.Sc. & A.H. as per VCI regulations), Masters of Veterinary Science (M.V.Sc.) in 16 Disciplines and Doctor of philosophy (Ph.D.) in 15 disciplines as per ICAR academic regulations for higher agricultural education. The strength of teaching faculty of the college during 2018-19 was 82. All the faculty members were involved in teaching, research and extension activities of the College. Besides this, some of the faculty members of the College have also shared the administrative responsibilities of University. Few of the faculty members were also involved in post graduate programme as resource persons in College of Biotechnology.

Admissions of students

Academic programme	Total Students Admitted	Male	Female
B.V.Sc. & A.H.	95	64	31
M.V.Sc.	41	33	08
Ph.D	07	04	03

B. COLLEGE OF BIOTECHNOLOGY

College of Biotechnology is running two academic programmes, namely- B.Sc. (Biotechnology) and B.Sc. (Industrial Microbiology). Faculty members have been appointed on contractual basis for teaching of undergraduate courses, whereas the post-graduate teaching programme was looked after by the faculty of College of Veterinary Science and Animal Husbandry and scientists of ICAR-CIRG, Makhdoom, Farah, Mathura.

Admissions of students

Academic programme	Total Students Admitted	Male	Female
B. Sc. (H) Biotechnology	24	10	14
B. Sc. (H) Industrial Microbiology	05	04	01

C. INSTITUTE OF PARAVETERINARY SCIENCES

College of Veterinary Science & Animal Husbandry initiated two Diploma Programmes i.e. Diploma in Veterinary Pharmacy (DVP) and Diploma in Livestock Extension (DLE) in the year 2013-2014 with one time financial assistance of Rupees ninety two lakhs under Rashtriya Krishi

Vikas Yojna. Initially both the programmes were of two years duration, however on the directions of Government of Uttar Pradesh, three months compulsory internship programme was included in the curricula of Diploma in Veterinary Pharmacy. These diploma programmes were further strengthened by creation of Institute of Para-Veterinary Science for administrative control of Diploma Programmes on 31.03.2017.

The institute has conducted three months of Internship Programme for 157 students of Diploma in Veterinary Pharmacy Batch 2013, 2014, 2015 and 2016 with satisfactory result. On the occasion of National milk day dated 26.11.2018, 50 students of Diploma programme participated in the programme organized by Department of Animal Husbandry, Dairying & Fisheries, Govt of India, New Delhi.

Admissions of students

Diploma programme	Total Students Admitted	Male	Female
Diploma in Livestock Extension	18	17	01
Diploma in Pharmacy	27	20	07

D. ACTIVITIES OF COLLEGE OF VETERINARY SCIENCE AND ANIMAL HUSBANDRY

Apart from routine teaching to students of different academic programme, College is imparting hands on training to students and also serving farmers, livestock owners and companion animal keepers.

1. Teaching Veterinary Clinical Complex (TVCC)

TVCC, the erstwhile Kothari Veterinary Hospital, is multi-specialty veterinary clinic. It is well equipped with state of the art diagnostic laboratory having automatic and semiautomatic blood and biochemical analyzers, urine analyzer, electrolyte machine in addition to conventional laboratory instruments. It's diagnostic imaging section is equipped with 500 mA fixed and 100 mA mobile x-ray unit, ultrasonography, endoscopy, echocardiography, color doppler machine, 9" C-Arm image intensifier, small animal dentistry unit, operating microscope, laproscopic surgery unit, orthopedic surgery instruments, eye surgery instruments, diathermy, multiparameter monitors, oxygenators, nebulizers, general unit for large and small animal and digital radiography unit. In addition to these facilities, there is well equipped operation theatre for small and large animal surgery, well equipped small animal ICU for two dogs, loading and unloading platform and indoor units for large and small animals. This centre provides hands on training to the students of B.V.Sc. & A.H., M.V.Sc. and Ph.D. degree programmes for diagnosis of diseases and treatment of animals. Students are well exposed to variety of clinical cases under the guidance and supervision of learned faculty members.

Clinical services were provided to farmers and animal owners in TVCC and also at the doorsteps of farmers through ambulatory services. Emergency clinical services are provided round the clock by the students under the supervision of teachers of clinical departments. For the farmers and animal owners coming from distant places, facility for their stay is also available.

During 2018-19, total 13,926 clinical cases were treated comprising of cases of 4826 large ruminants, 1113 small ruminants, 6317 pets (dogs/cats), 65 pigs, 829 equines and 776 wild animals/ others in the TVCC and the total revenue generated during the year was Rs. 7,91,725/- (Rupees seven lacs ninety one thousand seven hundred twenty five only).

2. Diagnostic Laboratory

Disease diagnostic laboratory of TVCC is equipped with semi-automatic blood and

biochemistry analyzer, urine analyzer, electrolyte analyzer and slide based dry chemistry analyzer. The laboratory provides diagnostic facilities to livestock and pet owners on no-profit-no-loss basis and this also serves as an important learning unit for undergraduate and postgraduate students. During 2018-19, the laboratory processed total 2458 samples comprising of 2167 blood samples for various blood parameters, 12 serum samples for biochemical analysis, 30 milk and urine samples for culture sensitivity and histopathology tests and generated a revenue of Rs. 1,89,730/- (Rupees one lakh eighty nine thousand seven hundred thirty only).

3. Ambulatory Services and Clinical Camps

The clinical services were provided by the faculty members and post graduate students at farmer's doorstep through clinical camps organized in different villages of Mathura district. The clinical camps at Deen Dayal Upadhayaya Dham, Farah (18.10.2018), Bandi (16.2.2019) and Bhimagadi Shergarh villages assisted in treatment of approx. 74 animals.

E. HANDS ON TRAINING OF STUDENTS UNDER EXPERIENTIAL LEARNING PROGRAMME

1. Poultry Production and Management

The breeder farm, layer farm and hatchery established under Experiential Learning Unit (ELU) in Poultry Science Department served as models for U.G., P.G. and Ph.D. teaching and also to train the students on different activities in these subunits. These subunits also served as models for internship students to train them regarding poultry farming and entre-preneurship. Students were trained in various farm activities pertaining to feeding, watering and management. In addition, the students were also trained on the hatchery operations. The resources of ELU viz. dead birds and embryonated eggs of different stages of development were also provided for educational and research purposes to different departments of Veterinary College. "Entrepreneurial training on poultry production" was conducted for B.V.Sc. & A.H. 2nd Year students from 01/03/19 to 21/04/19. 22 batches of hatches and 15,551 day old coloured chicks (Chabro) were obtained during this period. Further, 267 day old turkey poults, 171 day old guinea fowl keets were obtained during this period. In addition, 2nd year, 3rd Year and Internship students of B.V.Sc. & A.H. and P.G students of the department were trained on hatchery management during this period.

2. Milk and Meat Processing Unit

The Department of Livestock products technology is running Experiential Learning Programme on "Milk & meat processing and livestock product manufacturing". Under this programme, 3rd Professional B.V.Sc. & A.H. students and post-graduate students of the department were given practical training of preparation of different milk and meat products. The surplus milk of Livestock Farm Complex of the College was also processed for different milk products and made available to the employees of the University at the approved rates. During the reporting period 7486.5 liters of milk was processed into 1066.54 kg of Paneer and 121.40 kg of Khoa. Value added meat products like meat nuggets, meat patties and meat pickle were also processed.

3. Feed Production and Processing

Under this project, a feed processing unit and one Urea molasses mineral block unit were installed for which a total of Rs 55.6 lacs were sanctioned. Since the inception of this feed processing unit, a total of 25187.0 quintal concentrate feed of about Rs 4.5 crores value had been prepared from July 2012-March 2019. The University has not procured compounded feed for its farm animals from outside. Feeds produce from this unit is also available to farmers and goshala during Kisan melas and farmers

training. Urea molasses mineral block unit is used for preparing UMMB which are good source of mineral and readily soluble carbohydrates and nitrogen to ruminants during lean period. More than 650 students had been given hands-on training to formulate compounded feed as per the nutrient requirement of livestock. Practical training of students make them self reliant and can serve as microenterprise for student to starts their own ventures after B.V.Sc. & A.H. The unit also prepared area specific mineral mixture about 100 quintal/yr and provided to farmers on nominal cost. This year (2018-19) departmental sale of mineral mixture was about 70 quintal earning a cost of Rs 4.2 lacs.

F. OTHER ACADEMIC ACTIVITIES

1. Library

University library housed in double story building of the erstwhile Veterinary College. In this 125 students can be accommodated at a time. It opens on all working days from 10.00 A.M. to 5 P.M. Presently there are 34865 books in the library. Out of these 34377 books are of various subjects of Veterinary Science and Animal Husbandry and biotechnology and 488 books are of general studies. During financial year 2018-19 total 380 books were purchased. In addition to this, KOHA Library open source software was implemented in which data base of 2500 books were prepared and were bar coded. The theses which available in the library were scanned and loaded on E-Granth Krishi Kosh. One day book fair was also organized on 6th Dec. 2018 for exposure of students to the new books. The library also provides photocopier facility @50 paisa per page to the students.

2. Directorate of Councelling, Training and Placement

(i) Following firms have organized Campus interview at DUVASU, Mathura.

Name of Firm	Date of Interview	No. of students selected
Aarti agrifresh Hapud.	22 May, 2018	**05** students of BVSc & AH
Aarti agrifresh Hapud.	04th May & 07th May , 2018	**10** Diploma students
UPSRLM Lucknow.	08th jun., 2018.	**18** students of BVSc & AH
Amaze Brandlance Pvt Ltd. Mohali Panjab	14th Dec., 2018	10 Diploma students

(ii) Two training classes were organized for students of internship batch BVSc & AH for preparation of ICAR-JRF examination 2019. One for Animal Science and other for Veterinary Science group from 1Feb. 2019 to 31 march 2019.

(iii) Online Question Bank and test series for students of Animal Sc. and Veterinary Sc. for JRF/SRF/NET Preparation by NIPA GENX ELECTRONIC RESOURCES & SOLUTIONS P. LTD. New Delhi.

RESEARCH

A. Infra-Structure Development Projects

S.No.	Name of the Project	Name of PI and Co-PI	Funding Agency	Total Budget (Rs in lacs)
A1.	Entrepreneurial promotion by preparation of specimens from fallen animals	Prof. Archana Pathak Prof. Ajay Prakash, Prof. M.M. Farooqui, Dr. Abhinov Verma Dr. Neeraj Gangwar	RKVY	59.50
A2.	Establishment of referral laboratory for quality evaluation of milk and milk products	Prof. Vikas Pathak Dr. Meena Goswami Awasthi Dr. S.K.Bharti	RKVY	183.40
A3.	Demonstration Unit of Silage making and popularization of low cost silage technology for year round fodder availability for small scale farmers.	Dr. Shalini Vaswani Dr. Vinod Kumar Dr. Muneendrra Dr. RajuKushwaha	RKVY	90.91
A4.	Establishment of small scale feed processing demonstration unit to promote rural youth entrepreneurship. (Part-I)	Dr. Shalini Vaswani Dr. SanjeevKumar Dr. Amit Singh	RKVY	236.27
A5.	Establishment of small scale feed processing demonstration unit to promote rural youth entrepreneurship. (Part-II)	Dr. Shalini Vaswani Dr. SanjeevKumar Dr. Amit Singh	RKVY	190.27
A6.	Strategic control of subclinical parasitism for better animal health and enhanced productivity in Uttar Pradesh	Prof. Daya Shanker Dr. Jitender Tiwari Dr. Vikrant Sudan	RKVY	124.31
A7.	Establishment of environment controlled chamber and calorimetric unit to enhance productivity of livestock in the scenario of climate change in Uttar Pradesh	Dr. Brijesh Yadav Dr. Mukul Anand Dr. Rajneesh Sirohi Prof. Sarvajeet Yadav Prof. Arun K. Madan	RKVY	260.14
A8.	Propagation of Insemination techniques in goats and establishment of semen bank for enhanced productivity and socio-economic upliftment in state of Uttar Pradesh	Dr. Mukul Anand Prof. Sarvajeet Yadav Dr. Brijesh Yadav Prof. P.K. Shukla Prof. Atul Saxena Dr. Muneendra Dr. Anuj Kumar Dr. Shalini Vaswani	RKVY	312.15
A9.	Establishment of Modernized Goat Farm for strengthening Goat Husbandry Practices in State of Uttar Pradesh (Part-I & II)	Dr. Mukul Anand Dr. Madhu Tiwari Dr. Deep Naryan Dr. Mukesh Shrivastva	RKVY	612.00

A10.	Establishment of semen analytical laboratory for semen certification quality assurance of breeding buck semen	Dr. Mukul Anand Prof. Sarvajeet Yadav Prof. A.K. Madan Dr. Brijesh Yadav Dr. Dilip Swain	RKVY	169.00
A11.	Strengthening of semen analytical laboratory for semen certification quality assurance of breeding buck semen	Dr. Mukul Anand	RKVY	138.80
A12.	Strengthening of clinical facilities at university referral clinic for benefit of farmers and livestock owners	Dr. Sanjay Purohit Dr. Mukesh Srivastava Dr. Shankar Singh Dr. Vikas Sachan	RKVY	225.04

B. Extra-mural Research Projects

S.No.	Name of the Project	Name of PI and Co-PI	Funding Agency	Total Budget (Rs in lacs)
B1.	Mechanistic insights into the signal transduction pathways of Progesterone in regulating functional dynamics in bovine and caprine spermatozoa-[BT/PR27446/AAQ/1/717/2018]	Dr. Dilip Kumar Swain Dr. Somen Chaudhary	Department of Biotechnology (DBT), Govt. of India	84.98
B2.	Outreach programme on Ethno-Veterinary Medicine "Pharmacological studies and development of polyherbal formulation for reproductive disorders in animals"	Dr. Somen Chauduary Prof. S.K. Garg Dr. Amit Shukla Dr. Ajay Pratap Singh (Associated Scientist) Dr. Shankar Singh (Associated Scientist)	ICAR	5.05
B3.	Outreach Programme on Zoonotic Diseases-Verocytotoxic E. Coli	Dr. Udit Jain Dr. Barkha Sharma	ICAR	5.59
B4.	All India Network Programme on Diagnostic imaging and management of surgical conditions of animals	Dr. Sanjay Purohit Dr. Gulshan Kumar	ICAR	10.5
B5.	AICRP on Nutritional and Physiological interventions for enhancing reproductive efficiency in animals	Prof. Atul Saxena Dr. Shalini Vaswani Dr. Dilip Swain Dr. Vikas Sachan	ICAR	Non-Funding Center
B6.	Clinical trial of liquid feeding diet in dog.	Dr. Mukesh Srivastava Dr. P.N.Panigrahi	Aindhri Innovation Pvt. Ltd. Hyderabad	0.30
B7.	Conservation and Genetic improvement of Muzaffarnagari sheep for multiplication of superior germplasm	Dr. Deepak Sharma Dr. Madhu Tiwari	DAHDF, Ministry of Agriculture, GOI	79.66

PROJECT REPORTS

Project-A1 Enterpreneurial promotion by preparation of specimens from fallen animals

In R.K.V.Y project, during 2018-19, equipments and chemicals were procured. The construction work of lab was in progress. Many dried museum specimens, wet specimens were prepared, and preparations of many are in progress.

Project-A2 Establishment of referral laboratory for quality evaluation of milk and milk products

Several equipments were procured viz. Automatic Soxhlet Extraction system, Automatic Kheldahl Extraction system, PAGE, Gerber centrifuge, Refrigerated centrifuge, Milk analyzer, Somatic cell counter, Autoclave, Deep freeze, Refrigerator, Bio-safety cabinet, Bomb calorimeter, weighing balance, Hot air oven, Incubator, Digital water bath, Muffle furnace, Analytical balances, Millipore water purification system, Magnetic stirrer with hot plate, pH meter.

Project-A3 Demonstration Unit of Silage making and popularization of low cost silage technology for year round fodder availability for small scale farmers

During 2018-19, under this project two bunker silos along with the store unit had been constructed at ILFC. Facelift of laboratory at the Department of Animal Nutrition had been completed. About 40 tonnes silage of sorghum and 15 tonnes silage of maize was prepared in the bunkers and approx. 5 tonnes of bag silo was prepared and distributed to farmers. The research trials of two M.V.Sc. scholars in Department of Animal Nutrition were conducted from the prepared silage. One-day sensitization workshop on silage was also conducted in which silage preparation techniques were demonstrated to about 400 farmers. Under the project various instruments were purchased that are now utilized for analysis of silage and also sample analysis by the faculty and students of the University. The silage preparation technique using silo pack machine was also demonstrated to about 5000 farmers and livestock owners at Krishi Kumbh Lucknow. Presently, we are also receiving demand for silage from the different parts of the state.

Project-A4 & A5 Establishment of small scale feed processing demonstration unit to promote rural youth entrepreneurship (Part-I) and (Part-II)

During 2018-19, construction of demonstration unit and purchase of instruments and other equipments is under progress. The training and workshop will be held shortly after the completion of the construction work and purchase process. Youths from villages will be trained for self employment under the project.

Project-A6 Strategic control of subclinical parasitism for better animal health and enhanced productivity in Uttar Pradesh

Under this RKVY project, during 2018-19, renovation work had been done in the department. Under this two pre existing laboratories has been modified for molecular works and other sophisticated instruments. Renovation of other chambers and laboratories had also been done under the project. Under the project some major instruments like Thermocycler, (-20^{0}C deep freezer), 4^{0}C cooling cabinet, BOD incubator were purchased to modernize the laboratory facilities for research work.

Project-A7 Establishment of environment controlled chamber and calorimetric unit to enhance productivity of livestock in the scenario of climate change in Uttar Pradesh

The project envisages the establishment of building of a psychrometric chamber having facilities to accommodate six large animals, six calorimetric chambers (two for large animals and four for small animals) and construction/repair of laboratories equipped with instruments

capable of real time gas analysis produced by the animals in the calorimetric chamber, hematological, biochemical, genomic and proteomic analysis of different types of samples. Biospectrophotometer, Thermocycler, Real Time PCR, gel documentation system, 2D Gel electrophoresis system, refrigerated centrifuge, spectrophotometer, Blood analyzer, deep refrigerator (-80ºC), refrigerator, online UPS, weighing balance, pH meter, distillation unit, pipettes, magnetic stirrer, autoclave, incubator, vortex mixture and water bath had been purchased and most of the instruments are installed and in use. The construction of psychometric chamber is 95 % completed whereas construction of calorimetric unit is in progress. The psychrometric chamber will be used to simulate different types of environment i.e. from extreme cold to extreme hot dry and hot humid conditions by changing different temperature and humidity combinations. Thus this chamber can be used to study the heat tolerance of different breeds of livestock and poultry in the scenario of climate change. The calorimetric chamber will be used to collect basic and applied information about gas (Methane and Carbondioxide) emission from different ruminant population and recommending the apt methodologies to mitigate the effect of climate change.

Project-A8 Propagation of Insemination techniques in goats and establishment of semen bank for enhanced productivity and socio-economic upliftment in state of Uttar Pradesh

- A state of art facility for evaluation of goat semen- "Semen evaluation and analytical laboratory" was established. Commercial cryopreserved semen production unit was established and production of frozen semen straws for goats was started.
- Dairy Goat complex and milk product production center was developed at university farm.

Project-A9 Establishment of Modernized Goat Farm for strengthening Goat Husbandry Practices in State of Uttar Pradesh (Part-I &II)

Under the project different components under Dairy Goat Unit had been constructed in 2018-19 that included cryopreserved semen production center, Semen analytical and certification unit, Modernized buck shed, goat sheds while some units that include Machine milking parlour, mini auditorium, product utilization unit, clinical complex, quarantine shed are under construction. Elite bucks and goats of the Barbari and Jamunapari breeds had been purchased from their native tract. Animals are being reared on intensive feeding system and are now well adapted to this new system of rearing under the project. Purchase of almost all the equipments is completed. The research experiments of MVSc scholars of Department of Animal Nutrition and Veterinary Physiology were also conducted with the developed facilities under this project. Two days training of Veterinary officers of state was also conducted, in which hands on training on Artificial insemination techniques in goats were imparted. In the training about 50 Veterinary officers and nearly 350 farmers participated and were benefitted. The A.I. technique in goats was also demonstrated to the goat farmers and livestock owners at Krishi Kumbh Lucknow.

Project-A10 Establishment of semen analytical laboratory for semen certification quality assurance of breeding buck semen

For the first time in Uttar Pradesh, commercial production of cryopreserved goat semen has been started and is available for sale. The unit will produce approximately 1 lacs doses of cryopreserved semen per year for its sale and distribution in Uttar Pradesh and other adjoining states as per the requirement. Presently, cryopreserved semen of Jumunapari and Barbari breed is being prepared, but the facility will be extended for Sirohi, Beetle, Jakhrana and Black Bengal goat breeds in upcoming months. Also, the university is in process to develop the channel for goat milk that will be an addition source of income for the goat rearers that will help them to

improve farm income and stimulate goat rearing in Uttar Pradesh.

Project-A11 Strengthening of semen analytical laboratory for semen certification quality assurance of breeding buck semen

- A state of art facility for evaluation of goat semen- "Semen evaluation and analytical laboratory" was established. Commercial cryopreserved semen production unit was established and production of frozen semen straws for goats was started.
- Dairy Goat complex and milk product production center was developed at university farm.

Project-A12 Strengthening of clinical facilities at university referral clinic for benefit of farmers and livestock owners

RKVY project entitled as "Strengthening of clinical diagnostic and therapeutic facilities at university referral hospital for benefit of farmers and livestock owners" is running in TVCC and Surgery department to strengthen the diagnostic and therapeutic faculties. Under this project total 225.04 lakhs were released for construction of operation theatre for large animals and to procure the equipments. Out of this total 33.16 lakhs were released for construction of operation theatre. About 80 per cent construction work is completed and remaining work is on progress. The purchasing of the equipment/ instruments is under process.

Project-B1 Mechanistic insights into the signal transduction pathways of Progesterone in regulating functional dynamics in bovine and caprine spermatozoa-[BT/PR27446/AAQ/1/717/2018]

- Functional presence of Hv1, CB1, CB2 and TRPV1 had been confirmed in bull and buck spermatozoa.
- Functional presence of non-genomic progesterone receptor had been confirmed in bull and buck spermatozoa.
- Extracellular pH regulates sperm motility as well as hypermotility.
- Acid extrusion is dependent on activation of Hv1 channels.
- TRPV1 channels promote sperm capacitation.
- Sperm specific Catsper inhibition reduces hypermotility in spermatozoa.
- Cryopreserved spermatozoa showed reduced sensitivity to non-genomic P4 and thereby indicate poor fertilizing ability of spermatozoa.
- Ligand binding and immunoblotting of both buck and bull spermatozoa confirmed the presence of non-genomic P4 receptors on spermatozoa.
- Non-genomic P4 signalling is mediated through MAPK pathway. Inhibition of MAPK abolishes P4 mediated actions in the sperm cells.
- P4 in higher concentrations inhibit capacitation whereas at low concentrations stimulate capacitation in both buck and bull spermatozoa.

Project-B2 Outreach programme on Ethno-Veterinary Medicine "Pharmacological studies and development of polyherbal formulation for reproductive disorders in animals"

From the clinical cases of endometritis (34 cows and 36 buffaloes), total 62 bacterial isolates were collected. Among them 40 isolates were found to be ESBL positive. The most prevalent ESBL organisms in the uterine lumen were found to be *Escherichia coli* (64.5%) followed by *Klebsiella* spp. (11.2 %). Four isolates were suspected to be methicillin resistant *Staphylococci,* however, based on the biochemical and genetic analysis, one isolate was confirmed as methicillin-resistant *Staphylococcus. Eucalyptus robusta* and *Polyalthia longifolia* leaves methanolic extracts were not effective against standard ESBL organism however, both of them were found to be effective against methicillin resistant *Staphylococcus*. Determination of fractional inhibitory concentration (FIC) for either of the extract against oxacillin produced indifferent

action. Electron microscopy (TEM) studies revealed that both the plant extracts targets the cell wall and cell membrane to produce antibacterial action. They were also shown to disrupt the cytoplasmic contents along with nuclear materials. However, *Eucalyptus robusta* was found to be more effective in producing antibacterial action. Addition of the either of the plant extract with oxacillin did not produce any additive antibacterial action when compared to the action of individual extract alone. The efficacy of *E. robusta* leave methanolic extract was evaluated in surgically-induced endometritis model. The endometritis was induced by the clinical isolate of methicillin resistant *Staphylococcus*. Oral administration of *E. robusta* leaves extract (@ 25 mg/kg b.wt. for 5 days) was significantly more effective in reducing the uterine bacterial load and uterine secretion index as compared to the test positive drug (cefixime @ 20 mg/kg b.et orally for 5 days).

Project-B3 Outreach Programme on Zoonotic Diseases-Verocytotoxic E. Coli

Brucelloses:

- A total of 2640 samples were collected comprising 1218 milk samples of cattle(652) and buffalo(566), 520 serum samples of cattle(336) & buffalo(184), 135 from sheep, 113 from goat, 559 from human serum and 95 samples received from outbreak (Jhansi, Jalon & Lalitpur).
- A total of 1218 milk samples were collected from cattle and buffalo from 5 districts viz. Mathura, Agra, Hathras, Kasganj and Aligarh.
- The number of milk samples positive by I-ELISA was more in cattle 6.13% in comparison to buffalo 4.77%
- A total of 520 serum samples were collected form cattle and buffalo. 50(9.61%) samples positive by I-ELISA.
- A total of 248 serum samples from sheep (135) and goats (113) were collected. The percent positivity were 1.48% (2/135) in sheep, 10.61% (12) in goat serum samples.
- 559 Human sera samples were collected. 21/559 were found positive with 3.75 %.
- In abattoir 8.33% female and 6.66% male workers was positive.
- In Agra and Hathras districts, the prevalence of brucellosis was 7 (14.58%) and 8 (18.60%) due to poor hygiene and lack of awareness.
- In Mathura district, the prevalence was more in Gaushalas of Vrindavan i.e. 28(9.42%). This might be due to the reason that gaushala owners followed natural service practices and improper disposal of aborted materials.
- Received samples from Government state farms like State livestock cum agriculture farm, Bharari Jhansi. The percent positivity of brucellosis in cow milk (24.07%) and cow serum (50.0%) were found very high. It shows the outbreak like condition. Proper screening of all animals should be required.
- From Govt sheep and Goat farm Orai, Jalaun, 10 serums were received and tested for brucellosis. Out of 10, 5 were found positive by I-ELISA. (NIVEDI, Bengaluru Kit).
- The concerned farmers were informed about the situation and they have started action.

Verocytotoxic *E.coli* (VTEC):

- During the period under report, a total of 296 samples comprising 96 poultry farm samples & 200 clinical samples were tested which comprised of poultry cloacal swab (60) and its environmental sources samples (36), animal clinical samples (fecal, Pus, Urine) (70) and Human clinical samples (fecal, Pus, Urine) (65) & Environmental sources (Hand, Table, Trevis, Instrument swabs) (65), were collected and processed for detection of *E.coli*, VTEC and antimicrobial resistance and biofilm production (Congo red dye assay and molecular method by LuxS gene).
- Overall Percent positivity of VTEC was 2.02 % (6/296).
- In Poultry samples- Overall percent positivity was 4.16% (4/96) {samples collected from Poultry Farm of Shonkh, Adeeg, Baad, DUVASU, Farah and Goverdhan}

- Overall percent positivity in clinical samples of animal, human & their environment samples was 1.00% (2/200) (Intestinal & extra intestinal)
- In Animal clinical samples- 2.85% (2/70), comprising of 3.33% (1/30) positive in Animal fecal & 5.00 %(1/20) in Animal urine. VTEC was absent in pus samples (20) VTEC were also absent in all Human & Environmental sources.
- Drugs which were found sensitive- Imipenem (100%),
- Drugs which were found Resistance- 100% resistance in Oxacillin, Ampicillin, Vancomycin, Cefotaxime and Linezolid.
- Pathogenecity results: Congored dye binding ability of VTEC isolates - 4/6 (66.66%) and other *E.coli* (Non-VTEC) isolates, showing biofilm production -7/12- (58.33%)
- All 60 *E.coli* also tested for NdvB (gene responsible for antibiotic resistance in biofilm producing *E. coli* isolates), rfbO111 and rfbO157 genes. All were found negative after molecular confirmation.
- All 60 *E.coli* further tested for LuxS genes (biofilm production), 18 isolates were found positive. (These 18 isolates comprising of 6 VTEC isolates and 12 Non VTEC isolates)
- Submission of 21 Verotoxic *E.coli* at NC-VTC, ICAR-NRC on Equines, Hisar (2017-18) and got accession no's of 17 VTEC isolates(2018-19).
- 15 genes were submitted to NCBI GenBank in the year 2017-18, we got accession no. of 8 VTEC genes in this year.
- 35 *E.coli* isolates were submitted for serotyping to National Salmonella and Escherichia center, CRI, Kasauli, H.P.
- 15 genes were submitted for sequencing to Invitrogen Bioservices India Pvt Ltd, Gurgaon, Harayana.

Project-B4 All India Network Programme on Diagnostic imaging and management of surgical conditions of animals

All India Network Programme on Diagnostic Imaging and Management of Surgical Conditions in Animals (AINP-DIMSCA) is running in the Department of Veterinary Surgery and Radiology to strengthen the diagnostic imaging faculties and to manage surgical cases with good outcome. Rs. 10.96 lakhs (3.00 under equipment head, 6.22 under operational expenses and 0.50 for travelling expenses + In SCSP-0.92 under operational expenses and 0.32 under equipment head) allocated for financial year 2018-19. Out of these Rs 10.96 lakhs were utilized to purchase electrocautery, anaesthetics, suture material, hospital disposables (antiseptics, cotton, bandage, catheters, gloves, syringes,) training expenses etc. Two training programmes were organised for practicing veterinary officers of Animal Husbandry Department of U.P.

First short training (6 days) on diagnostic imaging techniques was organized from 17-22 December, 2018 for veterinary officers of the state animal husbandry department.

Project-B5 AICRP on Nutritional and Physiological interventions for enhancing reproductive efficiency in animals

- Double synch protocol of synchronization was carried out in nine (09) anestrus Sahiwal heifers. Animal were treated as per the standard protocol (Day 0-7-9-11) using PG-GnRH-PG-GnRh (PG@ 500ug and GnRh @ 20 microgram) with AI (Fixed time) conducted approx 16-18 hr after the end of treatment. All inseminated animals were diagnosed for pregnancy using sonography.
- Out of 09 animals, none conceived on induced oestrus, however, in subsequent oestrus, one (01/09=11.11%) conceived.
- Heatsynch protocol of synchronization was carried out in ten (10) anesturs Sahiwal heifers. Animal were treated as per the standard protocol (Day 0-7-8) using GnRH-PG-EB (GnRh @ 20 microgram, PG@ 500ug

and estradiol benzoate @ 1 mg) with AI (Fixed time) conducted approx 16-18 hr after the end of treatment. All inseminated animals were diagnosed for pregnancy using sonography.

- Out of 10 animals, none conceived on induced oestrus, however, in subsequent oestrus, three (03/10=30%) conceived.
- Double Prostaglandin protocol of synchronization was carried out in 25 anestrus buffaloes using two prostaglandin injections (500ug) given at 11 days apart. Animals were inseminated fixed time (between 72h - 80h) using cryopreserved semen.
- Similar protocol was carried out in thirty (30) anestrus Sahiwal cows. Out of 30 animals, twenty four (24) were inseminated with sexed semen, while the remaining (06) animals were inseminated with standard cryopreserved semen.
- Out of 25 animals, six (6/25=24%) animals conceived at induced estrus. On subsequent estrus, five (5/19= 26.3%) animals conceived.

Project-B6 Clinical trial of liquid feeding diet in dog

Four liquid diets from aindhri Innovations Pvt. Ltd. (Super Recovery, Renal Care, Gastro-intestinal and Cardio Care) were clinically assessed for improvement in body condition score, body weight, skin and coat quality, effectiveness, palatability and digestibility etc. Assessment was done for three days only and it was purely subjective i.e. does not involve any blood sampling or other specific test. The diagnosis of disease condition was done as per routine diagnostics at TVCC.

Project-B7 Conservation and Genetic improvement of Muzaffarnagari sheep for multiplication of superior germplasm

In "Conservation and Genetic improvement of Muzaffarnagari sheep for multiplication of superior germplasm" Project, initially nucleus herd was created by purchasing 40 healthy sheep (30 female and 10 male) of age between 12-18 months with breed true physical features and in four year 270 lambs (males and females) were obtained which led to more than 675% increase in the total flock size making the total flock size of nucleus herd as 310 animals. There was no significant increase in body weight in subsequent years due to increased number of twinning. Studies indicate that due to twinning the birth weight of twins is less than a single born lamb and birth weight is highly correlated with body weight of adults, subsequently a non-significant variation in body weight of lambs was observed. The twinning rate in Muzaffarnagari sheep at DUVASU, Mathura farm was about 26%, though in field conditions the twinning rate is normally 2-5% only. This trait could help in validating presence of fecundity genes in Muzzafarnagari sheep. The mortality recorded in the year 2014-15, 2015-16 and 2016-17 were 5.5%, 6.2% and 2%, respectively. 110 breeding rams were distributed in respective breeding tract of Muzaffarnagari breed (Meerut, Muzzafarnagar, Hapur, Bijnor) to propagate purebred animals as this was the ultimate aim to conserve critically threatened breeds. Morever, 170 ewes and 10 breeding rams were transferred to U.P. Animal Husbandry governed State Sheep and Goat Farm, Jalaun, U.P. for further propagation.

PROJECTS OF POST GRADUATE STUDENTS COMPLETED DURING 2018-19

A. List of Ph.D. and M.V.Sc./M.Sc. Theses completed

S.N.	Title of Thesis	Name of the Student	Name of the Guide	Subject
Ph.D. : Veterinary Science				
1	Molecular pathology and transcriptional profiling of enterotoxaemia in adult goats	Dr. Neeraj Kumar Gangwar	Dr. R.V.S. Pawaiya	Veterinary Pathology
2	Endothelium-dependent and Endothelium-independent relaxation pathways in uterine artery of buffaloes (*Bubalus bubalis*)	Dr. Udayraj P. Nakade	Prof. Satish K. Garg	Veterinary Pharmacology and Toxicology
3	Studies on Toxicodynamic of chromium with particular reference to its effect on myometrial activity in rat	Dr. Shirish Bhatiya	Prof. Satish K. Garg	Veterinary Pharmacology and Toxicology
4	Evaluation of excretory secretory antigen as a candidate for serodiagnosis of caprine amphistomosis	Dr. Amit Kumar Jaiswal	Prof. Daya Shanker	Veterinary Parasitology
Ph.D. : Biotechnology				
1	Development of omp31 protein based ELISA for diagnosis of ovine and caprine brucellosis	Ajay Singh	Prof. Rajesh Nigam	Biotechnology
M.V.Sc.: Veterinary Science				
1	Effect of varying dietary neutral detergent fibre levels on growth performance of heat stressed heifers	Dr. Vivek Kr Yadav	Dr. Vinod Kumar	Animal Nutrition
2	Effect of inorganic and nano zinc supplementation on performance and immune response in growing heifers.	Dr. Sharish Kumar	Dr. Vinod Kumar	Animal Nutrition
3	Investigation of the effects of dietary nickel supplementation on the performance of growing heifers	Dr. Anil Kumar Singh	Dr. Muneendra Kumar	Animal Nutrition
4	Effect of green fodder replacement with corn silage on residual metabolizable feed consumption (RMFC) in growing cattle	Dr. Ashwani K Verma	Dr. Muneendra Kumar	Animal Nutrition
5	Effect of Vanadium supplementation on performance of indigenous heifers	Dr. Praveen K Gupta	Dr. Shalini Vaswani	Animal Nutrition
6	Study on the marginalized dairy production scenario in the urban and peri urban areas: an exploratory study	Dr. Shivani Singh	Dr. Amit Singh	Veterinary Extension
7	Entrepreneurial and Adoption Behaviour of Rural Youth in Animal Husbandry Practices	Dr. Sandeep Singh	Dr. Sanjeev K. Singh	Veterinary Extension

8	Impact of supplementation of lukewarm water during winter season on performances of dairy cows	Dr. Dikshant Kanwar	Dr. Yajuvendra Singh	LPM
9	Study on development and shelf life assessment of functional smoothie using milk of indigenous cows	Dr. Brijesh Kumar	Dr. V.P. Singh	LPT
10	Morphological , Histological and Certain histochemical Studies on Thyroid Gland of Chabro Chicken Reared in Summer and Winter Seasons	Dr. Amit Singh Vishen	Dr. Varsha Gupta	Veterinary Anatomy
11	Morphological, histological and histochemical studies on the post hatch development of the bursa of fabricius in Chabro bird	Dr. Anand Singh	Dr. Shriprakash Singh	Veterinary Anatomy
12	Gross, histological and certain histochemical studies on the pancreas of Chabro Chicken	Dr. Renu Yadav	Prof. Ajay Prakash	Veterinary Anatomy
13	Effect of Melatonin on cryopreservation of Hariana bull spermatozoa	Dr. Dilip Kumar Yadav	Dr. Anuj Kumar	Veterinary Gyanecology & Obstetrics
14	Functional characterization of TRPV1 channel in bull spermatozoa	Dr. Akshay Kumar	Dr. Vijay Singh	Veterinary Gyanecology & Obstetrics
15	Studies on effect of trehalose on cryopreservation of Harianan bull spermatozoa	Dr. Gyanesh Kumar	Prof. Atul Saxena	Veterinary Gyanecology & Obstetrics
16	Studies on effect of soya milk based extender on cryopreservation of Harianan bull spermatozoa	Dr. Manoj Kumar Yadav	Prof Atul Saxena	Veterinary Gyanecology & Obstetrics
17	Evaluation of oxidant and antioxidant status of dogs affected with sarcoptic mange and its amelerioation by using antioxidant	Dr. Ankur Upadhyaya	Dr. Mukesh K. Srivastava	Veterinary Medicine
18	Evaluation of ameliorative effect of herbal drugs on oxidative stress and thrombocytopenia in dogs.	Dr. Amangeet Parashar	Dr. Mukesh K. Srivastava	Veterinary Medicine
19	Evaluation of Therapeutic Potential of Certain Homeopathic Preparations in Canine Atopic Dermatitis.	Dr. Sujeet Kr. Chaudhary	Dr. Shankar Kumar Singh	Veterinary Medicine
20	Mechanistic study on vascular dysfunctions in septic mice with pre-existing diabetes	Dr. Manju Gari	Prof. Satish K Garg	Veterinary Pharmacology and Toxicology
21	Study on the effect of oleic acid in isoprenaline-induced myocardial injury in rats	Dr. Pawan Kumar Singh	Dr. Soumen Choudhury	Veterinary Pharmacology and Toxicology

22	Studies on *Gymnema sylvestre* and ITK formulation for therapeutic management of cardiomyopathy in type II diabetic rats	Dr. Chandan Patil	Dr. Atul Prakash	Veterinary Pharmacology and Toxicology
23	Studies on therapeutic potential of *Tribulus terrestris* on diabetic nephropathy in Wistar rats	Dr. Priyanka Rajput	Dr. Atul Prakash	Veterinary Pharmacology and Toxicology
24	Molecular characterization and antimicrobial resistance of pathogenic strains of *E. coli* in poultry, poultry products and its environmental sources with public health significance	Dr. Neha Saini	Dr. Udit Jain	Veterinary Public Health
25	Canine Oculopathies- A Clinical Study on Incidence, Diagnosis and Surgico-therapeutic Management	Dr. Rajesh Kumar Pathak	Prof. R. P. Pandey	Veterinary Surgery & Radiology
26	Radiographic, Electrocardiographic and Echocardio-graphic Studies in Goats	Dr. Vimlesh Kumar	Dr. Sanjay Purohit	Veterinary Surgery & Radiology
27	Studies on ultrasonography of adrenal glands of dogs	Dr. Akash	Dr. Gulshan Kumar	Veterinary Surgery & Radiology
28	Clinical Studies on Upper Gastrointestinal Endoscopy in Dogs	Dr. Ajeet Kumar	Dr. Vivek Malik	Veterinary Surgery & Radiology
M.V.Sc. / M.Sc. : Biotechnology				
1	Functional Characterization of Voltage-gated Proton Channel (Hv1) In Bull Spermatozoa	Dr. Abhishek Mishra	Dr. Dilip Kr Swain	Biotechnology
2	Genetic polymorphic studies of fecundity genes in Muzaffarnagari sheep breed	Parul Singh	Dr. Deepak Sharma	Biotechnology
3	Heat shock protein 70 and redox status in fluid and spermatozoa in different segments of buck epididymis	Akhilesh Kumar	Dr. Brijesh Yadav	Biotechnology

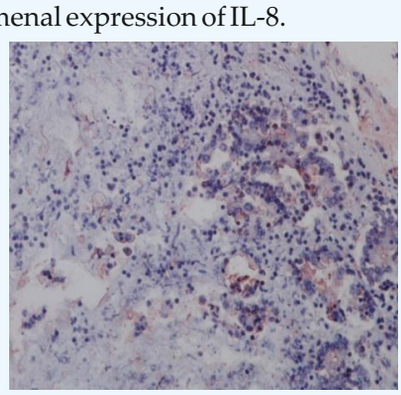
THESIS ABSTRACTS

Ph.D.

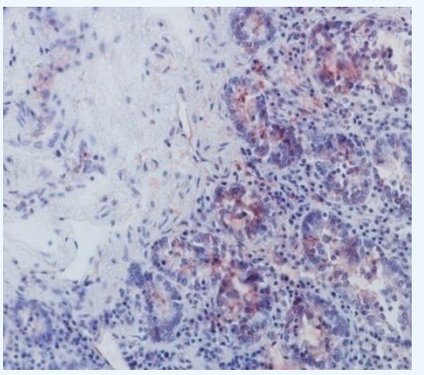
College of Veterinary Science and Animal Husbandry

1. Molecular pathology and transcriptional profiling of enterotoxaemia in adult goats

In current study, a total of 168 diarrhoeic fecal and 189 intestinal loop samples were collected from ICAR-CIRG, Makhdoom, Mathura (UP) and spontaneous outbreaks of Uttar Pradesh, Haryana and Rajasthan States of India. Toxinotyping were done by multiplex PCR using toxin genes viz., *cpa*, *cpb*, *cpb2*, *etx* and *iap*. After confirmatory diagnosis, molecular characterization for different isolates was done by PCR cloning and gene sequencing. Experimental study using characterized isolate (CIRG-NK) was undertaken to study molecular and gene expression profiles. Group I was treated with CS, group II with whole culture (WC), group III with washed cells (WAS) and group IV with only RCM medium (control). Treated animals were kept under observation for 72 hrs. Affected goats were euthanized and necropsied to observe the gross pathological changes and suitable samples were collected to confirm pathogen's presence at predilection site. *C. perfringens* type D was further confirmed by cultural and molecular methods. Expression profile of inflammatory genes IL-1β, IL-2, IL-8 and Cat-L was studied in intestinal tissues to understand molecular pathogenesis by implying qRT-PCR. In RCMM, gas production was observed along with turbidity, while Gram's staining showed stumpy or slender Gram positive rods with truncated or plumby ends. On CLS-BBA, greyish, rounded raised or flat colonies with double zones of hemolysis and on EYA, opalescence indicative of lecithinase activity were observed. The incidence percentage (%) of *C. perfringens* in diarrhoeic samples and necropsied goats was 16.07% and 22.75%, respectively. In clinically ill animals, 81.48% isolates of *C. perfringens* were toxinotype A and 18.51% were toxinotype D. In necropsied cases, 55.81% isolates were toxinotype A and 48.81% were toxinotype D. The gene encoding β2-toxin (*cpb2*) was present in 44.44% of diarrhoeic and 44.81% of necropsied goats suggesting its virulent association with clinical diarrhoea. Pathologically in goats, lesions occur mostly in distal portion of ileum with additional involvement of lung, kidney and brain to variable extend. The *etx* full length gene cloning and sequencing revealed point mutation (silent) CIRG NK and CIRG 3716 isolates compared to IVRI Vac1 reference strain. The native CIRG, isolates were unique compared to the Indian IVRI isolates. Culture supernatant containing activated ε toxin experimentally induced diarrhoea in goats in the shortest period (20-24 hrs. post inoculation) followed by whole culture containing live bacteria and ε toxin (20-24 hrs. post inoculation) and live bacteria (washed cells) (30-36 hrs. post inoculation) showed anorexia, depression and diarrhoea. Presence of epsilon toxin was demonstrated by immunohistochemistry. Gene expression study revealed the highest expression of IL-1β in spontaneous enterotoxaemia followed by experimental ET produced by activated å toxin which suggested severe inflammatory process of the disease and may act as a promising biomarker of acute ET disease. The mRNA expression of IL-2 gene was highest in field outbreaks followed by washed bacterial cells. The Expression of IL-8 was highest in CS group followed by field isolates explains the CS which has more toxin component has phenomenal expression of IL-8.

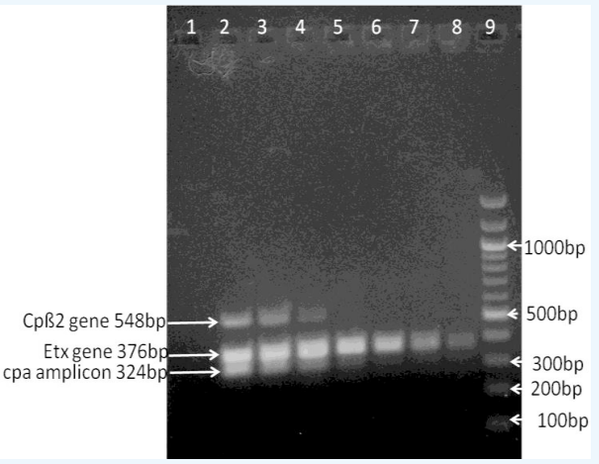


Intestine: showing epsilon toxin positive cytoplasmic immunolabelling of intestinal epithelial cells in enterotoxaemia affected goat (IPO AEC-Mayer's haematoxylin counter stain x200).



Intestine: Showing epsilon toxin positive cytoplasmic immunolabelling of intestinal crypts epithelial cells in enterotoxaemia affected goats (IPO-AEC-Mayer's Haematoxylin counter stain x200).

The Expression of cat-L was highest in spontaneous group of ET suggested that the toxin or other component of *C. perfringens* was involved in damaging the normal cellular functions during the ET pathogenesis.



Gel electrophoresis picture of multiplex toxinotyping PCR showing amplicons of genes *cpa, etx* and *cpb2* in diarrhoeic fecal samples of goats. Lane 1 is negative sample; **Lanes 2,3,4,5** showing alpha toxin gene with an amplified 324bp amplicon; **Lanes 2,3,4,5,6,7,8** showing epsilon toxin gene with 376bp product; **Lanes 2,3,4** showing beta two toxin gene amplicon with a size of 548bp and **Lane 9** showing 100bp ladder.

2. Endothelium - dependent and Endothelium-independent relaxation pathways in uterine artery of buffaloes *(Bubalus bubalis)*

The present study was undertaken to unravel the endothelium-dependent and endothelium-independent relaxant pathways in uterine artery of buffaloes collected from local abattoir and mounted in organ bath in MKHS maintained at 37 ± 0.5 °C. Micrometrical measurements showed that width of tunica interna, lumen and arterial diameter increased while width of tunica media decreased during pregnancy along with increase in the width of tunica externa and arterial wall thickness during early pregnancy and decrease during mid pregnancy as compared to non-pregnancy state. Following an equilibration period of about 1 hr, uterine arterial rings were pre-contacted with 60 mM KDS and thereafter pre-contracted with endothelin 1 to induce vasoconstriction. Endothelium intactness was ascertained by ACh-induced vaso-relaxation. Uterine artery collected from the animals in late phase of di-estrus with straight and smooth blood vessels responded best. Passive tension and pre-contractile agonist's studies revealed that, endothelin 1 was the best precontractile agent and 2 g passive tension was optimum for uterine arterial rings in MKHS. Uterine artery of the early pregnancy stage buffaloes was most sensitive to endothelin 1. Uterine arterial rings of non-pregnant buffaloes exhibited significantly higher basal tension or tonicity and archived lower maximal tension to 60 mM KDS than the uterine artery of pregnant buffaloes. Acetylcholine-induced relaxation in uterine artery of buffaloes was endothelium-dependent in both non-pregnant and pregnant buffaloes. Non-pregnant buffaloes uterine artery was most sensitive to vaso-relaxant effect of ACh. L-NAME at 300 µM, but not at 100 µM, blocked the release of NO in uterine artery of non-pregnant buffaloes. Both L-NMMA (100 µM) and PTIO (100 µM) failed to block ACh-induced vasorelaxation in non-pregnant buffalo uterine artery. Indomethacin (10 µM) alone failed to block ACh-induced vasorelaxation but when use in combination with L-NAME at 100 µM and 300

μM caused significant inhibition of ACh-induced relaxation in non-pregnant buffaloes uterine artery. ACh-induced relaxation in non-pregnant buffaloes uterine artery was significantly reduced in the presence of 60 mM KDS and it was decreased as the pregnancy advanced. Both Tram 34 (1 μM) and apamin (100 nM), alone and in combination, significantly reduced the ACh-induced relaxation in non-pregnant buffalo uterine artery. Indomethacin (10 μM) alone and in combination with L-NAME (100 μM) resulted in significant rightward shift of the DRC of ACh with significant attenuation in pD_2 value of ACh while L-NAME (100 μM) alone failed to significantly reduce ACh-induced relaxation in early-pregnancy stage uterine artery. In the presence of L-NAME (100 μM) and indomethacin (10 μM) respectively, the DRC of ACh was significantly shifted towards right and left with significant reduction and potentiation of the maximal responses respectively, while in the combined presence of L-NAME (100 μM) and indomethacin (10 μM) the DRC was superimposed over the DRC of ACh in uterine artery of mid-pregnancy stage buffaloes. SNP caused dose-dependent relaxation in buffalo uterine artery, and the DRC of SNP was significantly shifted towards left with significant increase in potency during pregnancy. In the presence of ODQ, the DRC of SNP was significantly shifted towards right with significant reduction in the potency without much change in the maximal relaxation. Amongst the different antagonists used, only combination of L-NAME (100 μM/300 μM) and indomethacin (10 μM) cause marked increase in basal tone of non-pregnant buffalo uterine artery. PCR, western blot and immunohistochemistery studies revealed the presence of eNOS, COX-1, and IK_{Ca} in the endothelium, BK_{Ca} in the smooth muscle and SK_{Ca} in both the endothelium and smooth muscle of buffalo uterine artery and their expression is differently regulated during pregnancy. Gene sequencing of eNOS, COX_1 and SK_{Ca} genes in uterine artery of buffaloes showed more than 93% structural similarity with ovine (*Ovis aries*), caprine (*Capra hircus*) and Indian cow (*Bos indicus*). From the results of present study, it is conclude that both endothelium-dependent (EDHF and EDRF) and endothelium-independent (sGC-cGMP) relaxant pathways are present in buffalo uterine artery and they differently contribute to vasorelaxation during non-pregnant and pregnancy states.

3. Studies on Toxicodynamic of chromium with particular reference to its effect on myometrial activity in rat

Present study was conducted to evaluate the effect of chromium on myometrial activity in rats and the possible mechanistic pathways. The study was undertaken in three phases i.e. Phase I-Biomonitoring studies; Phase II-In-vivo study on effect of chromium exposure @ 250 ppb, 1ppm and 10 ppm in drinking water for 90 days and, also 45 days after its withdrawal; and Phase III-In-vitro study on effect of chromium on myometrial activity and its mechanistic pathways. For in-vivo studies, adult female wistar rats were divided into seven groups of ten animals each. Rats of group I served as control group whereas group II, III and IV were orally administered potassium dichromate @ 250 ppb, 1 ppm and 10 ppm daily for 90 days while rats of groups V, VI and VII constituted the withdrawal groups and study was undertaken after 45 days of withdrawal following 90 days exposure. Cows and buffaloes suffering with different reproductive problems had higher blood levels of chromium than the permissible value of 0.5 μg/L. Highest blood levels of 1.90 ± 0.12 and 1.76 ± 0.22 μg/L were observed in cows and buffaloes having the history of repeat breeding and abortions, respectively. Highest chromium level was observed in Ganga river water (332.7 ± 34.1 μg/L) and lowest (57.70 ± 5.32 μg/L) in the water samples collected from Mathura University.After 90 days of continuous exposure and 45 days of withdrawal period, no significant effect was observed on the body weight, relative and absolute organ weights. Chromium-exposure resulted in significant ($p<0.05$) reduction in haemoglobin, TEC, TLC and MCV values. Plasma BUN and creatinine levels were significantly ($p<0.05$) increased in chromium treated rats of group III and IV as compared to the control group. Significant ($p<0.05$) increase in

ALT activity and bilirubin levels in rats of group II and group III indicated chromium-induced hepatotoxicity. Chromium significantly ($p<0.05$) increased lipid peroxidation, reduced catalase activity and significantly ($p<0.05$) reduced in GSH and GPx activity in erythrocytes, liver and kidneys in rats of chromium-treated groups. Withdrawal of chromium exposure for 45 days did not have any significant effect in restoring the MDA levels, catalase and GST activities and GSH levels in rats. Thus, suggesting chromium-induced oxidative stress which is irreversible up to 45 days. Exposure of rats to chromium @ 250 ppb, 1 ppm and 10 ppm for 90 days, resulted in accumulation of significantly higher concentration of chromium in uteri and ovaries of rats of 1 ppm and 10 ppm exposure groups but chromium levels did not significantly decline even after 45 days of withdrawal. Chromium significantly ($p<0.05$) decreased the blood levels of iron and zinc in rats of groups II, III and IV, and also V, VI and VII. Thus, suggesting that chromium exposure had long term deleterious effects on blood iron and zinc levels in rats. With the increment of chromium exposure levels, absolute tension (g), mean integral tension (g) and frequency (BPM) of chromium in rat myometria increased with increase in dose but the increase in tension was statistically significant only in 1 and 10 ppm exposure groups. CaCl2, KDS, oxytocin and PGF2á induced maximal contractions were significantly reduced in myometrium of rats of group II while significantly increased in rats of group III and IV but pD2 values in chromium exposed groups were significantly lower than in control group. Compared to the control, there was potentiation of the relaxant effect (Rmax) of terbutaline in uteri of rats of groups II and III while reduction in Rmax value in rats of group IV, but alterations in Rmax values were not statistically significant. Following withdrawal of chromium exposure, spontaneous myometrial activity data of the uteri of rats of groups V, VI and VII revealed that compared to groups III and IV; absolute tension (g) and mean integral tension (g) were significantly decreased in rats of groups VI and VII, respectively. Compared to the control, the Emax values of CaCl2, KDS, Oxytocin, PGF2á and BAY K 8644 in uteri of rats of groups II, III and IV and rats of groups V, VI and VII were found to be significantly reduced. The dose response curves of CaCl2, Oxytocin, PGF2á and BAY K 8644 were found to be significantly shifted towards right in all the chromium withdrawal groups V, VI and VII as compared to the DRC of oxytocin in control group. In vivo studies suggest chromium significantly decreased the contractile effect of CaCl2, KDS, PGF2á, oxytocin, BAY K8644 at low doses while higher doses increased it. Possibility of chromium inhibiting the Ca-channels and/or intracellular signaling pathways involved in mediating contractile effects of oxytocin and PGF2á cannot be ruled out. The results of the present in-vitro study suggest that chromium decreases the influx of Ca2+ through L-type Ca2+-channels, stimulates KATP and Kv channels and also stimulates â2 and â3 adrenergic receptors to produce inhibitory effect on rat myometrium.

4. Evaluation of excretory secretory antigen as a candidate for serodiagnosis of caprine amphistomosis

The study was conducted for the molecular characterization and development of sero-diagnostics for caprine amphistomosis. A total of 92 rumens of goats naturally infected with amphistome species were collected from Army Slaughter House, Mathura (U.P). Beside rumen, blood samples were also collected from 11 newly born kids of age upto 1 week and 240 goats by random sampling from Mathura district. Prevalence of amphistomosis by rumen examination was divided in three major groups *viz.* heavy, moderate and light infection. Month wise prevalence observed that the total maximum prevalence was found in month of July (21.87%) and minimum prevalence was observed in month of December. Years of study were also divided into three seasons viz. winter (Nov–Feb), summer (March–June) and monsoon (July–October). The highest overall prevalence of amphistomosis on the basis of rumen examination was reported in summer season (17.83%) and lowest in winter season (10.53%). The prevalence on the basis of faecal examination

(n= 240) revealed 17.08% during August to October 2016. Female goats (19.20%) were found more susceptible in comparison to male (11.11%). On the basis of morphology and molecular technique using amplification of ITS2 gene, three species of amphistomes *viz. Paramphistomum epiclitum* (95.60%), *Gastrothylax crumenifer* (3.20%) and *Fischoederius* spp. (1.08%) were identified from rumen. The amplicons of about 400bp were obtained by amplification of ITS2 gene with used primer. A total of 04 representative amplicons were sequenced by outsourcing. The sequences were submitted in NCBI and the accession number (*Paramphistomum epiclitum isolate* mtjamp1.1: KX657873; *Paramphistomum epiclitum* isolate mtjamp1.3: KX657875; *Fischoederius* sp.: KX639720 and *Gastrothylax crumenifer*: KY889141) were obtained. Genes of Mathura isolates were aligned with thirteen previously published sequences of amphistome species. Multiple sequence alignment report suggested that there was little difference between Mathura isolate with other Indian isolates. Percent identity matrix of Mathura isolates with other known isolates suggested more than 95% homology between Mathura isolates. *P. epiclitum* Mathura isolates showed 100% homology with each other without showing any difference of buffalo or goat origin. The 75% alcoholic fractionation of ES antigen was isolated from 200 to 300 live *P. epiclitum* for protein profiling and antibody detection enzyme immunoassay. Hyperimmune serum was raised against this ES antigen in wistar rats. Electrophoresing of ES antigen resolved 8 major polypeptides of size 56, 31, 27, 25, 22.5, 12, 11 and 10 kDa. On western blot analysis, five polypeptides of size 11, 12, 25, 27 and 31 kDa were found immunoreactive when probed with homologous hyperimmune serum. However, probing with pooled known positive serum revealed only two immunoreactive polypeptides (11 and 12 kDa). Antibodies to 75% alcoholic fractionation of ES antigen was detected in 32 (20.00%) goats of either sex serum samples by ELISA. The sensitivity and specificity of ELISA was found to be 100.00% and 86.76%, respectively. As per kappa value estimation, the strength of agreement was found to be good. The study confirmed that molecular characterization tools using ITS2 gene was very useful for the identification of the amphistome species and 75% alcoholic fractionation of ES antigen of *P. epiclitum* based ELISA may be used for serodiagnosis of caprine amphistomosis.

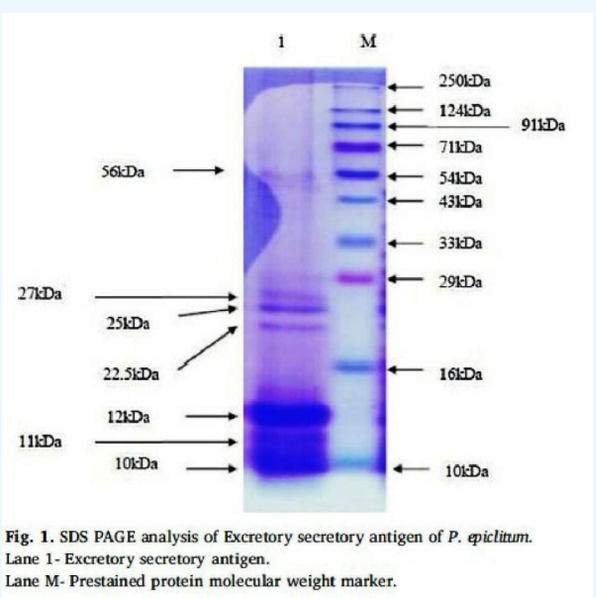


Fig. 1. SDS PAGE analysis of Excretory secretory antigen of *P. epiclitum*.
Lane 1- Excretory secretory antigen.
Lane M- Prestained protein molecular weight marker.

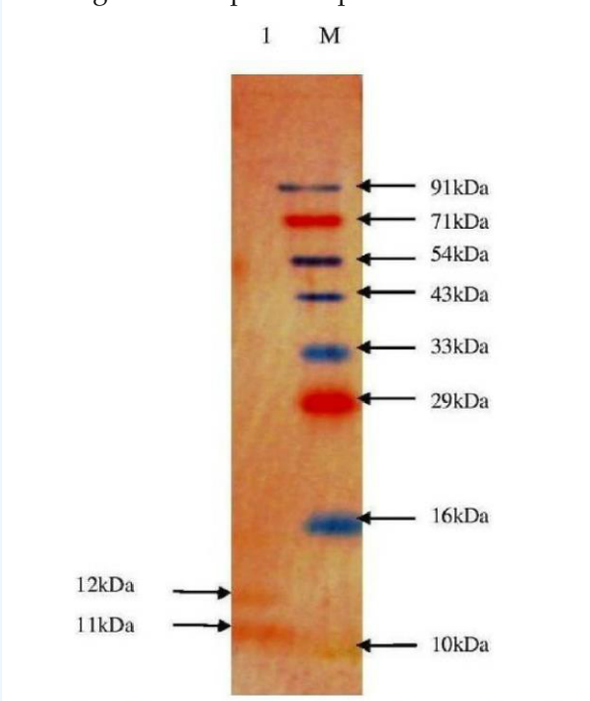


Fig. 2. Western blot analysis of Excretory secretory antigen of *P. epiclitum* with natural sera.
Lane M: Prestained coloured protein marker.
Lane 1 : Immunoreactive polypeptides when Excretory secretory antigen of *P. epiclitum* probed with pooled known positive sera.

Ph.D. Biotechnology

1. Development of omp31 protein based ELISA for diagnosis of ovine and caprine brucellosis

In India goat population contributes a lot to the agrarian economy, particularly in regions where crop and dairy farming are not economical, thus play an important role in the livelihood of landless, small and marginal farmers. Brucellosis caused by different species of *Brucella* is considered as a major public health problem due to its zoonotic nature, worldwide distribution and economic losses. Among various *Brucella* species, *B. melitensis* is most pathogenic and highly zoonotic and included as category B biothreat. The diagnosis of brucellosis in goat is very important for control of this disease as there is no vaccine available for human use. The present study was designed to develop the recombinant omp31 (rOmp31) protein antigen based in house ELISA for specific serodiagnosis of caprine brucellosis. *Omp31* gene of *B. melitensis* strain was cloned and expressed in pET22b(+) expression system. The recombinant protein was purified under denaturing conditions using 8 M urea. The purified recombinant protein was confirmed by western blotting using known caprine *Brucella* positive and negative serum. The sero-reactivity of recombinant protein was also checked by reacting with antisera of known *B. melitensis*. Serodiagnostic potential of recombinant antigen was tested against 92 clinical serum samples collected from goats by iELISA. Out of 92 samples tested, 18 (19.56%) were positive and 74 (80.43%) were negative by rOmp31 antigen based enzyme-linked immunosorbent assay (ELISA). In comparison to RBPT, the relative sensitivity and relative specificity of rOMP31-ELISA were found 92.85% and 93.59%, respectively. Positive predictive value of rOMP31-ELISA was found 72.22%, while negative predictive value was 98.64%. rOMP31-ELISA showed 93.40% in accuracy of prediction against RBPT. In comparison to commercial ELISA kit, the relative sensitivity and relative specificity of rOMP31-ELISA were found 94.11% and 97.33%, respectively. Thus, the test gave comparable results with the commercially available ELISA kit for diagnosis of brucellosis in goats. The rOMP31-ELISA showed 96.74% accuracy of prediction against commercial ELISA kit in diagnosis of brucellosis in goats. Concordance was higher between rOMP31-ELISA and commercial ELISA, which was (96.74%) than RBPT and rOMP31-ELISA test with a concordance of (93.48%). Kappa statistics between rOMP31-ELISA and commercial ELISA showed almost perfect agreement as the value observed was 0.894, while RBPT and rOMP31-ELISA showed substantial agreement as their Kappa value was 0.774. From the results, it can be concluded that the developed *in house* test may be used by the local veterinary diagnostic laboratories for diagnosis of caprine brucellosis and may have significant implications in control of brucellosis at least in Uttar Pradesh state. However, the efficacy of serodiagnosis also needs to be further evaluated using more number of sera samples from different geographic regions. Beside this, the comparative evaluation for rOmp31 i-ELISA with other reported recombinant Omps and also their combination use can also be explored.

M.V.Sc. Veterinary Science

1. Effect of varying dietary neutral detergent fibre levels on growth performance of heat stressed heifers

Present study was conducted to see the effect of supplementation of different levels of dietary neutral detergent fiber on growth performance, nutrient utilization, blood biochemical parameters and endocrine parameters of indigenous Hariana heifers. These different levels of dietary neutral detergent fibrous diet were tested at four levels (45.46, 49.77, 54.70, and 59.02%) having concentrate and roughages in the ratio of 50:50. Twenty Hariana heifers of 1 to 2 years of age were randomly allocated into 4 groups (T_1, T_2, T_3 and T_4) having 5 animals in each group, on body weight basis. All groups of Animals were fed with basal diet having different levels of dietary neutral detergent fibre diet maintained by changes in composition of

concentrate mixture. Body weight, body condition score and dry matter intake were recorded fortnightly. In present study temperature humidity index varied from 76.96 to 80.78. Respiration rate (RR), pulse rate (PR) and rectal temperature (RT) remained similar in all the experimental animals and they were found in normal physiological range. Average body weight, metabolic body weight, and body condition score remained were not impacted by different levels of dietary NDF diet. Feed conversion ratio and overall DM intake also remained similar in all the experimental groups. Nutrient digestibility and digestible nutrient intake were not impacted by supplementation of different levels of dietary NDF diet to Hariana heifers. Dry matter intake (kg/100 kg BW) and TDN intake (g/kg $W^{0.75}$) improved in lower percentage of fibrous diet as compared to higher, to supplemented group during digestion trial. Haematological parameters like blood haemoglobin concentration and pack cell volume values were not impacted bydifferent levels of dietary NDF diets. Overall plasma glucose concentration of treatment groups was lower in high dietary NDF supplemented group and higher in low dietary NDF diet supplemented group during growth trial. Plasma cholesterol level was found similar in all treatment groups. Total plasma protein, was found higher in increasing concentration of NDF levels in diet but it was within the physiological range. Albumin concentration was not impacted by supplemented different levels of dietary NDF diet. Blood urea nitrogen concentration was increasing with increasing NDF levels in diet. Overall plasma FRAP and SOD concentration were varying significantly with in physiological limits. Plasma FRAP concentration was found higher in T_1 and T_4 groups than T_2 and T_3 depicting high antioxidant activity. Different levels of dietary NDF diet did not adversely affected plasma mineral concentration. Plasma Insulin like growth factor (IGF-1) (ng/ml) concentration was significantly higher in all treatment groups at 30 days and 90 days, but overall concentration of all treatment groups were similar. Overall plasma T_3 and T_4 hormone concentration in plasma of all treatment groups were found similar. In conclusion, a dietary NDF level of below 50 is beneficial in summer stressed Hariana heifers as at higher NDF levels, stress parameters (SOD & FRAP) were adversely affected and growth was also lower.

2. Effect of inorganic and nano zinc supplementation on performance and immune response in growing heifers

Present study was conducted to see the effect of inorganic and nano zinc supplementation on growth performance, nutrient utilization, blood biochemical and immune response in Hariana heifers. In present study, control group was not supplemented with any extra amount of zinc other than present in the basal diet, T1 group was supplemented with inorganic zinc @50 mg/kd of DM offered, while T2 and T3 group were supplemented with nano ZnO @25 and 50 mg/kg of DM offered. Basal diet offered to experimental groups containg 50% concentrate, 25% green berseem and 25% wheat straw. DM was offered to all experimental group at about 4% of the body weight of animals. All groups of animals were fed with basal diet having same levels of nutrients. Body weight and dry matter intake were recorded fortnightly. DMI (kg/day), DMI (kg/100kgBW), TDN intake (g/kg $W^{0.75}$) and DCP intake (g/kg $W^{0.75}$) remained similar in all experimental groups. Nutrient digestibility and digestible nutrient intake were not impacted by supplementation of different levels of inorganic and nano zinc supplementation to all treatment groups. Average fortnight body weight gain, ADG, metabolic body weight gain were similar in all groups. FCR and FCE were not significantly different between treatment and control group. Zinc bioavailability was high in nano zinc supplemented T2 and T3 group in comparision to inoraganic supplemented group and control group. Haematological parameters like blood haemoglobin concentration and pack cell volume values were not impacted in different treatment groups. Overall plasma glucose, triacylglycerol, cholestrol, plasma total protein, plasma albumin, BUN , ALP, ALT, AST, bilirubin and creatinine were found in similar in all treatment and control group. Plasma globulin is significantly different

between the group at 90 day of trial and globulin concentration was found higher in T1, T2 and T3 treatment group than the control group. Plasma Ca and P in present study were similar in all the experimental groups. Plasma zinc concentration was high in nano zinc supplemented T2 and T3 group in comparision to inorganic zinc supplemented T1 and control group. Plasma copper concentration was low in all treatment groups in comparision to control group. Plasma SOD concentration was found higher in nano zinc supplemented T2 and T3 group than control group and inorganic zinc supplemented T1 group, at 30, 60, and 90 days. FRAP concentation increase within all groups over the time, and FRAP concentration were higher in all treatment groups than the control group. Plasma total immunoglobulin concentration was found higher in all treatment groups in comparision to control group. It may be concluded that nano Zn supplementation @25 and 50 ppm have better absorption, antioxidant and immunogenic effects thus may replace inorganic Zn source at lower level, @25 PPM.

3. Investigation of the effects of dietary nickel supplementation on the performance of growing heifers

This study was conducted to evaluate the effect of different levels of nickel (Ni) supplementation on feed intake, nutrient utilization, growth performance, nutrients metabolism, enzymatic activity, antioxidant status and immune response in growing Hariana heifers. Eighteen growing Hariana heifers were randomly allocated into three groups having six heifers in each groups and fed for 90 days. Feeding regimen was similar in all the groups except that treatment groups were supplemented with 0.0, 1.5 and 3.0 mg of Ni/kg dry matter (DM; ppm) in three respective groups. Group fed on basal diet supplemented with 0.0 mg Ni/kg DM served as a control. Nutrients requirement of experimental heifers were met by feeding concentrate mixture, berseem/oat fodder and wheat straw. Experimental heifers were monitored daily for DM intake (DMI) and fortnightly for body weight change. At the end of the study, a digestion trial of 7 days was conducted to study the effect of Ni supplementation on nutrients utilization. Blood samples were collected at 0, 30, 60 and 90 days post-Ni supplementation and analyzed for haematological attributes, biomarker of energy and lipid metabolism, biomarker of protein metabolism, biomarker of liver and kidney function, biomarker of antioxidant status and oxidative stress, biomarkers of immune response, urease activity and plasma mineral levels. Adding 3.0 ppm Ni to the diet of growing heifers increased ($P<0.05$) DMI and averaged daily gain (ADG) without affecting feed efficiency and nutrients digestibility. Ni supplementation exert positive effect ($P<0.05$) on their absorption and plasma levels whereas; showed no interaction ($P>0.05$) with Ca, P and Fe which is evidented from similar absorption and plasma levels of these minerals in all three groups. No significant difference ($P<0.05$) was found between the three treatments for blood haemoglobin (Hb) and haematocrit value (HIT or PCV) concentrations. Dietary supplementation of Ni did not ($P>0.05$) exert any effect on biomarkers of energy and lipid mobilization i.e. plasma glucose, cholesterol, triglycerides and non esterified fatty acids (NEFA) concentration. Plasma total protein, albumin, globulin and urea nitrogen (PUN) used as protein metabolism biomarkers, found significant higher ($P<0.05$) in Ni supplemented heifers as compared to non supplemented group. Eventhough the plasma level of bilirubin was higher ($P<0.05$) in 3.0 ppm group but values for all studied biomarkers of liver functions i.e. aspartate aminotransferase (AST), alanine aminotransferase (ALT), alanine phosphatase (ALP) and bilirubin were reported within normal physiological range. Heifers receiving diet supplemented with 3.0 ppm Ni showed higher ($P<0.05$) plasma creatinine concentration compared to 1.5 ppm and unsupplemented groups. No significant differences ($P>0.05$) of Ni supplementation upto 3.0 ppm level were observed on plasma lipid peroxide (LPO) and activity of superoxide dismutase (SOD) and catalase (CAT) whereas, total antioxidant status (TAS) was found lowest in 3.0 ppm Ni group but ranges within normal physiological limit.

Adding Ni to the diet of growing heifers did not exerts any effect on plasma total immunoglobulin and immunoglobulin G (IgG) concentrations. Urease activity measured as plasma pH unit change was significantly higher ($P<0.05$) in Ni supplemented heifers. Finally, it may be concluded that dietary supplementation of Ni improve feed intake and growth performance by increasing urease activity and protein metabolism in growing Hariana heifers.

4. Effect of green fodder replacement with corn silage on residual metabolizable feed consumption (RMFC) in growing cattle

This study was conducted to determine the effect of green fodder replacement with corn silage on feed intake, growth performance, feed utilization efficiency and blood metabolites in growing Hariana cattle. Present study was conducted into two phases, Phase 1: Silage preparation and evaluation and phase 2: Feeding trial. In Phase 1 study, corn silage was prepared in bunker silo and after ensiling for 60 days, silage was evaluated for nutrients content and physical and chemical characteristics. High pH value, lactic acid content, buffering capacity (BC), total volatile fatty acids (TVAs) and low ammonia-nitrogen (NH_3-N) content denoted that prepared corn silage was well preserved and off very good quality. In phase 2 study, 18 growing Hariana heifers were randomly allocated into three groups (n=6) on body weight and age basis. Experimental heifers either received a basal total mixed ration (TMR) devoid of corn silage ($S_{0\%}$) or were fed on TMR of which 50 ($S_{50\%}$) and 100% ($S_{100\%}$) berseem fodder were replaced with corn silage. Experimental heifers were monitored daily for DMI and fortnightly for body weight change, feed efficiency measures and physiological variables. At the end of the study, a digestion trial for a period of 6 days was conducted to study the effect of replacement of green fodder with corn silage on nutrient utilization. Blood samples were collected on the days 0, 30, 60 and 90 post treatments and analyzed for haematological attributes, biomarkers of protein metabolism, biomarkers of energy and lipid metabolism, liver and kidney function test, biomarker of antioxidant status and immune response and plasma mineral levels. Replacement of green fodder with corn silage had significant ($P<0.05$) effect on feed intake. As the level of inclusion of silage increased, dry matter intake (DMI) also increased while average daily gain (ADG) was similar among all groups. RMFC measured as difference between metabolizable energy (ME) intake and ME required showed significant ($P<0.05$) effect and showed linear increase with silage levels. Residual metabolizable feed consumption (RMFC) denoted that heifers in group $S_{50\%}$ and $S_{100\%}$ consumed 0.97 and 1.61 kg more DM/day than $S_{0\%}$ group while gaining at the similar rate. Residual intake and body weight gain (RIG) showed significantly ($P<0.05$) higher value in $S_{0\%}$ group followed by $S_{50\%}$ and $S_{100\%}$ groups. Other feed efficiency measures did not showed any effect of treatment. The apparent digestibility of crude protein (CP) was higher in $S_{0\%}$ group while digestibility of the other nutrients was similar among three groups. Haematological attributes, biomarkers of energy and lipid metabolism, biomarkers of liver and kidney function, antioxidant and immune response and plasma mineral levels showed non significant effect of green fodder replacement with corn silage. However, plasma concentrations of total protein and albumin was higher in $S_{0\%}$ group compared to $S_{50\%}$ and $S_{100\%}$ groups which could be due to higher protein content and digestibility. Cost of feeding increased with the increased level of corn silage inclusion. In conclusion, replacement of green fodder with corn silage increased feed intake, RMFC and cost of feeding without altering growth performance in growing Hariana cattle. However, corn silage can be used as alternate forage during scarcity period without adverse impact on performance of growing cattle.

5. Effect of Vanadium supplementation on performance of indigenous heifers

This study was conducted to investigate the effect of vanadium (V) supplementation on growth, metabolism, antioxidant, immunological and endocrine variables in

Hariana heifers. Eighteen indigenous Hariana heifers (body weight 130.0 ±3.0 kg; age 10.0± 2.0 months) were randomly blocked into three groups, each comprising of six animals. All the animals were on same dietary plan except that the treatment groups were additionally supplemented with 0.0, 2.5 and 5.0 mg of V/kg dry matter (DM), during the experimental period of 90 days. There was a linear increase ($p < 0.05$) in mean DMI and ADG in 5.0 mg of V/kg DM supplemented group. However, the feed efficiency remained unaffected. Although no effects ($p>0.05$) of V supplementation were observed on haemato-biochemical attributes but the mean plasma V concentration showed dose dependent increase ($p<0.001$) on V supplementation. The activity of SOD was significantly higher ($p<0.001$) whereas; mean values of LPO decreased linearly ($p<0.05$) in V supplemented groups. Plasma total antioxidant status (TAS) also increased linearly ($p<0.05$) in V supplemented groups. Plasma IgG levels increased linearly ($p < 0.05$). Plasma IGF-1 concentrations showed significant effect ($p<0.05$) of V supplementation. Plasma T4 concentration increased linearly ($p<0.05$). The results indicated the potential role of V in improving growth and metabolism through increased IGF-1 activity and are suggestive of immunomodulatory and antioxidant prospects of supplemental V in Hariana heifers.

6. Study on dairy production scenario in the urban and peri urban areas: a exploratory study

Urbanization is an index of transformation from traditional rural economies to modern industrial one. With the rural-urban distribution in India had increased to 68.84 percent and 31.16 percent, the population and economic growth has fostered urbanization in the country and the numbers of urban towns and cities have drastically increased. The growing population is putting tremendous pressure on the agriculture as there is sudden need to double the agriculture production to feed the growing population. Though India stands first in the production of milk, It is expected that demand of milk will increasing day by day due to rapid increase in demand of milk and milk products and it might be dream for anyone to capitalize this fact growing milk and its product market. This situation creates a prospectus for local dairy production in urban and peri-urban area and to enchase the income. The present scenario is giving a chance to the emergence of market-oriented commercial large scale and smallholder dairying. With these aspect the present study on "Study on the dairy production scenario in the urban and peri urban areas: An exploratory study" was planned. The present study was carried out in Firozabad and Mainpuri districts of Agra Division. Two blocks were randomly selected from each district and forty respondents selected from each district that considered as urban areas and twenty respondents from each block that considered as peri urban areas. To know the perception of consumers towards milk that procured from urban and peri urban areas forty respondents randomly selected from both districts thus comprises total 160 respondents for this study. Data was collected through pre-designed interview schedule as per the objectives of the study and the results were analyzed by using suitable statistical tools. The result revealed that majority of respondents (45.83%) was middle age group, possessing middle level of education (37.50%) and having high level of experience (46.67%), large herd size (47.50%). The respondents were having large herd size that is more than 7 animal and milk production ranges from 5 to 41 litres. The result further reveals the knowledge level of respondents reveals that there is an significant difference between the knowledge level of urban and peri urban farmers. The Urban farmer (45.72%) posses more knowledge the peri urban farmers (37.50%). It was observed that the consumer who are procuring milk from these dairy gave first preference to quality of milk (53.39 %) followed by impact on public health (45.71 %) and other consumer need (39.82 %). Remunerative prices of milk in and high demand of milk during festival season in urban & peri urban areas is the opportunity that is motivating for the farming. Major challenges that were faced by these farmers includes limited availability of credit for

establishment of dairy farms, higher frequency of disease incidence in dairy animals and limited availability of land for establishment of dairy farms.

7. Entrepreneurial and Adoption Behaviour of Rural Youth in Animal Husbandry practices

The youth represent the most dynamic and vibrant segment of the population and India is one of the youngest nations in the world in respect to age group of youth population. Approximately 65 percent of Indian population is under 35 years of age. Government of India is presently taking significant steps towards entrepreneurship development of youth through various ministries/ departments in various sectors including animal husbandry. Government of India has also launched several programmes & scheme for youth entrepreneurship viz., Intensive Dairy Development Programme (IDDP), Strengthening infrastructure for quality and clean milk production, Cooperative Dairy Development, KVK (Krishi Vigyan Kendra), ARYA (Attracting and Retaining Youth in Agriculture), Rural and Entrepreneurship Awareness Development Yojana (READY), NABARD, Micro Units Development Refinance Agency(MUDRA), Dairy Entrepreneurship Development Scheme as a part of creating productive youth workforce for sustainable development of the country. The main aim of Government of India behind these schemes is to promote the entrepreneurship and retaining youth in dairy, agriculture and its allied sectors.

The present study was conducted in ten villages of five blocks of Dholpur district of Rajasthan. Two villages were selected randomly from each block and twelve respondents were selected from each village thus comprising a total 120 respondents for this study. Data was collected through pre- structured interview schedules as per the objectives of the study and the results were analyzed using suitable statistical tools. The study revealed that majority of respondents belongs to 24 – 26 year age group, possessing secondary level of education and having medium family size. Most of the respondents were having medium experience of livestock rearing, having herd size of 5-6 animals.

The result further revealed that nearly 55.00 percent of the respondents possessed medium level of entrepreneurial behaviour that may be due to their medium financial condition and economic status, education level, medium economic motivation and scientific orientation. Majority of respondents (52.50) percent belongs to medium level adoption. Major constraint faced by rural youth is fear of failure, more risk & uncertainty, difficulties in getting loan, non-remunerative price for milk, high cost of concentrate and lack of experts advice etc.

8. Impact of supplementation of lukewarm water during winter season on performances of dairy cows

The present study was carried out to find out the effect of supplementation of lukewarm water at 25^{0}C during winter season to Sahiwal cows on their physiological, general, production, haematological, biochemical attributes and endocrine profile. For this purpose the present study was carried out with twelve healthy, lactating Sahiwal cows maintained at DDD farm within the premises of LFC of DUVASU, Mathura. These experimental cows were quasi randomly divided into two groups consisting six animals in each. All the cows were kept in conventional (tail-to-tail) system of housing for whole day. Cows of one group i.e. control were offered drinking water stored in water trough located in a corner of the shed at ambient temperature, whereas, the cows of supplemented group were offered lukewarm water at 25^{0}C which was prepared by mixing of partial amount of warm water in cold water. Cows of both the groups were offered weighed amount of ad lib water thrice a day (early morning, afternoon and late evening) in graduated buckets individually. They were also provided weighed amount of ad lib feed. Various physiological, general, production, haematological, biochemical attributes and endocrine profiles of these Sahiwal cows of control and supplemented group were

compared to observe the impact of supplementation of lukewarm water. Significantly high values for mean pulse rate (P<0.05), morning water intake (P<0..01), total plasma protein (P<0..05) in Sahiwal cows of supplemented group (79.32±1.25) per minute, 4.81±0.24 liter/day and 7.53±0.01 g/dL) was observed than those for control group (74.78±1.25 per minute, 3.49±0.24 liter/day and 7.49±0.01 g/dL) and low values were observed for RBC count (P<0.01), BUN concentration (P<0.05), plasma T4 (P=.08) and TSH (P=.07) concentration in Sahiwal cows of supplemented group (6.40±0.11x106 /mm3, 15.28±0.31 mg/dL, 13.96±0.06 ìg/dl, 0.238±0.005ìIU/ml) was observed than those for control group (7.06±0.11 x 106 /mm3, 16.15±0.31 mg/dL, 14.12±0.06 ìg/dl, 0.251±0.005 ìIU/mI). A significant difference for water intake (P<0.01), blood glucose (P<0.01), cholesterol (P<0.01) and total plasma protein concentration (P<0.05) in experimental Sahiwal cows among 0, 1st, 2nd , 3rd , 4th and 5th fortnights were observed. But, no significant (P<0.05) difference for any of the physiological, general, production, haematological, biochemical attributes and endocrine profiles between cows of supplemented and control groups on 0, 1st , 2nd , 3rd , 4th and 5th fortnights were observed. The results of the present study implied that supplementation of lukewarm water at 25^{0} C during winter reduced the loss of metabolic energy in the maintenance of body temperature and made it available for various productive activities. In Thus, supplementation of lukewarm water to Sahiwal cows during winter was beneficial.

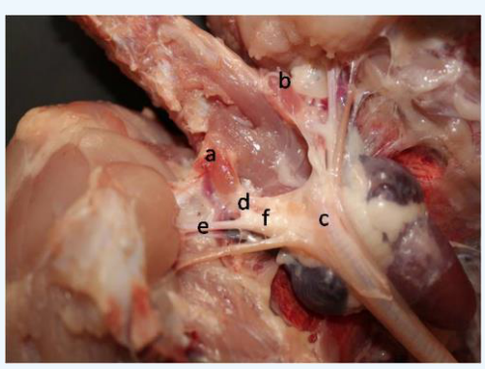
9. Study on development and shelf life assessment of functional smoothie using milk of indigenous cows

The present investigation was carried out to enhance the functional quality of milk smoothies and to enhance its shelf life. Total six experiments were conducted on various formulations of smoothies using banana and red plum/ kiwi/cherry in different proportions (75:25, 50:50 and 25:75) along with milk of Hariana, Cross breed and Sahiwal cows. In initial experiment,screening of milk was done for physico-chemical characteristics. Most of the physico-chemical characteristics showed non-significant (P>0.05) variations among all three breeds. However, significant (P<0.05) difference was observed in percent mean value of fat in the milk of these breeds. In second experiment, banana based milk smoothies were prepared using milk of Hariana, Cross breed and Sahiwal cows. Three sugar levels were tried to optimize the formulation and two percent sugar level was found best on the basis of sensory evaluation. On physico-chemical characteristics basis, non significant (P<0.05) differences were observed in the smoothies of Hariana, Cross breed and Sahiwal milk smoothies except in mean values of moisture, protein and solid-not-fat. In experiment three banana and red plum were used in all three proportions as mentioned above along with milk of all three breeds. Overall, 50:50 banana and red plum with milk of Sahiwal breed smoothie was selected on the basis of sensory evaluation. Physico-chemical characteristics indicated non significant differences in mean values of ash, fiber, pH, titrable acidity, specific gravity and vitamin-C among different breeds. However, significant (P<0.05) differences were observed in percent mean values of moisture, sugar, total solids and solid-not-fat. In experiment four, banana and kiwi were used in all three proportions as mentioned above along with milk of all three breeds. Overall, 50:50 banana and kiwi with milk of cross breed smoothie was selected based on sensory evaluation. Physico-chemical characteristics wise selected variants of smoothies of various breeds showed significant (P<0.05) differences in moisture, fat, sugar and solid-not fat. The significantly (P<0.05) higher mean values of protein and vitamin-C were observed in Sahiwal milk based smoothies while higher mean values of ash, solid-not-fat and pH were in Hariana milk based smoothies. In fifth experiment, banana and cherry were used in all three proportions as mentioned above along with milk of all three breeds. Overall, 50:50 banana and cherry with milk of cross breed smoothie was selected based on sensory evaluation. The physico-chemical characteristics of smoothies prepared with

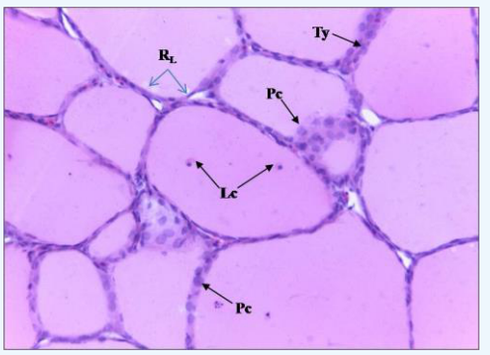
different breeds of cow showed non significant (P>0.05) differences in mean values of moisture, ash, fiber, pH, titrable acidity and specific gravity. However, significant (P<0.05) differences were observed in sugar, total solids and solid-not-fat among the breeds of smoothies. In shelf life assessment, the smoothies made with banana, milk and sugar were in good condition only for two days while these smoothies treated with Tulsi, Lemon grass and Aloevera showed four days shelf life under refrigeration. Similarly smoothies made with banana and red plum/kiwi/cherry was in good condition for four days and treated smoothies for six days. The microbial profile of stored smoothies showed significant (P<0.05) increase in SPC and Psychrophilic counts on advancement of storage days up to last day of storage. However, no Coliform and Yeast and mould were detected in all variants of smoothies during storage. TBA values also showed same trend during storage. But microbial counts and TBA both were under the prescribed limit as described by various organizations.

10. Morphological, Histological and Certain Histochemical Studies on Thyroid Gland of Chabro Chicken Reared in Summer and Winter Seasons

Gross, histological and certain histochemical studies were conducted on thyroid gland of eight to ten weeks old 24 apparently healthy Chabro chickens procured from Poultry Farm, DUVASU, Mathura after approval of CPCSEA. For this study the chickens were divided into two groups consist of 12 chickens in each group (six male and six female) reared in summer and winter season. The thyroid gland of chabro chicken was light pink coloured two oval bodies i.e. right and left thyroid located on the ventral surface of the base of the neck just caudal to the junction of subclavian and common carotid arteries. The left thyroid gland was situated more cranially than the right thyroid. The length and thickness of right thyroid were more than left. Weight of the thyroid gland was more in male in summer and almost equal in winter. Length and width in male and thickness in female was more in summer while in winter length in male and width and thickness in female was more. There was 1.8 and three times increase in carcass weight of chicken and weight of thyroid gland, respectively from summer to winter season. The average weight of chicken and thyroid, all biometrical parameters of thyroid viz. length, width and thickness were more in winter. Histologically, the thyroid gland was composed of stroma (capsule and interfollicular connective tissue) and parenchyma (follicles and 'C' cells). The capsule had outer thick adipose and inner thin fibrous layers. The follicles were filled with colloid produced by the cells lining the follicles. On the basis of diameter of follicles were classified into small, medium and large follicles. The percentage of small follicle was more followed by medium and large follicles. The follicles were lined by simple squamous epithelium in summer and cuboidal epithelial cells in winter. The colloid was less in amount and was lightly eosinophilic in active follicles. Bound lipids, protein and alkaline phosphatase reaction was intense in follicular cells. The nuclei of follicular cells exhibited intense positive Feulgen's reaction for DNA. The colloid showed strong reaction for PAS in both seasons. All micrometrical parameters, amount of reticular fibers, percentage of large and active follicles and concentration of T_3, T_4 and TSH were higher in winter. The thyroid of the chabro chicken was structurally and functionally more active in winter season as compared to summer season.



Photograph showing the location of right (a) and left (b) thyroid gland, common carotid artery (d), subclavian artery (e), brachiocephalic artery (f) and inverted trachea (c) in 9 weeks old male chabro chicken reared in summer season.



Photomicrograph of the thyroid gland of chabro chicken reared in winter season showing the resorption lacunae (R_L), cells of Langendorff (Lc) and presence of Parafollicular cells (Pc) in between thyrocytes (Ty) H&E X400

11. Morphological, histological and histo-chemical studies on the post hatch development of the bursa of fabricius in chabro bird

The present study was conducted on the bursa of Fabricious of Chabro bird. For this study 30 healthy birds were selected after the hatching irrespective of the sex and were divided into five groups; group 1st (0 day), 2nd (30 day), 3rd (60 day), 4th (90 day) and 5th (150 day) of age. The bursa of Fabricius was located on the dorsal aspect of cloaca and connected to the dorsal wall of the proctodeum by small stalk. The shape of the bursa was oval and it was creamy white colour in all groups. The luminal surface of the bursa of Fabricius was occupied by number of large and small folds called primary and secondary plicae, respectively. Biometrical studies revealed the significant increase in the body weight with advancement of age. The weight of bursa significantly increased upto 4th group then significantly decreased. The bursal index significantly increased in 1st and 2nd group and then significantly decreased in 4th and 5th group. The bursal length, width and thickness, plical length and height significantly increased upto 4th group and significantly decreased after 4th group which plical width start decreased from 3rd group.

Histologically, the wall of the bursa of Fabricius was comprised of three basic layers from inwards to outward, tunica mucosa, tunica muscularis and tunica serosa. There was significant increase in thickness of all tunics. Length of primary and secondary plicae significantly increased from group 1st to 4th group and significantly decreased from 4th to 5th group. The lining epithelium was made up of pseudostratified columnar epithelium while it was simple columnar in crypts. The pseudostratified columnar epithelium was consisted of three types of cells. Type I cells were columnar cells with elongated nucleus. Type II cells were basally placed with round nucleus. Type III cells were goblet cells found among the columnar cells. The epithelium covering the plicae were divided into two types viz, follicle associated epithelium (FAE) or epithelial tuft with pale columnar cells which was in direct contact with medulla of the lymphoid follicles and the interfollicular epithelium (IFE) covering the remaining part of the plicae consisting of darkly stained columnar cells i.e. between the follicles. The height of IFE was more than FAE in all group. Length and width of primary and secondary plicae and length of FAE and IFE significantly increased upto 4th group and significantly decreasing from 4th to 5th group. The lamina propria was consisted of connective tissue framework filled with lymphoid follicles of different shape and size in all age groups. The connective tissue consisted of network of fine collagen and numerous reticular fibres surrounding the follicles and scantly elastic fibers especially around blood vessels. The amount of collagen and reticular fibres increased with the advancement of the age. Each plica was completely filled with follicles separated by interfollicular connective tissue. Each lymphoid follicle was comprised of outer dark cortex and inner pale large medulla separated by a cortico-medullary junction. In 1st group the cortex and medulla of follicles could not be differentiated. The middle tunica muscularis layer consisted of an outer circular and inner longitudinal layers of smooth muscle fibres and longitudinal layer. A thin serosal layer was composed of connective tissue fibres. Thickness of tunica muscularis and tunica serosa increased significantly up to 4th group then it significantly decreased. After 3rd group relatively less increment in the weight of bursa, bursa length, width, height, plical length,

width and thickness and from 4th group to 5th group these observations were significantly decreased showed the involutory changes started from the 3rd group. Histologically, depletion of lymphocyte population from the periphery of cortex, medulla gives the acinar structure of the follicles, separation of cortex from adjacent follicles, vacuolation in the medulla, formation of cyst in epithelium and medulla of follicles, size of the bursal follicles was found to decreased, height of epithelium decreased, epithelial attenuation, vacuolation folding and detachment were noted over the plical surface and interplical area. With the decrease in size of follicles the amount of collagen and reticular fibers increased. The tunica muscularis layer deorganised.

Histochemically, the epithelial lining, showed mild to moderate PAS positive reaction, mild PAS positive reaction were observed in the cortex, medulla, corticomedullary junction which increased as age advanced. The epithelial lining showed moderate to intense activity of acid mucopolysaccharides which decreased with the advancement of age. The FAE and IFE corticomedullary junction showed mild activity in 1st group and increased with advancement of age. Alkaline phosphatase activity were observed in lining epithelium bursal follicles from group 2nd onwards the activity of alkaline phosphatase decreased with advancement of age. The acid phosphatase activity was mild in epithelial lining and follicles and moderate activity from group 2nd onwards.

12. Gross, histological and certain histo-chemical studies on the pancreas of Chabro Chicken

Gross, histological and histochemical studies were conducted on the pancreas of twenty four apparently healthy chabro chickens irrespective of sex. The birds were divided into 0 day, 30 days, 60 days and 150 days age groups. The pancreas was located in the abdominal cavity on the right side of median plane within the duodenal loop. It was elongated and was creamy white in group-1 and pale pink in other groups. It consisted of dorsal, ventral and splenic lobes which were drained by dorsal and ventral pancreatic ducts; these entered obliquely in the distal part of ascending limb of duodenal loop. Weight and length of pancreas increased significantly with age of birds.

The pancreas of chabro chicken was covered by thin fibrous connective tissue capsule. Septae extended from the capsule and divided the parenchyma into lobules and sublobules. Capsule and septae chiefly formed by reticular and collagen fibers and fibroblasts. Septae showed the presence of interlobular ducts, blood vessels and nerves along with the lymphocytes and nerve cell bodies. The interstitial tissue around the acini was formed by reticular fibers which generally encircled one third to two third part of the individual acini in group 1 and the entire acini in other groups. From group- 2 onwards fine to coarse reticular fibers were observed inside the islets of Langerhans. The lymphatic aggregations were relatively more in the stroma splenic lobe than the other lobes. Exocrine parenchyma consisted of serous tubuloacinar secretory acini and the duct system. Acini were elongated, oval and globoid. In group - 1 developed and developing acini were observed but in other groups most of acini were fully developed. The acinar epithelium consisted of single layer pyramidal cells but often columnar cells were also found. The cytoplasm of acinar cells had bipolar staining which became prominent from group- 2 onwards. The occurrence of the granules in the apical acidophilic zone varied considerably in the cell cytoplasm of different acini. The basophilic basal zone increased with the increase of age of birds. Usually one centroacinar cell was found but in some acini two cells were also observed. Duct system consisted of intercalated, intralobular and interlobular ducts. The wall of larger interlobular ducts consisted of mucosa and adventitia; the formar was projected in the lumen in the form of mucosal folds. Islets of Langerhans were oval and rounded however, their shape varied considerably. Their occurrence was relatively much higher in splenic lobe. Some islets had cluster of acinar and islets cells and appeared to be formed by the detached cells of the exocrine acini. Fully developed islets were

beta and mixed types were formed by the clustures of beta cells which were oval, triangular, irregular, elongated and polyhedral cells. Mixed islets were consisted of beta and apha cells and were found only in splenic lobe. The alpha cells were spherical, elongated and irregular in shape and appeared relatively smaller than beta cells.

The histochemical reactions for best carmine, acid muccopolysaccharides, bromophenol blue and Sudan black B exhibited similar reaction in the stroma and in stromal blood vessels in all age groups. The reaction for PAS was also similar in the stromal tissue in various groups but in stromal blood vessels it varied among the groups. In acinar cells the cytoplasm and in cytoplasmic granules reaction for PAS, acid muccopolysaccharides, best carmine, Sudan black B and bromophenol blue was similar in various groups. In the epithelium of various types of ducts the reaction for best carmine, Sudan black B and bromophenol blue was similar in all the groups but the reaction for acid muccopolysaccharides and PAS was different in various groups. In all the groups of present study the material in the lumen of various types of ducts exhibited similar reaction for PAS, acid muccopolysaccharides, best carmine, Sudan black B and bromophenol blue. All the cells of islets exhibited mild to moderate PAS positive reaction. The islets cells showed mild positive reaction for best carmine. The reaction for acid muccopolysaccharides was negative in the islets cells. The islets cells showed moderate positive reaction for bromophenol blue. Mild positive reaction for Sudan black B was found in the islets of Langerhans in all the groups of present study.

13. Effect of Melatonin on cryopreservation of Hariana bull spermatozoa

The present study evaluated the beneficial effects of Melatonin as an additive in Tris egg yolk based extender in Hariana bull semen opted for cryopreservation. The study evaluated physico-morphpological seminal attributes (motility, livability, HOS response and membrane integrity), cryocapacitation like changes and process of tyrosine phosphorylation after equilibration and thawing. Post-thaw seminal plasma enzymes activity (SOD, LPO and GST) was also evaluated. Eight ejaculates collected from four Hariana bulls were divided into four aliquots: One aliquot diluted with egg yolk tris glycerol (EYTG) extender Group I (control, without melatonin), Group II was diluted with EYTG and supplemented with – 0.5mM Melatonin/100×10^6 spermatozoa, Group III supplemented with 1.0mM Melatonin /100×10^6 spermatozoa, Group IV was diluted with EYTG and supplemented with 2.0mM Melatonin/ 100×10^6 spermatozoa were cryopreserved. Semen evaluation after equilibration and post-thaw stage showed supplementation of 2.0mM Melatonin/100×10^6 in semen significantly (P Â 0.05) increased motility (%), sperm livability (%), HOST (%), and acrosomal integrity (%) of spermatozoa. In the present study, seminal plasma enzymatic profile of semen *viz.*SOD, GST and MDA were evaluated at post-thaw stage of semen cryopreservation. Among the seminal enzymatic profile significant ($p<0.05$) difference was observed for MDA and GST enzymes activity. The degree of cryocapacitation was significantly ($P < 0.05$) decreased in group supplemented with 2.0mM Melatonin/100×10^6 spermatozoa at post-thaw stage of semen cryopreservation. However no significant difference was observed in degree of cryocapacitation at pre-freeze stage of semen cryopreservation between the groups. Immunoblot revealed seven proteins which were tyrosine phosphorylated and protein of 48kDa (p48) showed differential variation in intensity in the four groups. There was significant reduction in band intensity of 48kDa in Group IV as compared to other groups. Immunolocalisation studies revealed localization of tyrosine phosphorylated proteins at middle piece (high fluorescence), anterior part of head (high fluorescence) and post acrosomal region (medium fluorescence) at post-thaw stage of semen cryopreservation. The result of the present study clearly demonstrated beneficial effect of Melatonin @2.0mM on cryopreservation of Hariana bull spermatozoa.

14. Functional characterization of TRPV1 channel in bull spermatozoa

Calcium influx in flagellated cell like spermatozoa plays critical role in regulation of sperm motility, capacitation, hyperactive motility and acrosome reaction. Calcium influx is primarily mediated by Catsper channels and transient receptor potential (TRP) channels. TRP Vanilloid 1 is considered as most versatile thermosensitive, pH sensitive and chemosensitive ion channel found in spermatozoa. Little information is available with contrasting reports regarding the role of TRPV1 in regulation of sperm function. Molecular and functional characterisation of TRPV1 was carried out in spermatozoa of Hariana bulls. Sixty four ejaculates were collected from four bulls and were used for series of experiments. Immunoblotting and immunocytochemistry were employed for the molecular characterisation of TRPV1. Immunoblotting identified a single band of 104 kDa corresponding to TRPV1 in *Hariana* bull spermatozoa. Positive immune-reactivity was seen in acrosomal, preacrosomal, post acrosomal and flagellar regions corresponding to TRPV1. Functional study was carried out using TRPV1 blocker namely Capsazepine (Cp) @ 10µM and one activator was used namely Anandamide (AEA) @ 0.3µM. In the study, three groups were used namely, control (100 µL of sperm dilution medium (SDM) containing 1×10^6 cells), vehicle (3µL) and drug (Cp, AEA and their combinations). Different time of incubations was used depending on the experiments. Blocking of TRPV1 resulted in significant ($P<0.05$) reduction in progressive sperm motility as compared to the control; and with activation using AEA, PSM was decreased significantly ($P< 0.05$) till 1h and after that PSM was sustained as compared to control. However, both during blocking and activation of TRPV1, per cent spermatozoa showing hyperactive motility was increased (20-30%) ($P<0.05$). Evaluation of Cp and AEA treated spermatozoa stained with CTC revealed significant ($P< 0.05$) increase in B-pattern of spermatozoa indicating induction of capacitation. Spermatozoa treated with different pH gradients showed significant ($P< 0.05$) reduction in motility as compared to control both with and without drugs modulating TRPV1. Functions of TRPV1 were found to be mediated through cAMP and PKA pathway in the induction of hypermotility in sperm cells as evident from inhibition of sAC and PKA. Both L- and T- type of calcium channels were found to be associated with TRPV1 function as evident from their respective blocking and its effect on PSM. Blocking as well as activation of TRPV1 showed significant ($P< 0.05$) reduction in sperm livability, per cent spermatozoa having intact membrane, per cent spermatozoa having intact acrosome, per cent spermatozoa showing high mitochondrial transmembrane potential indicating the involvement of TRPV1 in the process of regulation of sperm functional dynamics. From the study, it was concluded that TRPV1 channels are found in bull spermatozoa and are pH dependent. These channels mediate number of sperm functions like hyper motility, capacitation and acrosome reaction through complex interacting pathways through calcium and pH dependent mechanisms. Further studies are required to find out the possible relationship between TRPV1 channels and other channels in regulating spermatozoa function and possible mechanisms associated with TRPV1 activation as well as its role in sperm function regulation.

15. Studies on effect of trehalose on cryopreservation of Hariana bull spermatozoa

The present experiment was designed to study the effect of supplementation of Trehalose on freezability and antioxidant activity of Hariana bull semen. Semen sample were diluted in TFYG extender containing different Trehalose concentrations (10mM, 30mM, 50mM, 100mM, 150mM). The control samples were extended with TFYG alone. Extended semen samples were packed into 0.25ml polyvinyl French straws and kept at 4^0C for 5 hours of equilibration. The straws were cryopreserved in the vapours of liquid nitrogen (LN_2) for 7 minutes then dipped in liquid LN_2. Frozen straws were thawed at 37^0C for 45 sec and samples were evaluated for semen

characteristics at various stages (after dilution, after equilibration and Post-thawing). Results clearly indicated that, 30mM Trehalose group had significantly (P<0.05) higher percentage of individual motility, sperm viability, HOST reactive sperm and acrosomal integrity in comparison to the control and other Trehalose supplemented groups. Trehalose @30mM supplemented group had significantly (P<0.05) increased percentage of capacitated spermatozoa when compared to control and other Trehalose supplemented groups. In biochemical assays, no clear cut demarcation for antioxidant enzyme was found for Trehalose supplementation. However, Trehalose supplementation has showed increased activity for Glutathion reductase. IN conclusion, extender supplemented with Trehalose @30mM and 10mM concentration improve the post thaw semen quality and was found to be having more beneficial effect on freezability of Hariana bull spermatozoa as evident by post-thaw seminal parameters.

16. Studies on effect of soya milk based extender on cryopreservation of Hariana bull spermatozoa

The present experiment was designed to study the effect of Soya milk based extenders on freezability of Hariana bull semen in order to have a better substitute for egg yolk based extenders following issues of xenobiotic contamination. For the experiment, four adult Hariana bulls were taken as semen donor. Twenty-eight semen samples were collected (7X4=28) by using Artificial Vagina. Semen sample were extended with TFYG and Tris glycerol extender supplement with 5%, 15% and 25% soya milk. Extended semen samples were packed into 0.25ml polyvinyl French straws and kept at 4^0C for 5 hours of equilibration. The straws were cryopreserved in the vapours of liquid nitrogen (LN_2) for 7 minutes then dipped in liquid LN_2. Frozen straws were thawed at 37^0C for 45 sec and samples were evaluated for semen characteristics at various stages (after dilution, after equilibration and Post-thawing). In the fresh ejaculates of four Hariana bulls, no significantly (P<0.05) differences was observed for semen volume (ml), mass motility (0-5 scale), pH, sperm concentration (million/ml). A significantly (P<0.05) higher value was observed in the percentage of progressive motility, live sperm, host reactive sperm, intact acrosome at all the stages (post dilution, pre-freeze and post-thaw) in egg yolk based (control) extender as compared to soya milk (5%, 15% and 25%) based extenders. However, the capacitation was significantly (P<0.05) reduced in soya milk based extenders. The seminal enzymatic profile study showed significant (P<0.05) difference for SOD (super oxide dismutase), MDA (malondialdehyde) and GR (glutathione reductase) enzymes activity with higher activity of SOD in control (egg yolk based) and lower activities of MDA and high GR activity in soya milk based extender. The experiment revealed role of soya milk concentration in cryopreservation of Hariana bull semen, however, a detail study is needed to further select a proper concentration of soya milk.

17. Evaluation of oxidant and antioxidant status of dogs affected with sarcoptic mange and its amelerioation by using antioxidant

Study describes the oxidant/antioxidant status of dogs affected with sarcoptic mange and ameliorative effects of antioxidant supplementation on oxidant/antioxidant status of dogs affected with sarcoptic mange. Study was undertaken on twelve client owned dogs confirmed to be suffering from sarcoptic mange, which were randomly divided in two groups (group 1 and 2) irrespective of age, sex and breed, comprising of six dogs each, while group 3 comprised of six healthy dogs. Group 1 dogs were treated with only Doramectin @ 0.4 mg/kg subcutaneously weekly for 5 treatments, whereas group 2 were additionally given S adenosylmethionine (SAMe) @ 20 mg/kg/d PO for 28 days. Blood samples were collected on day 0, 14 and 28 post therapy. The mean values of haemato-biochemical parameters viz. total leucocyte count, eosinophil counts, mean corpuscular volume, aspartate aminotransferase, alanine aminotransferase were significantly

higher in scabetic dogs than in control while haemoglobin, total erythrocyte count, haematocrit, lymphocyte counts, glucose, cholesterol total protein, albumin, albumin/ globulin ratio and blood urea nitrogen showed significantly lower mean values in scabetic dogs than in control. In the present investigation dogs with sarcoptic mange were found in a state of oxidative stress as indicated by significantly elevated Total Oxidant Status (TOS) and Oxidative Stress Index (OSI) values and significantly reduced Total Antioxidant Capacity (TAC) values as compared to healthy dogs. The dogs of group 2 showed better clinical recovery and marked ameliorations in TOS, TAC and OSI values in comparison to group 1 at the end of therapy. On the basis of findings of present investigation, it is concluded that administration of SAMe in addition to standard therapy can mitigate these alterations expediting the clinical recovery of diseased dogs and therefore can be recommended as an adjunct therapy with miticides for management of canine sarcoptic mange.

18. Evaluation of ameliorative effect of herbal drugs on oxidative stress and thrombocytopenia in dogs

In present investigation total 80 dogs were screened for ehrlichiosis, which was based on observation of 2-3 classical clinical symptoms of ehrlichiosis in dogs. All the screened dogs underwent for blood smear examination to confirm the disease status. Blood smear examination results showed 6 dogs positive for ehrlichiosis; primary PCR revealed 23 positive dogs, however nested PCR confirmed 79 dogs positive for ehrlichiosis of all screened dogs. Out of 79 positive dogs for ehrlichiosis, 8 dogs were found positive for *Babesia* spp as co-infection as evidenced by simple PCR examination test. Important clinical signs exhibited by the ehrlichia positive dogs in decreasing frequency were high fever and mucosal pallor followed by lymphadenomaegaly, melena, depression and splenomegaly. Clinical signs with moderate frequency were ecchymotic and petechial hemorrhages, weight loss, vomiting, epistaxis, ascites, hind limb/scrotal edema/facial edema. Signs with least frequency were ocular abnormalities, icterus, hematuria and hematemesis. Ocular abnormalities include corneal opacity, uveitis, scleral bleeding, and corneal ulcer. Vital parameter like rectal temperature, heart rate, respiration rate were significantly elevated with simultaneous fall in hemoglobin, total erythrocyte count, packed cell volume, leucocyte count, platelet count however the mean values of neutrophil was considerably increased with decreased in lymphocytes. The mean values of basophil, monocytes, eosinophil, MCV, MCH, MCHC were non-significant from the control. The mean values of ALT, AST, ALP, BUN were elevated while, albumin, total protein, glucose were decreased in ehrlichiosis affected dogs. The mean values of globulin, serum creatinine, triglycerides, cholesterol were non significant from the control. Weekly percentage enhancement of platelet count in dogs of group 1 with conventional treatment was compared with the other two groups with additional antioxidants and herbal platelet enhancer. Percentage positivity of ehrlichiosis was recorded on the basis of age, sex, breed and season, respectively, Age group with highest positivity was category 3 (> 1 year) with a positivity of 65.82 %, sex with highest positivity was male (70.88 %), German Shepherd breed (50.63%) and summer season (79.74%), respectively. In present study it was found that there was significant increase in total oxidative status and decrease in total antioxidant capacity in all the treatment groups of dogs in comparison with control. There was significant decrease in the total oxidative status in all the treatment groups with highest recovery is seen in group 3rd and 2nd and minimum in group 1st. Significant increase of total antioxidant capacity is seen in the groups 3rd followed by in group 2nd and minimum in group 1st. Therefore in terms of improvement in treatment groups of dogs, best recovery was assessed in treatment with conventional treatment with *Tinospora cordifolia* and *Carica papaya* extract and conventional treatment along with polyherbal preparation and minimum recovery assessed in group 1st in which no herbal drugs were prescribed.

19. Evaluation of Therapeutic Potential of Certain Homeopathic Preparations in Canine Atopic Dermatitis

Canine atopic dermatitis (CAD) in dogs is a multifactorial geneticallypredisposed inflammatory and pruritic skin disease with characteristic clinical features that is associated with IgE antibodies. A dysregulation of cutaneous immune system which favours an acute T-lymphocyte helper type-2 (Th2) pro-inflammatory reaction to allergens has recently been documented. The release of many pro-inflammatory cytokines after allergen exposure is now considered to be the key to the allergic response. Glucocorticoids (GCs) (prednisone, prednisolone, methylprednisolone) are considered to be the first line of sole therapy to manage CAD. However, GCs have potential detrimental side effects on the health of treated dogs and are not considered to be safe on prolong use. The dog-owning public is now more interested in "natural" and "alternative" methods of disease management. Albeit, homeopathic preparations are being used as alternative medicines since long, the scientific validation of their efficacy and mechanism of action in animal's skin diseases is still in infancy. Hence, the present study aimed to evaluate the efficacy of homeopathic preparations for clinical recovery and immuno-regulatory potential in dogs with AD. The dogs with atopic dermatitis were allocated into four groups of six dogs in each one. Dogs of Group 1 were treated with prednisolone; Group 2 were treated with Sulphur 200 C; Group 3 were treated with Psorinum 200 C and Group 4 were treated with the combination Sulphur 200C and Psorinum 200 C. All homeopathic medicines were given at a dose rate of 3-5 drops, three times in a day orally for 60 days. Dogs with AD revealed remarkable alterations in the leukograms in comparison to healthy controls. Remarkable elevations in circulatory inflammatory cytokines (IL-17 and IL-31) and total Ig-E levels were observed in dogs with AD. Atopic dogs treated with prednisolone and Psorinum + Sulphur revealed significantly amelioration of the altered haemato-biochemical panels. Similarly, these dogs also found to have significant reduction in circulatory pro-inflammatory cytokines (IL-17 & IL-31) and Ig-E levels at day 60 post-therapy as compared with their own day 0. Marked reduction in clinical scores (CADLI and VAS) of atopic dermatitis were revealed by the atopic dogs when treated with Sulphur alone and in combination with Psorinum at days 30 and 60 post-therapy as compared with day 0 scores. No adverse effects were observed in any of the homeopathy treated dogs. Therefore, it can be concluded that dogs with AD have a marked alterations in leukograms with eosinophilia. Remarkable elevation in circulatory pro-inflammatory cytokines (IL-17 and IL-31) and Ig-E might be associated with immuno-pathogenesis of canine atopic dermatitis. Combination of Psorinum 200 C and Sulphur 200 C could be a novel potent therapeutic agent for management of CAD. These preparations also have potential to heal the skin lesions of dogs with AD and have almost equivalent therapeutic potential to that of standard glucocorticoid. The homeopathic preparations; Psorinum 200 C and Sulphur 200C are quite safe and superior over prednisolone for long term therapy and have excellent potential to ameliorate the immunological aberration of dogs with AD and can cure the dermatological lesions of AD from the root in diseased dogs.

20. Mechanistic study on vascular dysfunctions in septic mice with pre-existing diabetes

Present study was undertaken to unravel the influence of experimentally induced pre-existing diabetes on survival time and/or mortality pattern in septic animals and how diabetes and sepsis, when occur concurrently, alter vascular reactivity of aorta. Type-1 diabetes was induced following intraperitoneal injection of streptozotocin (STZ: @ 65 mg/kg) for 5 consecutive days while sepsis was induced by caecal ligation and puncture (CLP). Strepto-zotocin produced a sustained hyperglycaemia in mice and there was decrease in body weight with progression of hypergly-caemic state. CLP caused hyperglycaemia followed by euglycaemia and hypoglycaemia, while in

diabeto-sepsis hypoglycaemia was set earlier, leading to early mortality. Alteration in vascular reactivity and endothelial dysfunction was observed. Histopathological examination showed that STZ caused destruction of only *beta* cells without affecting the exocrine and other cells and sepsis mainly affected the exocrine acinar cells without or mildly affecting the endocrine part, whereas in co-existing diabetes and sepsis, both exocrine and endocrine parts were affected. Histopathology of liver, lungs, kidney, brain and heart also showed that organ damage was more severe in co-existing diabetes and sepsis. Interestingly, histopathology of aorta showed intact endothelium in diabetes, damaged endothelium in sepsis, while in diabeto-sepsis endothelium became serrated and slightly damaged. Haematological and biochemical parameters revealed that sepsis in pre-existing diabetes shifted almost all the parameters towards healthy control. Interestingly, diabeto-septic group the platelet count was found to be almost comparable to that of control group. Functional studies revealed an augmented responses of vasoconstrictors (like high K^+-depolarising solution, noradrenaline and calcium chloride) in diabetes, while reduced response was observed in sepsis. Sepsis in pre-existing diabetes shifted the augmented response of vasoconstrictors towards in healthy control and sham operated (SO) groups. Diabetes increased the expression of $á_{1D}$ adrenoceptor which seems to be responsible for potentiation of NA response while in sepsis, there was decreased in $á_{1D}$ adrenoceptor expression which may be responsible for decrease in responsiveness to NA. Sepsis in pre-existing diabetes shifted the receptor expression towards normal level. Decreased potency of Calcium chloride in diabetes may be due to decrease in passive leakage of intracellular calcium from endoplasmic reticulum. Vascular response to endothelium-dependent vasorelaxant (Acetylcholine) did not differ in diabetes, but, was attenuated in sepsis. Sepsis in pre-existing diabetes decreased the vasorelaxant response to ACh but remained higher than in sepsis alone group. Diabetes also potentiated the ACh response, which may be due to comparatively less damage to endothelium and increased release of nitric oxide (NO) and prostacyclin. eNOS expression was decreased by 52% in diabetes, 71% in sepsis and 35% in diabeto-sepsis. Maximal relaxation response of endothelium-independent vasorelaxant i.e. sodium nitroprusside (SNP) did not differ in diabetes and diabeto-septic mice, while diabetes potentiated SNP response. Potentiation of vasorelaxant-response to SNP may be attributed to enhanced production of iNOS-derived NO.

21. Study on the effect of oleic acid in isoprenaline-induced Myocardial injury in rats

The present study was designed to assess the cardio-protective role of oleic acid in myocardial injury. Myocardial injury was induced in rats by intra-peritoneal injection of isoprenaline (ISO; 110 mg/kg b.wt) for two consecutive days at 24 h interval. Oleic acid was administered orally (@ 5mg/kg b.wt or 10 mg/kg b.wt) for 21 days before inducing myocardial injury to evaluate its ameliorative potential. Sample (blood, heart) were collected from different groups of experimental animals 24h after last injection of isoprenaline. Besides evaluation of heart weight to body weight (HW/BW) ratio, myocardial infarct size, oxidativestress parameters and haemato-bichemical parameters, cardio-specific biomarkers of injury,ECG, isolated right atrial response and mRNA expression of gene coding for cardiac uncoupling protein-2 (UCP-2) were quantified. Isoprenaline administration significantly increased the HW/BW ratio, myocardial infarct size, lipid profiles (total cholesterol, HDL-C,triglyceride) in ISO-induced myocardial injured rats. Further, ISO-induced myocardial injury significantly elevated the cardio-specific biomarkers (viz. LDH, CK-MB, cardiac troponin-I) suggesting the myocardial necrosis and alteration of membrane permeability. Necrosis and degeneration of cardiac myofibrils with deposition of collagen fibers were also observed in the histopathological examination of cardiac tissue sections. Further, significant increase in the heart rate and height of ST segment whereas decrease in RR and QT

intervals were observed in the ISO-induced myocardial injured rats implying the abnormality in the cardiac functionality in rats following isoprenaline administration. Oleic acid pre-exposure at higher dose significantly improved the HW/BW ratio, myocardial infarct size, lipid profiles and cardiac injury biomarkers suggesting its cardio-protective role. The ameliorative potential of higher dose of oleic acid was further substantiated by its ability to reduce the cardiac oxidative stress as evidenced by significant decrease in lipid peroxidation with corresponding increase in superoxide dismutase and reduced glutathione. Significant increase in RR interval and QT intervals in oleic acid pre-exposed rats were also observed. The mRNA expression of cardiac UCP-2 gene was significantly increased in the oleic acid pre-exposed group as observed in ISO-induced myocardial injured rats. Though UCP-2 gene is responsible for fatty acid oxidation, its potential role in modulating reactive oxygen species (ROS) is also mentioned. Thus increasing the gene expression of UCP-2 in cardiac tissue may be a protective measure against myocardial injury. Further, reduction of fatty acid oxidation is always not successful in heart failure because it may directly influence the supply of ATP to comprised heart resulting in further decrease in cardiac efficiency. Thus as an alternative measure up-regulation of glucose oxidation may be a useful measure in cardiac ischemia. Further studies are warranted to evaluate the effect of oleic acid on cardiac glucose oxidation. Based on the above findings it may be inferred that oleic acid has the potential cardioprotective action against myocardial injury due to its anti-oxidative property and its ability to modulate cardiac metabolic processes. Thus incorporation of oleic acid as a component of diet may be a useful measure against myocardial ischemia or injury.

22. Studies on Gymnema sylvestre and ITK formulation for therapeutic management of cardiomyopathy in type II diabetic rats

The objective of the present study was to explore the therapeutic potential of *Gymnema Sylvestre* and ITK formulation against obese streptozotocin-induced type II diabetes and diabetic Cardiomyopathy in male Wistar rats. In Phase I study, 80% hot methanolic extract of *Gymnema Sylvestre* leaves and hot aqueous extract of ITK formulation (ingredients gum acacia, black cumin, Wheat and barley) was prepared and evaluated for in vitro antioxidant and antidiabetic activity of Extracts. Extracts have potent antioxidant (studied by 2, 2-Diphenyl-1-picrylhydrazyl (DPPH) and 2,2'-Azino-bis (3-ethylbenzothiazoline-6-sulphonic acid) (ABTS) radical scavenging assay), antidiabetic (determined by in vitro á-amylase and á-glucosidase inhibitory activity) and glucose Uptake potential in cultured lymphocytes and were observed to possess alkaloids, flavonoids, Saponins, anthraquinones and phenols in *Gymnema sylvestre* leaves with additional resins, tanins, proteins, glycosides and fixed oils and fat in ITK formulation after screening by qualitative tests and further confirmed to possess active principles having antidiabetic, antioxidant, cardioprotective, nephroprotective, and anti-inflammatory properties. Further in Phase II study, 42 obese male Wistar rats were divided into seven groups viz. Group I (Normal control), group II (Obese control), group III (Obese diabetic), group IV (Obese Diabetic + Metformin), group V (Obese diabetic + *Gymnema sylvestre*), group VI (Obese diabetic + ITK) and group VII (Obese diabetic + *Gymnema sylvestre* + ITK) consisting six animals in each, were experimentally-induced-diabetes with streptozotocin @ 35 mg/kg body weight, i.p. *Gymnema Sylvestre* extract, ITK formulation and metformin were given @ 400 mg/kg, @ 445 mg/kg and @ 50 mg/kg body weight by oral gavage continuously for 60 days. Increase in feed and water intake, decrease in percent weight gain and anthropometric parameters, reduced percent haemoglobin and platelets count, significant increase in fasting blood glucose and percent glycated haemoglobin (hba1c), was recorded in obese diabetic group rats. Treatment with metformin and extracts alone and combination lowered blood glucose and percent hba1c, where, ITK formulation was emerged as a potent hypoglycaemic formulation and was comparable

to metformin, also this formulation reduced the feed and water intake towards control values. Dyslipidemia (increase in triglycerides, total cholesterol, LDL and decrease in HDL), rise in serum ALP, GGT, ALT, AST (liver injury markers), urea, creatinine, total proteins, albumin, globulin and ratio between albumin and globulin (kidney injury markers) and LDH, CK-MB, cardiac troponin-I (cardiac injury biomarkers) was observed in obese diabetic rats which were partially and significantly restored in rats treated with hot methanolic extract of *Gymnema sylvestre* leaves and hot aqueous extract of ITK formulation alone or in combination and metformin. Obese diabetic rats revealed a significant increase in MDA and decrease in GSH level, decreased activity of CAT, SOD, GST and GPX in heart whereas, improvement was observed in antioxidant enzymes in all the treatment groups. Mean arterial pressure was significantly increased and ECG indices were altered in diabetic rats and treatment with extracts alone and/or combination significantly restored the hypertension and also the ECG Indices (QRS interval, R-amplitude and ST-height) were shifted towards normal control values. A significant increase in expression of cardiac tissue glucose transporter-4 (GLUT-4) was observed in both extracts alone and combination of extracts compared to obese diabetic group revealing their protective action against hyperglycemia induced cardiac injury. Histopathological findings revealed degenerated pancreatic islets, acini and collagen deposition, disrupted cardiac myofibres and infiltration of inflammatory cells in obese diabetic rats whereas, treatment groups reversed the pathological features of cardiac injury, with decrease in collagen fibre deposition and showed less degenerative changes in pancreatic architecture. Thus, it can be concluded that, both hot methanolic extract of *Gymnema sylvestre* and hot aqueous ITK formulation are comparable to control hyperglycemia in STZ-induced-obese diabetic rats and to combat free-radical mediated derangements in the body.

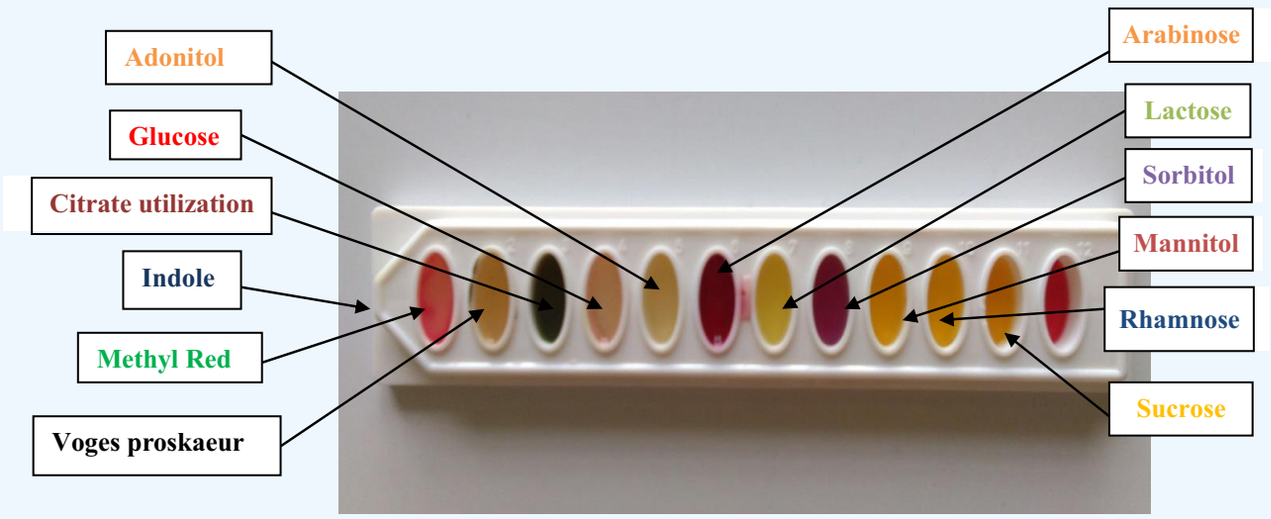
23. Studies on therapeutic potential of *Tribulus terrestris* on diabetic nephropathy in Wistar rats

The objective of the present study was to explore the therapeutic potential of *Tribulus terrestris* and ITK formulation against obese streptozotocin-induced type II diabetes and diabetic nephropathy in male Wistar rats. In Phase I study, 70% hot ethanolic extract of *Tribulus terrestris* fruits and hot aqueous extract of ITK formulation (ingredients gum acacia, black cumin, wheat and barley) was prepared and evaluated for *in vitro* antioxidant and antidiabetic activity of extracts. Extracts have potent antioxidant (studied by 2, 2-Diphenyl-1-picrylhydrazyl (DPPH) and 2, 2'-Azino-bis (3-ethylbenzothiazoline-6-sulphonic acid) (ABTS) radical scavenging assay), antidiabetic (determined by *in vitro* á-amylase and á-glucosidase inhibitory activity) and glucose uptake potential in cultured lymphocytes and were observed to possess carbohydrates, alkaloids, proteins and amino acids, tannins, flavonoids, saponins, fixed oils and resins in *Tribulus terrestris* fruits with additional glycosides in ITK formulation after screening by qualitative tests and further confirmed to possess active principles having antidiabetic, antioxidant, nephroprotective, cardioprotective and anti-inflammatory properties. Further in Phase II study, 42 obese male Wistar rats were divided into seven groups viz. group I (Normal control), group II (Obese control), group III (Obese diabetic), group IV (Obese diabetic + Metformin), group V (Obese diabetic + *Tribulus terrestris*), group VI (Obese diabetic + ITK) and group VII (Obese diabetic + *Tribulus terrestris* + ITK) consisting six animals in each, were experimentally-induced-diabetes with streptozotocin @ 35 mg/kg body weight, i.p. *Tribulus terrestris* extract, ITK formulation and metformin were given @ 200 mg/kg, @ 445 mg/kg and @ 50 mg/kg body weight by oral gavage continuously for 60 days. Increase in feed and water intake, decrease in percent weight gain and anthropometric parameters, reduced percent haemoglobin and platelets count, significant increase in fasting blood glucose and percent

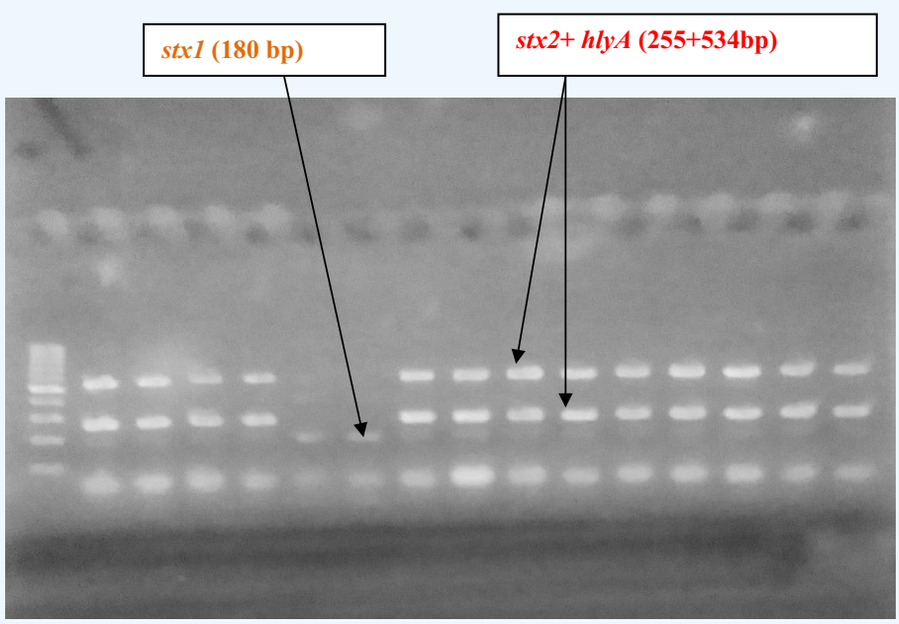
glycated haemoglobin (HbA1C) was recorded in obese diabetic group rats. Treatment with metformin and extracts alone and combination lowered blood glucose and percent HbA1C, where, ITK formulation was emerged as a potent hypoglycaemic formulation and was comparable to metformin, also this formulation reduced the feed and water intake towards control values. Dyslipidemia (increase in triglycerides, total cholesterol, LDL and decrease in HDL), rise in serum ALP, GGT, ALT, AST (liver injury markers), urea, creatinine, uric acid, total proteins, albumin, globulin and ratio between albumin and globulin (kidney injury markers) and urine output and urinary albumin (urinary biochemical parameters) was observed in obese diabetic rats which were partially and significantly restored in rats treated with *Tribulus terrestris* fruits extract and hot aqueous ITK formulation alone or in combination and metformin. Obese diabetic rats revealed a significant increase in MDA and decrease in GSH level, decreased activity of CAT, SOD, GST and GPX in liver, kidney, brain, spleen, testes and heart whereas, improvement was observed in antioxidant enzymes in all the treatment groups. A significant decrease in expression of sodium glucose co-transporter (SGLT-2) was observed in both extracts alone and combination of extracts compared to obese diabetic group revealing their protective action against hyperglycemia induced kidney injury. Histopathological findings revealed degenerated pancreatic islets, acini and severe collagen fibre deposition in kidney tubules and glomeruli in obese diabetic group rats whereas, in obese diabetic group rats, treatment groups reversed the pathological features of kidney injury and showed less degenerative changes in pancreatic architecture and restoration of kidney tubules and glomerular morphology with decrease in collagen fibre deposition. Thus, it can be concluded that, both hot ethanolic *Tribulus terrestris* extract and hot aqueous ITK formulation are comparable to control hyperglycemia in STZ-induced-obese diabetic rats and to combat free radical mediated derangements in the body.

24. Molecular characterization and antimicrobial resistance of pathogenic strains of E. Coli in poultry, poultry products and its environmental sources with public health significance

The purpose of study was to determine molecular characteristics and antimicrobial pattern of VTEC in poultry, poultry products and its environment. Out of total 350samples (200 cloacal swabs, 90 environmental samples & 60 from poultry products), 202 *E.coli* isolates were obtained. Out of 202 *E.coli* isolates from various sources, 27 pathogenic *E. coli* (only VTEC, no EPEC) were obtained, which was 13.37% of the total *E.coli* and 7.71% of the total samples collected. Percentage of pathogenic *E.coli* (VTEC) from cloacal swab,environmental samples & poultry product were 11.5%, 2.22% & 3.33%, respectively. From cloacal swab % pathogenic *E.coli* (VTEC) in Turkey, Quail, Chabro and broiler species were 14%, 12%, 12% & 8%, respectively. From environmental samples 6.67% positivity for pathogenic *E.coli* (VTEC) was found in utensil swab and litter sample, each. No pathogenic *E.coli* was found in hand swab, surface swab, feed and water. Among poultry products, 10% raw meat samples were positive for pathogenic *E.coli* (VTEC). Egg and ready to eat product were negative for VTEC. Molecular characterization of isolates through mPCR revealed 25.93% isolates positive for the *stx1* gene alone and 7.4% for *stx2* alone while all the other isolates were found carrying two or more VTEC genes. Also, the combinations found were *stx1* & *stx2*, *stx1* & *hlyA*, *stx2* & *hlyA* with a percentage of 3.7%, 18.5% and 44.4%, respectively. In 27 pathogenic *E.coli* (VTEC) positives, 7 *stx1* (4, 2 and 1 from cloacal swabs, environmental samples and poultry products, respectively), 2 *stx2*, 1 *stx1* & *stx2* and 5 *stx1* & *hlyA* (all from cloacal swabs only) and 12 *stx2* & *hlyA* (11 from cloacal swabs and 1 from poultry products) were found. No samples were found positive for *eaeA*, *hlyA* (single), *saa*, *rfb O111*, *rfb O157*and *fliC H7* gene and variants of *stx2* (C and D). All pathogenic *E.coli* (VTEC) positive isolates were also screened phenotypically by Combination disc test (CDT), Modified double disc synergy



Biochemical test kit showing Biochemical reaction of *E. coli*



Agarose Gel showing PCR amplified product for *stx1*, *stx2* and *hlyA*

test (MDDST) and Ezy MIC™ Strip test. All pathogenic *E.coli* (VTEC) isolates were negative for ESBL production. Congo red dye binding ability was found 37.03% (10 out of 27). Out of which the percent positivity in cloacal swab, environmental sources and poultry product was 30.43%, 50% and 100%, respectively. Also, the antibiogram testing has been done on all positive pathogenic *E.coli* (VTEC) isolates using 15 antibiotics. Result revealed that Imipenem and Chloramphenicol (100%) showed highest sensitivity followed by Amikacin (96.3%), Kanamycin (92.6%), while antibiotics like Clindamycin (100%), Enrofloxacin (100%), Erythromycin (88.89%) showed highest resistance towards the positive VTEC isolates.

25. Canine Oculopathies- A Clinical Study on Incidence, Diagnosis and Surgico-therapeutic Management

In this present study complete ophthalmic examination of normal dogs eyes in three age group i.e. <1 year,1-5 year and >5 year as well as clinical cases presented at TVCC DUVASU, Mathura from May 2017 to March 2018 was done. Hospital incidences of ocular affections were recorded and managed by surgically or therapeutically as per the conditions.Total 74 clinical cases were diagnosed of different ocular affections. The Schirmer tear test and Schiotz indentation tonometry was performed in all cases. The average mean value of Schirmer tear test for both eyes in group I, II, and III in normal dogs were 19.16 ± 0.60 mm/min, 17.08 ± 0.83 mm/min, 17.83 ± 0.81 mm/min, respectively. The average mean value of IOP for both eyes in group I, II, and III in normal dogs were 15.57 ± 0.25 mm Hg, 15.63 ± 0.85 mm Hg, 16.82 ± 1.13 mm Hg, respectively. There was no significant difference in the values of STT and IOP of normal and clinical cases except the KCS and Glaucoma cases. There were total 16 breeds presented, in which maximum hospital incidences of ocular affection was found in Labrador followed by Pug, Pomeranian, Rottweiler and GSD. Age wise distribution of cases revealed maximum incidence of affected eyes in the age group of 1 to 5 years (28 cases, 37.8%) followed by <1 year–old–dogs (25 cases, 33.7%) and least in >5 years (21 cases, 28.3%) Sex wise distribution indicated that more males (48, 65%) were affected than females (26, 35%). 74 cases of canine of concerning about ophthalmological conditions were diagnosed in surgery department. i.e 4.34 % of total surgical cases and 1.40 % of total canine cases, and 0.6% of total TVCC cases. Affections wise maximum hospital incidence of cherry eye recorded i.e 18 cases (30 eyes,20%), 13 cases of KCS (22 eyes,14.8%), 13 cases of cataract (25 eyes,16.8%), followed by cornal opacity in 10 cases (15 eyes, 10.1%), corneal ulcers in 8 cases(10 eyes, 6.75%), pigmentary keratopathy in 7 cases (12 eyes, 8.1%), glaucoma in 3 cases (4 eyes, 2.70%), traumatic injury in 6 cases (8 eyes, 5.40%), RD in 4 cases (4 eyes, 2.70%), VD in 4 cases (5 eyes, 3.33%),conjunctivitis in 5 cases(7 eyes, 4.72%),Blepharitis in 3 cases (4 eyes, 2.7%), enophthalomos in 2 cases (3 eyes, 2.0%), then one case of proptosis, eye dermoid, aphakia, lens luxations, Viterous hemorrhage also recorded. Surgical correction was done for cases of Cherry eye , Cataract, Proptosis and Eye dermoid. Therapeutic management was done for other ocular affections viz. corneal opacity, corneal ulcer, Pigmentary Keratopathy, Conjuctivitis, Glaucoma, Blepharitis, Traumatic injury, Retinal detachment, Vitreous degeneration and Vitreous hemorrhage etc.

26. Radiographic, Electrocardiographic and Echocardiographic Studies in Goats

Present study was conducted on twelve apparently healthy goat free from cordiothoracic diseases. The animals were divided into two groups each containing 6 animals to evaluate various the cardiothoracic parameters. Mean ± S.E values of body weight and age were measured 11.83 ± 0.70 (range 10 - 15) kg, 3.75 ± 0.31 (range 3 - 5) month and 25.67 ± 1.73 (range 16-30) kg, 8.58 ± 0.95 (range 6.5 - 12) month in animals of the group-I and II, respectively. The purpose of this study was to establish the standard values (range) for parameters of the heart and thorax. Most of the parameters were found to be non – significantly different between group-I and group-II animals, except VHS-(Buchanan and Buchler (1995) and Ljubica et al. (2007) method); Cardiosternal contact, Cardiac height/T_3-T_5, Cardiac height + cardiac width /T_3-T_5 and right side castophrenic angle. Significant positive correlations with age and body weight were observed in 2TD/3, while it was significant negative in cardiac width / T_3-T_5. Positive correlations with age and body weight were observed in tracheal angle, cardiac width /thoracic height, cardiac height / R_3-R_5, cardiac height + cardiac width/R_3-R_5, CVC/AO, CVC/T_4, CVC/R_4, AO/R_4 and castophrenic angle. While with body weight Cardiac width/R_3-R_5 and AO/T_4 while other parameters show negative correlation with age and body weight were observed. In electrocardiographic studies, the mean ± S.E. values of the heart rate were 153.83 ±

5.85 (range 133 - 166) bpm and 142.17 ± 8.99 (113 - 166) bpm in the goats of the group I and II, respectively. Significant ($p < 0.05$) negative correlation was found in the value of heart rate with body weight and age of the goats. No significant difference was recorded in the mean values of electrographic amplitude and duration. Amplitude of P wave showed positive correlation with both age and body weight, R and T wave with only body weight while R wave was also showed the significant positive correlation with age while other parameter of amplitude are negative correlation with both age and body weight of the animal. Significant positive correlation with both age and body weight were observed in duration in QRS complex, R-R interval while P-R and S-T interval showed only with age while other parameter of duration were negatively correlated with both age and body weight of the animal.

In echocardioraphic studies, B- mode, M-mode and Doppler mode examinations were performed to generate the reference values of echocardiographic parameters in goats. In B-mode echocardiographic examinations of animals showed normal structural conformations of various cardiac structures. On M-mode echocardiography, most of the parameters were found to be non-significantly different between group-I and II of the animals, except RVDd, cardiac output, and mitral velocity of A peak (MV_A) in M - mode and doppler echocardiography, respectively. Positive correlation with age and body weight were observed in M – mode echocardiographic measurements of EPSS, RVDd, LVDd, PWD, IVSs, LVDs, EF%, S%, LVM, LA/AO, EDV, ESV, and cardiac output (CO) while with age stroke volume and body weight with PWs. Significant positive correlation with body weight was observed in stroke volume while other parameter was negative correlation with age and body weight of the animals. Significant positive correlation with age was observed in of pulse wave doppler echocardiographic measurements of tricuspid E peak and tricuspid E/A ratio.

Positive correlation with age and body weight was observed in pulse wave doppler echocardiographic measurements of peak mitral velocity (E peak, A peak) and aortic velocity. While with age $M_{E/A,}$ tricuspid A peak and with body weight tricuspid E peak, $T_{E/A.}$ while other parameter was negative correlation with age and body weight of the animals.

27. Studies on ultrasonography of adrenal glands of dogs

The present study was undertaken in dogs to standardize ultrasonographic examination protocol and generation of reference images. This study was conducted in two parts. Part I of the study was conducted on 18 apparently healthy dogs divided into three groups of six animals each namely, Group I, II and III. Part II comprised of patients reporting to the TVCC with symptoms like lethargy, anorexia vomiting, weight loss, bradycardia, weak femoral pulse and abdominal pain, or polydipsia, polyuria hyper-glycaemia etc. Ultrasonographic examination was done in lateral recumbency in all the dogs without using any sedative or anaesthetic agent. Ultrasonographic images of adrenal glands were recorded only in sagittal plane because adrenal glands could not be differentiated from the surrounding structures in transverse plane. The left adrenal was best visualised by keeping transducer at left paralumbar fossa just behind the last rib. The right adrenal was best visualised by keeping transducer at right paralumbar fossa just behind the last rib. The length of left adrenal gland was 1.61 ± 0.17 cm in Group I, 2.2 ±0.177 cm in Group II and 2.44±0.30 cm in Group III. The cranial pole diameter of left adrenal gland was 0.32±0.033 cm, 0.49±0.048 cm and 0.54±0.08 cm in Group I, II, III, respectively. The caudal pole diameter of left adrenal was 0.35± 0.037 cm, 0.54 ± 0.029 cm and 0.52±0.08 cm in Groups I, II, III, respectively. The left adrenal gland was at a distance of 1.1±0.107 cm from the skin in Group I, 2.02±0.43 cm in Group II and 2.05±0.25 cm in Group III. The volume of gland was 0.60± 0.155 ml, 1.85±0.29 ml and 2.32±0.52 ml in group I, II, III respectively. The length of right adrenal gland was 1.57 ± 0.12 cm, 2.1 ± 0.10 cm and 2.20 ± 0.27 cm in Groups I, II and III, respectively. The cranial pole diameter of

right adrenal gland was 0.36±0.03 cm, 0.48±0.03 cm and 0.61±0.07 cm in Groups I, II and III, respectively. The caudal pole diameter of right adrenal gland was 0.39±0.04 cm, 0.54±0.05 cm and 0.56±0.08 cm in Groups I, II and III, respectively. The right adrenal gland was at a distance of 1.1±0.13cm from the skin in Group I, 1.56±0.27 cm in Group II and 1.86±0.21 cm in Group III. The volume of gland was 0.63±0.14 ml, 1.68±0.24 ml and 2.06±0.44 ml in Groups I, II and III, respectively.

The left adrenal gland appeared as a peanut shaped hypoechoic area, and was homogenous in all the groups. The outline of the left adrenal was clear. The difference in the echotexture of cortex and medulla were not discernible. The cranial and caudal poles of the left adrenal were easily discernible. The left adrenal gland was the first structure to appear in ultrasonogram beneath the skin, aorta appeared as an anechoic pulsating oblong structure below the left adrenal gland. The right adrenal gland was almost oval shaped hypoechoic structure as compared to the surrounding tissue, and was homogenous in all groups. The outline of the adrenal was smooth but the cortex could not be differentiated from the medulla as in case of the left adrenal. The right adrenal gland appeared either dorsal to the caudal vena cava or at the level of caudal vena cava.

In Part II of the study, which comprised of clinical cases, the adrenal measurements and the echotexture of both the adrenal glands were well within the normal ranges and comparable to those of the Part I of the study. However, in one animal, the ultrasonographic examination of left adrenal revealed enlargement of caudal pole thickness (2.09 cm) and the echotexture of the gland was slightly heterogenous. So it was suspected for the adrenal carcinoma.

Ultrasonography of adrenal glands in dogs does not require anaesthesia. Subcostal approach is the best approach to scan left and right adrenals, the scanning of adrenal can be easily done using a 7.5 MHz Linear transducer, in lateral recumbency by placing the probe caudal to the last rib and ventral to the lumbar process. The dimensions and the echotexture of the adrenal glands may assist in the diagnosis of pathologies of the adrenals or other organs.

28. Clinical Studies on Upper Gastro-intestinal Endoscopy in Dogs

Endoscopic evaluation of oesophagus, stomach and duodenum was conducted in twelve dogs of either sex, belonging to different breeds and age groups presented to the Teaching Veterinary Clinical Complex (TVCC), Kothari Veterinary Hospital, College of Veterinary Science and A.H, U.P. Pandit Deen Dayal Upadhyay Pashu-Chikitsa Vigyan Vishwavidyalaya Evam Go-Anusandhan Sansthan, Mathura (U.P.) with the history of reduction in food intake, regurgitation or chronic vomiting and not responding to symptomatic treatment. Diagnosis was made on the basis of clinical symptoms, haematobio-chemichal, radiographic, ultrasonographic, endoscopic and histopathologic evaluation and appropriate treatment was done as per need. The breeds of dogs reported with different gastro-intestinal problems which were subjected to endoscopy were Labrador Retriever (8), German Shepherd (2), Rottweiler (1) and Lhasa apso (1). There were seven males and five females among the animals investigated. The age of the dogs ranged from five months to ten years with an average value of 3.95 ± 0.87 (mean ± S.E.) years. The body weight of dogs ranged from 10 kg to 35 kg with average values of 20.65 ± 2.56 (mean ± S.E.) kg. The prominent clinical signs observed were chronic vomiting, regurgitation and anorexia. Glycopyrrolate (0.01 mg/kg) + xylazine (0.5 mg/kg) + butorphanol (0.2 mg/kg) combination was used as preanesthetics. Induction of anesthesia was achieved with propofol (2-4 mg/kg) till effect to intubate the animals. A surgical plane of anesthesia was maintained throughout the procedure with isoflurane (1.5-2.5%) in oxygen using a semiclosed system of inhalation anaesthesia. Left lateral recumbency was found appropriate for performing upper gastro-intestinal endoscopy in all animals under study. Upper gastro-intestinal endoscopy was performed using a multipurpose video endoscope with a working length of 140 cm, outer diameter of 7.9 mm and a channel

diameter of 2.8 mm in twelve dogs. The different conditions diagnosed on endoscopy included gastric foreign body obstruction (2), oesophagitis (3), megaoesophagus (2), oesophageal diverticulum (1), extramural mass and ulcer (1), haemorrhagic gastritis (2) and gastric adenocarcinoma (1). Rradiographic (plain and contrast), ultrasonographic finding complemented the endoscopic examination. Foreign bodies were retrieved by endoscopy in two cases and management of clinical cases was carried out to achieve optimum success. Out of 12 clinical cases that have undergone endoscopic procedure, 10 cases showed significant clinical progress, however two cases could not survive. Endoscopy was found to be minimally invasive and efficient diagnostic tool to visualize precise location of the lesion and facilitated surgical manoeuvres to be undertaken in dogs.

M.Sc. Biotechnology

1. Functional Characterization of Voltage-gated Proton Channel (Hv1) in Bull Spermatozoa

Acid extrusion and regulation of intracellular alkalisation are the two key events during sperm capacitation which are mediated through proton gated channels (Hv1). Literature is meagre regarding the presence and involvement of Hv1 in bull spermatozoa. In the current study, molecular and functional characterisation of Hv1 was carried out in spermatozoa of Hariana bulls. Sixty four ejaculates were collected from four bulls and were used for series of experiments. Immunoblotting and immunocytochemistry were employed for the molecular characterisation of Hv1. Immunoblotting identified a single band of 32 kDa corresponding to Hv1 in *Hariana* bull spermatozoa. Positive immune-reactivity was seen in principal piece of the spermatozoa for Hv1. Functional study was carried out using two Hv1 blockers namely 2-Guadinobenzimidazole (2GBI) @ 200µM and Zinc Chloride @ 1mM, whereas, one activator was used namely Anandamide (AEA) @ 0.3µM. In the study, three groups were used namely, control (100 µL of sperm dilution medium (SDM) containing 1×10^6 cells), vehicle (3µL) and drug (2GBI/Zinc/AEA and their combinations). Different time of incubations was used depending on the experiments. Blocking of Hv1 resulted in significant ($P<0.05$) reduction in progressive sperm motility as compared to the control; and with activation using AEA, PSM was decreased significantly till 1h and after that PSM was sustained as compared to control. However, both during blocking and activation of Hv1, per cent spermatozoa showing hyperactive motility was increased (10-20%) ($P< 0.05$). Evaluation of 2-GBI, Zinc and AEA treated spermatozoa stained with CTC revealed significant ($P< 0.05$) increase in B-pattern of spermatozoa indicating induction of capacitation. Spermatozoa treated with different pH gradients showed significant ($P< 0.05$) reduction in motility as compared to control both with and without drugs modulating Hv1. Functions of Hv1 was found to be mediated through cAMP and PKA pathway in the induction of hypermotility in sperm cells as evident from inhibition of sAC and PKA. Both L- and T- type of calcium channels were found to be associated with Hv1 function as evident from their respective blocking and its effect on PSM. Blocking as well as activation of Hv1 showed significant ($P< 0.05$) reduction in sperm livability, per cent spermatozoa having intact membrane, per cent spermatozoa having intact acrosome, per cent spermatozoa showing high mitochondrial transmembrane potential indicating the involvement of Hv1 in the process of regulation of sperm functional dynamics. From the study- it was concluded that Hv1 channels were found in bull spermatozoa and were pH dependent. These channels mediate number of sperm functions like hyper motility, capacitation and acrosome reaction through complex interacting pathways through calcium and pH dependent mechanisms. Further studies are required to find out the possible relationship between Hv1 channels and other channels in regulating spermatozoa function and possible mechanisms associated with Hv1 activation as well as its role in sperm function regulation.

2. Genetic polymorphic studies of fecundity genes in Muzaffarnagari sheep breed

Three major genes whose mutations can increase ovulation rate have been discovered, and all related to the transforming growth factor â (TGFâ) superfamily. Different mutations in the Growth differentiation factor (GDF9), Bone morphogenetic protein (BMP15) also known as growth differentiation factor 9B (GDF9B), and the mutant of *FecB* of Bone morphogenetic protein receptor 1B (BMPR1B) had an additive effect on ovulation rate in sheep. The aim of the current study was to determine the mutations in GDF9, BMP15, and BMPR1B genes & the possible polymorphism in the Muzzafarnagari sheep breeds. DNA was isolated from blood samples were collected from the Muzzafarnagari sheep breeds (n=200) during 2017-18 maintained at LFC of DUVASU, Mathura, U.P. The PCR products of 190bp of BMPR1B (part of exon-8), 141bp of BMP15 (part of exon-2) and, 139bp of GDF9 (part of exon-1) were amplified using reported primers. The PCR products of the genes were digested with *AvaII* restriction enzymes for the BMPR1B (*FecB*) gene giving uncut 190bp, *HinfI* for the BMP15 (*FecX*) gene producing 111bp and 141bp, and with *DdeI* for the GDF9 (*FecG*) gene giving 105 bp and 34 bp products. The results showed no difference in the band patterns of digested products as only the wild-type alleles (++) were detected in the locii of BMP15, BMPR1B genes & only mutant type in GDF9 gene, and were found monomorphic in nature and none of the sheep carried heterozygous genotype for *FecB*, *FecX*, and *FecG* variants in this breed. Our study revealed that Muzzafarnagari sheep population in the present study was homozygous and non-carrier of *FecB*, *FecX*, and *FecG* mutation.

3. Heat shock protein 70 and redox status in fluid and spermatozoa in different segments of buck epididymis

The present study was carried out to estimate antioxidative status and HSP70 level in spermatozoa and fluid of different segments of buck epididymis.The experiment was carried out on the testes collected from sexually mature and healthy buck aged 2-3 years. Within one hour after the slaughter the testes were brought to the laboratory in pre-chilled phosphate buffer saline. The entire epididymis was separated from testes which was demarcated and cut into caput (head), corpus (body) and cauda (tail). The epididymal fluid containing spermatozoa was diluted and used for further analysis. Tissue samples were stored in 10% formalin for histological examinations. After assessing the gross features of the spermatozoa, objective analysis was carried out using CASA and sperm viability was examined. The luminal fluid and spermatozoa were separated and used for further analysis. The kinematic pattern of spermatozoa in different segments of epididymis varied significantly ($p<0.05$). Although the variation was less between caput and corpus but it was found to be more pronounced in cauda. Head to head adhesion was observed in the spermatozoa of corpus region as compared to caput and cauda region. The cytoplasmic droplets were found to be present at proximal, middle and distal part of the tail of the sperm in caput, corpus and cauda epididymis, respectively. The luminal epithelial lining was longer in corpus region as compared to caput and cauda region. A definite pattern of redox status was not observed either in the fluid or in the spermatozoa of different segments of epidymis. The HSP70 concentration in fluids was significantly ($p<0.01$) higher in corpus epididymis as compared to caput and cauda epididymis. The HSP70 concentration in sperm lysate was found to be significantly ($p<0.01$) higher in caput epididymis as compared to corpus and cauda epididymis. Similarly, relative expression of HSP70 mRNA decreased significantly ($p<0.01$) in the spermatozoa of corpus and cauda epididymis as compared to caput epididymis. Immunoblot confirmed the presence of HSP70 in the sperm of all the three segments of epididymis. HSP70 was found to be localized on the surface of the acrosomal cap region of the spermatozoa in cauda epididymal only. The results confirmed that the antioxidative status and HSP 70 concentration in spermatozoa vary in the fluid and spermatozoa of different segments of epididymis.

EXTENSION

1. DEPARTMENT OF VETERINARY AND ANIMAL HUSBANDRY EXTENSION

A. Trainings coordinated by the department:

i. Trainings organized for Veterinary Officers of the State Animal Husbandry Department

S.N.	Title	Number of participants	Duration	Funding agency	Grant (in Lacs) Rs.
1.	Reproductive Ultra sonography in Dairy Animals	23	06th – 18th Aug., 2018	UPLDB, Lucknow	1.3
2.	Reproductive Ultra sonography in Dairy Animals	23	10th – 12th Sep., 2018		1.3
3.	Reproductive Ultra sonography in Dairy Animals	23	24th – 26th Sep., 2018		1.3
4.	Reproductive Ultra sonography in Dairy Animals	22	04th – 06th Oct., 2018		1.3
5.	Reproductive Ultra sonography in Dairy Animals	24	16th – 18th Jan., 2019		1.3

ii. Trainings organized for farmers

S.N.	Title	Number of participants	Duration	Funding agency	Grant (in Rs)
1.	Recent Scientific Technological Developments in Animal Husbandry & Vermi composting	30	17th -19th Jan., 2019	Jan Kalyan Sanstha, Meerut	20,900/-
2.	Recent Scientific Technological Developments in Animal Husbandry & Milk Production	30	06th -07th Feb., 2019	Parivar Society, Ghaziabad	8,715/-

B. Exhibition of University technologies during different melas/exhibitions

S.N.	Title	Place	Date
1.	39th Foundation Day of ICAR-CIRG	ICAR-CIRG, Farah, Mathura	12th Jul., 2018
2.	Krish Evam Gram Vikas Pradarshani	Deen Dayal Dham, Nagala Chandrabhan, Farah, Mathura	06 th – 08 th Oct., 2018
3.	Krishi Kumbh	Indian Institute of Sugarcane Research, Lucknow	26th to 28th Oct., 2018
4.	Fasal Avshesh Prabandhan Mela, Krishi Pradarshani Evam Krisak Gosthi	Khanpur, Chata, Mathura	27th Feb., 2019

C. Exposure visits of farmers

S.N.	Department/Agency	Date	Number	
			Male	Female
1.	Animal Husbandry Department, Dongargoan (Chhattisgarh)	10.04.18	13	-
2.	Animal Husbandry Department, Jangir champa (Chhattisgarh)	09.07.18	10	01
3.	Animal Husbandry Department, Bemetara (Chhattisgarh)	18.07.18	40	-
4.	Farmers Visit from Chhattisgarh	21.07.18	10	18
5.	Farmers Visit from SBBR Sharda University, Greater Noida	29.09.18	Total 73	
6.	Farmers Visit from Rajasthan	03.10.18	-	37
7.	Farmers Visit from Ghaziabad	06.02.19	07	22
8.	Animal Husbandry Department, Champa (Chhattisgarh)	11.02.19	28	-
9.	Farmers Visit from Chhattisgarh	25.02.19	23	-
10.	Animal Husbandry Department, Sakti (Chhattisgarh)	28.02.19	13	-
11.	Farmer Visit from Farrukhabad	29.03.19	44	-

D. Extension Literature published

I. Chapters for book (in English)

1. Jitendra Chauhan, Amit Singh and Sanjeev Kumar Singh (2018). *Role of ICT in Doubling Farmers Income* in the book "Doubling Farmer's Income through Animal Husbandry". Satish Serial Publishing House, New Delhi, pp 1-8, ISBN No. – 978-93-88020-20-6.
2. Vinay Kumar and Sanjeev Kumar Singh (2018). *Integrated Farming Systems – An innovative and unique approach for upliftment of livestock owners* in the book "Doubling Farmer's Income through Animal Husbandry". Satish Serial Publishing House, New Delhi, pp 21-32, ISBN No. – 978-93-88020-20-6.
3. Sanjeev Kumar Singh, Amit Singh and Rashmi (2018). *Risk Management Strategies in Dairy Sector* in the book "Doubling Farmer's Income through Animal Husbandry". Satish Serial Publishing House, New Delhi, pp 89-96, ISBN No. – 978-93-88020-20-6.
4. Amit Singh, Sanjeev Kumar Singh, and Rashmi (2018). *Extension methodologies in identification and control of infectious disease* in the book "Artificial Insemination in Bovine and Livestock Management". Satish Serial Publishing House, New Delhi, pp 201-208, ISBN No. – 978-93-88020-18-3.
5. Sanjeev Kumar Singh, Amit Singh and Rashmi (2018). *Extension Services Delivery to Augment Technology Adoption* in the book "Artificial Insemination in Bovine and Livestock Management". Satish Serial Publishing House, New Delhi, pp 209-218, ISBN No. – 978-93-88020-18-3.
6. Sanjeev Kumar Singh, Amit Singh and Vijay Kumar (2018). *Livestock entrepreneurship as a means of self employment & empowerment* in the book "Artificial Insemination in Bovine and Livestock Management". Satish Serial Publishing House, New Delhi, pp 271-280, ISBN No. – 978-93-88020-18-3.
7. Amit Singh, Sanjeev Kumar Singh, and Rashmi (2018). *Risk management tool of dairy farmers:*

Livestock Insurance in the book "Artificial Insemination in Bovine and Livestock Management". Satish Serial Publishing House, New Delhi, pp 307-318, ISBN No. – 978-93-88020-18-3.

8. Sanjeev Kumar Singh, Manoj Rathore and Amit Singh (2018). *Disaster Management of Livestock* in the book "Artificial Insemination in Bovine and Livestock Management". Satish Serial Publishing House, New Delhi, pp 319-332, ISBN No. – 978-93-88020-18-3.

II. Chapters for book (in Hindi)

1. अमित सिंह, संजीव कुमार सिंह एवं रश्मि. (2018) *वर्तमान परिदृश्य में ब्रज में गोवंश की महत्ता, गो–पालन*, सतीश सीरियल पब्लिकेशन हाउस नई दिल्ली, 11&16, ISBN No. 973-93-88020-17-6.
2. रश्मि, संजीव कुमार सिंह एवं अमित सिंह. (2018) *गोवंश उत्पादों से स्वरोजगार कैसे करें, गो–पालन*, सतीश सीरियल पब्लिकेशन हाउस नई दिल्ली, 203-214, ISBN No. 973-93-88020-17-6.
3. संजीव कुमार सिंह, अमित सिंह एवं रश्मि. (2018) *जैव ऊर्जा संसाधनों से रोजगार का सृजन, गो–पालन*, सतीश सीरियल पब्लिकेशन हाउस नई दिल्ली, 235-240, ISBN No. 973-93-88020-17-6.

III. Books Published

1. Sanjeev Kumar Singh, Satish Kumar Garg, Amit Singh, Madhu Tiwari and Daya Shankar. (2018). Doubling Farmer's Income through Animal Husbandry, Satish Serial publishing House, New Delhi, ISBN No. – 978-93-88020-20-6.
2. Sanjeev Kumar Singh, Satish Kumar Garg, Deepak Sharma, Anuj Kumar and Gulshan Kumar. (2018). Artificial Insemination in Bovines & Livestock Management, Satish Serial publishing House, New Delhi, ISBN No. – 978-93-88020-18-3.
3. Sanjeev Kumar Singh, Satish Kumar Garg, Gulshan Kumar and P K Shukla. (2018). Go-Palan, Satish Serial publishing House, New Delhi, ISBN No. – 978-93-88020-17-6.

2. KRISHI VIGYAN KENDRA, DUVASU, MATHURA

The Krishi Vigyan Kendra (KVK) of the University conducted several on and off - campus trainings, frontline demonstrations and on-farm testings for the benefit of farmers. A number of farmers' meets and events were also organized by KVK.

a. Trainings:

KVK conducted both on and off Campus trainings for practicing farmers and farm women, rural youth and extension functionaries, besides collaborative trainings with line Departments of the Government of U.P.

Clientele	No. of Courses	Male	Female	Total participants
Farmers & farm women	97	1837	485	2322
Rural youth	12	190	97	287
Extension functionaries	10	363	92	455
Vocational Training	01	-	25	25
Total	**120**	**2390**	**699**	**3089**

b. Frontline Demonstrations:

To demonstrate the production potential of various proven technologies, frontline demonstrations on farmer's field were organized as per the details given below:

Enterprise	No. of Farmers	Area (ha)	Units/Animals
Oilseeds	115	50.0	-
Pulses	125	50.0	-
Cereals	67	27.4	-
Vegetables	20	8.0	-
Other crops (Berseem, Oat & Multicut Jwar)	50	4.0	-
Total	**377**	**139.4**	**-**
Livestock & Fisheries	17	-	17
Other enterprises	40	-	40
Total	**57**	**-**	**57**
Grand Total	**434**	**139.4**	**57**

c. On Farm Trials (OFT):

To test the suitability of technology under local environment and farming system, On Farm Trials were conducted by the KVK Scientists. The new varieties of Paddy PB-22 and Brinjal (Kashi

Sandesh) and performance of the micro nutrition on yield were tested during Kharif 2018. New varieties of Mustard, Onion and Tomato were also tested besides providing chabroo chicks to farmers for testing their performance in backyard poultry farming at local farmers level.

d. Diagnostic –cum-Inspection Visits:

Dr. S. K. Mishra, Sr. Scientist and Head undertook diagnostic-cum-inspection visits of the Paddy fields which were severely attacked by "stem borer" in various villages under Chhatta sub division along with a high level team constituted by Government of Uttar Pradesh. The high level team comprised of Sub Divisional Magistrate and Ch. Laxmi Narayan, Hon'ble Cabinet Minister in Government of Uttar Pradesh.

e. Kisan Mela Organized:

Two grand Kisan Melas, one each in village Pentha (Goverdhan) and Khanpur (Chhata) were organised. The farmers were enlightened about various scientific technologies and machineries/equipments to manage their crop residues. In the village Pentha, Hon'ble Member of Parliament Mathura, Smt. Hema Malini ji, exhorted the farming community to take a pledge not to burn the crop residues and manage it scientifically. More than 1000 farmers participated in this Kisan Mela.

The other Kisan Mela was organised in the adopted village Khanpur, where Ex. MLC Shri Lekharaj was the Chief Guest. During his address he also advocated the harmful effects of crop residues burning and exhorted the farmers to adopt the scientific methods to manage the crop residues. In this Kisan mela more than 1000 farmers participated.

f. Seed & Planting Material Production

Produce	Quantity	Value (in Rs.)
Seed	856.50 quintal	27,40,800.00
Planting material	33244 (No.)	9,983.00
Vermicompost	3296 kg	9,230.00

g. Soil and Water samples tested

Samples	Numbers	No. of Beneficiaries	Revenue generated (in Rs.)
Soil	685	398	4795.00
Water	54	44	0.00
Total	**739**	**442**	**4795.00**

h. Activities under Crop Residue Management (CRM)

S.N.	Particulars	No. of Programme	No. of Participants
1	Farmers awareness programme	15	812
2	Extension functionary awareness training programme	1	74
3	Educational Institution awareness programme-Rally, Essay Writing, Poster Making etc.		
	(i) Primary School	1	102
	(ii) Inter College	1	153
	(iii) Degree College	1	155
	(iv) Sanskriti University, Mathura	1	130
4	Farmers Scientists Interaction programme	1	73
5	Five Days Training programme for Farmers	1	25
6	Literature Published		
	(i) Booklets	1 No.	1500 copies
	(ii) Stickers	1 Nos.	4000 copies
	(iii) Pamphlets	4 Nos.	16000 copies
	(iv) Folders	3 Nos.	17000 copies
7	Wall Painting	-	At 60 Points
8	Flex Banners (for slogans)	-	66 Nos.
9	Radio Zingle (2 times a day) for one month All India Radio, Mathura	From Oct 1 to 31th Oct., 18	

i. Other Extension Activities:

Scientists of KVK Mathura delivered 20 radio talks, gave 10 T.V. bites, appeared on 02 live TV programme on Kisan channels. KVK Mathura distributed Moong seeds to farmers to promote pulses production in the district. KVK Mathura celebrated Mahila Kisan Diwas (15th Oct., 2018), World Soil Health Day (5th Dec., 2018), Kisan Samman Diwas (23rd Dec., 2018) and Swachhta Campaign (15 Sep. to 02nd Oct., 18) with great enthusiasm.

3. DIRECTORATE OF EXTENSION

A. Organization of Training

S.N.	Theme of Training	Duration	Number of participants	Beneficiaries	Funding Agency
1.	"Capacity Building of Veterinary Officers for effective delivery of Critical Services"	17.12.18 to 19.12.18	19	Newly recruited Veterinary Officers of UP	UP VCI, Lucknow
2.		09.01.2019 to 11.01.2019	18		
3.		19.02.2019 to 21.02.2019	15		
4.	"Improved production and management of Small ruminants"	04.02.2019 to 08.02.2019	12	Veterinary Officer	UP Animal Husbandry Dept.
5.	"Vyagyanik Paddhati se Dudharu Pashuwon ka Prabhandhan"	18.02.2019 to 22.02.2019	25	Selected Farmers of ATMA, Bharatpur (Rajasthan)	ATMA, Bharatpur (Rajasthan)
6.		25.02.2019 to 01.03.2019	30		

B. Farmers/Students/Scientists visit to University to interact with teachers of the University

S.N.	Date of Visit	Number & Address of Farmer	Sponsoring Agency	Remarks
1.	09.07.2018	10 Farmers from Janjgir Champa district of Chhattisgarh under the leadership of Dr. V. P. S. Jagat (VAS) and Shri D. S. Banakar (AVFO)	Animal Husbandry Dept., Chhattisgarh	Provided information & literature regarding dairy farming & visit to PGC and dairy unit. One lecture delivered on scientific management practices for farm animals
2.	09.07.2018	02 Farmers, Shri Dhirendra Sharma and Shri Harish Kumar from Nagla Chandrabhan, Industrial area, Mathura	Self	Provided information & literature regarding starting of dairy farm and loan facilities by government
3.	19.07.2018	40 Farmers from Bemetara, district of Chhatisgarh state from 4 different blocks under the leadership of Dr. Hemant Kumar, Dr Akash Chandrakar, Dr. Vijay Kurre and Dr. Yogesh Katake	Animal Husbandry Dept. Chhattisgarh state under Krishak Kaushal Vikas Yojana	Expert lecture on Importance of Indigenous breeds of cattle and buffaloes and Important dairy characters at Seminar Hall of PGC and visit to University dairy farm

4.	27.07.2018	10 Farmers from Gwalior district of Madhya Pradesh state under the leadership of Shri Ajay Kumar Bhadauria (BTS)	ATMA, Gwalior (MP)	Provided information & literature regarding Animal husbandry and one expert Lecture on Care and Management of Neonates and dairy animals at Seminar Hall of PGC. Visit to PGC & University dairy farm
5.	23.09.2018	50 Farmers from Jaipur District of Rajasthan state under the leadership of Shri Sanwar Mal Yadav, Deputy Director ATMA, Jaipur	ATMA, Jaipur (Rajasthan)	Provided information & literature regarding Animal husbandry and one expert Lecture on Importance of Clean Milk Production at Seminar Hall of PGC & Visit to PGC & University dairy farm
6.	03.10.2018	37 Women Farmers from Kota District of Rajasthan state under the leadership of Shri Inayat Ali Khan (Agri. Officer, PP)	Department of Agriculture, Jaipur (Rajasthan)	Provided information & literature regarding Animal husbandry and one expert Lecture on Scientific Managemental Practices for optimum Production at Seminar Hall of PGC & Visit to PGC & University dairy farm
7.	29.11.2019	Shri Dilip Kumar Yadav	All India Radio, Vrindavan, Mathura	Provided 300 literature for distribution to farmers for Kisan Mela at Hasanand Gaushala, Mathura
8.	17.01.2019	Shri Rishipal Singh	Pariyojana Prabhandhak Jankalyan Sanstha, Meerut	Lecture on Improved management of dairy animals for maximum profit and visit to PGC and dairy and distribution of literatures
9.	04.02.2019	Shri Inayat Ali Khan	A.O. (PP) DDA, Kota (Rajasthan)	Visit of 42 woman farmers at Dairy & PGC and one lecture on Role of woman in Dairy sector to improve their socio-economic status
10.	18.02.2019	Shri Amar Singh and Shri Moharpal Singh,	ATMA, Sikar (Rajastha)	Visit of 25 Farmers at Dairy Farm, Goat Farm, PGC and one lecture on Scientific Dairy and Goat Farming in Arid and Semi-Arid region and Distribution of extension literature to the farmers
11.	22.02.2019	Shri Rakesh	West Zone, Nabard	Visit of 50 personnel's at University dairy farm

12.	25.02.2019	Shri Muhmmad Umar	Ganna Kisan Sansthan, Gorakhpur	Visit of 45 Farmers at Dairy Farm and PGC and one lecture on Selection criteria of Dairy animals and Management of Dairy animals
13.	28.02.2019	Shri Dilip Paikra	AVFO, Chhatisgarh	Visit of 30 Farmers at Dairy Farm and PGC. one lecture on General Management of dairy animals. Distribution of literature to the farmers
14.	16.03.2019	Shri Dileep, Village Umari, Kosi-Kalan Khurd, Mathura	Self	Provided knowledge & literature about the schemes of Government for Animal Husbandry
15.	16.03.2019	Shri Ankush Kumar	Self	Provided knowledge & literature about the schemes of Government for Animal Husbandry
16.	28.03.2019	Shri Anoop Tiwari	Krishi Vibhag Farukhabad	Visit of 44 Farmers at PGC and Dairy Farm. Delivered lecture on Dairy Farming management and clean milk production at Seminar Hall of PGC and distribution of literature.

(i) Teachers of Veterinary College, DUVASU participated in Krishi Kumbh Mahotswa on dated 26th -28th Oct., 2018 at Lucknow and distributed the extension leaflets and provided technical assistance to farmers and livestock owners.

(ii) Department of Veterinary and Animal Husbandry Extension Education, Mathura provided 500 extension folders, booklets and leaflets for distribution at Paintha, Goverdhan Mela on 11th Feb., 2019.

Veterinary Officers' Training organized by the faculty of Veterinary College

Farmers of Bemetara District Chhattisgarh interacting with teachers of Veterinary College

Farmers of Gwalior district Madhya Pradesh visited Pashu Gyan Chaupal

Farmers of Jaipur (Rajasthan) visited University under ATMA scheme

Women Farmers of Kota District of Rajasthan interacting with faculty of Veterinary College

Farmers of Champa District of Chhattisgarh visited University

University Stall at Krishi Kumbh, 2018

OTHER EXTENSION ACTIVITIES BY THE COLLEGE OF VETERINARY SCIENCE AND ANIMAL HSBANDRY

(i) The faculty of College of Veterinary Science and A.H. Delivered many lectures in training programmes organized by Directorate of Extension/Departments

Name of Faculty member	Date	Name of Programme	Organized by
Dr. Mukesh Srivastava	29.01-2018	Capacity Building of Veterinary Officers for Effective Delivery of critical Services	Directorate of Extension, DUVASU, Mathura.
Dr. Mukesh Srivastava	18.03.2019	All India network programme on Diagnostic Imaging and management of surgical conditions in animals	Department of Surgery and Radiology, DUVASU, Mathura.
Dr. Shankar Kumar Singh		Hands on training of laboratory methods for diseases diagnosis in animals	

(ii) **Extension education activities organised**

Strengthening socio-economic development of ST families under AICRP on FMD, Tribal Sub Plan: Establishment of mini backyard poultry unit

Date	District	Block	No of Village	No. of Beneficiaries/ families	Items Distributed	Other Items
2.3.19	Sonbhadra	Myorpur	5	40	30 chicks/family For Backyard poultry unit	Medicines, chick feed, feeder and waterer

(iii) Awareness programme and lectures of experts on Swachhta and Pashujanyarog under ICAR funded Outreach programme on zoonotic diseases project organized at three places:

Place	Date
Valmiki basti, Damodarpura, Mathura	29.03.2019
Murga Phatak Slaughter workers, Mathura	05.04.2019
Khatik Muhalla, Sadar, Mathura (for Women)	05.04.2019

Distribution of Sanitation Kit in Swachta evam Pashujanya rog programme at Valmiki Basti, Damodar pura Mathura

Awareness programme and distribution of Sanitation Kit to womens at Khatik Muhalla, Sadar Mathura

UNIVERSITY FARMS

A. LIVESTOCK FARM COMPLEX (LFC)

The total number of animals on 31.03.2019 at LFC Mathura was 689 which included Hariana cattle (236), crossbred cattle (70), Sahiwal cattle (299) and buffaloes (84). 17787.89 quintals green fodder was received from Pasture Unit for feeding to animals. During 2018-19, total milk production at the farm was 2, 28, 854.00 liters (cow milk 1,88,739.00 liters and buffalo milk 40,115.00 liters). The average milk production per day was 627.00 liters.

B. POULTRY FARM

Different species, breeds and varieties of birds were maintained in poultry farm of the Department of Poultry Science during 2018-19.

S.N.	Species, Breeds and Varieties	Flock size
1.	Layers	136
2.	Chabro breeders	240
3.	Chabro chicks	654
4.	Other breeds chicks	646
5.	Chabro (Revolving Fund)	360
6.	Aseel Peela birds	37
7.	Kadaknath birds	70
8.	Naked Neck	1
9.	Japanese quail	759
10.	Turkey	183
11.	Guinea fowl	28
12.	Emu	3
13.	Other breeds (Black Rock, White Rock, Red Cornish, Dahlem Red, Barred Rock, Punjab Brown)	133

During FY 2018-19, poultry farm generated a revenue of Rs. 7,66,707/- (Rupees seven lacs sixty six thousand seven hundred seven only) from sale of different birds and eggs. Additionally, a sum of Rs. 5,99,182/- (Rupees five lacs ninety nine thousand one hundred eighty two only) was generated from sale of poultry products under Experiential Learning Unit (ELU).

C. DIRECTORATE OF FARMS

Madhuri Kund Agriculture Farm

Total crops (mustard, wheat, oats, barley, paddy and sesame) and berseem production at Madhuri Kund farm of the University during FY 18-19 was 11166.85 quintals and 3.15 quintal, respectively. Out of this, 3462.85 quintal barley and 105.09 quintal oats were transferred to LFC for preparation of feed concentrate. Total revenue generated through sale of total crops during 2018-19 at Madhuri Kund Farm was Rs. 75,43,750/- (Rupees seventy five lacs forty three thousand seven hundred fifty only).

D. PASTURE UNIT

During FY 2018-19, total seed production at the farm was 324.40 quintal (wheat – HD 3086) and a revenue of Rs. 1269052.00 was generated. 40.10 quintals wheat bran and 138.40 quintals wheat straw were transferred to livestock farm complex of the University. Unit also produced 79.75 quintal of sorghum fodder which was transferred to LFC for feeding to animals.

LFC fodder unit produced 18283.04 quintals green fodder during the period under report for utilization at the dairy farm. The farm also produced 180.10 quintals wheat straw, 26.80 quintals oats grain and 168.72 quintals barley grain during this period.

HUMAN RESOURCE DEVELOPMENT

Training programmes

Winter School on "Applications of Advanced Anatomical Techniques in Disease Diagnosis and Animal Health"

Department of Veterinary Anatomy, College of Veterinary Science and Animal Husbandry, DUVASU, Mathura organized ICAR sponsored 21 days Winter School on "Applications of Advanced Anatomical Techniques in Disease Diagnosis and Animal Health" from 14 November to 04 December, 2018. 18 participants from different SAU's and ICAR institutes - Chattisgarah, Jammu and Kashmir, Karnatka, Kerela, M.P., Maharashtra, Tamil Nadu, Punjab, West Bengal and Uttar Pradesh attended the Winter School. Hon'ble Vice Chancellor, Prof. K.M.L. Pathak, inaugurated the training programme. Prof. P.K. Shukla, Registrar and Dr. Ajay Prakash, Professor and Head, Department of Veterinary Anatomy and Dr. Archana Pathak, Course Director of Winter School were the other Dias dignitaries. A training manual comprising of 35 lectures and 18 practicals was released by the Hon'ble Vice Chancellor during inauguration. Comprehensive training was imparted to the participants in the field of modern museum technology, histochemistry, embryo collection and preservation, ultrastructure, enzyme histochemistry, immunohistochemistry, cellular and molecular biology, genomics and proteomics and techniques commonly used in diagnostics such as ultrasonography, radiography, computerized tomography scanning (CAT), magnetic resonance imaging (MRI) etc.

ICAR Sponsored 10 Days Short Course on "Genomic and Proteomic approaches for elucidation of environmental pollutants induced health hazards and quality assurance for food of animal origin

ICAR-sponsored Short Course on "Genomic and Proteomic Approaches for Elucidation of Environmental Pollutants-induced Health Hazards and Quality Assurance for Food of Animal Origin" was organised by Department of Veterinary Pharmacology & Toxicology, CVSc & AH, DUVASU from 25th Oct to 3rd Nov, 2018. This training programme was directed by Prof. Satish Kumar Garg, Professor & Head, Department of Veterinary Pharmacology & Toxicology and Dr Soumen Choudhury and

Dr Amit Shukla were the Course Coordinator. The Short Course was inaugurated by Chief Guest Prof. Rajesh Nigam, Dean, College of Biotechnology on 25th of October 2018. All the faculty members of Veterinary College graced the inaugural function. Thirteen participants from various Universities from different parts of India including Andhra Pradesh, Gujarat, Jammu & Kashmir, Kerala, Punjab, West Bengal, Telangana and Uttar Pradesh participated in the training programme. Apart from the resource persons from host Institute i.e. DUVASU, two eminent scientists- Dr. Ravikumar Gandham, Scientist-G from National Institute of Animal Biotechnology, Hyderabad and Dr. Naresh K Sood, Senior Veterinary Pathologist & In-charge CCDL, Veterinary College, GADVASU, Ludhiana also delivered the guest lectures during training programme. The participants also visited ICMR-JALMA, Agra to interact with the scientists. The Valedictory function was held on November 03, 2018 which was presided over by Prof. K.M.L Pathak, Hon'ble Vice Chancellor, DUVASU, Mathura and Prof Atul Saxena, Director Research as Guest of Honour. The Chief Guest and Guest of Honour along with Course Director, Prof Satish K Garg distributed the certificates of "Short Course" to all the participants.

PARTICIPATION OF FACULTY MEMBER IN INTERNATIONAL / NATIONAL SYNMPOSIA / CONFERENCES

S.N.	Name of faculty member	Title of event	Date
I.	**International**		
1.	Dr. Avneesh Kumar Dr. Vinod Kumar Singh	6th National Conference on Laboratory Animal Science (NCLAS) on "Animal Welfare for Better Research" organized by Laboratory Animal Science Association of Malaysia (LASAM) at Avenue Garden Hotel, Bangi, Malaysia.	01st -02nd Aug., 2018
2.	Prof. Sharad Kumar Yadav	Immunology Summit-2018 at New York, USA	19th -20th Oct., 2018
3.	Prof. Sharad Kumar Yadav	5th International Conference on Nanotechnology for Renewable Materials held at Singapore	18th -19th Mar., 2019

S.N.	Name of faculty member	Title of event	Date
II.	**National**		
1.	Dr. Yajuvendra Singh Dr. D.N. Singh	XXXV National Convention of Indian Society of Animal Production Management held at Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, Gujarat	11th -13th Apr., 2018
2.	Prof. Satish K. Garg	3rd Annual Interactive Meeting of the Nodal Officers of SAUs to ICAR, held at ICAR-Central Island Agricultural Research Institute, Port Blair	04th -05th May, 2018
3.	Prof. Vikas Pathak	10th meeting of Scientific Panel for 'Meat and Meat Products including Poultry' organized by Food Safety and Standards Authority of India (FSSAI), Ministry of Health & Family Welfare, Government of India held at FDA Bhawan, New Delhi	16th Aug., 2018
4.	Dr. Udit Jain	FSSAI-ICMSF-CHIFFS International Symposium on "Microbiological food safety sampling and testing in food safety management" held at New Delhi	09th -10th Oct., 2018
5.	Dr. Ambika Sharma	1st National Biomedical Research Competition (NBRCom-2018) held at All India Institute of Medical Sciences (AIIMS), Rishikesh, Uttarakhand	15th Oct., 2018
6.	Dr. Neeraj Kumar Gangwar Dr. Shyama N. Prabhu	XXXV Annual Conference of Indian Association of Veterinary Pathologists, IX annual meeting of IAVP and national symposium on "Recent advances in Veterinary Pathology and disease diagnosis for sustainable Livestock Poultry production" organized by COVSc & AH., Sardarkrushinagar, Dantiwada Agricultural University, Sardarkrushinagar, Gujarat	22th -24th Oct., 2018
7.	Dr. Dilip Swain Dr. Shri Prakash Singh Dr. Abhinov Verma	International Conference on "Current Challenges in Goat Industry and the Strategies to Combat in Asia Region" organized by ICAR-CIRG, Makhdoom, Mathura and The Asian Regional Conference on Goats (ARCG 2018), held at Amity University, Rajasthan, Jaipur	22nd -26th Oct., 2018
8.	Dr. Vijay Pandey	3rd Convention of Society of Veterinary Biochemists & Biotechnologists of India (SVBBI) and National Symposium on "Bridging Biochemical Interventions and Environmental Remediations for one Health Improvement" held at College of Veterinary Science, Lala Lajpat Rai University of Veterinary and Animal Sciences (LUVAS), Hisar (Haryana)	02nd- 3rd Nov., 2018

S.N.	Name of faculty member	Title of event	Date
9.	Dr. Amitav Bhattacharyya	XXXV Annual Conference of Indian Poultry Science Association held at CIARI, Port Blair	15th -17th Nov., 2018
10.	Dr. Vinod Kumar Dr. Muneendra Kumar	XI Biennial Conference of Animal Nutrition Association (ANACON 2018) on "Reorienting animal nutrition research in the perspective of farmers welfare" organized by Department of Animal Nutrition, Bihar Animal Sciences University, Patna	19th -21th Nov., 2018
11.	Prof. Vikas Pathak Dr. Meena Goswami Awasthi	International Symposium and 8th Conference of Indian Meat Science Association on 'Technological innovations in muscle food processing for nutritional security, quality and safety" held at West Bengal University of Animal and Fisheries Sciences (WBUAFS), Kolkata	22nd-24th Nov., 2018
12.	Dr. Sanjay Purohit	42nd Annual Conference and National Symposium of Indian Society for Veterinary Surgery held at Navsari, Gujarat.	22nd -24th Nov., 2018
13.	Dr. Mukesh Srivastava	17th WSAVA CE Programme on "Diagnostic Imaging in Companion Animal Practice held at Ramoji Film City, Hyderabad	23rd Nov., 2018
14.	Prof. Satish K. Garg	Golden Jubilee International Conference of Indian Agricultural Universities Association held at NAS Complex, New Delhi	23rd-25th Nov., 2018
15.	Dr. Mukesh Srivastava	Federation of Small Animal Practitioners Association of India (FSAPAI)- CE program " Pain Management in Companion Animal Practice" held at Ramoji Film City, Hyderabad.	24-25th Nov., 2018
16.	Dr. Pawanjit Singh	Seminar on "National Milk Day" organized at NASC Complex, ICAR, New Delhi	26th Nov., 2018
17.	Prof. Sarvajeet Yadav Prof. A. K. Madan Dr. Rajneesh Sirohi Dr. Brijesh Yadav	XXVII Annual Conference of Society of Animal Physiologists of India (SAPI) and National Symposium held at ICAR- National Dairy Research Institute, Karnal (Haryana)	27th -28th Nov., 2018
18.	Dr. Abhinov Verma	XXXIII Annual Convention of IAVA and National Symosium on "Veterinary Anatomy from novices to expert: Supporting development of professional skills in doubling farmer's income" held at Central Agricultural University, Selesih, Aizwal, Mizoram	28th -30th Nov., 2018
19.	Dr. Brakha Sharma Dr. Praul	XIII Biannual National Conference of Association of Public Health Veterinarians and Symposium on The role of Veterinary Public Health in Improving Food Security & Safety through one Health Approach held at COVAS, G.B.P.U.A.&T., Pantnagar, Uttarakhand	30th Nov.- 01st Dec., 2018

S.N.	Name of faculty member	Title of event	Date
20.	Dr. Atul Prakash	ISVPT-2018 Conference, held at AAU, Anand, Gujarat.	05th -07th Dec., 2018
21.	Dr. Sanjay Purohit	6th Annual Conference and Symposium of SVSBT held at Udaipur, Rajasthan	13th -14th Dec., 2018
22.	Prof. Rashmi Singh	XXV Annual Convention of Indian Society of Veterinary Immunology & Biotechnology & National Conference (VIBCON-2018) on "Innovative Biotechnological Approaches for Improving Animal Health and Productivity" organized by ICAR- National Research Centre on Mithun, Medziphema, Dimapur, Nagaland	13th-15th Dec., 2018
23.	Dr. Vinod Kumar Dr. Amitav Bhattacharyya Dr. Ajay Pratap Singh Dr. Pradeep Kumar Dr. Vinod K. Singh Dr. P.N.Panigrahi Dr. Amit Shukla	4th National Convention on AGRIVISION-2019: Integrated Agriculture: Prosperous Bharat" organized by Vidhyarthi Kalyan Nyas, Bhopal (MP) held at NASC complex, PUSA campus, New Delhi	28th -29th Jan., 2019
24.	Dr. Mukesh Srivastava Dr. Shankar Kumar Singh Dr. Arvind Tripathi Dr. P.N.Panigrahi	37th Annual Convention of ISVM and National Symposium on "Holistic Approach in Veterinary Medicine for Better Animal Health to Meet Challenges of One Health Mission" held at RAJUVAS, Bikaner.	01st -03rd Feb., 2019
25.	Dr. Ajay Pratap Singh	XXXII Annual convention of IAVMI and National conference on "Technological Innovations in Animal Health care for better production and trade" held at Bihar Animal Sciences University, Patna	04th -06th Feb., 2019
26.	Dr. Mukesh Srivastava	Indian VETopia-2019 Education Program held at Kingdom of Dreams, Gurugram, NCR	8th-10th Feb., 2019
27.	Dr. Udit Jain	National Conference on Challenges and opportunities for tackling veterinary public health issues at the Human, Animal and Environment interface & XVI Annual Symposium of Indian Association of Veterinary Public Health Specialists held at Nagpur Veterinary College, MAFSU, Nagpur	26th -27th Feb., 2019

PARTICIPATION OF FACULTY MEMBER IN TRAININGS / WORKSHOPS

S.N.	Name of faculty member	Title of event	Date
I.	**International**		
1.	Dr. Vinod K. Singh Dr. Avneesh Kumar	2nd LASAM workshop on IACUC: "Embracing Legalities and Responsibilities in Animal Research" organized by Laboratory Animal Science Association of Malaysia (LASAM) at Avenue Garden Hotel, Bangi, Malaysia	30-31st Jul., 2018
2.	Dr. Avneesh Kumar	4th Innovative Approaches for Antiviral Agents Summer School organised by University of Cagliari in Santa Margherita di Pula, Cagliari, Sardinia, Italy.	24th – 28th Sep., 2018
II.	**National**		
1.	Dr. Mukesh Srivastava	One day workshop on "Diagnostic Ultra-sonography of the Dogs and Cats" organized by Central Small Animal Association at Agra, U.P.	7th Apr., 2018
2.	Dr. Amit Singh Dr. Rashmi	AgMOOCs Fundamentals of Agricultural Extension in agriculture (Six Week Online programme) organized by Department of Extension Education BHU, Varanasi and Centre for Development of Technical Education, IIT, Kanpur	23rd Apr. - 31st May, 2018
3.	Dr. S.P. Singh Dr. Madhu Tiwari	21 days Summer school on "Production and Post-Production Interventions to Increase Returns from Livestock Enterprises-A Step Towards Doubling Farmers' Income" organized by SKUAST-K, Srinagar	19th Jun. – 09th Jul., 2018
4.	Dr. Udit Jain Dr. Meena Goswami Awasthi	Summer School Training Programme on "Livestock products quality and safety assurance by advanced microbiological and spectrometry approaches" organized by Division of LPT, CIRG, Makhdoom (Farah)	31th Jul. - 20th Aug., 2018
5.	Dr. P.N.Panigrahi	12 days ICAR sponsored national training (CAFT) program on "Updates in the disease diagnosis and treatment protocols in health management of farm and companion animals" held at TANUVAS, Chennai	21th Aug. - 10th Sep., 2018
6.	Dr. Avinash Kumar	21 days short course on "Nutrition for Reproduction in Farm Animals" organized by CAFT in Animal Nutrition, ICAR-IVRI at Izatnagar, Bareilly	26th Aug.- 16th Sep., 2018
7.	Dr. Sanjay Kumar Bharti	Summer School Training Programme on, "Technological advances in value addition as well as production of green and safe poultry products" organized by Division of PHT, CARI, Izzatnagar, Bareilly, U.P.	04th - 24th Sep., 2018

S.N.	Name of faculty member	Title of event	Date
18.	Dr. Avneesh Kumar	21 day CAFT training program on 'Gene Mining Approaches and In Silico Functional Analyses' organized at Central Institute of Fisheries Education, Mumbai under ICAR, capacity building programme.	3rd – 23rd Dec., 2018
19.	Prof. Rashmi Singh Dr. Barkha Sharma Dr. Ajay Pratap Singh Dr. Neeraj Kumar Gangwar Dr Shyama N. Prabhu Dr. Renu Singh Dr. Parul	Online Foot-and-Mouth Disease Investigation Training Course for India, organized by Eu-FMD in partnership with the DFMD, ICAR	01st - 14th Jan., 2019
20.	Dr. Jitendra Tiwari Dr. Amit Kumar Jaiswal	21 days winter school on "A short course on diagnostic methods and control of emerging parasitic diseases" held at CAFT in Veterinary Parasitology, Veterinary College, Hebbal, Bengaluru	10th - 30th Jan., 2019
21.	Dr. Soumen Choudhury	21 days CAFT Training on "Application of genomic tools in unraveling of physiological process" held at Division of Physiology and Climatology, ICAR-IVRI, Izzatnagar, Bareilly	29th Jan.- 18th Feb., 2019
22.	Dr. Rajneesh Sirohi Dr. Raju Kushwaha	21 days Training programme on "Relevance of Feed Processing Technologies to Improve the Economics of Livestock Farming" held at Centre of Advanced Poultry Training in Animal Nutrition Division, IVRI, Izzatnagar, Bareilly.	20th Feb. – 12th Mar., 2019
23.	Dr. Rajkumar Singh Yadav	5 days workshop (WeCARE-2019) on "Ethical contemplation of animal resources for experimentation" organized by iCARE, IMTECH Chandigarh, Punjab	25th Feb.- 01st Mar., 2019
24.	Dr. Soumen Choudhury	National Workshop on Status, Scope and Challenges in Ethno-Veterinary Practices, organized by BAIF Developmental Research Foundation, Pune, Maharashtra	27th -28th Feb., 2019
25.	Dr. Mukesh Srivastava	Workshop on "Economically Sustainable Gaushala Management: Successful Case studies" organized by www. Indiancattle.com (Bombay Gow Rakshak Trust, Mumbai) at Mumbai, Maharashtra	10th Mar., 2019

* 23 Faculty members of CVSc.&AH, DUVASU attended 30 days "Massive Open Online Course on Dynamics of Teaching and Learning" organised by ICAR-NAARM, Hyderabad from 01 – 30th Nov., 2018

Dr. Vinod Kumar, Dr. Barkha Sharma, Dr. Udit Jain, Dr. Atul Prakash, Dr. Neeraj Kumar Gangwar, Dr. Pawanjeet Singh, Dr. Dilip Swain, Dr. Ashish Srivastava, Dr. Amit Singh, Dr. Soumen Choudhury, Dr. Muneendra Kumar, Dr. Ajay Pratap Singh, Dr. Yajuvendra Singh, Dr. Arvind Tripathi, Dr. Ruchi Tiwari, Dr. Meena Goswami Awasthi, Dr. D.N. Singh, Dr. Raju Kushwaha, Dr. Shyama N. Prabhu, Prof. Rashmi, Dr. Amit Shukla, Dr. Renu Singh and Dr. Avneesh Kumar

S.N.	Name of faculty member	Title of event	Date
8.	Dr. Shalini Vaswani	21 days winter school training programme on "Nutritional strategies to enhance livestock productivity and farm economy" organized by DCN division of NDRI, Karnal	05th - 25th Sep., 2018
9.	Dr. Yajuvendra Singh	Brain storming workshop on "Genomic Selection and its Implementation in India the Way Forward" organized by ICAR-IVRI, Izzatnagar, Bareilly, U.P.	17th Sep., 2018
10.	Dr. Ruchi Tiwari	21 days ICAR Winter school on "Practicability, Scope and Future Prospects of Ethnobotanicals in Minimizing Antibiotic Resistance" (IVRI) Izzatnagar, Bareilly, U.P.	26th Sep. – 16th Oct., 2018
11.	Dr. Jitender Kumar	21 days advanced training course on "Current Reproduction Technologies vis-a-vis Fertility Augmentation in Farm Animals" at GADVASU, Ludhiana	09th – 29th Oct., 2018
12.	Dr. Udit Jain Dr. Mukesh Srivastava Dr. Arvind Tripathi	Short course training programme on "Genomic and Proteomic approaches for elucidation of environmental pollutants induced health hazards and quality assurance for foods of animal origin" organized by Dept. Of Veterinary Pharmacology and Toxicology, DUVASU, Mathura	25th Oct.- 03rd Nov., 2018
13.	23 Faculty members of CVSc.&AH, DUVASU *	30 days Massive Open Online Course on "Dynamics of Teaching and Learning" organised by ICAR-NAARM, Hyderabad.	01 – 30th Nov., 2018
14.	Dr. Varsha Gupta Dr. Shri Prakash	21 days Winter School Training programme on "Applications of advanced anatomical techniques in disease diagnosis and animal health" held at Dept. of Veterinary Anatomy, COVSc & A.H., DUVASU, Mathura.	14th Nov.- 04th Dec., 2018
15.	Dr. Shankar Kumar Singh	21 days ICAR Winter School Training on "Practicability, Scope and Future prospect of Ethno-Botanicals in Minimizing Antibiotic Resistance'' organized by Division of Veterinary Medicine, IVRI, Izzatnagar, Bareilly, UP	26th Nov.- 16th Dec., 2018
16.	Dr. Vinod K. Singh	21 days ICAR Winter school on "Applications of Reverse Genetics and Transcription Profiling in Molecular Pathogenesis of Viral Diseases with special reference to Avian Viruses" held at MVC, TANUVAS, Chennai	28th Nov.- 18th Dec., 2018
17.	Dr. Barkha Sharma	3 days training on Epidemiology organized by ICAR-NIVEDI, Bangalore	03rd-05th Dec., 2018

VISIT OF DIGNITARIES

1. Shri. Ram Nayak Ji, Honourable Governor, Uttar Pradesh

2. Shri. Radha Mohan Singh, Union Minister, Agriculture and Farmers Welfare, GOI

3. Shri Dinesh Sharma, Deputy Chief Minister, Uttar Pradesh

4. Shri. Surya Pratap Shahi, Cabinet Minister, Agriculture, Agriculture Education and Agriculture Research, Government of Uttar Pradesh

5. Prof. S.P. Singh Baghel, Cabinet Minister, Animal Husbandry, Fisheries and Minor Irrigation, Government of Uttar Pradesh

6. Shri. Kaushik Bhai Patel, Minister (Finance), Government of Gujarat

7. Dr. Narendra Singh Rathore, DDG (Education), ICAR, New Delhi

8. Prof. Dhreendra Pratap Singh, Chairman, UGC, GOI

9. Shri. Amit Mohan Prasad, Principal Secretary (Agriculture), Government of Uttar Pradesh

10. Prof. Vishnu Sharma, Vice Chancellor, RAJUVAS, Bikaner (Rajasthan)

11. Dr. Sanjeeta Sharma, Dean, PGIVER, Jaipur (Rajasthan)

12. Shri. Puran Prakash, MLA, Baldeo

13. Shri. Karinda Singh, MLA, Goverdhan

STUDENTS WELFARE

National Cadet Corps Activities

During 2018-19, 30 and 17 cadets appeared in "B" and "C" Certificate examination, respectively. While, 20 students participated in Army Attachment Camp at RVC Centre and College Meerut Cantt from 15.09.2018 to 01.10.2018. 25 students participated in CATC camp-40 at Surajbhan Saraswati Vidya Mandir Inter College, Sikrapur, Khurja from 05-14 October, 2018. All the registered cadets participated in "SWACHHTA HE SEWA" from 15.09.2018 to 02.10.2018 as well as in "SWACHHTA PAKHWADA" from 01-12 December, 2018. Second year B.V.Sc.&A.H. students, Cadet Sonam Kumari represented Uttar Pradesh Directorate in Republic Day Parade, 2019 at New Delhi and Cadet Simran Josan participated in ATT TRG of NCC Girl Cadets (SW) to Army Hospitals from 03-15 December, 2018 making the University proud of their achievements. On the occasion of 8th Convocation of University and inaugural function of Pt. Deen Dayal Auditorium, NCC students gave 'Guard of Honour' to the Hon'ble Governor of Uttar Pradesh on 31.08.2018 and 12.02.2019, respectively under the leadership of Associate NCC Officer Lt. Rajneesh Sirohi. NCC cadets also escorted and gave 'Guard of Honour' to the Hon'ble Vice Chancellor of the University on Republic Day and Independence Day.

Literary and Cultural Events

Literary and Cultural events were organized by DUVASU in which students from C.V.Sc. and A.H., COB and Institute of Para Veterinary Sciences participated. During this, events like drawing and painting, collage making, clay modeling, essay writing, rangoli, poster making, songs, debate, declamation, general knowledge quiz, antakshari and extempore speech competitions were held. The students participated with gusto and enthusiasm. The festival concluded with prize distribution to the winners by Dean, CVSc& AH and Dean, PGS.

South India Educational Tour of Students

35 Students including 24 boys and 11 girls of 4th Year B.V.Sc & A.H went on South India Educational Tour from 26th June 2018 to 10th July 2018. During this tour, they visited Veterinary Colleges at Mumbai, Bangalore, Hyderabad and other ICAR institutes. The students were exposed to various facilities available and recent developments in these Institutions. Dr. Mukul Anand, Assistant Professor, Department of Veterinary Physiology and Dr. Deepak Sharma, Associate Professor, Department of Animal Genetics and Breeding accompanied the students as tour leaders.

17th Annual Sports Meet

17th Annual Sports Meet of the University was organized on 25th–26th February 2019. The meet was inaugurated and declared open by Chief Guest of the occasion Prof. Vishnu Sharma, Hon'ble Vice-Chancellor of RAJUVAS, Bikaner, Rajasthan. After march past, salutation and sports oath by players, white doves were released as a token of peace and freedom. Prof. Daya Shankar, President Games and Sports welcomed the Chief Guest, officers, teachers and students of the University. Majority of inter-class competition of in-door and out-door games i.e. table tennis, badminton, volleyball, chess, kho-kho, kabaddi, hockey, cricket and some of the athletic events were completed before the meet and the remaining athletics events were organized on 25th and 26th February 2019 in which first position was secured by Deepak Kumar

(B.V.Sc.&A.H. first year) in 200 meter and 400 meter races, Baldev Singh (Diploma first year) in 200 meter hurdle race and long jump, Mangla Ram (B.V.Sc.&A.H. third year) in 1500, 5000 and 10000 meter races, Deva Ram (B.V.Sc.&A.H. first year) in high jump, Rohit Kumar Chaudhary (B.V.Sc.&A.H. second year) in javelin throw, Suryapratap Singh (B.V.Sc.&A.H. second year) in short put. Nikita Rani (Biotechnology Third year) represented the University in District open Badminton championship. The "Closing Ceremony" was held on 26th February 2018 and was presided by Prof. K.M.L Pathak, Hon'ble Vice-Chancellor of the University wherein he awarded prizes to the winners of sports meet and blessed all the participants.

Participated in 19th All India Inter Agricultural Universities Sports Competition

28 students from University, 20 boys and 8 girls, participated in 19th All India Inter Agricultural Universities sports competition organized by Punjab Agricultural University (PAU) from 02-05 January, 2019. Dr. Madhu Tiwari, Assistant Professor, Department of Animal Genetics and Breeding and Dr. Muneendra Kumar, Assistant Professor, Department of Animal Nutrition accompanied the students as tour leaders.

Participated in All India Inter-Veterinary Colleges Badminton and Table Tennis Tournament and All India Professional Quiz Competition

Nineteen students of the College of Veterinary

Science participated in All India Inter Veterinary Colleges Badminton and Table Tennis Tournament and All India Professional Quiz Competition organized by GB Pant University of Agriculture and Technology, Pantnagar from 14th to 16th March 2019. Girls badminton team was runner-up in the final match and received prize and certificates. Dr. Meena Goswami Awasthi, Assistant Professor, Department of Livestock Products Technology accompanied the students as tour leader.

Participated in National level Inter-University Debate Competition

Four students of College of Veterinary Science and Animal Husbandry participated in National level Inter-University Debate Competition held on 14th -15th January, 2019 at G. B. Pant University of Agriculture and Technology, Pantnagar. Mohini Sharma, B. V. Sc. & A. H. third year student got Best Advocacy Award in Hindi Debate competition. Dr. Meena Goswami Awasthi, Assistant Professor, Department of LPT was the tour leader.

Participated in AGRIUNIFEST-2018-19

Twenty one students of the University participated in AGRIUNIFEST 2018-19 organized at Sardarkrushinagar Dantiwada Agriculture University, Sardarkrushinagar, Banaskantha, Gujarat from 03-07 February, 2018. Students participated with great enthusiasm and spirit in different cultural and literary events. Dr. Amitav Bhattacharya, Assistant Professor, Department of Poultry Science and Dr. Ruchi Tiwari, Assistant Professor, Department of Veterinary Microbiology, accompanied the team as their mentors.

Scholarships received by students

- 328 students of the University, belonging to General, OBC, SC and minority categories, received Uttar Pradesh Government's Scholarship through "Samaj Kalyan Vibhag" of Govt. Of U.P.
- 04 students of B.V.Sc. & A.H. and 01 student of M.V.Sc. received University Merit Scholarship.
- 06 students of B.V.Sc. & A.H. and 15 students of M. V. Sc. received National Talent Scholarship provided by Indian Council of Agricultural Research (ICAR), New Delhi.

DUVASU Premier League Cricket tournament

DUVASU Premier League (DPL)-2018 cricket tournament was held from 16th September 2018 to 21st October 2018. In this tournament, twelve teams comprising of students, teachers and non teaching staff participated with immense josh and zeal. The non-teaching staff team (White bombers) won the 3rd DUVASU Premier League (DPL) trophy by beating PG team (White Hawks). The prizes were distributed by Prof. S.K. Garg, Dean, College of Veterinary Science & A.H., Prof. P.K. Shukla, Dean PGS and Prof. Dayashankar, President Games and Sports. Mr. Jatin Jain of first year B.V.Sc.&A.H. and Mr. Manish of Non-teaching staff team were adjudged as the Best Batsman (Orange cap) and Best Bowler (Purple cap) of the tournament, respectively. Dr. Vijay Pandey, Dr. Amit Singh and Mr. Dinesh Rautela actively participated and coordinated in successful organization of the DPL-2018 tournament.

Run for unity

To foster and reinforce dedication, unity and integrity in University, 142nd birth day of Sardar Vallabhbhai Patel the 'Iron Man of India' was celebrated on 31st Oct. 2018. On this occasion, Prof. Satish K. Garg, Dean, College of Veterinary Science & A.H. along with Prof. Vikas Pathak, DSW and other officers flagged off the 'Run for Unity'. Baldev (Diploma First year), Saavan Kumar (Diploma Second year) and Gaurav Kumar (Diploma Second year) won the gold, silver and bronze medals, respectively in boys category whereas Prachi Mishra (Diploma First year), Nivedita Chahar (Diploma second year) and Shruti Gautam (Diploma First year) won gold, silver and bronze medals respectively in girls category.

OTHER HIGHLIGHTS AND ACTIVITIES

Entrance Examination

University conducted Pre-Veterinary Test-2018 on 20th May, 2018 in five cities- Allahabad, Kanpur, Bareilly, Lucknow and Mathura in which total 7810 candidates appeared. Out of these, 1301 candidates qualified the prelim examination. PVT Mains was conducted on 24th June, 2018 at two centers in Mathura wherein 928 candidates qualified. University also conducted Pre-Diploma Entrance Examination-2018 on 08th July, 2018 and Postgraduate (M.V.Sc. and Ph.D.) Entrance Examination-2018 on 15th July, 2018 wherein 69, 60 and 05 candidates, qualified the respective examinations. Selected candidates were admitted to different academics degree and diploma programmes on the basis of their merit in the competitive examination under various categories as per availability of seats in the College of Veterinary Science & Animal Husbandry and Institute of Para Veterinary Sciences for session 2018-19.

Oath taking ceremony 2018

Oath taking ceremony of B.V.Sc. & A.H. students batch 2013 was organized on 19th July, 2018 int Pant Hall. On this auspicious occasion, the outgoing students were sworn the oath to utilize their professional knowledge with dignity and follow the principles of veterinary medical ethics. The chief guest of the occasion was Hon'ble Vice-Chancellor, Prof. K. M. L. Pathak. Prof. S. K. Garg, Dean, Veterinary Faculty administered oath to the outgoing students. "Chaudhary Charan Singh Smriti Pratibha Puraskar" by Kisan Trust was awarded to two topper students of the batch; namely Jitendra Singh Gandhar and Prabha Sharma.

Independence Day celebrations

Dil se nikalegi na marker bhi watan ki ulfat..meri mitti se bhi khushboo-e-watan aayegi……

Carried with care, coated with pride, dipped in love, overwhelming vibe of patriotism, pride and a feeling of gratitude fly in glory, moments of freedom in shade of joy…….proud to be an Indian…… Hon'ble Vice-Chancellor, Prof. K.M.L. Pathak hoisted the National flag on 15th August, 2018 and along with other officers of the University paid floral tributes to Mahatma Gandhi. Let us plant trees!!! Let us green our DUVASU… and celebrate this day!!! was the theme to celebrate the occasion. University staff members planted trees and the function ended with distribution of sweets.

Gandhi and Shastri Jayanti

Be the change you wish to see in the world ……. Following the footsteps of Father of the Nation, Mohandas Karamchand Gandhi was remembered on 2nd October, 2018 in DUVASU. The portrait of Gandhiji was garlanded by Hon'ble Vice-Chancellor, Prof. K.M.L. Pathak and other officers of the University. Lal Bahadur Shastri, a simple man with exemplary lifestyle, visionary ideas and gigantic deeds, was also paid tribute on Shastri Jayanti on 2nd October with traditional zeal and fervour in Shastri Hostel.

Pt. Deen Dayal Upadhayaya Jayanti

Birth anniversary of Pandit Deen Dayal Upadhyaya was celebrated on 25th September, 2018. Hon'ble Vice Chancellor, officers, teachers and employees offered floral tributes to Pandit Deen Dayal Upadhyaya on his birth anniversary and his golden words of guidance were remembered.

Book Exhibition

University library organized an exhibition of the books related to Veterinary Science and Biotechnology subjects in the Campus on 06th December, 2018. Ten publishers/distributors participated in the exhibition with their sample books displayed. The book exhibition was attended by large number of students and faculty members of the University.

Fresher's Day

Newly admitted students to different academic programmes *i.e.* B.V.Sc. & A.H., B.Sc. Biotechnology and Diploma programmes of Para Veterinary Sciences were warmly welcomed by 2nd year students along with other senior students, faculty and staff members. On the welcome day, lively cultural programmes were presented by the first year students with full of hues and amusement. Shri Bablu Kumar, Senior Superintendent of Police graced the occasion as Chief-Guest and distributed the prizes of Miss and Mister Performers of the College of Veterinary Science and AH.

Foundation Day

DUVASU celebrated its foundation day on 25th October, 2018 at Kisan Bhawan of the University. Rangoli making and dance competitions and

various cultural programmes were held on this occasion in which students from College of Veterinary Science & A.H., College of Biotechnology and Institute of Para Veterinary Sciences participated with great zeal. Prof. S. K. Garg, Dean, College of Veterinary Science & AH, DUVASU, Mathura graced the occasion as the Chief Guest and addressed the gathering with his precious words. The celebration concluded with prize distribution to the winners of literary, cultural and fine arts competitions by chief guest and other higher officials of university.

8th Convocation of DUVASU

8th convocation of DUVASU, Mathura was held on 31st August, 2018. Convocation function was presided over by Hon'ble Governor of Uttar Pradesh and Chancellor of U.P. Pt. Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go Anusandhan Sansthan, Mathura, Shri Ram Naik ji, Prof. D.P. Singh, Chairman, University Grant Commission graced the auspicious occasion as Chief Guest and Prof. S. P. Baghel, Hon'ble State Minister, Animal Husbandry, Minor Irrigation and Fisheries was the Guest of Honour. Proceedings of the Convocation commenced with lighting of

lamp, Saraswati Vandana followed by University song. After a warm welcome of the Hon'ble Governor of Uttar Pradesh and Chancellor, DUVASU, Mathura and distinguished dais dignitaries, the Convocation was declared open by Hon'ble Governor of Uttar Pradesh. Hon'ble Vice Chancellor presented the University progress report. Hon'ble Chancellor conferred degrees to 93 students, 10 students received their Ph.D. degree in Veterinary and Animal Sciences subjects, 04 students PhD in Biotechnology, 17 students M.V.Sc., 39 B.V.Sc. & A.H., 21 students B.Sc. degree and 02 students MSc in Biotechnology. 15 students were awarded medals for their academic excellence and extra-curricular activities. Hon'ble Chancellor, DUVASU blessed and congratulated the degree recipients. Hon'ble Chief Guest, Prof. D. P. Singh delivered the Convocation address and congratulated the degree recipients.

Republic Day

70th Republic Day was celebrated on 26th January, 2019 in main ground of Veterinary College of the University. Chief Guest of the occasion, Prof. K.M.L. Pathak, Hon'ble Vice-Chancellor of the University unfurled the Tricolour National Flag. Floral tributes were paid to the Father of Nation, Mahatma Gandhi. Blood Donation Camp was also organized on this auspicious day by the University in which students, non teaching staff and faculty members of the University donated seventy five units of blood.

Ambedkar Jayanti

University celebrated the 126th birth anniversary of Dr. Bhimrao Ramji Ambedkar on 14th April, 2018 with zeal and enthusiasm. The officers, faculty members, staff and students of the University paid floral tributes to Dr. B.R. Ambedkar and remembered his contribution to this country.

World Veterinary Day Celebration

On 28th April 2018, World Veterinary Day was celebrated at Kothari Veterinary Hospital, DUVASU, Mathura. On this day, Hon'ble Vice-Chancellor, Prof. K.M.L. Pathak, graced the occasion by vaccinating a dog against rabies. Numerous animals were treated for various diseases and dogs and pups were vaccinated against rabies free of cost. Prof. S.K. Garg, Dean, College of Veterinary Science & A.H., Prof. R.P. Pandey, Director Clinics, Heads/In-Charges of different departments, teachers and students participated in the celebration.

International Yoga Day

International Yoga Day was celebrated at DUVASU on 21st June, 2018. Hon'ble Vice-Chancellor, Prof. K.M.L. Pathak, Prof S.K. Garg, Dean, College of Veterinary Sc. & A.H., faculty members, non-teaching staff and students participated with great enthusiasm. On this occasion, Hon'ble Vice-Chancellor addressed the gathering and emphasised on importance of yoga for healthy life and prevention of various life style diseases.

AWARDS AND HONOUR/ACHIEVEMENTS

S.No.	Name	Name of award	Event	Date
1.	Dr. Rajneesh Sirohi	BRICPL Emerging Scientist Award	International Conference on Agriculture, Allied & Applied Sciences (ICAAAS-2018) at Jawahar Lal Nehru University (JNU) Convention Centre, New Mehrauli Road, New Delhi.	28th – 29th April, 2018
2.	Dr. Madhu Tiwari	Appreciation letter	ICAR sponsored Summer School on "Production and post-production interventions to increase returns from livestock enterprises- A step towards doubling farmers' income" organized by Division of Livestock Production and Management, F.V.Sc.&A.H., SKAUST-K.	19th June- 09th July, 2018
3.	Dr. S.P. Singh			
4.	Dr. Vikas Pathak	Nominated by Export Inspection Agency	Ministry of Commerce & Industry, Government of India for Inter Departmental Panel (IDP) visit of M/S Mahan Mlik Foods Ltd., Hathras	19th October, 2018
5.	Dr. Neeraj Kumar Gangwar	Rapporteur	XXXV Annual conference of Indian Association of Veterinary Pathologists, IX annual meeting of IAVP and National Symposium on "Recent advances in Veterinary Pathology and disease diagnosis for sustainable Livestock Poultry production" organized by COVSc & AH., Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, Gujarat	22th -24th October, 2018
6.	Dr. Shyama N Prabhu	Dr C.M. Singh award for best research article		
7.	Dr. Amitav Bhattacharyya	2nd Best Poster Presentation Award	XXXV Annual Conference of Indian Poultry Sc. Association held at CIARI, Port Blair	15th -17th November, 2018
8.	Dr. Vikas Pathak	Vice President of Indian Meat Science Association	IMSCAON-VIII held at West Bengal University of Animal and fisheries Sciences (WBUAFS), Kolkata	22nd -24th November, 2018
9.	Dr. Meena Goswami Awasthi	Executive Member of Indian meat Science Association		
		Best oral (3rd) presentation award		

10.	Dr. Abhinov Verma	IAVA Young Scientist Award Dr. K.L. Suri Award and Best Poster Presentation	XXXIII Annual Convention of IAVA and National Symposium on "Veterinary Anatomy from novices to expert: Supporting development of professional skills in doubling farmer's income" held at Aizwal	28th- 30th November, 2018
11.	Dr. Neeraj Kumar Gangwar	Expert	Pashu Arogya Mela-2018	2018
12.	Dr. Brijesh Yadav	Best paper with highest impact Award	Animal Physiologists Association	2018
13.	Dr. Mukesh Srivastava Dr. Ashish Srivastava	Best poster (1st) award	37th Annual Convention of ISVM and National symposium on "holistic approach in veterinary medicine for better animal health to meet challenges of one health mission" held at RAJUVAS, Bikaner	01st- 03rd February, 2019
14.	Dr. Mukesh Srivastava	Best oral (2nd) presentation award		
		Best oral (3rd) presentation award		
15.	Dr. Shankar Kumar Singh	Best oral (1st) award		
16.	Dr Yajuvendra Singh	Member of committee for evaluation of state nominations (RGM)	National Kamdhenu and Gopal Ratna Awards by DADF, GOI, New Delhi	—
17.	Dr. Vikas Pathak	Member of Scientific Panel for 'Meat and Meat Products including Poultry	Food Safety and Standards Authority of India (FSSAI), Ministry of Health & Family Welfare, Government of India	—
18.	Dr. Vijay Pandey	Gold medal	Online NPTEL Certification course organized by Indian Institute of Technology, Kanpur under the project of NPTEL in association with NASSCOM funded by Ministry of Human Resource Development, Government of India	—
19.	Dr. Mukesh Srivastava	Vice President	Professional society of "Central Small Animal Veterinary Association", Agra, UP.	—
20.	Dr. Mukesh Srivastava	Executive General Secretary	Professional society of "Veterinary Internal and Preventive Medicine-VIPM", Mathura, UP.	—

21.	Dr. Shankar Kumar Singh	Member of Executive Council (Central Region Secretary)	Indian Society for Veterinary Medicine (ISVM)	—
22.	Dr Rashmi Singh	Reviewer Excellence Award	Indian Journal of Animal Research	—
23.	Dr. Vinod Kumar Singh			
24.	Dr. Ruchi Tiwari	Brand Ambassador	Bentham Science Publisher	—

RESEARCH PUBLICATIONS

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3. Chaudhary, A. K., Singh, V. K., Srivastava, M. K., Parashar, A., Upadhyay, A. and Chaudhary, S. K. (2018). A report on clinical mastitis associated with pseudopregnancy in a Great Dane bitch. *Applied Biological Research,* 20(2): 215-217.
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7. Chaudhary, A., Pathak, A., Prakash, A., Verma, A. and Farooqui M.M. (2019). Ossification of metacarpal in prenatal goat (*Capra hircus*). *Indian Journal of Veterinary Anatomy,* 31 (1): 08-10.
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10. Farooqui, M.M., Sharma, C.P., Gupta, V., Kumar, P. and Prakash, A. (2019). Anatomical and histochemical studies of prenatal prostate gland in buck (*Capra hircus*). *Indian Journal of Veterinary Anatomy,* 31 (1): 1-4.
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13. Goswami, M., Sharma, B.D., Mendiratta, S.K. and Pathak V. (2018). Functionality improvement of refined wheat flour cookies with incorporation of carabeef powder and pigeon pea flour. *International Journal of Basic and Applied Agricultural Research,* 16(1): 47-54.
14. Gupta, R. K., Swain, D. K., Singh, V., Anand, M., Choudhury, S., Yadav, S., Saxena, A. and Garg, S. K. (2018). Molecular characterization of voltage-gated potassium channel (Kv) and its importance in functional dynamics in bull spermatozoa. *Theriogenology,* 114:229-36.
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DETAIL OF NEW CONSTRUCTION / RENOVATION WORK DONE DURING FINANCIAL YEAR 2018-19

Grants from Government

S.No.	Name of work	Cost in Lakh
1.	Parking shed near Pasture Department	7.94
2.	Construction of bathroom in Clerk type Quarters	11.23
3.	Earth work near Semen Lab at ILFC	7.81
4.	CC parking and Drain work in VIP	13.78
5.	Renovation work in Kothari Hospital	8.92
6.	Construction of 100 meter boundary wall	8.18
7.	Additional construction of Toilets in Sarjojini Hostel	14.06
8.	Kharanja work near semen lab at ILFC	7.16
9.	Construction of boundary wall near goat shed	10.05
10.	Construction of 03 feet boundary wall near semen lab and goat shed at ILFC	13.12
11.	Various renovation work in VIP	9.54
12.	Construction of kitchen and drain work in Lab Asstt. Quarters	33.81
13.	Replacement of roof on first floor in Sarojini Hostel	39.69
14.	Construction of boundary wall between bull shed and goat shed	4.67844
15.	Renovation work in Gynaecology	4.73
16.	Construction work of toilets near LMP department	9.96
17.	Renovation work in Type super fourth houses in main campus	8.88
18.	Roof replacement work of Deputy COE room in main building	8.94
19.	Roof replacement work of examination hall no. 03 in main building	9.93
20.	Drain work near buck shed at ILFC	5.81
21.	Gate fixing, Fibre sheet fixing and MS gate fixing and granite work in Teachers Home Cum Guest House and Nehru Hostel	3.38
22.	Construction of soak pit and drain work in Nehru Hostel	3.02
23.	Paver block tiles work in VC camp office	2.09
24.	Renovation work in toilets of suit no-02 and 03 of VIP	3.04
25.	Beautification work near main entry gate of university	5.91
26.	Treatment work in Dining hall and kitchen VIP	1.55
27.	Tiles flooring work in dining hall and kitchen VIP	5.40
	Total	**262.60844**

Grants from Indian Council of Agricultural Research, New Delhi

S.N.	Name of the civil work	Location of Civil Work (specify college and place)	Release fund (in Lakh)
1.	Roof Replacement and renovation work of Examination Hall no. 04	Main Building	34.46
2.	Roof replacement of one room on first floor	Main Building	2.90
3.	Construction of parking shed near old cycle stand	Main campus	9.87
4.	Roof replacement of stairs	Main building	4.47
5.	Roof replacement of Academic section and Record room	Main building	9.95
6.	Lab no. 01 Renovation work in Physiology	Main campus	9.94
7.	Lab no. 02 Renovation work in Physiology	Main campus	8.67
8.	Lab renovation work in Pathology	Main campus	4.70
9.	False ceiling and floor tiles work in Physiology	Main campus	.57
10.	Establish of Godrez type doors in almirah at Deen Dayal Hostel	New Campus	8.882
11.	Construction of Parking shed near main building	Main campus	8.883
12.	Kharanja work near cow shed	ILFC	8.82
13.	Drain and Railing work near cow shed	ILFC	7.875
	Total		**119.99**

FINANCIAL STATUS

State Government	Salary	Contingency	Total
	4238	1209.32	5447.32
ICAR Development Grant			293.37
University receipt			309.22

RIGHT TO INFORMATION ACT

In compliance of the order of Govt. of Uttar Pradesh and provision of RTI Act, 2005, PIO received 35 applications out of which 27 appliactions were cleared and 8 are under consideration.