

# Annual Report

## 2020-21



**DUVASU**



उ.प्र. पं. दीनदयाल उपाध्याय पशु चिकित्सा विज्ञान विश्वविद्यालय  
एवं गो अनुसंधान संस्थान, मथुरा-281 001 (उ.प्र.) भारत

U.P. Pandit Deen Dayal Upadhyaya Pashu-Chikitsa  
Vigyan Vishwavidyalaya Evam Go Anusandhan Sansthan  
(DUVASU), Mathura-281 001 (U.P.) INDIA



Distribution of fruits and books to the primary school students by Hon'ble Governor of Uttar Pradesh on the occasion of 10<sup>th</sup> convocation of DUVASU, Mathura



Shri Laxmi Naryan Chaudhary, Minister of Dairy Development, Animal Husbandry, Fisheries, Govt. of Uttar Pradesh inaugurating the feed processing plant constructed under RKVY



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## FOREWORD

It is a matter of great pleasure and satisfaction for me to present the Annual Report of 2020-21 of U.P. Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go Anusandhan Sansthan (DUVASU), Mathura as a mark of another outstanding chapter in the chronicles of the University. The Annual Report of the University portrays the wide spectrum of various academic and co-curricular activities at the University and its affiliated colleges. The Editorial Committee has candidly tried to capture the vibrant academic environment that exists in the University Campus highlighting the research projects, research publications, participation in national, international seminars and workshops, special achievements including awards and honours. The notable contributions made by the faculty members and significant achievements of the students are also included.




The University conducted all the entrance examinations (PVT-2020, PDT-2020 and PGET-2020) successfully by ensuring social distancing and other safety measures enforced in the wake of the Covid-19 pandemic. The various academic programmes during 2020-2021 are also running smoothly in College of Veterinary Science and Animal Husbandry, College of Biotechnology and Institute of Paraveterinary Science through on line mode.

During this financial year, 29 externally funded projects were in operation in various departments of College of Veterinary Science and Animal Husbandry. Out of these, 13 projects were funded by RKVY, 05 projects by ICAR, 02 by NIF-DBT and one each by DBT, GOI, NIF (DST), DADF, DAHD, GOI, Central Council for Research in Homeopathy and 05 projects by Private companies. Along with this, 30 intramural university funded projects have also been sanctioned to young faculty members of various departments of College of Veterinary Science and Animal Husbandry. Various literary and cultural events were organized in online mode during the pandemic situation of COVID-19 for overall personality development of the students. University also received Rs. 646.90 lacs for the construction of New Girls Hostel. Old hostels have also been renovated under the reported year. Repair and renovation work of Vice Chancellor's office, IDP-NAHEP building, establishment of Covid-19 laboratory are some important work of estate office undertaken in addition to other renovation and repair works in various offices, farm, departments and residential areas of the university.

The 10th Convocation of the University was held on 23<sup>rd</sup> February, 2021. Hon'ble Chancellor of the University and Governor of Uttar Pradesh, Smt. Anandiben Patel ji had conferred degrees and medals to successful Under Graduates, Post Graduates and PhD candidates. I am immensely happy to know that our students brought laurels to the University by winning many national level competitions. Our teachers were also adorned with several prestigious awards and academic accomplishments at national and international levels. One International webinar, several national webinars, online conferences, training programmes and e-quiz competitions were organized by various departments. The published research papers are the reflection of the quality of research work done at any academic institute. A total of 97 research articles in national and international peer reviewed journals were published. The Directorate of extension education along with KVK and other departments of College of Veterinary Science and Animal Husbandry organized several trainings for the benefit of farmers, field veterinarians, paraveterinary staff and youths

On behalf of the University, I express my sincere thanks and gratitude to Government of Uttar Pradesh, ICAR, New Delhi, RKVY, UPCAR, DST, DBT and Government of India for adequate financial support. The supports from RKVY and ICAR have played pivotal role in improving the infrastructural facilities, strengthening of teaching, research and extension activities, disease diagnosis, treatment of diseased animals and several other animal welfare activities. I am extremely thankful to the Additional Chief 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 and supportive staff and students for their commitment towards their work and keeping the reputation of the University high. Their everlasting hard work, sincerity and cooperation helped a lot in achieving the set targets, objectives and mandates.

The efforts made by the editorial committee to bring out this Annual Report well in time depicting various activities and achievements of the University is duly acknowledged and appreciated.

  
(G.K. Singh)

## प्राक्कथन

उत्तर प्रदेश पंडित दीन दयाल उपाध्याय पशु चिकित्सा विज्ञान विश्वविद्यालय एवं गो अनुसंधान संस्थान (DUVASU), मथुरा की वार्षिक रिपोर्ट 2020-21 को विश्वविद्यालय के इतिवृत्त में एक और उत्कृष्ट अध्याय के सूचक के रूप में प्रस्तुत करना मेरे लिए अत्यंत हर्ष एवं संतोष का विषय है। विश्वविद्यालय की वार्षिक रिपोर्ट विश्वविद्यालय और इससे सम्बंधित महाविद्यालयों में विभिन्न शैक्षणिक और सह-पाठ्यक्रम गतिविधियों की व्यापकता को चित्रित करती है। संपादकीय समिति ने निश्चित रूप से विश्वविद्यालय परिसर में व्याप्त शैक्षणिक वातावरण को उल्लेखित करने का प्रयास किया है, जिसमें अनुसंधान परियोजनाओं, शोध प्रकाशनों, अंतर्राष्ट्रीय सेमिनारों और कार्यशालाओं में प्रतिभाग, पुरस्कार और सम्मान सहित विशेष उपलब्धियों पर प्रकाश डाला गया है एवं संकाय सदस्यों द्वारा किए गए उल्लेखनीय योगदान और छात्रों की सार्थक उपलब्धियों को भी सम्मिलित किया है।



विश्वविद्यालय ने कोविड-19 महामारी के दृष्टिगत लागू सामाजिक दूरी और अन्य सुरक्षा उपायों को सुनिश्चित करते हुए सभी प्रवेश परीक्षाओं (पीवीटी-2020, पीडीटी-2020 और पीजीईटी-2020) का सफलतापूर्वक आयोजन किया। सत्र 2020-2021 के दौरान पशु चिकित्सा एवं पशुपालन महाविद्यालय, जैव प्राद्यौगिकी महाविद्यालय एवं इंस्टीट्यूट ऑफ पैरा वेटरनरी साइंस में विभिन्न शैक्षणिक कार्यक्रम ऑनलाइन मोड के माध्यम से संचारु रूप से चलते रहे हैं।

इस वित्तीय वर्ष के दौरान पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय के विभिन्न विभागों में 29 बाह्य वित्तपोषित परियोजनाएं चल रही थीं। इनमें से 13 परियोजनाओं को आरकेवीवाई द्वारा, 05 परियोजनाओं को आईसीएआर द्वारा, 01 परियोजनाओं को डीबीटी, भारत सरकार द्वारा, 02 को एनआईएफ—डीबीटी द्वारा, 01 को एनआईएफ (डीएसटी) द्वारा, 01 को डीएडीएफ द्वारा, 01 को डीएएचडी, भारत सरकार द्वारा, 01 को केंद्रीय होम्योपैथी अनुसंधान परिषद द्वारा और 05 परियोजनाओं को निजी कंपनियों द्वारा वित्त पोषित किया गया था। इसके साथ ही पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय के विभिन्न विभागों में युवा फैकल्टी सदस्यों को प्रोत्साहित करने हेतु 30 इंटरम्यूरल यूनिवर्सिटी फंडेड प्रोजेक्ट्स भी स्वीकृत किए गए हैं। छात्रों के समग्र व्यक्तित्व विकास के लिए कोविड-19 महामारी की स्थिति के दौरान ऑनलाइन मोड में विभिन्न साहित्यिक और सांस्कृतिक कार्यक्रमों का आयोजन किया गया। रिपोर्टिंग वर्ष में विश्वविद्यालय को नए गर्ल्स हॉस्टल के निर्माण के लिए 646.90 लाख रुपये प्राप्त हुए। पुराने छात्रावासों का नवीनीकरण भी किया गया है। संपत्ति कार्यालय के कुछ महत्वपूर्ण कार्यों में विश्वविद्यालय के विभिन्न कार्यालयों, विभागों और आवासीय क्षेत्रों में नवीनीकरण और मरम्मत कार्यों के अतिरिक्त कुलपति कार्यालय एवं आईडीपी—एनएएचडीपी भवन, की मरम्मत एवं नवीनीकरण तथा कोविड-19 प्रयोगशाला की स्थापना आदि सम्मिलित हैं।

विश्वविद्यालय का 10वां दीक्षांत समारोह 23 फरवरी, 2021 को आयोजित किया गया था। विश्वविद्यालय की माननीय कुलाधिपति और उत्तर प्रदेश की राज्यपाल श्रीमती आनंदीबेन पटेल जी ने अंडर ग्रेजुएट, पोस्ट ग्रेजुएट और पीएचडी सफल उम्मीदवारों को डिग्री और मेडल प्रदान किए। मुझे यह जानकर बेहद प्रसन्नता हुई कि हमारे छात्रों ने कई राष्ट्रीय स्तर की प्रतियोगिताओं को जीतकर विश्वविद्यालय का नाम रौशन किया। हमारे शिक्षकों को राष्ट्रीय और अंतर्राष्ट्रीय स्तर पर कई प्रतिष्ठित पुरस्कारों और अकादमिक उपलब्धियों से भी नवाजा गया। विभिन्न विभागों द्वारा एक अंतर्राष्ट्रीय वेबिनार, कई राष्ट्रीय वेबिनार, ऑनलाइन सम्मेलन, प्रशिक्षण कार्यक्रम और ई-प्रश्नोत्तरी प्रतियोगिताएं आयोजित की गईं। प्रकाशित शोध पत्र किसी भी शैक्षणिक संस्थान में किए गए शोध कार्य की गुणवत्ता का प्रतिबिंब होते हैं। इसी क्रम में इस वर्ष राष्ट्रीय और अंतर्राष्ट्रीय समकक्ष समीक्षित पत्रिकाओं में कुल 97 शोध लेख प्रकाशित हुए। प्रसार निदेशालय ने पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय, केवीके एवं अन्य विभागों के साथ मिलकर किसानों, क्षेत्र के पशु चिकित्सकों, पैरा-पशु चिकित्सा कर्मियों एवं युवाओं के लाभ के लिए अनेक प्रशिक्षण कार्यक्रम आयोजित किये।

विश्वविद्यालय की ओर से, मैं पर्याप्त वित्तीय सहायता के लिए उत्तर प्रदेश सरकार, भारतीय कृषि अनुसंधान परिषद, नई दिल्ली, राष्ट्रीय कृषि विकास योजना, यूपीसीएआर, डीएसटी, डीबीटी, भारत सरकार का हार्दिक धन्यवाद और आभार व्यक्त करता हूं। आरकेवीवाई और आईसीएआर के समर्थन ने बुनियादी सुविधाओं में सुधार, शिक्षण को मजबूत करने, अनुसंधान और प्रसार गतिविधियों, रोग निदान, रोगग्रस्त जानवरों के उपचार और कई अन्य पशु कल्याण गतिविधियों में महत्वपूर्ण भूमिका निभाई है। मैं माननीय राज्यपाल के अपर मुख्य सचिव, पशुपालन, उत्तर प्रदेश और प्रमुख सचिव, पशुपालन, उत्तर प्रदेश का इस संस्थान के समग्र विकास में उनके समर्थन के लिए के प्रति बहुत आभारी हूं। मैं इस अवसर पर विश्वविद्यालय के सभी अधिकारियों, विभागों के प्रमुखों और प्रभारियों, शिक्षण संकाय, तकनीकी, गैर-तकनीकी, प्रशासनिक और सहायक कर्मचारियों और छात्रों के अपने काम के प्रति प्रतिबद्धता और विश्वविद्यालय की प्रतिष्ठा को ऊंचा रखने के लिए दिए गए योगदान की सराहना करता हूं। उनकी नितांत कड़ी मेहनत, ईमानदारी और सहयोग ने निर्धारित लक्ष्यों, उद्देश्यों और जनादेशों को प्राप्त करने में महत्वपूर्ण भूमिका निभाई है। विश्वविद्यालय की विभिन्न गतिविधियों और उपलब्धियों को दर्शाते हुए इस वार्षिक रिपोर्ट को समय पर प्रकाशित करने के लिए संपादकीय समिति के सदस्यों द्वारा किए गए प्रयास भी विशेष सराहनीय हैं।

$$\frac{1}{2} \left| \frac{1}{\sqrt{2}} \right|^{1/2}$$



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# Executive Summary



## EXECUTIVE SUMMARY

### TEACHING

- During 2020-21, College of Veterinary Science and Animal husbandry admitted 87 students in B.V.Sc. & AH programme, out of which 44.82% were girls. In M.V.Sc. and Ph.D. programmes, 21 and 03 students, respectively, were admitted.
- 05 students received their PhD and 40 their M.V.Sc. degree and 60 students their B.V.Sc. & A.H. from College of Veterinary Science and Animal husbandry.
- During the year, College of Biotechnology admitted 26 and 07 students to B.Sc. Biotechnology and B.Sc. Industrial Microbiology programmes respectively and 08, 01 and 14 Students received their Ph.D., M.Sc. and B.Sc. degrees, respectively from College of Biotechnology.
- During 2020-21, 60 students were admitted to Diploma in Veterinary Pharmacy (DVP) and 60 students in Diploma in Livestock extension (DLE) programmes, respectively, and 27 and 16 Students completed their DLP and DLE programmes, respectively. Three months Internship programme for 27 students of Diploma in Veterinary Pharmacy 2018 batch was also organized.
- Veterinary Clinical complex (VCC) is well equipped with modern facilities which include small and large animal operation theatres, two ICU for pets, C-arm image intensifier, digital X-ray machine, CCTV camera, USG machine, laproscopy set, mobile X-ray machine, small animal anesthesia machine, loading and unloading platform and indoor unit for small and animals and handled 11, 269 clinical cases during 2020-21. The total revenue generated by VCC during this period was Rs. 5,12,245/- (five lacs twelve thousand two hundred forty five only).
- Disease diagnostic laboratory of VCC is equipped with digital microscope, dry chemistry analyzer, hematology analyzer electrolyte analyzer. During 2020-21, the laboratory checked total 1919 samples comprising of blood samples for various blood parameters, serum samples for biochemical analysis, milk and urine samples for culture sensitivity and histopathology tests and other samples and generated a revenue of Rs. 2,20,790/- (two lacs twenty thousand seven hundred ninety only).
- During the year under report, the clinical services were provided by the faculty members of clinics and post graduate students at farmer's doorstep through clinical camps organized at nearby villages of Mathura district.
- The breeder farm, layer farm and hatchery established under Experiential Learning Unit in Poultry Science Department (ELU) served as models for U.G., P.G. and Ph.D. teaching and also served as models for internship students to train them regarding poultry farming and entrepreneurship. Students were trained in various farm activities pertaining to feeding, watering, hatchery operations and management. The total revenue generated from experiential learning was Rs. 6,74,886.00/- (six lacs seventy thousand eight hundred and eighty six only).
- Experiential Learning Programme on "Milk & meat processing and livestock product manufacturing" in Department of Livestock Products Technology imparted practical trainings on preparation of different milk and meat products to undergraduate and post-graduate students. During the reporting period, 3830.5 liters of milk was processed into Paneer and Khoa. Value added meat products like meat nuggets, meat patties etc. were also processed.
- University Library has 35499 books of various streams like Veterinary Science, Animal Husbandry and Biotechnology, 12 journals including online journals [www.cera.jccc.in](http://www.cera.jccc.in) and various hindi and English news papers. The various facilities of the library includes: Circulation service, Reference service, Computer/Internet service, thesis reading service etc. CD-ROM= VET CD 1973 to Aug., 2004, CAB CD 1972 to May 2005, CAB Abstract 1990 to Dec., 2005.
- Feed production and processing project under Department of Animal Nutrition has a feed processing unit and one Urea molasses mineral block unit that provides hands-on training to the students to formulate compounded feed as per the nutrient requirement of livestock. Feeds and UMMB produced from these units are available to our university and also to farmers and goshala



during Kisan melas and farmers training. This year (2020-21) departmental sale of mineral mixture generated revenue of Rs 6.0 lacs (six lacs only).

## RESEARCH

- During the reporting year, 29 externally funded projects were running in various departments of College of Veterinary Science and Animal Husbandry. Out of these, 13 projects were funded by RKVY, 05 projects by ICAR, 01 project by Department of Biotechnology (DBT), GOI, 01 by NIF-DBT, 02 project by NIF (DST), GOI, 01 project by DADF, Ministry of Agriculture and Farmers Welfare, 01 project by DAHD, GOI, 01 project by Indian Herbs Pvt. Ltd., 01 project by Himalaya Drug company, 01 project by Ms. Datt Mediproducs Pvt. Ltd. Gurgaon, Haryana, 01 project by Central Council for Research in Homeopathy, 01 project by DRDO-INMAS and 01 project by Ayurved Limited, Baddi, Solan, H.P.
- During the reporting year 30 intramural university funded projects have been sanctioned to various departments of College of Veterinary Science and Animal Husbandry.
- During 2020-21, 03 Ph.D. and 26 M.V.Sc. thesis in Veterinary and Animal Sciences subjects, 06 PhD and 01 M.Sc. thesis in Biotechnology was submitted as per academic research in various departments.
- During the year under report, University published 97 research publications.

## EXTENSION

- During 2020-21, Directorate of Extension with the assistance of faculty of College of Veterinary Science and Animal Husbandry organized two on the campus trainings, 12 visits of farmers, animal owners and others in Pashu Gyan Chaupal, Dairy Farm and Goat Unit. Through these trainings, 16 Veterinary Officers and 30 farmers/ livestock owners were trained and exposed to latest managerial and entrepreneurial skills. Through visits, 412 farmers were benefited.
- 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 and keepers.
- Consultation services were provided to large number of farmers about animal husbandry and poultry farming practices in 3 days Krishi Mela /Kisan Gosthi.

- Department of Veterinary and Animal Husbandry Extension also conducted six trainings for farmers/livestock owners/ Multi Purpose Artificial Insemination Technicians in Rural India (MAITRI) trainees during the reporting period and exhibited latest technologies in animal husbandry practices. Exposure visit for 109 farmers from different districts of Uttar Pradesh and Madhya Pradesh was also conducted.
- During this year, various extension trainings were organized by different departments of College of Veterinary Science and Animal Husbandry which included 2 trainings for Veterinary Officers under AINP-DIMSCA by Department of Veterinary Surgery and Radiology, 1 training program for Food Safety Officers by Department of Livestock Products Technology under RKVY project, 2 training programs for rural youths by Department of Animal Nutrition under RKVY project, 1 training program by Department of Parasitology for Veterinary Officers under RKVY project and 10 training programs for Veterinary Officers, Pashu Sakhi and Women Farmers, AI workers and farmers by Department of Veterinary Physiology.
- During this year, total of 104 trainings were conducted by KVK scientists for 2909 participants. Out of these, 89 trainings were for farmers and farm women, 09 for rural youth, and 06 for extension functionaries through which 2401 farmers and farm women, 179 rural youth and 329 extension functionaries were trained.
- To demonstrate the production potential of various proven technologies, the frontline demonstrations on farmers field were conducted for 597 farmers and livestock owners.
- Under the technology assessment and refinement, technology assessed for crops and livestock were 8 and 1 respectively with 51 number of trials wherein 51 farmers were benefitted. Total 221 extension activities were conducted by KVK for 9389 participants. KVK provided mobile advisory services during the pandemic era of COVID-19 to serve the farmers of the adjoining districts.
- In year 2020-21, KVK produced 650.00 quintal seeds, 40370 planting material and 1970 kg. bio-products and generated total revenue of was Rs. 24.70 lac, 3433.00/- and Rs. 2850.00/- respectively through these productions.



- Gosthies, Diagnostic visits, Kisan Melas, Kisan Samman Diwas were organized for improving connectivity with farmers. During this year, Soil and Water Testing Laboratory of KVK analyzed 720 soil and 48 water samples and on the basis of result recommendations for balance fertilization and watering were given to 652 beneficiaries.

### UNIVERSITY FARMS

- During 2020-21, total milk production at LFC was 234987.50 liters, out of which, the production of cow milk was 197458.50 liters and that of buffalo milk was 37529.00 liters. The total revenue generated during this period was 74, 58, 558/- (seventy four lacs fifty eight thousand five hundred and fifty eight only).
- Poultry farm of Veterinary College maintained variety of species and breeds including layers, Chabro, Aseel, Kadaknath, Naked neck, Japanese quail, Turkey, Guinea fowl and Emu. During FY 2020-21, the farm generated a revenue of Rs. 9,06,265.00/- (nine lacs six thousand two hundred and sixty five only) from sale of different birds and eggs.
- The revenue generated in Kharif season 2020 from Paddy was Rs. 13, 05,101.00 and approximate Revenue generated Rabi season 2020-21 from Wheat, oats, Barley and Bhusa was Rs. 62,91,030.00 and Thus total revenue generated during the financial year (2020-21) at Madhurikund farm was Rs. 75,96,131.00 (seventy five lacs ninety six thousand one hundred thirty one only).

### HUMAN RESOURCE DEVELOPMENT

- Department of Veterinary Biochemistry organized an International Webinar under the NAHEP flagship on 31<sup>st</sup> August 2020 on the topic "Iron metabolism and its disorders: from anemia to hemochromatosis".
- Department of Animal Genetics and Breeding organized a webinar entitled "Modern genetic approaches for improvement of indigenous cattle" under Interactive Session for Students with Industry and Academic Programme within NAHEP project on July 29, 2020.
- Department of Veterinary Anatomy organized one National Webinar on "Conceptualization of Modern Anatomy: Theory & Practice" on 4<sup>th</sup> and 5<sup>th</sup> August, 2020 under NAHEP and two National e-quiz competitions on the occasion of 104<sup>th</sup> Birth Anniversary of Pandit Deen Dayal Upadhyaya on 25<sup>th</sup> September, 2020 and 72<sup>nd</sup>

Republic day of India on 26<sup>th</sup> January 2021 under NAHEP.

- Department of Veterinary Biochemistry organized two National Webinars viz; one on 14<sup>th</sup> August 2020 on the topic "In-depth bovine milk analysis to unearth goldmine beneficial for health applications" and second National Webinar on "Igniting Young Minds towards Science" on 22<sup>nd</sup> August 2020 under NAHEP. Department of Veterinary Biochemistry also organized 5<sup>th</sup> Annual Convention of Society of Veterinary Biochemists and Biotechnologists of India (SVBBI) and National Symposium on "Current challenges for Animal Biochemists and Biotechnologists for improving Animal Health and Production in Post COVID scenario" from March 24-25, 2021 in virtual (online) mode.
- Department of Veterinary Epidemiology organized National Webinar on 'Revisiting Package of Practices for the Control of Brucellosis' on 24<sup>th</sup> Sept, 2020.
- Department of Livestock Products Technology organized two days National webinar on "Functional foods of animal origin: role in health promotion and diseases prevention" on 06<sup>th</sup>-07<sup>th</sup> August, 2020 and One day National webinar on "Current practices and innovations in the packaging of meat and poultry products" on 12<sup>th</sup> February, 2021 under "Interactive session for students with industry and academic programme" component of IDP-NAHEP project.
- Department of Veterinary Medicine organized Online 7 days training programme on Basics of electrocardiography in dogs from 17<sup>th</sup> to 23<sup>rd</sup> August, 2020.
- Department of Veterinary Microbiology organized National Webinar on "Current Concepts in Clinico-therapeutic management of Snake bite in Animals" under IDP-NAHEP project on 20<sup>th</sup> March, 2021 in online mode.
- Department of Veterinary Pharmacology and Toxicology organized Hands on Training on "Bioprospecting of Phytoconstituents to combat antimicrobial resistance" w.e.f. 6<sup>th</sup> - 15<sup>th</sup> March, 2021 under SCSP of ICAR All India Network Programme on Ethno-Veterinary Medicine. Department also organized 20<sup>th</sup> Annual Conference of Indian Society of Veterinary Pharmacology & Toxicology (ISVPT) as Virtual Conference (e-conference) and one International Webinar on "Receptor dynamics in cell signaling" and National Webinar on "Translational

approaches in herbal drug development” on 4<sup>th</sup> -5<sup>th</sup> Oct, 2020.

- Department of Poultry Science organized National webinar organized on ‘Atma Nirbhar Indian Poultry in New Normal’ on 09<sup>th</sup>-11<sup>th</sup> August, 2021.

### STUDENTS' WELFARE

- During 2020-21, 26 and 44 cadets appeared in ‘B’ and ‘C’ certificate examination respectively. 70 cadets participated in CATC-38 camp in reporting year. Six cadets of NCC participated in 6<sup>th</sup> Phase of online Ek Bharat Shreshtha Bharat (EBSB) held from 22<sup>th</sup> – 27<sup>th</sup> March, 2021. Cadet Praveen Kumar participated in a camp at IMA-Dehradun held from 21<sup>st</sup> December 2020 to 8<sup>th</sup> January 2021.
- Dr. Rajneesh Sirohi was awarded with an appreciation letter for working as an Associate NCC officer in compliance to the orders from Director General, National Cadet Corps, New Delhi.
- Literary and cultural events were organized by DUVASU in online mode in which students from CVSc and A.H., COB and Institute of Para Veterinary Sciences participated. During the LITCUL FEST, events like speech, essay writing, debate, extempore, poetry recitation, poster making, collage making, portrait of Gandhiji, painting, clay modeling, competitions were held. Literary competitions were conducted in both English and hindi languages.
- Webinars were organized by the office of Dean Students Welfare, DUVASU, Mathura on various relevant topics for the students of the University under Interactive Sessions for Students with Industry and Academia of Institutional Development Plan (IDP)-National Agricultural Higher Education Project granted to this University.

### OTHER HIGHLIGHTS AND ACTIVITIES

- University successfully conducted the Pre-Veterinary Test (PVT- 2020) on 11<sup>th</sup> October 2020, Pre-Diploma Entrance Examinations (PDT-2020) on 27<sup>th</sup> September 2020 and Postgraduate (M.V.Sc. and Ph.D.) Entrance Examinations (PGET-2020) on 15<sup>th</sup> November 2020.
- DUVASU celebrated its 20<sup>th</sup> Foundation Day on 25<sup>th</sup> October 2020 in an online-offline mode looking towards the precautions to be taken during COVID-19 pandemic.
- The 10<sup>th</sup> convocation of DUVASU, Mathura was held on 28<sup>st</sup> August, 2019. 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, Smt. Anandi Ben Ptael Ji graced the auspicious occasion as chief guest.

- The birth anniversary of the principal architect of the Indian Constitution Bhimrao Ambedkar was celebrated on 14<sup>th</sup> April 2021.
- DUVASU, Mathura, celebrated 104<sup>th</sup> birth anniversary of Pandit Deen Dayal Upadhyaya ji on 25<sup>th</sup> September 2021.

### AWARDS & HONOUR/ACHIEVEMENTS

- Prof. Vikas Pathak acted as lead speaker in National Webinar organized by Department of Livestock Products Technology, GADVASU, Ludhiana. He acted as panelist in Brainstorming Session on “Potential of non-bovine milk” organized by National Academy of Agricultural Sciences. He became Member of Working group on Cell based meat for FSSAI, Ministry of Health & Family Welfare, Government of India. He also got selected as Vice President of Indian Meat Science Association.
- Prof. Archana Pathak received Appreciation Certificate for delivering invited lecture conducted by IDP-Cell, GADVASU, Ludhiana.
- Prof. Rashmi Singh was member of Screening and Assessment committee of CAS, ASRB, New Delhi and also Nodal Officer for COVID-19 Testing Lab, DUVASU, Mathura. She also delivered three expert lectures under IDP- Cell, GADVASU, Ludhiana.
- Prof. Rashmi Singh, Dr. Brakha Sharma, Dr. Udit Jain, Dr. Jitendra Tiwari, Dr. Neeraj Gangwar, Dr. A.P. Singh, Dr. Soumen Chaudhary, Dr. Ruchi Tiwari, Dr. R.K. Yadav, Dr. V.K. Singh, Dr. Vikrant Sudan and Dr. Parul got appreciation letter for working in COVID-19 Testing Lab, DUVASU, Mathura.
- Dr. Udit Jain won awards in All India Monthly article writing and National level video creating competitions.
- Dr. Neeraj Kumar Gangwar was selected as Zonal Secretary for North zone of the IAVP society, India.
- Dr. Barkha Sharma was selected as Member of Editorial Board of Pashupatrika.com and Acta Scientific Veterinary Sciences. She was also winner of All India monthly article writing competition by Pashupalan.com.





- Dr. Rajneesh Sirohi received DG NCC Commendation Card on Republic Day Camp 2021.
- Dr. Shriprakash Singh got Best Hindi article Award by e-pashupalan. He also received Padam Shree Dr B.V. Rao Poultry entrepreneurs Global award by Pashudhan Praharee
- Dr. Ruchi Tiwari received Best PhD thesis award in 4<sup>th</sup> International conference on “CAAAAHASSE-2021” organized by AEDS and RajmataVijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior (Madhya Pradesh), India
- Dr. Meena Goswami Awasthi received Young Scientist Award in 4<sup>th</sup> International conference on “CAAAAHASSE-2021” organized by AEDS and RajmataVijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior (Madhya Pradesh), India. She was also elected as Executive Member of Indian Meat Science Association (IMSA).
- Dr. Vijay Pandey was Member, Scientific Advisory Board and received Certificate of Appreciation from International Journal of Livestock Research
- Dr. Ambika Sharma received InSc Research Excellence Award for Best research paper
- Drs. Barkha Sharma, Ambika Sharma, Mukesh Srivastava and Meena Goswami Awasthi received National Excellence Award under “Ram Singh Memorial National Animal welfare Award 2020” by Pashudhan Praharee
- Dr. Ambika Sharma, received Best Paper Award, Dr. Vikrant Sudan received best oral presentation, Dr. Dilip Kumar Swain received two best paper award and appreciation award and Dr. Brijesh Yadav received best paper award and appreciation award in 5<sup>th</sup> Annual Convention of Society of Veterinary Biochemists and Biotechnologists of India at DUVASU, Mathura
- Drs. Barkha Sharma, Ambika Sharma, Meena Goswami Awasthi and Parul received Inspiring Lady Veterinarian Award on International Women’s Day by Pashudhan Praharee
- Dr. Renu Singh received 2<sup>nd</sup> prize in poster presentation in Online elephant conference at Vels institute of science, Technology and Advanced studies, Chennai
- Dr. Dilip Kumar Swain received best paper award in XXIX SAPI Annual conference organized by Bihar Animal Science University, Patna. He also received Letter of

appreciation and recognition as Editorial Board Member in Animal Reproduction Science, Elsevier/ Science Direct

- Dr. Brijesh Yadav received letter of appreciation and recognition as reviewer of The International Journal of Biometeorology, Asian Research Journal of Gynaecology and Obstetrics, Journal of Animal Physiology and Animal Nutrition
- Dr. Deep Narayan Singh received Young Scientist Award in ISAO 2020, Research Excellence Award in EEA conference, 2020, Yashashwi Samman by RASSA, Dr. C.M. Singh National Award of Excellence and Dr. R. K. Memorial Award of Excellence under National Level Essay writing competition and Prani Mitra Award 2021 for Significant and outstanding contribution in the field of Animal welfare by pashudhan praharee.

### FINANCE AND BUDGET

- During 2020-21, University received Rs. 4602.00 lacs and Rs. 2077.49 lacs under salary and contingency heads, respectively from Govt. of U.P.
- During the year, total receipt generated by the University was Rs. 400.00 lacs.

### ESTATE AND MAINTAINNANCE ORGANIZATION

- During the financial year 2020-21, University received sum of Rs 296.04 lacs and this sum was utilized for repair and renovation work of Vice Chancellor’s room, dissection Hall of Anatomy department, Essential repair in finance office, renovation at goat farm, To mark the IDP-NAHEP building, LED light board, repair and correction of slant of IDP-NAHEP parking, to establish of COVID-19 laboratory, construction of drain, repair and renovation work in 20 quarters of Class -4 employees, renovation of FMD building, construction of shed in front of shed no. 3 at livestock farm to protect the animals from adverse effect heat, cold, and water during summer, winter and rainy season etc.
- University also received Rs. 646.90 lacs for construction of new girls hostel.

### RIGHT TO INFORMATION ACT

- In compliance of the order of Govt. of Uttar Pradesh and provision of RTI Act, 2005, PIO received 50 applications out of which 39 applications were cleared and rest are under consideration.

## कार्यकारी सारांश

### पाठ्यक्रम

- पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय, जैव प्रौद्योगिकी महाविद्यालय एवं पैरा वैटरिनरी विज्ञान संस्थान अपने शैक्षणिक सत्र नियमित रूप से चला रहे हैं।
- वर्ष 2020-21 के दौरान 87 विद्यार्थियों ने पशु चिकित्सा विज्ञान एवं पशुपालन स्नातक कार्यक्रम में प्रवेश प्राप्त किया, जिसमें 44.82 प्रतिशत छात्राएँ हैं। पशु चिकित्सा विज्ञान स्नातकोत्तर तथा विद्या वाचस्पति कार्यक्रम में क्रमशः 21 और 03 विद्यार्थियों ने प्रवेश प्राप्त किया। इसी सत्र में पशु चिकित्सा विज्ञान स्नातकोत्तर तथा विद्या वाचस्पति के क्रमशः 40 और 05 विद्यार्थियों ने पशु चिकित्सा एवं पशुविज्ञान के विभिन्न विषयों में उपाधि प्राप्त की, साथ ही 60 विद्यार्थियों ने पशु चिकित्सा विज्ञान एवं पशुपालन स्नातक की उपाधि प्राप्त की।
- वर्ष 2020-21 में जैव प्रौद्योगिकी महाविद्यालय में 26 विद्यार्थियों ने जैव प्रौद्योगिकी स्नातक कार्यक्रम तथा 07 विद्यार्थियों ने औद्योगिकी सूक्ष्म जीव विज्ञान स्नातक कार्यक्रम में प्रवेश प्राप्त किया। इसी सत्र में जैव प्रौद्योगिकी में 08, 01 एवं 14 विद्यार्थियों ने क्रमशः विद्या वाचस्पति, स्नातकोत्तर एवं स्नातक की उपाधि प्राप्त की।
- वर्ष 2020-21 में वैटरिनरी फार्मसी एवं पशुधन प्रसार में डिप्लोमा के लिए क्रमशः 60 एवं 60 विद्यार्थियों ने प्रवेश लिया जबकि 27 तथा 16 विद्यार्थियों ने वैटरिनरी फार्मासिस्ट डिप्लोमा तथा पशुधन प्रसार में डिप्लोमा प्राप्त किया। इसी दौरान बैच 2018 के डिप्लोमा वैटरिनरी फार्मसी के 27 विद्यार्थियों ने तीन माह के इंटर्नशिप कार्यक्रम को पूर्ण किया।
- वी0सी0सी0 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 आई०सी०यू० एक्स-रे तथा अल्ट्रासाउण्ड यूनिट की सुविधा उपलब्ध है। वर्ष 2020-21 के दौरान 11269 रोगी पशुओं का उपचार किया गया। इन सेवाओं से वी0सी0सी0 को रु० 5,12,245.00 (पाँच लाख बारह हजार दो सौ पैतालीस) का राजस्व प्राप्त हुआ।
- वी0सी0सी0 की रोग निदान प्रयोगशाला अर्धस्वचालित ब्लड एनालाइजर, बायोकेमिकल एनालाइजर, यूरिन एनालाइजर उपकरणों से सुसज्जित है। वर्ष 2020-21 में 1919 नमूनों की सामान्य खून जाँच, बायोकेमिकल एनालिसिस, मूत्र एवं दूध की जाँच की गई। इन सेवाएँ से रु. 2,20,790.00 (दो लाख बीस हजार सात सौ नब्बे) का राजस्व प्राप्त हुआ।
- वर्ष 2020-21 में पशुचिकित्सा संकाय के शिक्षकों एवं स्नातकोत्तर विद्यार्थियों के द्वारा पशुओं के लिए मथुरा जिले के विभिन्न गांवों में चिकित्सा शिवरों 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 प्रबंधन व अण्डे सेवन सम्बन्धित विषयों का व्यवहारिक ज्ञान प्रदान करने में महत्वपूर्ण भूमिका निभाई। वर्ष 2020-21 में प्रायोगिक प्रशिक्षण यूनिट द्वारा विश्वविद्यालय को 6,74,886.00 /- (छह लाख चौहत्तर हजार आठ सौ छियासी) रूपयों का राजस्व प्राप्त हुआ।
- पशुधन उत्पाद प्रौद्योगिकी विभाग द्वारा संचालित प्रायोगिक 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 3830.5 लीटर दूध को पनीर एवं खोआ में प्रसंस्करित किया गया। विभिन्न मूल संवर्धित मॉस उत्पाद जैसे चिकिन नगेट, चिकिन पेटिज, इत्यादि भी बनाये गये।
- विश्वविद्यालय पुस्तकालय में विभिन्न संकायों जैसे की पशु चिकित्सा, पशुपालन एवं जैव प्रौद्योगिकी की 35499 पुस्तकें, 12 ऑनलाइन जर्नल्स तथा हिंदी और अंग्रेजी के कई अखबार उपलब्ध हैं। पुस्तकालय में उपलब्ध अन्य सुविधाओं में सकुलेशन सर्विस, रिफरेन्स सर्विस, कंप्यूटर इंटरनेट सर्विस, शोध पठन सुविधा, CD-ROM= VET CD 1973 से अगस्त 2004, CAB CD 1972 से मई 2005, CAB Abstract 1990 से दिसंबर 2005 इत्यादि उपलब्ध हैं।
- 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 लिए संतुलित आहार बनाने का प्रशिक्षण दिया जाता है। विभाग द्वारा विश्वविद्यालय के डेरी फार्म के पशुओं के लिए प्रचुर मात्रा में फीड भी उपलब्ध कराया गया। इस वर्ष 2020-21 में विभाग ने खनिज मिश्रण को बेच कर 6.0 लाख (छह लाख) रुपये का राजस्व प्राप्त किया।

**अनुसंधान**

- वर्ष 2020-21 में विश्वविद्यालय के पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय के विभिन्न विभागों में 29 बाह्य वित्त पोषित परियोजनाएँ चल रही हैं, जिसमें से 13 राष्ट्रीय कृषि विकास योजना द्वारा, 05 भारतीय कृषि अनुसंधान परिषद् द्वारा, 02 डी.बी.टी., भारत सरकार के द्वारा 01 ऐन आई अफ 0026 डी. एस.टी. द्वारा, 01 डी.ए.डी.एफ., 01 कृषि एवं किसान कल्याण मंत्रालय द्वारा, 01 डी.ए.एच.डी., भारत सरकार 01 इंडियन हर्ब्स प्राइवेट लिमिटेड द्वारा, 01 हिमालय ड्रग्स कंपनी द्वारा, 01 मैसर्स दत्त मेडीप्रोडक्ट्स प्राइवेट लिमिटेड, 01 सी.सी.आर.एच., 01 डी.आर.डी.ओ.-इनमास, 01 आयुर्वेद लिमिटेड द्वारा वित्त पोषित है।
- वर्ष 2020-21 में विश्वविद्यालय में 30 अन्तःसंस्थानिक परियोजनाएँ स्वीकृत की गईं।
- वर्ष 2020-21 में विभिन्न विभागों में किये जाने वाले अनुसंधानों पर 03 पीएच०डी०, 26 एम०वी०एससी० पशु चिकित्सा एवं पशु पालन विज्ञान संकाय में एवं 06 पीएच०डी० और 01 एम०एससी० जैव प्रौद्योगिकी संकाय में शोधग्रंथ पूर्ण किए गए।
- वर्ष 2020-21 में विश्वविद्यालय द्वारा 97 शोध पत्र प्रकाशित किये गये।

**प्रसार**

- वर्ष 2020-21 में प्रसार निदेशालय ने पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय के सहयोग से विश्वविद्यालय के प्रांगण में 02 प्रशिक्षण तथा पशु ज्ञान चौपाल, डेयरी फार्म एवं बकरी फार्म में 12 भ्रमण कृषकों, पशुपालकों एवं अन्य के लिये आयोजित किए। इन प्रशिक्षण कार्यक्रमों द्वारा लगभग 16 पशु चिकित्सक, 30 किसान लाभान्वित हुए। भ्रमण द्वारा 412 किसानों ने लाभ प्राप्त किया।
- प्रसार निदेशालय द्वारा प्रशिक्षण पुस्तिका, लीफलेट्स एवं सामान्य लेखों को पुस्तिका के रूप में किसानों तथा पशुपालकों के हित के लिए प्रकाशित किया गया।
- प्रसार निदेशालय ने किसान मेले एवं किसान गोष्ठी द्वारा किसानों को पशु एवं मुर्गी पालन से सम्बंधित परामर्श सेवा उपलब्ध कराई गयी।
- पशुचिकित्सा एवं पशुपालन प्रसार विभाग द्वारा द्वारा 06 प्रशिक्षण कार्यक्रम किसानों, पशुपालकों एवं MAITRI प्रशिक्षणार्थियों के लिए आयोजित किये गए तथा इन्हें नवीनतम प्रबंधन तथा उद्यमशील कौशल का तकनीकी प्रशिक्षण दिया गया। विभाग द्वारा कुल उत्तर प्रदेश एवं मध्य प्रदेश के विभिन्न जनपदों के 109 किसानों के लिए एक्सपोजर विजिट आयोजित किये गए।

- वर्ष 2020-21 में, पशु चिकित्सा एवं पशु पालन महाविद्यालय के विभिन्न विभागों द्वारा कई प्रशिक्षण कार्यक्रमों को आयोजित किया। पशु चिकित्सा शल्य क्रिया विभाग द्वारा AINP-DIMSCA के अंतर्गत पशु चिकित्सा अधिकारियों के लिए 2 प्रशिक्षण, पशुधन प्रौद्योगिकी विभाग द्वारा खाद्य सुरक्षा अधिकारियों के लिए आर के वी वाई परियोजना के अंतर्गत 1 प्रशिक्षण, पशु पोषण विभाग द्वारा ग्रामीण युवाओं के लिए 2 प्रशिक्षण, पशु चिकित्सा परजीवी विभाग द्वारा राष्ट्रीय कृषि विकास योजना द्वारा वित्त पोषित परियोजना के अंतर्गत पशु चिकित्सा अधिकारियों के लिए 01 प्रशिक्षण एवं पशु चिकित्सा जैव क्रिया विभागद्वारा पशु सखियों, महिला कृषकों एवं कृत्रिम गर्भाधान कार्यकर्ताओं के लिए 10 प्रशिक्षणों को आयोजित किया।
- कृषि विज्ञान केंद्र द्वारा आयोजित कुल 104 प्रशिक्षणों में 2909 लोगों ने प्रतिभाग किया जिनमें क्रमशः 89 प्रशिक्षण द्वारा 2401 पुरुष एवं महिला कृषकों को, 09 द्वारा प्रशिक्षणों द्वारा 179 ग्रामीण युवकों को एवं 06 प्रशिक्षणों द्वारा 329 प्रसार कार्यकर्ताओं को लाभ प्राप्त हुआ।
- 597 कृषकों एवं पशुपालकों के ईलाको में उत्पादन क्षमता बढ़ाने वाली विभिन्न सिद्ध तकनीकियों को प्रदर्शित किया गया।
- प्रौद्योगिकी मूल्यांकन एवं शुद्धिकरण के अंतर्गत, 51 किसानों के लिए 08 फसल एवं 01 पशुधन सम्बंधित प्रौद्योगिकियों के कुल 51 परीक्षण किये गए। कृषि विज्ञान केंद्र द्वारा 9389 प्रशिक्षणार्थियों के लिए कुल 221 प्रसार गतिविधियों का आयोजन किया गया। COVID-19 महामारी के दौरान के वी के द्वारा निकटस्थ जनपदों के किसानों को दूरभाष द्वारा परामर्श सेवाएं दी गयीं।
- वर्ष 2020-21 में, कृषि विज्ञान केंद्र ने 650.00 कुंतल बीज 40,370.00 पौधों एवं 1970 किग्रा जैवउत्पाद उत्पादित किया जिससे क्रमश रुपए 24.70 लाख, रुपए 3,433.00 तथा रुपए 2,850.00 का राजस्व प्राप्त हुआ।
- किसानों से जुड़े रहने के लिए गोष्ठियाँ, नैदानिक भ्रमण, किसान मेला तथा किसान सम्मान दिवस आयोजित किये गये। इस वर्ष में 720 मृदा एवं 48 जल के नमूनों की जाँच मृदा एवं जल जाँच प्रयोगशाला में की गयी, जिनकी रिपोर्ट के आधार पर 652 लाभार्थियों को संतुलित खाद एवं पानी डालने की क्रिया बताई गयी।



### विश्वविद्यालय प्रक्षेत्र

- वर्ष 2020-21 में, एल0एफ0सी0 के डी.डी.डी. फार्म पर 234987.50 लीटर दुग्ध का उत्पादन हुआ जिसमें की गाय का दूध 197458.50 लीटर तथा भैंस का दूध 37529.00 लीटर हुआ।
- इस वर्ष एल एफ सी फार्म को कुल रुपए 74,74,558.00/- (चौहत्तर लाख चौहत्तर हजार पाँच सौ अठ्ठावन का राजस्व प्राप्त हुआ)।
- महाविद्यालय के कुक्कुट फार्म पर विभिन्न प्रजातियों की मुर्गियों जैसे चाबरो, असील, कड़कनाथ, नेकड नेक, जापानी तीतर, टर्की, गिन्नी फॉऊल, ऐमू का पालन किया जा रहा है। इनके अण्डों, चूजों तथा कुक्कुट इत्यादि की बिक्री से कुल 906265.00/- (नौ लाख छह हजार दो सौ पैसठ) रुपयों का राजस्व प्राप्त हुआ।
- माधुरी कुंड फार्म में खरीफ के मौसम में धन द्वारा रुपए 1305101.00/- तथा रबी के मौसम में गेहूं, जय, जौ एवं भूसे द्वारा रुपए 6291030.00/- का राजस्व प्राप्त हुआ। अतः वर्ष 2020-21 में कुल रुपए 7596131.00/- का राजस्व प्राप्त हुआ।

### मानव संसाधन विकास

- पशु जैव रसायन विज्ञान विभाग, दुवासु, मथुरा ने 31 अगस्त 2020 को NAHEP के अंतर्गत एक दिवसीय अंतर्राष्ट्रीय वेबिनार “Iron metabolism and its disorders: from Anemia to hemochromatosis” का आयोजन किया।
- पशु आनुवंशिकी एवं प्रजनन विभाग ने “Modern genetic Approaches for improvement of indigenous cattle” विषय पर NAHEP फ्लैगशिप के अंतर्गत एक राष्ट्रीय वेबिनार का आयोजन जुलाई 29, 2020 को किया।
- पशु शरीर क्रिया विज्ञान विभाग ने NAHEP तत्वाधान के अंतर्गत "Conceptualization of Modern Anatomy: Theory and Practice" विषय पर राष्ट्रीय वेबिनार का आयोजन 4 एवं 5 अगस्त 2020 को किया। इसके अतिरिक्त दो इक्विज प्रतियोगिता एक पं० दीन दयाल उपाध्याय जी की 104 वी 25<sup>th</sup> सितम्बर 2020 तथा दूसरा 72<sup>वे</sup> गणतन्त्र दिवस 26<sup>th</sup> जनवरी 2021 को किया।
- पशु जैव रसायन विज्ञान विभाग ने NAHEP फ्लैगशिप के अंतर्गत दो राष्ट्रीय वेबिनार का आयोजन 14 और 22 अगस्त 2020 को किया। इनके विषय “In-depth bovine milk Analysis to unearth goldmine beneficial for health Applications” एवं “Igniting Young Minds

towards Science” थे। विभाग ने पांचवी SVBBI एवं राष्ट्रीय संगोष्ठी का आयोजन “Current challenges for animal biochemists and biotechnologists for improving animal health and production in post COVID scenario” विषय पर मार्च 24-25, 2021 को ऑनलाइन मोड में किया।

- पशु सार्वजनिक स्वास्थ्य एवं महामारी विभाग ने राष्ट्रीय वेबिनार का आयोजन 24 सितम्बर 2020 को किया जिसका विषय ‘Revisiting package of practices for the control of brucellosis’ था।
- पशुधन प्रौद्योगिकी विभाग विभाग ने दो राष्ट्रीय वेबिनार का आयोजन किया प्रथम वेबिनार “Functional foods of Animal origin: role in health promotion and diseases prevention” विषय पर 06 एवं 07 अगस्त 2020 को आयोजित किया एवं द्वितीय राष्ट्रीय वेबिनार “Current practices and innovations in the packaging of meat and poultry products” का आयोजन 12 फरवरी, 2021 को किया गया।
- पशु चिकित्सा विज्ञान विभाग दुवासु, मथुरा द्वारा ऑनलाइन सात दिवसीय प्रशिक्षण का आयोजन “Basics of electrocardiography in dogs” विषय पर किया गया।
- पशु चिकित्सा सूक्ष्म जीवी विभाग द्वारा NAHEP फ्लैगशिप के अंतर्गत “Current Concepts in Clinico-therapeutic management of Snake bite in Animals” विषय पर राष्ट्रीय वेबिनार का आयोजन 20 मार्च 2021 को किया।
- पशु औषध एवं विष विज्ञान विभाग द्वारा भा०कृ०अ०प०-EVM के SCSP के अंतर्गत “Bioprospecting of Phytoconstituents to Combat Antimicrobial Resistance” शीर्षक पर हैंड्स ऑन ट्रेनिंग का आयोजन 06-15 मार्च 2021 को किया। विभाग द्वारा ISVPT की बीसवीं राष्ट्रीय संगोष्ठी ऑनलाइन एवं अंतर्राष्ट्रीय वेबिनार “Receptor Dynamics in Cell Signaling” and National Webinar on “Translational Approaches in Herbal Drug Development” विषय पर 4-5 अक्टूबर 2020 किया गया।
- कुक्कुट विज्ञान विभाग द्वारा राष्ट्रीय वेबिनार का आयोजन 09-11 अगस्त, 2020 को ‘Atma Nirbhar Indian Poultry in New Normal’ विषय पर 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 2020-21 में 26 छात्रों ने 'B' सर्टीफिकेट एवं 44 छात्रों ने 'C' सर्टीफिकेट हेतु परीक्षा दी। 70 कैडेट्स ने एन.सी.सी. के CATC 38 कैम्प शिविर में भाग लिया। NCC के 6 कैडेट्स ने 6<sup>th</sup> phase of online EBSB में भाग लिया। कैडेट प्रवीण कुमार ने देहरादून के कैम्प में 21<sup>st</sup> दिसंबर 2020 से 08<sup>th</sup> जनवरी, 2021 तक भाग लिया।
- डॉक्टर रजनीश सिरौही को डायरेक्टर जनरल NCC नई दिल्ली द्वारा एसोसिएट अफसर के पद हेतु प्रशस्ति पत्र प्रदान किया गया।
- वर्ष 2020-21 में साहित्यिक एवं सांस्कृतिक कार्यक्रमों का online आयोजन हुआ, जिसमें पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय, जैव प्रौद्योगिकी महाविद्यालय एवं डिप्लोमा के छात्रों ने भाग लिया।
- विश्वविद्यालय के छात्र कल्याण अधिष्ठाता कार्यालय द्वारा छात्रों के लिए IDP-NAHEP परियोजना के अंतर्गत विभिन्न विषयों पर वेबिनार का आयोजन किया गया।

**अन्य झलकियाँ एवं कार्यकलाप**

- विश्वविद्यालय द्वारा प्री वेंटनरी परीक्षा (पी०वी०टी०-2020) 11 अक्टूबर 2020 को आयोजित की गई, जबकि प्री- डिप्लोमा प्रवेश परीक्षा (पी०डी०टी०-2020) तथा स्नातकोत्तर (एम०वी०एससी० तथा पीएच०डी०) प्रवेश परीक्षा (पी०जी०टी०- 2020) क्रमशः 27 सितम्बर 2020 तथा 15 नवम्बर 2020 को आयोजित की गई।
- दुवासू ने 25 अक्टूबर 2020 को offline- online mode पर अपना 20<sup>th</sup> 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।
- विश्वविद्यालय द्वारा पूरे उत्साह से अम्बेडकर जयन्ती, स्वतंत्रता दिवस, पं० दीन दयाल उपाध्याय जयन्ती, गांधी जयन्ती, गणतन्त्र दिवस, अंतर्राष्ट्रीय योग दिवस एवं बसंत पंचमी मनाई गयी।

**पुरस्कार एवं सम्मान**

- प्रोफेसर विकास पाठक गडवासू, लुधियाना के पशुधन प्रौद्योगिकी विभाग द्वारा आयोजित राष्ट्रीय वेबिनार के मुख्य वक्ता थे। वह राष्ट्रीय कृषि विज्ञान अकादमी द्वारा “Potential of non bovine milk” पर आयोजित बुद्धियोत्तेजक सत्र में पेनलिस्ट भी रहे हैं। वह FSSAI, स्वास्थ्य एवं परिवार कल्याण मंत्रालय के अर्न्तगत

“कोशिका आधारित मॉस” की कार्यकारी समिति के सदस्य भी रहे। वह भारतीय मॉस विज्ञान संस्था के उपाध्यक्ष भी चयनित हुए।

- प्रोफेसर अर्चना पाठक को गडवासू, लुधियाना के IDP-Cell द्वारा आयोजित व्याख्यान हेतु प्रशस्ति पत्र प्रदान किया गया।
- प्रोफेसर रश्मि सिंह ASRB, नई दिल्ली के CAS समिति की अनुवीक्षण एवं मूल्यांकन समिति सदस्य रही। वह दुवासू मथुरा के COVID-19 परीक्षण प्रयोगशाला की नोडल अधिकारी के रूप में कार्यरत हैं। उन्होंने गडवासू, लुधियाना के IDP Cell के अर्न्तगत तीन विशेष व्याख्यान भी दिए।
- प्रोफेसर रश्मि सिंह, डॉ० बरखा शर्मा, डॉ० उदित जैन, डॉ० जितेन्द्र तिवारी, डॉ० नीरज गंगवार, डॉ० अजय प्रताप सिंह, डॉ० सोमेन चौधरी, डॉ० रुचि तिवारी, डॉ० आर के यादव, डॉ०वीके सिंह डॉ० विक्रान्त सूदन एवं डॉ० पारूल ने दुवासू मथुरा के COVID-19 परीक्षण प्रयोगशाला में योगदान हेतु प्रशस्ति पत्र प्राप्त किए।
- डॉ० उदित जैन ने अखिल भारतीय मासिक लेख लेखन एवं राष्ट्र स्तरीय विडियो सृजन प्रतियोगिता में पुरस्कार प्राप्त किया।
- डॉ० नीरज कुमार गंगवार IAVP संस्था के उत्तरीय क्षेत्र के क्षेत्रीय सचिव चयनित हुए।
- डॉ० बरखा शर्मा पशु पत्रिका डॉट कॉम के सम्पादकीय मंडल की सदस्या चयनित हुईं। वह पशुपालन, कॉम द्वारा आयोजित अखिल भारतीय लेख लेखन प्रतियोगिता की विजेता भी रही।
- डॉ० रजनीश सिरौही को DG NCCC द्वारा गणतंत्र दिवस शिविर-2021 में सराहना पत्र प्राप्त हुआ।
- डॉ० श्रीप्रकाश सिंह को e-पशुपालन डॉट कॉम द्वारा सर्वश्रेष्ठ हिन्दी लेख पुरस्कार प्राप्त हुआ। उन्हें पदम श्री डॉ० वी०वी० राव कुक्कुट उद्यामिता वैश्विक पुरस्कार भी प्राप्त हुआ।
- डॉ० रुचि तिवारी को ADES तथा राजमाता विजया राजे सिधिया कृषि विश्वविद्यालय द्वारा चतुर्थ अन्तराष्ट्रीय संगोष्ठी CAAAHAASSE-2021 में सर्वश्रेष्ठ शोध ग्रन्थ पुरस्कार प्राप्त हुआ।
- मीना गोस्वामी अवस्थी को ADES तथा राजमाता विजया राजे सिधिया कृषि विश्वविद्यालय द्वारा चतुर्थ अन्तराष्ट्रीय संगोष्ठी CAAAHAASSE-2021 में उभरते हुए युवा वैज्ञानिक पुरस्कार से सम्मानित किया गया। वह भारतीय मांस विज्ञान संस्था के कार्यकारिणी सदस्या के रूप में भी चयनित हुईं।

- डॉ० विजय पाण्डे को International Journal of Livestock Research के वैज्ञानिक परामर्श मण्डल का सदस्य चुना गया एवं उन्हें इस जर्नल द्वारा प्रशस्ति पत्र श्री प्राप्त हुआ।
- डॉ० अम्बिका शर्मा को सर्वश्रेष्ठ शोध पत्र हेतु InSc शोध उत्कृष्टता पुरस्कार प्राप्त हुआ।
- डा बरखा शर्मा, डॉ० अम्बिका शर्मा, डॉ० मुकेश श्रीवास्तव एवं डॉ० मीना गोस्वामी अवस्थी को पशुधन प्रहरी द्वारा “रामसिंह स्मृति राष्ट्रीय पशु कल्याण पुरस्कार 2020” के अर्न्तगत राष्ट्रीय उत्कृष्टता पुरस्कार प्राप्त हुआ।
- दुवासू मथुरा द्वारा आयोजित भारतीय वैटरिनरी बायोकेमिस्ट एवं बायोटेक्नोलॉजिस्ट संस्था के पाचवे वार्षिक सम्मेलन में डॉ० अम्बिका शर्मा को सर्वश्रेष्ठ शोध पत्र पुरस्कार, डॉ० विक्रान्त सूदन को सर्वश्रेष्ठ मौखिक प्रस्तुतिकरण एवं डॉ० दिलीप कुमार स्वैन एवं डॉ० बृजेश यादव को सर्वश्रेष्ठ शोध पत्र पुरस्कार तथा प्रशस्ति पत्र प्राप्त हुए।
- डॉ० बरखा शर्मा, डॉ० अम्बिका शर्मा, डॉ० मीना गोस्वामी अवस्थी तथा डॉ० पारूल को पशुधन प्रहरी द्वारा अर्न्तराष्ट्रीय महिला दिवस के उपलक्ष पर प्रेरक महिला वेटनेरियन पुरस्कार प्राप्त हुए।
- डॉ० रेनू सिंह को वैल इन्स्टीट्यूट ऑफ साइन्स एवं टेक्नोलॉजी तथा एडवांस स्टडीज, चेन्नई द्वारा आयोजित ऑनलाईन हाथी संगोष्ठी में पोस्टर प्रस्तुतीकरण के लिए द्वितीय स्थान प्राप्त हुआ।
- डॉ० दिलीप कुमार स्वैन को बिहार पशुचिकित्सा विश्वविद्यालय पटना द्वारा आयोजित उन्नतीसवें SAPI वार्षिक संगोष्ठी के उत्कृष्ट शोध पत्र सम्मान प्राप्त हुआ। साथ ही उन्हें Animal Reproduction Science, Elsevier/Science direct के सम्पादकीय मण्डल के सदस्य के रूप में प्रशस्ति पत्र प्राप्त हुआ।
- डॉ० बृजेश यादव को International Journal of Biometeorology, Avian Research Journal of Gynecology and obstetrics तथा Journal of Animal Physiology And Animal Nutrition

द्वारा सर्वश्रेष्ठ आलोचक हेतु प्रशस्ति पत्र प्राप्त हुआ।

- डॉ० दीप नारायण सिंह को ISAO 2020 द्वारा उभरते हुए युवा वैज्ञानिक पुरस्कार, EEA संगोष्ठी 2020 में उत्कृष्ट शोध पुरस्कार RASSA द्वारा यशस्वी सम्मान, डॉ० सी०एम० सिंह राष्ट्रीय उत्कृष्टता पुरस्कार राष्ट्रीय निबन्ध लेखन प्रतियोगिता में डॉ० आर०के० स्मृति उत्कृष्टता पुरस्कार तथा पशुधन प्रहरी द्वारा पशु कल्याण क्षेत्र में महत्वपूर्ण योगदान के लिए प्राणी मित्र पुरस्कार 2021 प्राप्त हुआ।

#### वित्त एवं बजट

- वर्ष 2020-21 में विश्वविद्यालय को वेतन मद में रु. 4602.00 लाख एवं कंटीजैन्सी मद में रु. 2077.49 लाख बजट प्राप्त हुआ।
- इस वर्ष विश्वविद्यालय को कुल रु. 400.00 लाख राजस्व की प्राप्ति हुई।

#### निर्माण एवं अनुरक्षण

- सत्र 2020-21 में विश्वविद्यालय को रु० 296.04 लाख की धनराशि प्राप्त हुई। इस धनराशि का उपयोग कुलपति कार्यालय के पुनःनिर्माण एवं मरमत, शरीर रचना विभाग के विच्छेदन भवन के रेनोवेशन, वित्त कार्यालय, बकरी फार्म, IDP-NAHEP की ईमारत, लाइट बोर्ड, पार्किंग इत्यादि, COVID-19 प्रयोगशाला की स्थापना, नाली के निर्माण, समूह घ के 20 आवासों की मरमत एवं पुनः निर्माण, बिल्डिंग, पशुधन फार्म के शेड का निर्माण आदि हेतु व्यय किया गया।
- विश्वविद्यालय को रूपए 646.90 लाख महिला छात्रावास के निर्माण हेतु अनुमोदित किया गया।

#### जनसूचना अधिकार

- उत्तर प्रदेश सरकार के निर्देशों तथा आर०टी० आई० एक्ट 2005 के अनुपालन के क्रम में 50 प्रार्थना पत्र प्राप्त हुए, जिनमें से 39 का निस्तारण किया गया तथा अन्य विचाराधीन है।





## 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; and
- 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 practice 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 to 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 commensurates with the minimum requirements as per the specifications of Veterinary Council of India for under-graduate 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; and
- 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 of the Government of U.P. and ICAR.
- 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 teamleaders;
- Faculty up-gradation, filling vacant teaching posts and creating faculty positions in newer and upcoming faculties;
- 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; and
- To augment University financial resource and refurbish infrastructure.

#### 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;





# Introduction



## INTRODUCTION

U.P. Pandit Deen Dayal Upadhyaya Pashu-Chikitsa Vigyan Vishwavidyalaya Evam Go Anusandhan Sansthan Mathura, first of its kind in the State and fourth in the Country, was established vide Act. No. 27 of 2001 on 25.10.2001 by Govt. of UP with the erstwhile UP College of Veterinary Science & AH, Mathura as its main constituent College with its all the moveable and immovable assets. University is having 782.34 acres prime land in Mathura, which includes all the buildings of Veterinary College, residential complex, hostels, Dairy Farm, Poultry Farm and agriculture land and another agriculture farm of around 1400 acres at Madhurikund, about 25 Km from the main campus.

After establishment of the University in 2001, initially the University offices were located in the Administrative block of Veterinary College, however, after inauguration of the Administrative Block of University by His Excellency Shri T.V. Rajeshwar, Hon'ble Chancellor and Governor of U.P. on February 24, 2009, all the central offices of University were shifted to new campus. The employees and teachers have occupied the newly constructed houses in new campus. The newly

constructed College of Biotechnology building was inaugurated by John George, Advisor DBT, Ministry of Science and Technology, Government of India in the august presence of Prof. M.L. Madan, the Hon'ble Vice Chancellor, Dr Lal Krishna, ADG (Animal Health) ICAR, New Delhi and other officers of the University on September 25, 2009.

The Act of University envisages opening of four more colleges, namely - College of Biotechnology, College of Fisheries, College of Livestock Products Technology and College of Animal Industries and Business Management. However, these colleges could not be started in spite of the best efforts of University due to financial constraints and non- sanction of any teaching or other positions by the Govt. During the year 2009, Government permitted the University to start College of Biotechnology under self-finance scheme. University started the College of Biotechnology from the academic session 2010-11. In an endeavor to augment research and extension activities, Directorate of Research and Directorate of Extension have also been created to coordinate research and extension activities, respectively.



## ORGANIZATIONAL SET-UP

The organizational set-up of the University (Flow Chart 1) is in almost conformity with other state agricultural, veterinary and academic universities and various bodies and authorities of the University exercise their powers at various levels to coordinate and regulate administration, education, research and extension activities.

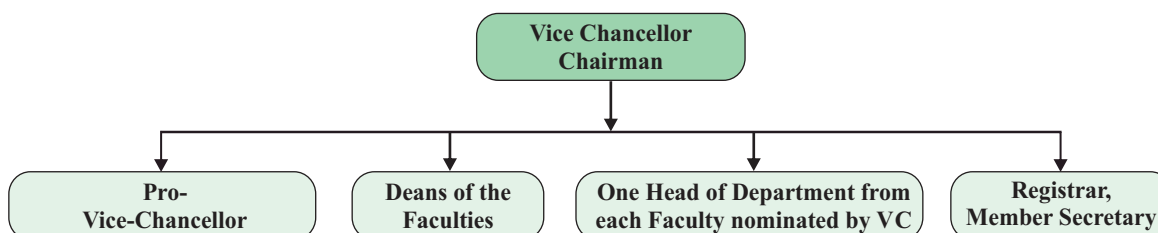
### A. Authorities of the University

#### 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 Pro-Vice Chancellor, Secretary Animal Husbandry and Fisheries, Secretary Finance, 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.

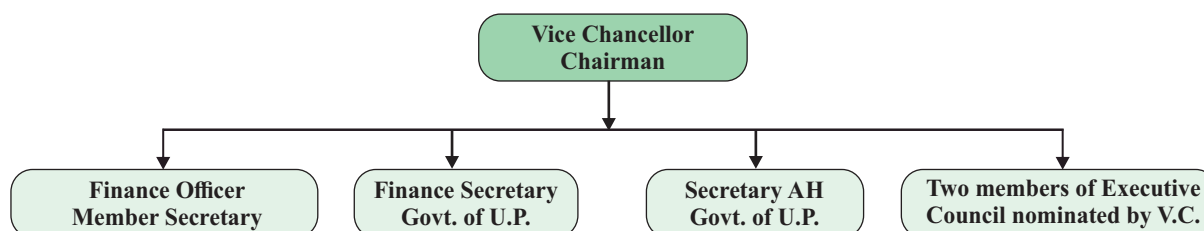
#### 2. Academic Council

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



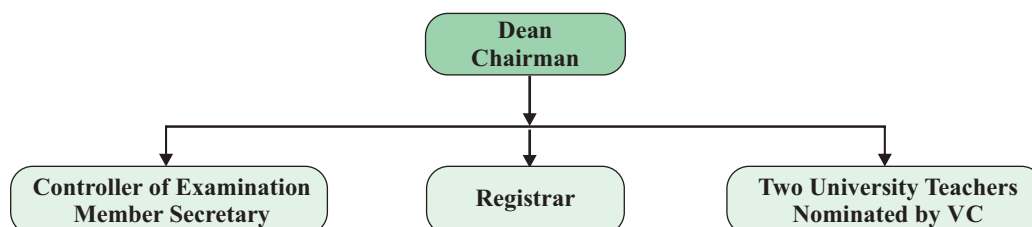
#### 3. Finance Committee

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 examiers, tabulation and moderation of results and make recommendations of the Academic Council for improvement in examination system. The flow chart of the composition of the examination committee is presented below:

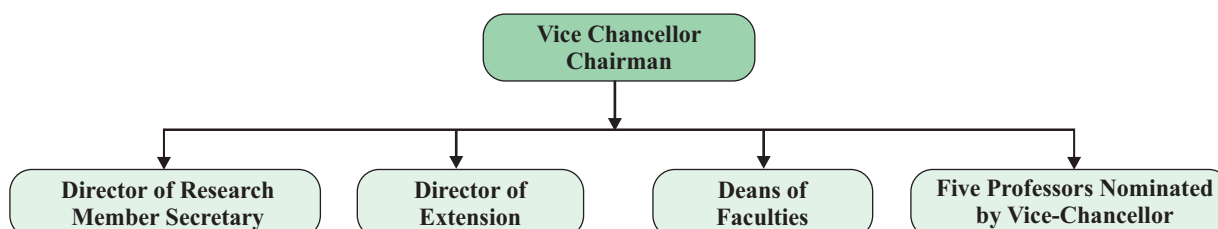


#### 5. Board of Faculty

Board of Faculty is for framing the curricula for undergraduate and post graduate programmers and to make recommendations of 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.

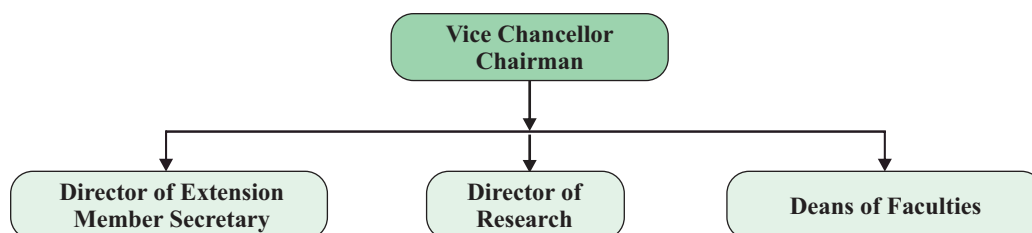
#### 6. Research Advisory Committee

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

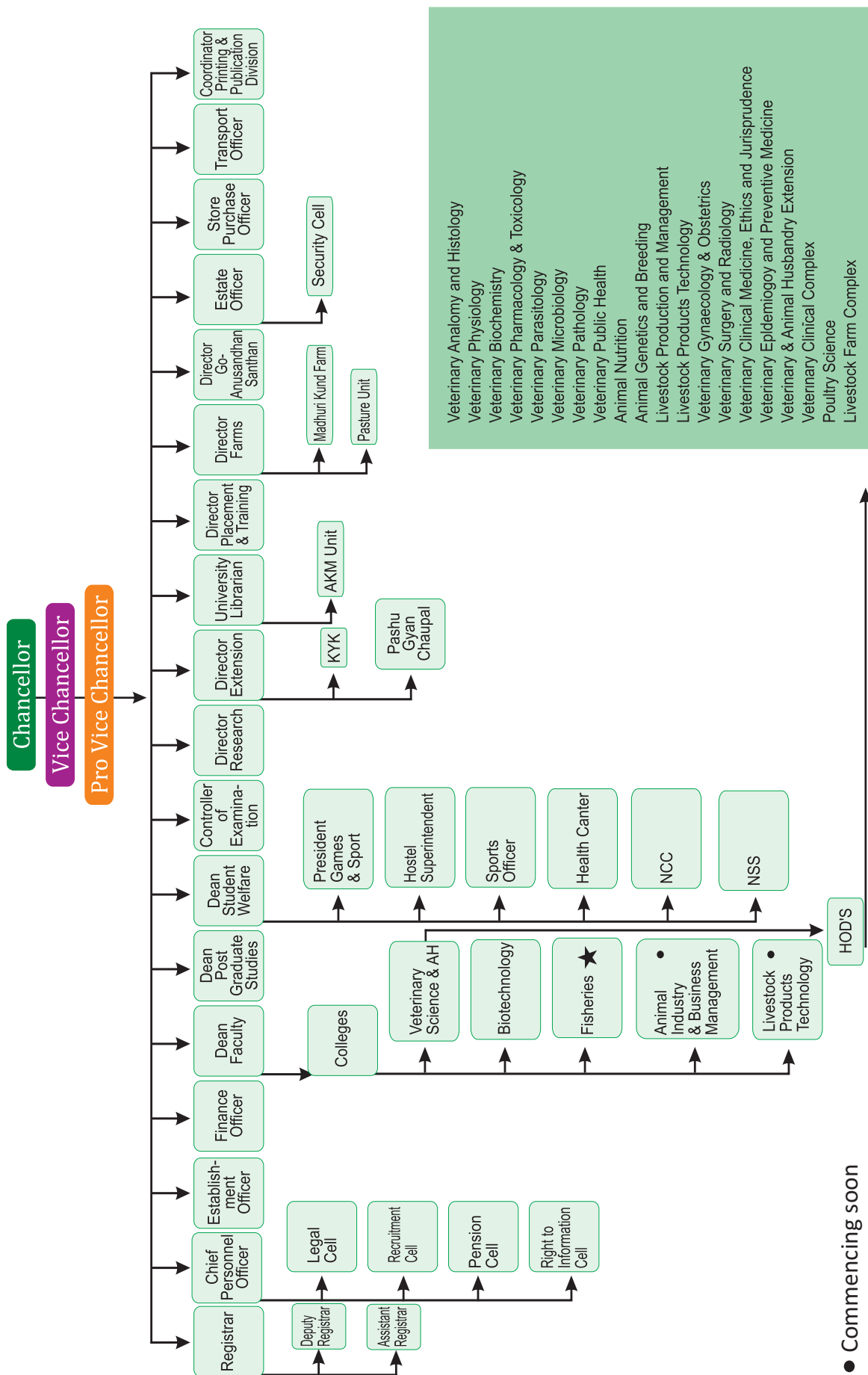
Extension Advisory Committee is the policy making body on extension activities of the University with Vice-Chancellor as its Chairman and Director of Extension as the Member Secretary. The set-up of this committee is as shown here:





## ORGANIZATIONAL STRUCTURE

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



## B. Organizational Meetings

### Executive Council

S. No.	Meeting No.	Date	Venue
1.	38 <sup>th</sup>	14-07-2020	DUVASU, Mathura
2.	38 <sup>th</sup>	14-09-2020	DUVASU, Mathura
3.	40 <sup>th</sup>	22-02-2021	DUVASU, Mathura

### Academic Council

S. No.	Meeting No.	Date	Venue
1.	77 <sup>th</sup>	15-06-2020	DUVASU, Mathura
2.	78 <sup>th</sup>	17-08-2020	DUVASU, Mathura
3.	79 <sup>th</sup>	08-09-2020	DUVASU, Mathura
4.	80 <sup>th</sup>	14-10-2020	DUVASU, Mathura
5.	81 <sup>st</sup>	18-02-2021	DUVASU, Mathura

## C. Officers of the University

S. No.	Designation/Post	Name of the Officer	From	Date To
1.	Chancellor	Hon'ble Smt. Anandi Ben Patelji, Governor of U.P.		
2.	Vice Chancellor	Prof. G.K. Singh	March 02, 2019	Continuing
3.	Registrar	Prof. P.K. Shukla	July 05, 2016	Continuing
4.	Deputy Registrar	Dr Brijesh Yadav	June 21, 2014	Continuing
5.	Finance Officer	Shri Sushil Kumar	June 02, 2018	Continuing
6.	Controller of Examination	Prof. Daya Shanker	August 29, 2012	Continuing
7.	Dean, COVSc & A.H.	Prof. Satish K. Garg	June 30, 2009	September 13, 2020
		Prof. P.K. Shukla	September 14, 2020	Continuing
8.	Dean, College of Biotechnology	Prof. Rajesh Nigam	February 05, 2013	Continuing
9.	Dean, PGS	Prof. P.K. Shukla	January 15, 2013	Continuing
10.	Dean, Student Welfare	Prof. Vikas Pathak	November 14, 2018	Continuing
11.	Director Clinics	Prof. R.P. Pandey	September 18, 2010	Continuing
12.	Director Research	Prof. Atul Saxena	November 24, 2009	Continuing
13.	Director Extension	Prof. Sarvajeet Yadav	November 24, 2009	Continuing
14.	Director Gau-Anusandhan	Prof. Vikas Pathak	January 03, 2018	Continuing
15.	Director, Farms	Prof. Ajay Prakash	May 20, 2015	Continuing
16.	University Librarian	Dr Sanjay Purohit	November 26, 2016	Continuing



## TEACHING AND EDUCATION

**D**UVASU has two constituent colleges: College of Veterinary Science and Animal Husbandry and College of Biotechnology. Both colleges are running their degree Programmes. The University is running its Diploma programme in the Institute of Para veterinary Sciences.

### A. College of Veterinary Science and Animal Husbandry

College of Veterinary Science & Animal Husbandry since its inception in the year 1947; became the constituent college of DUVASU in the year 2001 has been striving hard in the spheres of teaching, research and extension so as to serve the society mainly the rural areas of the country with the kind service of qualified budding veterinarians, strengthen knowledge through researching in various thrust areas and dissemination of

techniques and expert advices to various animal owners and farmers through its extension activities.

The college is running its undergraduate programme as Bachelor of Veterinary Science and Animal Husbandry (B.V.Sc. & A.H.) as per VCI regulations, Master's programme as Masters of Veterinary Science (M.V.Sc.) in eighteen disciplines and Doctor of Philosophy (Ph.D.) in fifteen disciplines as per ICAR academic regulations for higher agricultural education with robust faculty strength of 82 during the year 2020-2021. The faculty from College of Veterinary Science & Animal Husbandry is engaged in teaching, research and extension activities; apart from these few faculty members are involved in administrative responsibilities of the University.

#### Admission:

S. No.	Academic programme	Intake capacity	Total students admitted	Male	Female
1.	B.V.Sc. & A.H.	80+8	87	48	39
2.	M.V.Sc.	49	21	07	14
3.	Ph.D.	24	03	03	00

### B. College of Biotechnology

Two academic programmes are running under the College of Biotechnology; B.Sc. (Biotechnology) and B.Sc. (Industrial

Microbiology). Teaching in the undergraduate courses is being looked after by the Teaching associates appointed on contractual basis.

#### Admission:

S. No.	Academic programme	Intake capacity	Total students admitted	Male	Female
1.	B.Sc. (H) Biotechnology	45	26	09	17
2.	B.Sc. (H) Industrial Microbiology	15	07	02	05

### C. Institute of Paraveterinary Sciences:

There are two diploma programmes running under Institute of Para Veterinary Sciences established in the year 2013 viz; Diploma in Livestock Extension (DLE) and Diploma in

Veterinary Pharmacy (DVP). The teaching is taken care of by the qualified Veterinary post graduate contractual staff appointed by the University administration.

#### Admission:

S. No.	Academic programme	Intake capacity	Total students admitted	Male	Female
1.	Diploma in Livestock Extension (DLE)	60	60	55	05
2.	Diploma in Veterinary Pharmacy (DVP)	60	60	09	51

### D. Activities of College of Veterinary Science and Animal Husbandry

Apart from routine teaching to students of

different academic programmes, College of Veterinary Science and Animal Husbandry imparts hands on training to students and also serving



farmers, livestock owners and companion animal keepers.

### 1. Veterinary Clinical Complex (VCC)

VCC, the erstwhile Kothari veterinary hospital, is a multi-specialty veterinary clinic. It imparts practical teaching to the students of the college in terms of diagnosis, its interpretation and line of treatment of various animals coming to the clinical complex. Moreover, it has different units for surgery, gynecology and medicine with round the clock learned and experienced faculty. VCC has the C-Arm image intensifier, digital x-ray machine, CCTV camera, USG machine, Laparoscopy set, mobile X-ray unit, small animal anesthesia machine. In addition to these facilities, there is a well equipped operation theatre for small and large animal surgery, well equipped two small animals ICU for dogs, loading and unloading platform and indoor units for small and large animals. A total of 11,269 clinical cases were treated during the year 2020-2021 and the total revenue generated during this year was Rs. 5,12,245/- (Rupees Five lac twelve thousand two hundred and forty five only). Final year students undergo a rotatory internship programme in the VCC.

### 2. Diagnostic Laboratory:

To provide diagnostic facilities VCC has a very well equipped Veterinary Diagnostics laboratory to serve the animal owners having advance instrumentation for proper diagnosis of diseases on no-profit-no-loss basis and serve as an important learning unit for students. The laboratory is having Digital microscope, Dry chemistry analyzer, Hematology analyzer and Electrolyte analyzer. During 2020-2021, the laboratory processed total 1919 samples for various blood parameters, histopathology tests, milk and urine samples and generated revenue of Rs. 2, 20,790/- (Rupees two lacs twenty thousand seven hundred ninety only).

### 3. Ambulatory Services and Clinical Camps

Apart from this, ambulatory clinical services are also provided at the doorsteps of animal owner to the nearby villages of Mathura district by the clinics faculty and students through clinical camps.

### E. Experiential Learning

Different departments of the college impart hands on experiential learning programme for the students.

#### 1. Poultry production and management

Under the experiential learning Unit (ELU) in the Department of Poultry Science, the breeder and layer farms and hatchery unit aided in training of the undergraduate and post graduate students of

College of Veterinary Science with a main motto to make them learn poultry farming and opt it as entrepreneurship.

- The above sub units also served as models for internship students to train them on the activities in these subunits. The students were trained on the various farm activities pertaining to feeding, watering and management. Further, they were also imparted hands on training on rearing of Chabro birds and layers in the sub units of ELU during the internship training. In addition, the students were also trained on the hatchery operations.
- During the year 2020-21 the total revenue generated under ELU was 6,74,886/-.
- The sub units have also been used to cater the training needs of the army persons during their training courses on poultry conducted by Department of Animal Husbandry and Extension.
- The resources of ELU viz. dead birds and embryonated eggs of different stages of development were used to cater the educational and research needs of students and staff of Anatomy, Pathology, Biotechnology and Microbiology departments.

#### 2. Milk and meat processing Unit

- The Department of Livestock Products technology is actively involved in delivering lectures/practical demonstrations for various officers, unemployed youth, rural women etc. for promotion of entrepreneurship in the area of milk and meat processing under training programmes organized by various agencies of the University.
- Department of LPT organized three days training programme for Food Safety Officers on “Dugdh utpadon ki gunvatta ka mulyankan” under RKVY project entitled “Establishment of referral laboratory for quality evaluation of milk and milk products” from 17<sup>th</sup> to 19<sup>th</sup> February, 2021 in which 20 Food safety officers from different districts of Uttar Pradesh participated. Various informative lectures and hands on training were given to them regarding quality evaluation of milk and milk products.
- The department is running a Revolving Project on “Processing of milk, meat and eggs for value added products”. The undergraduate students of 3<sup>rd</sup> Professional B.V.Sc. & A.H. and post-graduate students of the Department are imparted practical training for preparation of different milk and meat products which are made available to



employees of the University at nominal rates approved by the competent authority of the University. During the reporting year, 3830.5 liters of surplus milk from Livestock Farm Complex was processed into paneer and khoa which was sold to university employees and students at approved rates.

### 3. Feed production and processing

- i. Experiential learning on “Feed production and Processing” project sanctioned in budget session 2010-11 by ICAR, New Delhi. Under this project a total of Rs 55.6 lacs were sanctioned. A feed processing unit and one Urea molasses mineral block unit were installed. Since the inception of this feed processing unit, a total of 33270.0 quintal concentrate feed of about Rs 5.98 crore values was prepared from July 2012-March 2021 and more than 900 students has been given hands on training to formulate compounded feed as per the nutrient requirement of livestock. Since the installation of unit, 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. Practical training of students make them self-reliant and it can serve as microenterprise for student to starts their ventures after B.V.Sc. & A.H. Experiential learning on feed production and processing is very successful asset with University. Unit also prepared area specific mineral mixture about 100 quintal/yr and provid to farmers on nominal cost. This year (2020-21) Departmental sale of mineral mixture was about 100 quintal cost Rs 6 lacs.
2. Construction of Laboratory, Feed unit, record room at Livestock farm complex and at main campus is now completed. Microwave digester, Automatic milk analyzer, Feed plant with pellet mill, Bomb calorimeter etc are the major instruments purchased and installed.

### c. Campus placement of students

**List of students placed in different firms under the period of report:**

Sl.No.	Degree/Diploma	Number of students selected	Name of the firm/company/competitive examination
1.	BVSc & AH	22	GVK-EMRI
2.	BVSc & AH	06	UPPCS
3.	BVSc & AH	02	Food Safety officer

## F. Other Academic Activities

### 1. Library:

DUVASU has a well organized 18 X 25 square meter double storey library with good repository of books for students and faculty with a seating capacity of 100 persons at a time. Opening timings of the University library is 10.00 AM to 5.00 PM on every working day. At present, there are 35499 books of various streams like Veterinary Science, Animal Husbandry and Biotechnology, 12 journals including online journals [www.cera.jccc.in](http://www.cera.jccc.in). University library procure newspapers regularly. These are Danik Jagran, Amar Ujjala, Hindustan (Hindi), Times of India, Hindustan Times, The Hindu, Indian Express. The various facilities of the library includes: Circulation service, Reference service, Reading facility, Journal reading, News paper reading facility, over night Issue service, Computer/Internet service. Thesis reading service etc. CD-ROM = VET CD 1973 to Ag., 2004, CAB CD 1972 to May 2005, CAB Abstract 1990 to Dec., 2005. In order to meet the demands of students and faculty a good photostat facility is also available on payment basis @ Rs. 0.50 per page.

### 2. Training and Placement cell:

To enhance competitive environment and encourage career opportunities for veterinary science students, University has training and placement cell wherein various activities took place during the year 2020-21.

#### a. Campus interviews:

Students were placed at different work stations to serve the society after online interview by reputed firms from all over the country.

Under the institutional development programme students were regularly informed verbally and through the University website, whats App group, e mails about the various job opportunities; 70 in different sectors like feed, pharmaceutical companies, slaughter houses, Educational institutes etc.

#### b. Classes organized

In order to strengthen the vocabulary in English language, classes for English language was conducted online by expert as a non-credit course for the First professional BVSc & AH students.



Research



## RESEARCH

### A. Extra-mural 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.	Strategic control of subclinical parasitism for better animal health and enhanced productivity in UP	Prof. Daya Shanker Dr Jitendra Tiwari Dr Vikrant Sudan	RKVY	124.31
A4.	Strengthening of clinical diagnostic and therapeutic facilities at university referral hospital for benefit of farmers and livestock owners.	Prof. Sanjay Purohit Dr Mukesh Srivastava Dr Sankar K. Singh Dr Vikash Sachan	RKVY	225.04
A5.	Establishment of A2 Genotype Testing Laboratory for Cattle of Uttar Pradesh	Prof. Deepak Sharma Dr Mukul Anand Dr Satyendra Pal Singh Dr Madhu Tiwari Dr Avneesh Kumar Prof. Sanjeev Kr. Singh	RKVY- RAFTAAR	99.95
A6.	Capacity building & entrepreneurship development of farming community through establishment of community radio station	Prof. Sanjeev Kr. Singh	RKVY	98.57
A7.	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 Dr Brijesh Yadav Dr Anuj Kumar Dr S.P. Singh Dr Shalini Vaswani	RKVY	312.15
A8.	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 Narayan Singh Dr Mukesh Srivastava	RKVY	Part I- 449.11 Part II- 163.00
A9.	Establishment of Semen analytical Laboratory for semen certification and quality assurance of breeding buck semen (Part I & II)	Dr Mukul Anand Prof. Sarvajeet Yadav Dr Arun Kumar Madan Dr Brijesh Yadav Dr Dilip Swain	RKVY	Part I- 169.00 Part II-138.00
A10.	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 Prof. Sarvajeet Yadav Dr Arun Kumar Madan Dr Dr Mukul Anand Dr Dilip Swain	RKVY	260.14
A11.	Establishment of Embryo Transfer Technology lab and Training Center (ETT&TC) with Ovum Pick Up - In	Dr Mukul Anand Prof. Sarvajeet Yadav Dr Anuj Kumar	RKVY	743.51

	<i>vitro</i> fertilization (OPU-IVF) facility to propagate superior germplasm and enhance productivity of Indigenous cattle breeds	Prof. Atul Sexana		
A12.	Demonstration unit for silage making and popularization of low cost silage technology for year round fodder availability for small-scale farmers	Dr Shalini Vaswani	RKVY	90.91
A13.	Establishment of small-scale feed processing demonstration unit to promote rural youth entrepreneurship (Part I and Part II)	Dr Shalini Vaswani	RKVY	Part I- 236.27 Part II- 90.27
A14.	AICRP on Nutrition and Physiological approaches for enhancing reproductive performance in cattle and buffalo (Part I and Part II)	Prof. Atul Saxena	ICAR	9.5514
A15.	National Agricultural Higher Education Project-Institutional development plan (NAHEP-IDP)	Prof. Atul Saxena	ICAR	2375.28
A16.	All India Network Programme on Diagnostic Imaging and Management of Surgical Conditions in Animals (AINP-DIMSCA)- ICAR	Prof. Sanjay Purohit Dr Gulshan Kumar	ICAR	05.83 (for year 2020-21)
A17.	Pharmacological studies and development of polyherbal formulation for reproductive disorders in animals	Dr Soumen Choudhury Dr Amit Shukla	ICAR	98.80
A18.	Outreach programme on zoonotic diseases (OPZD)	Dr Udit Jain Dr Barkha Sharma	ICAR, New Delhi	4.35
A19.	Integrated indigenous cattle centre for conservation and improvement of indigenous milch breeds of cows (Gokul Gram Project)	Dr Yajuvendra Singh	DADF, Ministry of Agriculture and Farmers Welfare, GOI	421.00
A20.	NADCP-FMD	Dr Ajay Pratap Singh	DAHD, GoI	4.00
A21.	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	Department of Biotech- nology (DBT), Ministry of Science and Technology GOI	84.98
A22.	Clinical Evaluation of indigenous technologies against mastitis among cattle and buffaloes	Dr Mukesh Srivastava Dr Arvind Tripathi Dr P.N. Panigrahi	NIF- (DBT), India	3.63
A23.	Clinical Evaluation of Some Homeopathic Medicines against Mites Induced Dermatitis in Dogs	Dr Shanker K. Singh Dr Ashish Srivastava	Central Council for Research in Homeopathy (CCRH), NEW DELHI	11.47
A24.	Wound healing efficacy assessment of Ascorbate formulation on large animals (Goat Sheep/Cattles)	Dr Amit Shukla Dr Soumen Choudhury	INMAS- DRDO	7.25



A25.	Evaluation of the efficacy of velgraft / velvert in reconstitutions of surgical wounds in goats	Dr Amit Shukla	M/s. Datt Medi-products Pvt. Ltd. Gurgaon, Haryana	5.95
A26.	Evaluation and Popularization of Indigenous Acaricidal Medication Against Tick Infestation in Regions of Uttar Pradesh	Dr Jitendra Tiwari Dr Vikrant Sudan Prof. Sanjiv Singh	NIF, Autonomous Body of DST, Govt. of India	6.38
A27.	Study on the Efficacy of feeding Mineral mixtures (Min Mix) on production and reproduction parameters, repeat breeding and silent anestrus of lactating dairy cows	Prof. Vinod Kumar	The Himalaya Drug Company Bangalore cost	5.0
A28.	Evaluation of antiviral and immunomodulant potential of Animunin (polyherbal formulation)	Dr Neeraj Kumar Gangwar	India Herbs Pvt. Ltd.	6.85
A29.	Evaluation of the Efficacy of a Polyherbal Immunomodulator at Improving the Response to Foot-and-Mouth Disease and Hemorrhagic Septicemia Vaccination in Cattle	Prof. Rashmi Singh Dr Rajneesh Sirohi	Ayurvet Limited, Baddi, Solan, H.P.	4.00

#### B. Intra-mural Research Projects

Sl.No.	Name of the Project	Name of PI and Co-PI	Funding Agency	Total Budget (Rs in lacs)
B1.	External morphological traits of the mammary gland of Jamunapari and Barbari goats and their relationship with somatic cell count (SCC)	Dr Varsha Gupta Dr Mukul Anand	DUVASU, Mathura	1.4
B2.	Structural and Functional Status of lymphoid organs in boilers during different seasons	Dr Shriprakash Dr Abhinov Verma Dr Amitabh Bhattacharya	DUVASU, Mathura	1.80
B3.	Mechanistic insights into melatonin signaling in bull spermatozoa and understanding its role in regulation of sperm capacitation and acrosome reaction	Dr Dilip Kumar Swain Dr Vikas Sachan	DUVASU, Mathura	2.00
B4.	Effect of increasing THI on physiological acclimatization in Sahiwal calves	Dr Brijesh Yadav	DUVASU, Mathura	2.00
B5.	Studies on Drug Resistance Profile of <i>Staphylococcus aureus</i> and <i>Escherichia coli</i> Isolates Recovered from Clinical Samples of Animals and their Biological Control through Bacteriophages	Dr Barkha Sharma	DUVASU, Mathura	2.00
B6.	Evaluation of therapeutic potential of some medicinal plants on calf diarrhoea	Dr Arvind Tripathi Dr Ashish Srivastava	DUVASU, Mathura	1.90
B7.	Evaluation of therapeutic potential of poly herbal formulation on mastitis	Dr P N Panigrahi Dr Mukesh Kr. Srivastava	DUVASU, Mathura	1.8

B8.	Evaluation of vitamin D status on health and growth of dairy calves	Dr Ashish Srivastava Dr Arvind Tripathi	DUVASU, Mathura	1.36
B9.	Phytochemical screening and evaluation of antibacterial activities of Plumeria	Dr Rajkumar Singh Yadav Dr Ajay Pratap Singh	DUVASU, Mathura	1.947
B10.	Investigation on serum and milk biomarkers for subclinical mastitis in goats and cows during summer and winter seasons	Dr Pawanjit Singh Dr Vijay Pandey Dr Mukul Anand	DUVASU, Mathura	1.10
B11.	Analysis of the canine tumor proteome as an exploratory study for future implication in tumor biomarker discovery	Dr Vijay Pandey Dr Neeraj Gangwar Dr Brijesh Yadav	DUVASU, Mathura	2.08
B12.	Standardization of urinary protein markers as diagnostic aid of anestrus in farm animals	Dr Ambika Sharma Dr A. K. Tripathi Dr Vikas Sachan	DUVASU, Mathura	2.00
B13.	Comprehensive studies on health promoting dairy products prepared from milk of indigenous breeds of different milch animals	Dr Meena Goswami Awasthi Dr Sanjay Kumar Bharti	DUVASU, Mathura	1.98
B14.	Packaging potential of whey protein based nanocomposite active edible film with antimicrobial functionality for muscle food	Dr Sanjay Kumar Bharti Dr Meena Goswami Awasthi Dr Vinod Kumar Singh	DUVASU, Mathura	1.25
B15.	Estimation of threshold THI for Sahiwal calves in semi-arid India	Dr Rajneesh Sirohi Dr Brijesh Yadav Dr Varsh Gupta	DUVASU, Mathura	1.985
B16.	Differential pattern in milk somatic cell count and composition of Sahiwal and Haryana cows during different stages of lactation	Dr Yajuvendra Singh Dr Rajneesh Sirohi Dr Muneendra Kumar	DUVASU, Mathura	0.95
B17.	Identification, Prediction of Age and Production Performance Using Muzzle Printometry Technique in Sahiwal Cattle	Dr Deep Narayan Singh Dr Yajuvendra Singh Dr Rajneesh Sirohi	DUVASU, Mathura	2.953
B18.	Effect of flooring on performance of Haryana calves	Dr Mamta Dr Rajneesh Sirohi Dr Brijesh Yadav	DUVASU, Mathura	1.24575
B19.	Expression profile of cytokines and TLRs in cattle and buffalo with natural tropical theileriosis	Dr Vikrant Sudan Dr Jitendra Tiwari Dr Shanker Kr Singh Dr Brijesh Yadav	DUVASU, Mathura	2.00
B20.	Study of Immune Responses in cutaneous tissue of cattle phenotypically resistant and susceptible for ticks	Dr Jitendra Tiwari Dr Jitendra Tiwari Dr Vikrant Sudan Dr Rajneesh Sirohi	DUVASU, Mathura	2.00
B21.	Evaluation of Acaricidal Potential of herbal essential oils against bovine ticks	Dr Amit Kumar Jaiswal Dr Pradeep Kumar Dr Shanker Kr Singh	DUVASU, Mathura	1.90
B22.	Assessment of epithelial mesenchymal transition (EMT) through immunohistochemical identification of biomarkers in canine tumors	Dr Shyam N. Prabhu	DUVASU, Mathura	2.00
B23.	Clinico-pathological and Immuno-histochemical Study on the Expression of biomarkers of canine mammary tumors	Dr Neeraj Gangwar	DUVASU, Mathura	2.12



B24.	Studies on Bacterial Isolates from Dairy Environment with Special Reference to Biofilm Production	Dr Parul Dr Barkha Sharma Dr Ajay Pratap Singh	DUVASU, Mathura	1.40
B25.	Participatory development of plan for promoting scientific knowledge and better production in small ruminants: An Action Research	Dr Amit Singh	DUVASU, Mathura	2.00
B26.	To evaluate the effect of ozone therapy and cephalixin in treatment of Sub-Clinical endometritis in cattle and buffaloes	Dr Jitendra K. Agarwal	DUVASU, Mathura	1.22
B27.	Clinico-Microbiological investigation of ascites cases in canines and their need-based therapeutic interventions	Dr Ruchi Tiwari	DUVASU, Mathura	2.00
B28.	Development of a rapid skin test for the diagnosis of Johne's disease	Dr Vinod Kumar Singh	DUVASU, Mathura	2.00
B29.	Clinico-Microbiological Investigation of Ascites Cases in Canines and their Need-Based Therapeutic Interventions	Dr Ruchi Tiwari	DUVASU, Mathura	2.00
B30.	Development of a rapid skin test for the diagnosis of Johne's disease	Dr Vinod Kumar Singh	DUVASU, Mathura	2.00



## PROJECT REPORT

### A. Extra-mural Projects

#### Project A1. Entrepreneurial promotion by preparation of specimens from fallen animals

In R.K.V.Y project, during 2020-21, different types of dry, wet and plastinated specimens were prepared.

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

Department of LPT organized three days training programme for Food Safety Officers on “Dugdh utpadon ki gunvatta ka mulyankan” under RKVY project titled “Establishment of referral laboratory for quality evaluation of milk and milk products” from 17<sup>th</sup> to 19<sup>th</sup> February, 2021 in which 20 Food safety officers from different districts of Uttar Pradesh participated. Various informative lectures and hands on training were given to them regarding quality evaluation of milk and milk products. Milk samples (n=30) of different buffalo, Sahiwal, Haryana and goat were evaluated for their basic composition by Lactoscan, microbiological examination through Somatic cell count, mineral content through AAS, amino acid profile through UPLC and fatty acid analysis by GC. Complete product profile analysis of Paneer samples (n=6) prepared from these milk samples was also carried out to compare nutritive and health promoting properties of milk products from different milch animals. The study showed variations in proximate composition and mineral content as goat milk and paneer samples contained significantly ( $P<0.05$ ) lower Ca and Fe whereas significantly ( $P<0.05$ ) higher Zn and moisture content than buffalo and cow milk. Samples also showed significant ( $P<0.05$ ) difference in amino fatty acids profile in terms of SFA, MUFA and PUFA.

#### Project A3. Strategic control of subclinical parasitism for better animal health and enhanced productivity in UP

Under RKVY sponsored project on “Strategic control of subclinical parasitism for better animal health and enhanced productivity in UP” three days Training programme for Veterinary Officers of UP was organized on the topic “Control of subclinical parasitism in dairy animals” from 08-10 Feb, 2021. More training programmes for Veterinary Officers and farmers will be organized soon. Under this project some instruments like Ultrasonicator,

Vortex machine, Dry bath Incubator, VDRL shaker, Electronic Weighing Scale, UV Trans-illuminator, Magnetic Stirrer, Orbital Shaker were procured.

#### Project A4. Strengthening of clinical diagnostic and therapeutic facilities at university referral hospital for benefit of farmers and livestock owners

RKVY Project on Strengthening of clinical diagnostic and therapeutic facilities at university referral hospital for benefit of farmers and livestock owners-out of Total budget of RKVY Rs 223.20 Lakh, during this financial year, large animal endoscopy, large animal ventilator, Doppler based BP manometer, Tonometer, Fundoscopy camera were procured.

#### Project A5. Establishment of A2 Genotype Testing Laboratory for Cattle of Uttar Pradesh

The project was allotted in year 20-21 under RKVY. The cost of project 99.95 Lacs was allotted in March 21. The contractor/कार्यदायी संस्था has been nominated by Government and civil work is going to start soon. Some instruments have been purchased and rest are in order to be procured.

#### Project A6. Capacity building & entrepreneurship development of farming community through establishment of community radio station

The whole budget is divided into two parts in financial year 2020-21. One part is transferred to construction agency for modification or renovation of building and another part is transferred to BESIL for establishment of community radio station.

#### Project A7. Propagation of insemination techniques in goats and establishment of semen bank for enhanced productivity and socio-economic upliftment in state of Uttar Pradesh

- Semen Production center with highest capacity in country has been established at Veterinary University Mathura.
- High quality Frozen semen doses from Six North Indian Goat breed is being prepared at disseminated to different areas across country.
- 104 Buck of Superior genotype viz Barbari, Jamunapari, Sirohi, Beetal, Jhakrana and Black Bengal are being maintained at farm.

- More than 70 Veterinary Officers have been Trained for Master Trainer from State of Uttar Pradesh, Madhya Pradesh and Chhattisgarh.
- More than 120 Artificial Insemination workers (both men and women) have been trained for AI at field level from 5 states of North country.
- 50,000 frozen semen doses have been provided to different agencies across country for breed improvement in goat.
- Revenue of Rs 20,00,000/- (20 lacs) has been generated in year 2020-21 from the center.
- 8 trainings have been conducted and Research on goat by different departments of university and research scholar (MVSc-3 and PhD-1) is carried out.
- With assistance of university-Artificial Insemination has been started in 9 states across country for breed improvement and improved farmers' income.

### **Project A8. Establishment of Modernized Goat Farm for strengthening Goat Husbandry Practices in State of Uttar Pradesh (Part I & II)**

- Establishment of zero waste goat farm on complete intensive feeding system.
- Six Major North Indian Goat breeds are being maintained at farm.
- More than 40 women farmers have been trained for scientific goat rearing.
- 80 farmers have been trained for scientific goat farming and are in process of establishing modern goat farm for income generation with technical assistance of Veterinary University Mathura.
- More than 4 trainings have been conducted.
- More than 80 genetically superior male and female have been made available to farmers for breed improvement.
- Revenue of Rs 7,00,000/- has been generated in year 2020-21 from the center.
- Milk processing plant and automatic milking plant is being established to develop goat milk marketing channel for doubling farmers' income.
- Establishment of modern goat farms at farmers' doorstep in Deoria district.
- MOU with 4 different agencies to cater university facilities to farmers across country.
- More than 7000 Lts of goat milk has been produced at farm and made available to farmers.
- Dedicated Goat clinical complex to provide vaccines to farmers at low cost. Impart knowledge about first aid and modern techniques of treatment and surgery to Veterinary officers.

### **Project A9. Establishment of Semen analytical Laboratory for semen certification and quality assurance of breeding buck semen (Part I & II)**

- First laboratory in state of Uttar Pradesh for evaluation of goat semen comprising ultra modern facilities like flow cytometer and CASA etc.
- Separate labs for genomic and proteomic study.
- More than 70 Veterinary officers and 80 AI workers from 3 different states have been trained for semen evaluation and analysis for better conception rate under field condition.
- Assisting other department of university in conducting research on goat.
- 5 MVSc and 1 PhD have conducted their research work.

### **Project A10. Establishment of environment-controlled chamber and calorimetric unit to enhance productivity of livestock in the scenario of climate change in Uttar Pradesh**

The infrastructure facility developed in the department is being used by students from department of LPM, Animal Nutrition, Gynecology, Poultry Science, Biochemistry and Microbiology of College of Veterinary Sciences apart from College of Biotechnology, assisting them for their post graduate research. The best THI model for Goats under semi-arid conditions have been identified as  $THI = 1.8 \times Tdb + 32 - [(0.55 - 0.0055 \times RH) \times (1.8 \times Tdb - 26.8)]$  and  $THI = (0.8 \times Tdb) + [(RH/100) \times (Tdb - 14.4)] + 46.4$ . Further, it has been found that PR is the most sensitive physiological parameter and first to alter after the onset of heat stress. Barbari goats are better adapted in semi-arid region as compared to Jamunapari and threshold THI can be used as a tool to compare the adaptability of different breeds of a livestock species. Dr. Poonam Yadav from department of Veterinary Physiology did a comprehensive work on the epigenetic regulation of adaptability of buffalo heifers and her work has been published in the Journal of Thermal Biology. It was found that even at a very high THI (87-90) buffalo heifers experience a moderate level of heat stress. It was also found that adaptability in buffaloes is also mediated by non-genetic factors like miRNAs. Both the papers have been published in the Journal of Thermal Biology. It has also been established that Barbari exhibited lower intraday variation in physiological parameters as compared to Jamunapari and Barbari goats are more thermotolerant than Jamunapari goats in the semi-arid regions of India. The paper has been communicated to the Journal of Bioclimatology. The effect of heat stress on rumen microbiota in buffalo heifers was also studied and it was found that



under given heat stress exposure (THI; 87-90), resilience of rumen microbial population invoked overwhelmed adaptive responses and did not produce any adverse effect on fermentation and digestibility. However, comprehensive research on changes in microbial population and their corroboration with rumen fermentation, methane emission and gut health should be undertaken to decipher many enigmas. Dr Anandita Srivastava, a PhD scholar is presently working on adaptability of lactating Sahiwal cattle during increasing THI.

**Project A11. Establishment of Embryo Transfer Technology lab and Training Center (ETT&TC) with Ovum Pick Up - *In vitro* fertilization (OPU-IVF) facility to propagate superior germplasm and enhance productivity of Indigenous cattle breeds**

Establishment of Embryo Transfer Technology lab and Training Center (ETT&TC) with Ovum Pick Up - *In vitro* fertilization (OPU-IVF) facility for Indigenous cattle breeds, where establishment of unit is under progress.

**Project A12. Demonstration unit for silage making and Popularization of low cost silage technology for year round fodder availability for small-scale farmers**

Under this project, Silage Unit has been established at university Farm. Low cost silage is being prepared and is made available to cows for better health and production. Technology has been dissipated among 300 farmers for availability of green fodder throughout the year. More than 40 veterinarians have been trained to prepare silage. Low cost silage from pea waste and barseem has been prepared and technique is being transferred to farmers. 1 MVSc has conducted their research work. Approx 250 ton of silage has been prepared in unit and is being made available to Goshalas for better health of cows. More than 5.30 lacs has been generated as revenue in financial year 2020-21.

**Project A13. Establishment of small-scale feed processing demonstration unit to promote rural youth entrepreneurship (Part-I and Part-II)**

Feed processing plant and advances lab for feed evaluation have been established at university Farm under this project. Feed samples from National institutes and state university are being evaluated (IVRI, Agriculture university, Meerut, Faizabad etc). Low cost mineral mixture and concentrate mixture is being prepared and is made available to cows for better health and production. Technology has been dissipated among 150 farmers for availability of green fodder throughout the year. Low cost silage from pea waste and

barseem has been prepared and technique is being transferred to farmers. 1 MVSc has conducted their research work. Approx 168 ton of silage has been prepared in unit. Low cost mineral mixture and concentrate mixture is being made available to Goshalas for better health of cows. More than 6.50 lac has been generated as revenue in financial year 2020-21.

**Project A14. AICRP on Nutrition and Physiological approaches for enhancing reproductive performance in cattle and buffalo**

In AICRP on "Nutritional and Physiological interventions for enhancing reproductive efficiency in animal" assigned objectives were (i) to induces oestrus in pubertal heifers (Sahiwal/Haryana) through nutritional interventions (ASMM/ Bypass fat etc) and (ii) to validate progesterone sensitivity as a marker of predicting fertilizing competence of spermatozoa. For the first objective selection of animals (n=26, Sahiwal and Haryana) was made. This was followed by follicular dynamic study for a period of one month. The animals are now being subjected to feeding experiment (Bypass fat and ASMM) for a period of 60 days. The study was conducted late due to slow release of funds. The second objective is yet to start as procurement of chemicals etc was delayed. A sum of Rs 9.5514 lakhs was released in six instalments of which the utilized amount was Rs 5.50227 lakhs. The last instalment was received in the month of March 21 with a sum of Rs 4.9854 lakhs. No SRF/YP-II could be appointed due to paucity of funds and the intimation by the nodal agency of a likely cut in the committed budget due to COVID pandemic. Under SCSP component of the project, two infertility camps were held in the month of March. A total of 47 numbers of cases pertaining to infertility were treated in the camp. Mineral mixture, sanitary kit (soap, gloves, mask and sanitizer, potassium permagnet etc) and Medicine were distributed in the camp. The camps were held in collaboration with the Animal Husbandry Department of Mathura District.

**Project A15. National Agricultural Higher Education Project-Institutional development plan (NAHEP-IDP)**

DUVASU, received the IDP project in March 2019. The total budgetary outlay for the 4 year Project was Rs 2375.28 lakhs. The objectives set for the project focused on three fronts i.e. student centric, faculty centric and on administrative front and so the object framed were

- Enhancing the professional competence of the students;
- Capacity building of faculty;
- Improving academic and administrative system through e-governance





As per the approved plan of the project, for FY 20-21 a sum of Rs 1276.89 lakhs was approved, of which Rs 746.48 lakhs was towards capital and Rs 530.41 lakhs was towards revenue. Against the approved budget, the released budget was Rs 170.5 lakhs under capital and Rs 160.67 lakhs under revenue head. With the released amount of Rs 331.17 lakhs, the overall utilization was of Rs 136.052 lakhs corresponding to 41.08% utilization.

University have dedicated one building for the work of IDP and named the building as NAHEP- IDP building. This building was inaugurated by Hon'ble Chancellor of University and Governor of U.P Her Excellency Madam, Anandi Ban Patel ji on July 15, 2020. All major activities such as language lab, virtual classroom, one digital classroom, incubation center, conference room, gallery, cafeteria etc placed in this building. Additionally, this building will be equipped with 50KVA solar system, green toilet and provision for rain water harvesting.

For enhancing the professional competence of student, the planned activities include creation of 15 digital classrooms. The activity is partially completed with the procurement of digital podium.

In order to get students the exposure of thinking for entering into an entrepreneurship or from job prospective, 14 interactive sessions with different industries (feed, dairy, pharma, poultry, infertility clinics, vaccine unit, small animal practice, etc) were planned. We could able to achieve 03 using virtual mode.

With a holistic approach of enhancing communication and soft skills of students, creation of one language lab was planned. The activity was partially completed with procurement of students work station. The other things required for establishing the language lab is tagged with other procurement activity. Further to personality development, 5 lectures were targeted; however, 8 such lecture was virtually organized.

For imparting quality teaching, visiting/adjunct/guest faculty lectures were planned. Out of 30 such lectures targeted for the FY, nineteen (19) virtual lectures were conducted. All lectures were focused with UG teaching and eminent professors who have their interest in teaching were selected for such deliberations.

For collaborative exchanges of idea in teaching & extension, three MOU were signed. Amongst them 2 are Universities and 1 is an NGO which will work as our extension wing with intention of genetic improvement of small ruminants. Toward improvement in academics and administrative system, University has implemented AMS and PIMS system of NAHEP component 2.

Further, digitalization of key working areas is under way with support from U.P Govt initiative for digitalization. Digitalization of library facilities was also planned. In our entire procurement plan, 40 STEP activities are uploaded. Out of which 14 step activities were completed in FY under report.

#### **Project A16. All India Network Programme on Diagnostic Imaging and Management of Surgical Conditions in Animals (AINP-DIMSCA)- ICAR**

All India Network Programme on Diagnostic Imaging and Management of Surgical Conditions in Animals (AINP-DIMSCA)- ICAR-During 2020-21, Total budget Rs 15.375 lakhs was received from ICAR. A six days training on "Application of diagnostic imaging technology and management of surgical conditions in animals" was organised under (AINP-DIMSCA) for 10 veterinary officers of Animal Husbandry Department of U.P. from 27 Jan-012-Feb, 2020. Total 8 theory lectures and 12 Hands on training were conducted. The training was highly fruitful to veterinary officers and they further recommend specialized training of orthopedic and ophthalmic affections. Availing facilities developed under DIMSCA, the clinical cases are treating with good outcome.

#### **Project A17. Pharmacological studies and development of polyherbal formulation for reproductive disorders in animals**

- Surgical induction of endometritis in rats with clinical isolate of ESBL producing *E. coli* though did not produce any adverse effect on general systemic parameters in rats, albeit, produced uterine inflammation with presence of visible pus, edematous uterine horn and characteristic histopathological changes indicative of inflammatory changes in uterine tissue section.
- Treatment with *E. robusta* leaves (ER) crude extract significantly decreased uterine secretion index as well as neutrophil counts in the uterine tissue sections of endometritic rats. Further, there was marked (40.33%) reduction in the expression of COX-2 mRNA expression in uterine tissue. However, it failed to cause any significant change in uterine bacterial load. Combination of ER extract with ciprofloxacin did not produce any marked therapeutic benefit in endometritic rats.
- Earlier we have reported the *In vitro* antibacterial action of ER extract against clinical isolate of methicillin resistant *Staphylococcus* (S4). To further assess the effect of ER extract on growth kinetics of S4

clinical isolates, time kill assay was performed. Marked antimicrobial action of ER extract against S4 isolate was initiated at 8 h post-exposure while bactericidal action was observed at 16 h post-exposure. Further, we have observed that following 18 h post-exposure to ER extract, S4 isolates lost the cell membrane integrity as evidenced by fluorescence microscopy.

- Surgical in-utero inoculation of S4 isolates produced marked endometritis in rats. Treatment with either cefixime or ER extract produced significant ( $P < 0.05$ ) down-regulation of COX-2 mRNA expression in the uterus in comparison to endometritic group. On histopathological examination, uterine sections from endometritic animals treated with ER extracts showed mild inflammatory changes, fibrosis and hyperplastic endometrial lining epithelium. The endometrial glandular epithelium also showed mild hyperplastic changes. Combined treatment with cefixime and ER extract did not show any improvement in histopathological score or change in inflammatory markers in the uterine samples from endometritic rats.

#### **Project A18. Outreach programme on zoonotic diseases (OPZD)**

A total of 1148 samples were collected comprising 318 milk samples of cattle (235) and buffalo (83), 760 serum samples of cattle (630) & buffalo (130), 40 human serum and 30 bovine serum samples received from gaushalas for diagnosis of Brucellosis in suspected animals (Hasanand Gaushala Vrindavan, Brij Gau Samridhi Sansthan, Vrindavan). A total of 318 milk samples and 760 serum samples were collected from cattle and buffalo from 3 districts viz. Mathura, Bharatpur and Palwal as a part of sampling plan/survey for brucellosis. Species-wise Prevalence of bovine brucellosis (Cattle and Buffaloes) in milk samples by MRT and I-ELISA test and it was 28(8.80%) & 27(8.49%) respectively. In Bharatpur district, prevalence of brucellosis was more in buffaloes (28.57%) than Palwal district (17.39%) & Mathura district (7.81%). Concurrent study Leptospirosis with Brucellosis have been conducted in this year. 100 sera samples were sent to ICAR-NIVEDI for diagnosis of Leptospirosis by MAT test. Total number of samples reacted in MAT were 18 (final serum dilution was 1:50). Panel of 20 serovars used in the MAT (Australis, Bankiang, Herdjo, Pomona, Canicola, Grippotyphosa, Panama, Lai, Javanica, Pyrogenes, Shermani, Kaup, Tarassovi,

Herstbridge, Hebdomadis, Copenhageni, Djesiman, Bataviae, Ballum, Icterohaemorrhagiae). Some of the samples reacted were having abortion history and some infertility problem. All 18 samples were already confirmed Brucella positive by I-ELISA and C-ELISA test. Concurrent study of *E.coli* & CRYPTO-SPORIDIOSIS: During the period under report, a total of 112 fecal samples of dairy calves aged between 1 to 30 days were collected from LFC DUVASU, Mathura, Gaushalas of Goverdhan & Vrindavan were processed for concurrent detection of *E.coli* & *Cryptosporidium* spp. Overall Percent positivity of *E.coli* & *Cryptosporidium* spp. was 72.3% (81/112) and 30.35% (34/112).

#### **Project A19. Integrated indigenous cattle centre for conservation and improvement of indigenous milch breeds of cows (Gokul Gram Project)**

Gokul gram Project is running at LFC, DUVASU, Mathura, which is financially supported by DADF, GOI, New Delhi. This year a multipurpose cow shed was been constructed at LFC under this project. As per the main mandate of the project i.e. conservation and propagation of the elite germplasm of Sahiwal and Hariana cows, a total of 12 animals were provided to Veterinary College, BASU, Patna; 02 animals to Karshni Aashram, Mathura, 02 animals to Sanskriti University, Mathura and 13 animals to CVSc & AH, Palampur.

#### **Project A20. NADCP-FMD**

A total of 7468 pre-vaccination and 5975 post-vaccination bovine serum samples sent by Animal Husbandry Department, Govt. of Uttar Pradesh were processed at FMD-CP Laboratory, DFMD, IVRI Campus, Bengaluru for FMD vaccine seromonitoring. The pre-vaccination serum antibody titre was observed to be 9.9%, 28.7 % and 7.5% for FMD-virus serotype O, A and Asia 1 respectively. The post vaccination serum antibody titre showed significant upward trend with 18.2 %, 8.6% and 22.3 % of vaccine animals protected against FMD-virus serotype O, A and Asia 1 respectively.

#### **Project A21. Mechanistic insights into the signal transduction pathways of Progesterone in regulating functional dynamics in bovine and caprine spermatozoa- [BT/PR27446/AAQ/1/717/2018]**

The major aim of the project was to decipher the intracellular signaling cascades during non-genomic progesterone signalling in bull and goat spermatozoa. In the study, classical pathways known in human and murine spermatozoa were addressed first followed by new or possible novel

pathways. The results of the study indicated that, 1 pM P4 induces capacitation and 1  $\mu$ M P4 induces acrosome reaction. It has been reported that both these processes are independent and require different intracellular pathways during non-genomic signalling of P4; however, we found that both sperm capacitation and acrosome reaction in bull and goat spermatozoa employ similar intracellular pathway and blocking of any single pathway does not abolish induction of capacitation or acrosome reaction; rather, multiple pathways interplay simultaneously to regulate sperm capacitation and acrosome reaction. In our study, we targeted cAMP, PKA, MAPK, Akt  $\frac{1}{2}$ , Src kinase, c-JNK, IP3, Catsper, Cannabinoid receptors, TRPV1, tyrosine phosphorylation and GABA receptors. We are proposing new novel pathways like TRPV1, Akt  $\frac{1}{2}$ , Src kinase, c-JNK, GABA and Cannabinoid receptors role during non-genomic P4 signalling. We also propose that, P4 acts by inducing intracellular alkalization, membrane polarization and induce free radical generation. Probably, free radicals mediate the downstream pathways of P4 and require validation. Only a sub-population of spermatozoa responds to P4 and not all at the same moment. This may be another possible pathway in which sperm cells are selected in the female genital tract. Our study results reporting five new pathways for P4 non-genomic signaling and requires further validation.

#### **Project A22. Clinical Evaluation of indigenous technologies against mastitis among cattle and buffaloes**

The fund received as first installment has been almost utilized. Total 135 milch cows were screened for subclinical mastitis and prevalence of 8.15% has been recorded. Based on study of 308 lactating cows, 5.84% prevalence of clinical mastitis has been recorded. Approximate 90 milk samples from clinical and subclinical mastitis has been analyzed for culture and sensitivity test along with identification of pathogen. Clinical trial of herbal gel has been evaluated in 18 lactating cows with clinical mastitis. Clinical trial of herbal gel has been evaluated in 22 lactating cows with Sub-clinical mastitis.

#### **Project A23. Clinical Evaluation of Some Homeopathic Medicines against Mites Induced Dermatitis in Dogs**

Procurement of non-recurring items has been started, and most of the items have been procured. Procedures for recruitment of scientific staff has been initiated. We have started screening sick dogs for the clinical trial. One post-graduate student's research work is to be planned in this project.

#### **Project A24. Wound healing efficacy assessment of Ascorbate formulation on large animals (Goat Sheep/Cattles)**

Ethical approval from IAEC, DUVASU, Mathura and Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) has been taken. Animals have been identified through survey conducted by the Committee and goats will be purchased as soon as possible. The purchase process has been initiated as per the rules and regulations of University.

#### **Project A25. Evaluation of the efficacy of velgraft / velvert in reconstitutions of surgical wounds in goats**

Successful completion of an Ad-hoc Project entitled "Evaluation of the efficacy of Velgraft/Velvert in reconstitution of surgical wounds in goats" funded by M/s. Datt Mediproducs PVT. LTD, Gurugram.

#### **Project A26. Evaluation and Popularization of Indigenous Acaricidal Medication against Tick Infestation in Regions of Uttar Pradesh**

Under NIF sponsored project on "Evaluation and popularization of indigenous acaricidal medication against tick infestation in regions of Uttar Pradesh" all the research work has been completed and the field demonstration of acaricidal activities of herbal products will be done in near future.

#### **Project A27. Study on the efficacy of feeding mineral mixtures (Min Mix) on production and reproduction parameters, repeat breeding and silent anestrus of lactating dairy cows**

Eighteen lactating Sahiwal cows were randomly allocated into three groups of 6 animals each in a randomized block design to study effect of chelated mineral mixture on production performance. Control group (C) was not supplemented with any mineral mixture, whereas; T<sub>1</sub> and T<sub>2</sub> group were supplemented with mineral mixture-1 (inorganic) and mineral mixture-2 (chelated), respectively, with dose rate of 30 g/animal/day. Basal diet offered to experimental groups contains concentrate mixture, berseem fodder and wheat straw in 40, 30 and 30%, respectively, on DM basis. Body weight and dry matter intake were recorded fortnightly and blood parameters were done at monthly interval. At the end of experiment 7 days digestion trial was conducted. DMI (kg/day) and body weight gain were similar in all groups. Nutrient digestibility and nutrient intake were not impacted by supplementation of different mineral mixtures. However, mean digestibility of CP was significantly (P<0.05) improve in T<sub>1</sub> and T<sub>2</sub> compared to control group. Blood parameters like



Hb, PCV and pH values were not impacted in different treatment groups. Biochemical parameters like plasma glucose, NEFA, plasma total protein, plasma albumin, plasma globulin, PUN, ALT, AST and creatinine were found similar in all treatment and control group. Plasma Ca concentration and FRAP was significantly high in T<sub>1</sub> and T<sub>2</sub> group in comparison to control group. However, Plasma P, and total immunoglobulin concentration were found similar in all treatment and control group. Milk yield and milk composition in mineral mixture were also similar to control. So, It may be concluded that supplementation of mineral mixtures (1 & 2) improved balance of Ca and digestibility of protein. Dried Moringa oleifera leaves can be supplement at 3.0 % level without any deleterious effect on blood parameters and hepatic metabolism, it also exhibited stimulatory effect on the antioxidant status, ameliorated stress and improved the seminal attributes and testosterone concentration of experimental bucks

**Project A28. Evaluation of antiviral and immunomodulant potential of ANIMUNIN (polyherbal formulation)**

The objective of this study was antiviral and immunomodulatory property of the polyherbal formulation from Indian Herbs private ltd. was tested in broiler chicken birds at Department of Veterinary Pathology, Veterinary University, DUVASU, Mathura. This study was conducted as per the agreed study plan. Four groups were selected having 12 birds in three group and 06 birds in control group. The test item was fed to the broiler birds for 35 days the challenge with New

castle disease virus and Infectious bursal disease virus and then observed for 7 days. The test item treated overall showed normal growth as compared to control group. This may be due to some strong test in the item. The test item exhibited good progression in terms of immunomodulation throughout study duration without any adverse effect. It was noted that the consistent progressive growth observed in the test item fed group as compared to infected group. The histopathological score was better in test item fed group than infected group when compared to control group. In cell culture showed reduction in cytopathic effect when treated with test items as compared to control. The quantitative estimation of pro-inflammatory genes, oxidative stress genes/cytokines in the qPCR, cell culture and ELISA showed increase expression in infected group but after test item fed then these proinflammatory cytokines normalized when compared with control group birds. In conclusion, the results of the present study revealed that the test item, Animunin accelerate immunomodulatory property against viral infection in the broiler chicken birds.

**Project A29. Evaluation of the Efficacy of a Polyherbal Immunomodulator at Improving the Response to Foot-and-Mouth Disease and Hemorrhagic Septicemia Vaccination in Cattle**

The project aims at studying the effect of herbal preparation as immunomodulator in FMD and HS - vaccinated lactating cows in dairy farm, DUVASU. The project grant has been received and the project is initiated in March 2021.





## PROJECTS OF POST GRADUATE STUDENTS COMPLETED DURING 2020-21

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

S. No.	Title of Thesis	Name of the Student	Name of the Guide	Subject
<b>PhD: Veterinary Science</b>				
1.	Studies on effect of lead and nickel on functional dynamics and associated signaling pathways in buck spermatozoa	Dr Rajkumar S. Yadav	Prof. Satish Kr. Garg	Pharmacology and Toxicology
2.	Study on Isolation, Characterization and Antibacterial Potential of Bacteriophage against Bovine Mastitis	Dr Ruchi Tiwari	Dr Sharad Kr. Yadav	Veterinary Microbiology
3.	Sero-surveillance of surra in equines using recombinant surface glycoprotein antigen from <i>Trypanosoma evansi</i>	Dr Ruchi Singh Gaur	Prof. Daya Shanker	Veterinary Parasitology
<b>PhD: Biotechnology</b>				
1.	Studies on toxicity of acrylamide and its amelioration in Wistar rats	Pratishtha Sharma	Prof. Sharad Kr. Yadav	College of Biotechnology
2.	Isolation and characterization of antimicrobial compounds in root extracts of <i>Elytraria acaulis</i> against methicillin resistant <i>Staphylococcus aureus</i>	Simmi Singh	Prof. Rajesh Nigam	College of Biotechnology
3	Molecular characterization of mannose binding lectin gene1 (MBL1) in <i>Bubalus bubalis</i> & its variability in cattle and buffalo genome	Manali Baghel	Prof. Deepak Sharma	College of Biotechnology
4.	Molecular Characterization of <i>Bax</i> inhibitor gene (TMBIM) in response to heat stress in goats of semi arid region	Ritu Singh	Dr P.K. Raut	College of Biotechnology
5.	Studies on Detection, Prevalence and Molecular Characterization of Avian Rotavirus	Shalini Yaduvanshi	Prof. Rashmi Singh	College of Biotechnology
6.	Molecular characterization and serosurveillance of <i>Theileria annulata</i> using recombinant Tams1 protein based ELISA	Sanjhi Paliwal	Prof. Daya Shanker	College of Biotechnology
<b>M.V.Sc.: Veterinary Science</b>				
1.	Evaluation of Antibacterial Activity of <i>Eucalyptus robusta</i> Nano-formulation	Dr Gaurav Chaudhary	Prof. Satish Kr. Garg	Pharmacology and Toxicology
2.	Evaluation of aortic Notch signaling during late phase of sepsis	Dr Vandana Singh	Dr Soumen Choudhury	Pharmacology and Toxicology

3.	Mechanistic studies on antidiabetic activity of <i>Pterocarpus marsupium</i> and ITK formulation in rats	Dr Sawant Suraj Sitaram	Dr Atul Prakash	Pharmacology and Toxicology
4.	Studies on the mechanism of action of methanolic extract of <i>Eucalyptus robusta</i> leaves against resistant bacteria isolated from clinical cases of uterine infections in bovines	Dr Raktim Saikia	Dr Soumen Choudhury	Pharmacology and Toxicology
5.	Ultrasonographic and Clinico-Biochemical Studies of Hepatobiliary System in Cattle and Buffaloes	Dr Raveendra Tadagani	Prof. R.P. Pandey	Veterinary Surgery and Radiology
6.	Studies on thoracic radiography, electrocardiography and echocardiography in small breed dogs	Dr Prabha Sharma	Prof. Sanjay Purohit	Veterinary Surgery and Radiology
7.	Ultrasonographic Studies on Kidneys in Sahiwal Calves	Dr Chetan Sharma	Dr Gulshan Kumar	Veterinary Surgery and Radiology
8.	Molecular Characterization of Bovine Intrauterine <i>Escherichia coli</i> Isolates and their Pathomorphological Studies in Rat model	Doni Keyang	Dr Rashmi Singh	Veterinary Microbiology
9.	Isolation and molecular characterization of carbapenem resistant Gram-negative bacteria from livestock in Mathura region	Dr Ambika Arun	Dr Ajay Pratap Singh	Veterinary Microbiology
10.	Molecular characterization and association studies of CYP19 (aromatase) and estrogen receptor alpha (ER $\alpha$ ) allelic variants with reproduction and production traits in Indian cattle breeds	Dr Vishakha Uttam	Dr Madhu Tiwari	Animal Genetics & Breeding
11.	Molecular characterization of Follicle stimulating hormone receptor (FSHR) and Luteinizing hormone receptor (LHR) genes and their polymorphism studies in Indian cattle breeds.	Dr Aditya Kumar	Dr Satyendra Pal Singh	Animal Genetics & Breeding
12.	Efficacy of feeding mineral mixture on production and reproductive health of lactating cows.	Dr Akash Tyagi	Prof. Vinod Kumar	Animal Nutrition
13.	Effect of dietary supplementation of dried <i>Moringa oleifera</i> leaves on the performance of bucks	Dr Savere Bajrang Murlidhar	Dr Shalini Vaswani	Animal Nutrition
14.	Antioxidant and immunomodulatory studies on calves treated with herbs and probiotics	Dr Prashant Singh	Dr Pawanjit Singh	Veterinary Biochemistry



15.	Effect of floor type on performance and behaviour of buffalo heifers	Dr Priti Shakya	Dr Rajneesh Sirohi	Livestock production and Management
16.	Infrared Thermo-graphical Study of Estrus in Dairy Animals	Dr Saurabh Tiwari	Dr Yajuvendra Singh	Livestock production and Management
17.	Development and quality assessment of fruit pulp incorporated goat milk yogurt	Dr Suraj Kumar	Dr Meena Goswami Awasthi	Livestock Products Technology
18.	Development and quality assessment of goat milk shrikhand incorporated with fruit pulp	Dr Vivek Sahu	Dr Vikas Pathak	Livestock Products Technology
19.	Development and quality assessment of fiber fortified enrobed turkey meat cutlets	Varun Kumar H. Mehta	Dr Meena Goswami Awasthi	Livestock Products Technology
20.	Diagnostic Relevance of Serum Cystatin-C and SDMA in Detection of Early Renal Dysfunction associated with Canine Ehrlichiosis	Dr Anubhav Singh	Dr Mukesh Kumar Srivastava	Veterinary Medicine
21.	Role of endocannabinoid receptors (CB <sub>1</sub> and CB <sub>2</sub> ) in mediating non-genomic signalling of hormone progesterone receptor in bull spermatozoa	Dr Abhishek Mahajan	Dr Dilip Kumar Swain	Veterinary Physiology
22.	Expression of miRNA during heat stress in buffaloes	Dr Poonam Yadav	Dr Brijesh Yadav	Veterinary Physiology
23.	Effect of dietary supplementation of graded levels of <i>murraya koenigii</i> leaf meal on the performance of coloured chicken	Dr Subrat Dubey	Prof. P.K. Shukla	Poultry Science
24.	Effect of dietary supplementation of ferrous sulphate on the performance of turkey poults	Dr Ankit Sharma	Dr Amitav Bhattacharyya	Poultry Science
25.	Effect of dietary supplementation of L-valine on the performance of turkey poults	Dr Vaibhav Kumar Singh	Prof. P.K. Shukla	Poultry Science
26.	Studies on effect of curcumin on cryopreservation of Haryana bull spermatozoa	Dr Shashikant Gupta	Dr Anuj Kumar	Veterinary Gynecology & Obstetrics
<b>M.Sc.: Biotechnology</b>				
1	Myostatin (MSTN) gene molecular characterization and polymorphic studies in Muzaffarnagari sheep	Priyanka	Dr Madhu Tiwari	College of Biotechnology

## THESIS ABSTRACTS

### PhD

#### College of Veterinary Science and Animal Husbandry

##### 1. Studies on effect of lead and nickel on functional dynamics and associated signaling pathways in buck spermatozoa

The present study was undertaken to evaluate the adverse effects of lead on motility, livability, functional membrane integrity, acrosome intactness, MTP, sperm levels of cAMP and  $\text{Ca}^{2+}$ , apoptosis, phosphorylation of tyrosine containing sperm proteins and on ultra-structures of bucks spermatozoa along with their effects on kinematics of sperm cells and interplay with  $\text{Ca}^{2+}$  channel agonist and antagonists. Effect of nickel on motility, livability and kinematics and on ultra-structures of buck spermatozoa was also studied. Six adult healthy Barbari bucks of similar body weight were selected for collection of semen samples. Each semen ejaculate was diluted using PBS (pH 7.4) with 0.5 % glucose to obtain the final concentration of  $40 \times 10^6$  sperm cells per ml. Four different concentrations of lead acetate (0.5, 5, 10 and 20 ppm) and nine different concentrations (0.25, 0.5, 1.25, 2.5, 5.0, 10, 25, 50 and 100 ppm) of nickel chloride were selected for the present study and the exposure time allowed for both the heavy metals was 15 min and 3 h. Lead and nickel along with calcium were found to be present in whole semen, seminal plasma and sperms mass. Following *in-vitro* exposure, lead was found to kill sperm cells, reduce total motility, affect functional membrane integrity and reduce the acrosome intactness in concentration-and time-dependent manner. Lead decreased the number of spermatozoa showing high MTP and significantly increased the caspase 3 and 7 activity and damaged DNA in treated sperm cells. Further, lead acetate even at the lowest used concentration (0.5 ppm) significantly damaged DNA following exposure for 15 min. Following exposure to lead, Bcl-2 gene (anti-apoptotic) was not expressed but expression of Bax gene (pro-apoptotic) was increased, therefore, apparently lead seems to promote apoptosis in spermatozoa after 3 h of exposure. Lead acetate not only modulated the intracellular levels of cAMP in exposed sperm cells but also produced concentration-dependent inhibitory effect on percentage of the sperm cells showing intracellular calcium release. CTC staining revealed that lead acetate did not induce any B-pattern in spermatozoa following exposure for 15

min or 3 h which indicates capacitation in sperm cells, rather it produced concentration- and time-dependent increase in AR pattern in sperm cells. Lead acetate at 5, 10 and 20 ppm levels increased the relative expressions of tyrosine phosphorylated (TP) proteins after both the time intervals (15 min and 3 h). Pre-acrosomal cap and post acrosomal regions of the treated-spermatozoa showed positive immune-reactivity to TP. Lead and nickel altered the motility and velocity parameters of treated sperm cells but only observed at higher concentrations. Interaction studies with Bay-K, the calcium channel agonist, and nifedipine and NNC, the calcium channel blockers, revealed that lead probably acts by inhibiting the availability of sufficient intracellular calcium required for motility of sperm cells. Analysis of the SEM and TEM images revealed that lead and nickel produced deleterious effects on plasma membrane and different organelles of sperm cells and all these cellular-insults, which included swollen acrosome, wavy middle piece, rupture of the plasma membrane, loss of acrosome content from sperm head and swollen mitochondria having collapsed cristae and distorted outer dense fiber etc., to sperms were concentration-and time-dependent. Thus, our findings evidently suggest that lead and nickel affect the functional attributes of spermatozoa which in turn may be responsible for altering the functionality and fertilizing capacity of buck spermatozoa. The mechanistic pathway of lead-induced spermo-toxicity seems to involve multiple pathways like oxidative stress induced or directly results in AR, induces apoptosis and also direct damage to sperm cells ultrastructures, which ultimately result in compromised functional ability of sperm cells and loss of fertilizing competence.

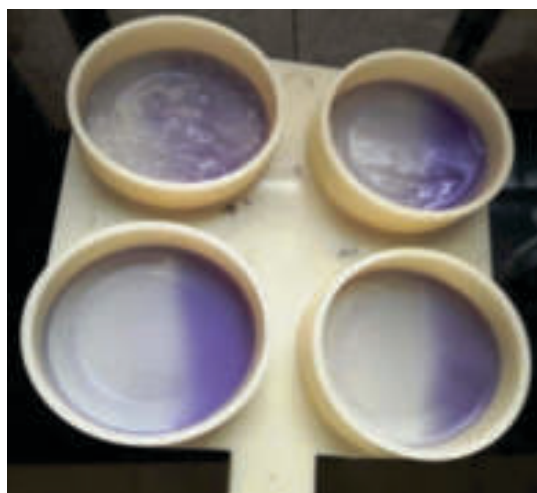
##### 2. Study on Isolation, Characterization and Antibacterial Potential of Bacteriophage against Bovine Mastitis

The objective of the study included isolation of major bacteria from cases of mastitis from lactating cows and buffaloes, followed by isolation of bacteriophages against these bacterial isolates from samples of animal wastewater to assess the *In vitro* antibacterial potential of phage isolates. For this, collection, isolation and preliminary characterization of major bacteria (*Staphylococcus aureus* and *E. coli*) from milk samples of clinical mastitis (CM) and sub-clinical mastitis (SCM) cases from various farms and goshalas in and

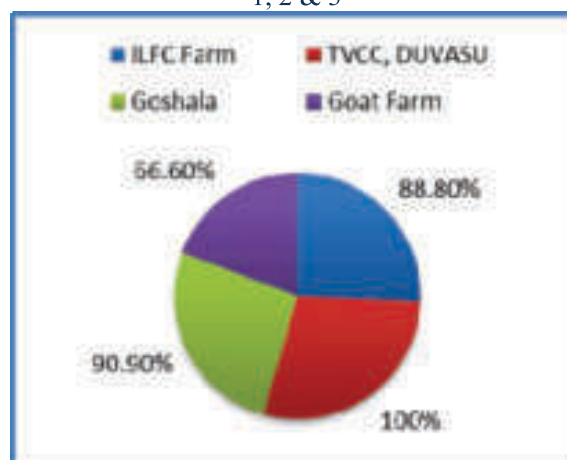


around Mathura, U.P. India was conducted and antibiotic sensitivity testing was performed. For this, a total of seven hundred seventy composite milk samples from lactating cows and buffaloes were screened for SCM and CM and tested for bacterial isolation. The prevalence of SCM in lactating cows was found to be 32.94% by CMT and 50.9% by SCC, while in buffaloes 23.43% by CMT and 29.68% by SCC. The prevalence of CM was 87.5% in lactating cows and 73.47% in lactating buffaloes. Among 770 lactating cows and buffaloes, 61.94% animals were found positive for bacterial growth and no bacteria could be isolated from 38.06% animals. In the present study, a total of 85 *S. aureus*, 271 Coagulase negative Staphylococci (CNS) and 121 *E. coli* isolates were recovered. When antibiotic susceptibility testing was done, antibiotic resistant strains of *S. aureus* (resistant to kanamycin, methicillin, vancomycin and cotrimoxazole) and *E. coli* (resistant to ampicillin, amoxycillin, penicillin, methicillin and co-trimoxazole) were recovered. Among coagulase negative staphylococci, 100 % resistance was recorded against methicillin and co-trimoxazole, while more than 50% resistance was observed against ampicillin, amoxycillin, ampicillin/sulbactam, amikacin, erythromycin, gentamicin, kanamycin, penicillin-G, chloramphenicol, streptomycin, tetracycline, vancomycin, ceftriaxone, cefotaxime including methicillin and co-trimoxazole. For rapid and preliminary detection of Staphylococcal phage and coliphage, a total of 55 representative samples of animal wastewater (urine/dung) constituting various body excretions of animals (cattle, buffalo, goats, sheep and poultry) were collected from various places including ILFC farm DUVASU Mathura, TVCC, DUVASU Mathura, different Goshalas of Mathura, Barsana, Goverdhan and Vrindavan, Goat farm, Sheep unit and Poultry farm. For rapid detection of phages, among 55 samples of wastewater, 45 (81.8%) samples were found positive by turbidity reduction method, while 30 (54.5%) were positive by spot inoculation method. A total of 51 phage isolates were obtained including 21 phage strains isolated against *S. aureus* while 30 against *E. coli*. Phage isolates (SaD<sub>1</sub>, SaD<sub>2</sub>, SaD<sub>3</sub>, EcD<sub>1</sub>, EcD<sub>2</sub>, and EcD<sub>3</sub>) were tested against bacterial isolates of *S. aureus* (85) and *E. coli* (121) to assess the *In vitro* lytic activity and maximum bacteriolytic activity was shown by EcD<sub>2</sub> (100%), followed by EcD<sub>1</sub> (94.21%), EcD<sub>3</sub> (90.08%), SaD<sub>1</sub> (81.17%), SaD<sub>3</sub> (78.64%) and SaD<sub>2</sub> (75.29%). Electron microscopic findings indicated that coliphages belonged to family *Siphoviridae*. Coliphages were found more efficacious and can be explored for cocktail preparation in treating cases of SCM and

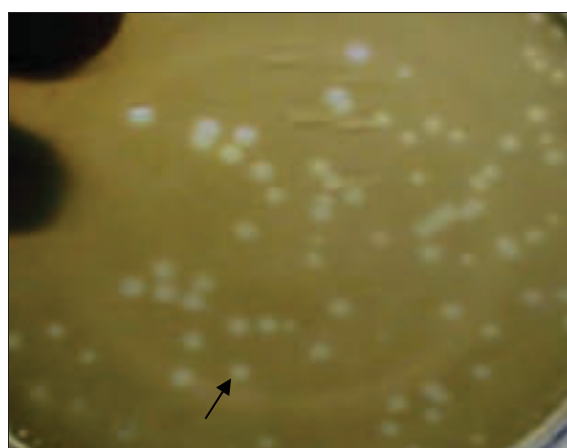
CM. Study provided first ever effort in Braj region (U.P.) focusing on investigation of the *In vitro* lytic strength of bacteriophages against *S. aureus* and *E. coli* involved in bovine mastitis.



Results of California mastitis test (CMT)-Score 0, 1, 2 & 3



Percentage of animal wastewater samples from different locations showing bacteriolytic activity due to Bacteriophage by turbidity reduction method



Large sized clear round plaques on bacterial lawn (EcD<sub>3</sub>)

### 3. Sero-surveillance of surra in equines using recombinant surface glycoprotein antigen from *Trypanosoma evansi*

The *Trypanosoma evansi* is a haemoflagellate and is a serious constraint in the health and productivity of animals throughout the world. Numerous phylogenetic markers have been tested over a period of time for delineating evolutionary history of *T. evansi*. RoTat 1.2 VSG gene and ITS 1 gene used for characterization of *T. evansi* across the globe. A total of 10 equine isolates of *T. evansi* from Northern India were characterized using VSG and ITS 1 gene. PCR products were sequenced and sequences were compared with available sequences across India and world. By using RoTat 1.2 VSG Indian isolates formed multiple clades with two haplotypes. The present isolates showed 99.49–100.00% nucleotide homology within themselves. Similarly by using ITS 1 gene *T. evansi* isolates showed distribution into three haplotypes with 99.06–100.00% nucleotide homology within themselves. Vast genetic divergence was seen between the isolates suggesting of multiple distinct lineages of *T. evansi* amongst the Indian livestock. Interestingly, variations in sequences were seen based on the host range of isolates. The findings are very important from molecular evolutionary point of view. Further, expression of RoTat 1.2 VSG protein was carried out using PET32b vector and SDS-PAGE analysis revealed molecular weight of the expressed recombinant RoTat 1.2 VSG fused protein as approximately 43 kDa. Alongside for mass sero-screening test such as ELISA was performed. In the present study, the RoTat 1.2 VSG of *T. evansi* was expressed in prokaryotic system (*E. coli*) and thereafter its immunoreactivity has been evaluated in immunoblot and enzyme immuno assay. The expressed protein showed 100 % sensitivity, 86.16 % specificity. The developed antigen has also been validated with field serum samples from horse collected from Mathura and adjoining areas. The data showed that the developed recombinant antigen can be a diagnostic tool to detect carrier animals as well as control of the disease.

#### PhD

#### College of Biotechnology

### 1. Studies on toxicity of acrylamide and its amelioration in Wistar rats

Present study was designed in Wistar rats in two phases to study acrylamide toxicity and its amelioration using Vitamin E, GSH and hot aqueous extract of *Ocimum sanctum* (HAE). In the first phase of study, acrylamide was fed @ 10, 20 and 30mg/kgBW for 45 days and basing on neurophysiological as well as histopathological

findings, the dose of acrylamide was finalized @ 30mg/kg BW and duration of experiment for 45 days. The phase II study was the major study which was carried out for 45 day in eleven groups of rats along with a vehicle control group for corn oil. The different groups taken during the major study were-(Group A: Acrylamide; Group B: Acrylamide + Vitamin E; Group C: Acrylamide + hot aqueous extract of *Ocimum sanctum* (HAE); Group D: Acrylamide + Reduced Glutathione (GSH); Group E: Acrylamide + Vit E + HAE ; Group F: Acrylamide + Vit E + GSH; Group G: Acrylamide + HAE + GSH; Group H: Acrylamide + HAE + Vit E + GSH; Group I: Basal diet+GSH; Group J: Basal diet + Vitamin E (Antioxidant); and Group K: Negative control= Normal diet and Water. Corn oil group was taken as vehicle control. Three ameliorating agent were orally administered into rats namely – *Ocimum sanctum* hot aqueous extract @ 250mg/kg BW;  $\alpha$ -tocopherol (Vit E) @ 5 IU/kg BW and reduced Glutathione @ 2mg/kg BW. After 45 days of experiment, erythrocyte oxidative stress markers, tissue oxidative stress markers, histopathological changes in various organs, plasma cytokine levels, blood biochemicals, cauda sperm attributes, testicular bioinjury markers and micronuclei formation in hepatocytes and spleenocytes were evaluated. Feeding acrylamide for 45 days resulted in significant increase in MDA, significant reduction in the activities of SOD, GST, GSH, and CAT in erythrocytes and all tissues indicating rise in oxidative stress and reduction in antioxidant defense due to acrylamide toxicity as compared to all other groups (B to I); however, concurrent feeding with Vitamin E (group B) and combination of Vitamin E, GSH and HAE (Group H) rats showed significant improvement in antioxidant defense indicating ameliorative potential of these agents. All other ameliorating agents in alone improved the antioxidant status but not significant as compared to Group B and H. Histopathological findings indicated that acrylamide induced number of cellular, degenerative and inflammatory changes in liver, testes lungs, spleen, heart, brain, and kidneys; however, concurrent feeding with Vitamin E (Group B) and combination of vitamin E, GSH and HAE (Group H) rats showed significant protection of these organs from degenerative changes. Similar trend was observed for blood biochemical parameters and plasma cytokines which were decreased due to acrylamide toxicity. Cauda retrieved sperm cells showed significant reduction in functional attributes and spermatozoa showed decreased motility, viability, membrane integrity and DNA fragmentation indicating toxic effects of acrylamide. Testicular

bioinjury markers were significantly increased due to acrylamide toxicity along with higher formation of micronuclei in spleenocytes and hepatocytes. Concurrent feeding with Vitamin E (Group B) and combination of Vitamin E, GSH and HAE (Group H) rats showed significant amelioration from acrylamide toxicity. Vitamin E feeding along with acrylamide (Group B) showed highest amelioration indicating the best agent to neutralize the toxic effects of acrylamide. From the findings of the study, it was concluded that acrylamide induces subtle changes in antioxidant system of host and it can be suitably ameliorated by using Vitamin E or GSH or HAE of *Ocimum sanctum* either alone or in combination. ACR toxicity can be minimized using antioxidants and therefore, it was concluded that ACR mostly acts by forming free radicals affecting oxidative status of the host.

## **2. Isolation and characterization of antimicrobial compounds in root extracts of *Elytraria acaulis* against methicillin resistant *Staphylococcus aureus***

The present study was undertaken to isolate and characterize antimicrobial compounds in root extracts of *Elytraria acaulis* against methicillin-resistant *Staphylococcus aureus*. Fresh roots of *Elytraria acaulis* were collected from North Uttar Pradesh, Firozabad district, India, separated, washed and naturally dried. The dried samples were grinded, weighed and extracted using three solvents; ether, methanol and aqueous: Maceration cold and Soxhlet hot extraction. The maximum and minimum percentage yield of root extract was observed in aqueous hot extract of *Elytraria acaulis* (32.03%) and ether hot extract i.e. 0.679 respectively. Eight (8) pooled fractions and nine (9) pooled fractions from methanol and ether respectively, were processed further after column chromatography. Qualitative phytochemical analysis of eight collected methanol extract fractions revealed the presence of glycosides, carbohydrate and flavonoids. Similarly, qualitative phytochemical analysis of pooled ether extracts tested positive for glycosides, flavonoids, and carbohydrates. The qualitative UV-VIS profile at the wavelength of 200 nm to 1100 nm of pooled methanol (hot) and ether (cold) extracts showed the highest absorption peaks at 200 to 600 nm. The lowest MIC was found against MRSA (ATCC 33591) in M-8 fraction (2.86 mg/  $\mu$ l) and in E-3 fraction (7.29 mg/  $\mu$ l). Antibacterial activities using agar well-diffusion method of *Elytraria acaulis* were tested against strains of microbes namely MRSA, *Escherichia coli*, *Klebsiella pneumoniae*, *Streptococcus agalactiae*, *Pseudomonas aeruginosa* and *Bacillus cereus* with

standard antibacterial drug enrofloxacin (1.3mg/ml), as a positive control and DMSO as the negative control and highest zone of inhibition was observed against MRSA (ATCC33591) M-7 (31.0  $\pm$  3.11mm). Similarly, highest zone of inhibition was found E-1(31.6  $\pm$  1.05mm) in ether cold extracts. The AI index of 4 as highest was recorded in both the extracts. On performing one dimensional FTIR spectra of methanol hot and ether cold extracts, bands around 2881-2946 cm<sup>-1</sup>, 3368 cm<sup>-1</sup> were attributed to the stretching vibration of =CH 2 and -NH band of glycosides and flavonoids in sample M-7 whereas bands around 2800-3600 cm<sup>-1</sup>, 2723.6 cm<sup>-1</sup> were attributed to the stretching vibration of -OH, -NH and -CH band of protein, amino acid and aldehyde group in sample E-1. The GC-MS profiling of M-1, M-2, M-7, and M-8 revealed the presence of 23, 24, 15, and 14 phytoconstituents respectively which has been reported to show antibacterial activities. Whereas, GC-MS profiling of E-1, E-2, E-5 and E-8 revealed the presence of 21, 20, 20, and 13 phytoconstituents respectively which have also been found to possess antibacterial properties. Further, the studied extracts can be isolated in pure form and used for various formulations which may help in treating various infections/diseases.

## **3. Molecular characterization of mannose binding lectin gene1 (MBL1) in *Bubalus bubalis* & its variability in cattle and buffalo genome**

Mannan-binding lectin (MBL), a collagen like pattern recognizing serum protein, is one of the important components of innate immunity. It provides first line of defence by its ability to bind the bacterial surface through its carbohydrate recognition domain and activates the complement pathway leading to lysis of bacteria independent of antibody. Most mammals have two MBL genes, MBL1 and MBL2, which encode the MBL-A and MBL-C proteins, respectively. A number of mutations have been found in both the coding as well as the non-coding regions of the MBL1 gene in various species, of which several variations affected the assembly of MBL1, thus lead to a low level of plasmic MBL and innate immune dysfunctions. MBL1 possibly contributed to bacterial infection resistance and was proposed as an indirect molecular marker of milk production traits to control mastitis and to improve dairy mastitis resistance traits in cattle. Hence, sequence analysis is important to locate mutations in nucleotide and amino acid sequence of MBL1 gene. In the present study, complete CDS of MBL1 gene was cloned and characterized in Murrah buffalo breed and DNA polymorphisms were also



investigated in Indian cattle (Sahiwal and Harijana) and buffalo (Murrah) breed. Multiple sequence alignment revealed that the complete CDS of Murrah buffalo was 98.1-99.6% similar to buffalo breeds and 98.3-98.5% similar to cattle breeds at nucleotide level. It was 96.8-98.8% similar to buffalo breeds and 96.8-97.2% similar to cattle breeds at amino acid level. Two unique non-synonymous mutations were found in MBL1 CDS of Murrah buffalo at position 538 (T→C) that caused an amino acid substitution at 180 (Serine→Proline) and 611 (T→C) that caused an amino acid substitution at position 204 (Leucine→Proline). Phylogenetic analysis revealed that Murrah buffalo was more closely related to another Murrah buffalo followed by Mediterranean buffalo breed and exhibited a close phylogenetic evolutionary relationship with cattle and yak. DNA polymorphism study was also conducted in a total 150 animals (50 Sahiwal, 50 Harijana cattle and 50 Murrah buffalo) maintained at LFC, DUVASU, Mathura (UP) by using PCR-RFLP assay. Amplification of intron I (g.855G>A), exon 2 (g.2686T>C) and exon 2 (g.2651G>A) regions of MBL1 gene revealed 588 bp, 401 bp and 162 bp PCR products, respectively. ApaI/intron I PCR-RFLP assay generated three genotypes viz. GG (311 and 277 bp), GA (588, 311 and 277 bp) and AA (undigested; 588bp), where GG genotype was more frequent (81.3%) than GA (16.6%) and AA (2.0%) and frequency of G allele was higher (0.89) than A allele (0.10) in all the screened animals. Chi square ( $\chi^2$ ) analysis revealed that all the screened cattle and buffalo population was in Hardy-Weinberg equilibrium (HWE). No significant difference was observed among genotypes on performing association study with milk production traits and somatic cell score (SCS). HaeIII/exon 2 PCR-RFLP assay revealed three genotypes viz. TT (274 and 127 bp), TC (274, 184, 127 and 90 bp) and CC (184, 127 and 90 bp), where CC genotype was more frequent (60.6%) than TT (24.6%) and TC (14.6%) and frequency of C allele was higher (0.68) than T allele (0.32) in all the screened animals.  $\chi^2$ -test showed that cattle population was not found in HWE whereas Murrah buffalo population was found in the HWE. Association study of observed genotypes with milk production traits and SCS revealed significant ( $P<0.05$ ) difference with age at first calving and SCS in Harijana cattle only where, CC genotype had lower SCS ( $170\pm84$ ) than other genotypes. Styl/exon 2 PCR-RFLP assay revealed monomorphic pattern with only undigested 162 bp band (GG genotype). Therefore, association analysis could not perform with milk production traits and SCS.

#### 4. Molecular Characterization of Bax inhibitor gene (TMBIM) in response to heat stress in goats of semi arid region

Bax inhibitor-1 (BI-1) gene, known as TMBIM6, is evolutionary conserved and regulates cell survival in response to various stress in animals and plants. The Bax and Bcl-2 is the most important genes that regulate program cell death (PCD) and Caspase helps to degradation of cells. The present study was carried out to analysed the TMBIM6 (Transmembrane Bax inhibitor motif) gene in relation to stress susceptible and stress tolerant phenotypes in different goat breeds. The environmental temperature was varied from 45-49.40°C, relative humidity 14.33-27%, and THI 85.40-89.80. Phenotype of individuals were carried out basing on heart rate (HR) and respiration rate (RR) during peak heat stress period and recognized as heat stress tolerance (HST) and heat stress susceptible (HSS). TMBIM6 genotyping was carried out by HRM (high resolution melting). The four different genotypes was blue (AA) 44.44%, red (AC) 36.11%, green (CC) 11.11%, purple (TT) 8.33%, analysed in sample. Frequency of allele A, C and T was 0.56, 0.20 and 0.20. Transition 33.33 % and transversions 66.65% was observed. Two novel mutant were identified at base position 55(T>C) in heat stress-tolerant (HST) individual in Barbari goat. Similarly the mutation at base position 96(A>C) was observed in heat stress-susceptible (HSS) individual in Jakhkana goat. The nucleotide sequence analysis indicated that the percent similarity of TMBIM6 gene fragment of goat with cattle, human and mouse was 92.2, 85.2 and 80.9%, respectively. For expression analysis: of Bax, Bcl-2 and Caspase total RNA was isolated from blood and subjected to RT-PCR. Relative fold expression of Bax at 3 month, 9 month, 12 month and adult was 0.9173, 22.19, 0.3005, and 7.044 respectively in HST phenotype. Similarly, in HSS phenotype the relative fold expression of Bax gene at 3 month, 9 month, 12 month and adult was 0.061, 23.24, 0.552 and 22.97 respectively. The relative expression of Bax was significantly higher at 9 month age group compared to 3 month, 12 month and adult in HST and HSS phenotypes. The ratio of relative expression of Bax was significantly higher at 9 month compared to Bcl-2 and Caspase gene. Relative mRNA expression profile of genes indicates that goat are more susceptible and tolerance during summer season. Higher expression of Bax gene during summer indicated that susceptibility of cells to PCD. Based on this finding it can be concluded that heat stressed goats are more susceptible to cell apoptosis and also responsible for genetic variability.



## 5. Studies on Detection, Prevalence and Molecular Characterization of Avian Rotavirus

Rotaviruses are the foremost cause of acute gastroenteritis. Outbreaks of rotavirus infection can lead to significant economic losses in livestock and poultry industry. Group A and D rotavirus are the predominant enteric viruses groups in birds. Limited prevalence studies are available to date in India including Braj region. Poultry samples consisting of 20 fecal samples and 80 intestinal content samples were collected during September 2017 and December 2018 from organized and unorganized poultry units/meat shops in and around Mathura region. Out of 100 samples screened by PAGE, no sample was positive for rotavirus. All samples screened by VP6 gene based diagnostic PCR for avian rotavirus A was negative. Out of 20 fecal samples collected from the Mathura region, 5 (25%) samples were positive in diagnostic analysis of avian rotavirus D-VP6 gene. Among the 80 intestinal samples, 22 (27.5%) were positive for AvRVD-VP6 gene giving an amplicon of 185 bp. Twenty seven samples screened for VP4, VP7, NSP4 and NSP5 genes of AvRVD were negative for VP4, VP7 and NSP4. Six samples were positive for NSP5 gene giving an amplicon of 652 bp size. 27.5% prevalence of AvRVD was observed. Most of positive samples were from organized farm collected in winter months and were mostly diarrheic. Cloning of amplified PCR product of NSP5 genes of six positive samples was done using pJet1.2/blunt cloning vector and recombinants were selected and sequenced. The isolates F14, F16, F19, D1, D3 and D4 showed 99.4 to 100% sequence similarity among themselves at nucleotide level. The percent nucleotide similarity of the sequences with chicken RVD isolates was in the range 78.2-85.1%. All the isolates showed the highest similarity of 85% with the chicken isolate D62 (KM254201) from South Korea followed by Germany (81.5%) and Australia (78.2%). The phylogenetic analysis exhibited three different clades in the dendrogram. All the six isolates (F14, F16, F19, D1, D3 and D4) clustered together and formed a separate clade with the isolates from Australia, Germany and South Korea. In the phylogenetic tree the RVA formed a separate clade while RVF and RVG were clustered in a separate group. Histopathology of duodenum, jejunum and ileum parts of small intestine from affected bird showed signs of enteritis, characterized by significant desquamation and loss of enterocytes and infiltration of a large number of inflammatory cells in the lamina propria, vacuolation and separation of enterocytes. The villi were severely damaged and distorted.

## 6. Molecular characterization and serosurveillance of *Theileria annulata* using recombinant Tams1 protein based ELISA

The present study deals with molecular characterization and sero-surveillance of theileriosis caused by *Theileria annulata* (*T. annulata*) using recombinant Tams1 protein based ELISA. Total 202 blood samples were screened for BTT with blood smear examination and PCR protocol. The best suited primers for PCR based diagnosis of *T. annulata* were screened. The primer set NTA F/R was found to be highly efficient in detecting the infection in comparison to standard N516/517 and Tams F/R primers. Alongside, primer set Tams F/R had better detection efficiency when used as outer primer with NTA F/R as inner primer in nested PCR protocol. A colorimetric LAMP assay for rapid diagnosis of theileriosis was also standardized. Colorimetric LAMP was found to be at par with nested PCR in detecting theileriosis and was more sensitive than single PCR. Alongside, PCR-RFLP analysis based on Tams1 gene revealed coexistence of four circulating genotypes of *T. annulata*, while a uniform restriction pattern was observed with HSP 70 gene in PCR-RFLP analysis. Thereafter, 14 *T. annulata* samples were characterized through sequencing. Thus obtained sequences were submitted in GeneBank and accession numbers MH277607-MH277620 were obtained. These 14 sequences, covering the five haplotypes, shared 91.3-100% nucleotide homology within them and varied between 90.3-99.0% with isolates from India whereas it was 86.6-98.2% when compared across the globe. Subsequently, phylogenetic analysis, were made for various isolates of *T. annulata* as well as for various *Theileria spp.* from around the globe. Present isolates were phylogenetically closer to Haryana and Bareilly isolates amongst the Indian counterparts isolates and globally to Turkey isolate. Merozoite surface protein analysis placed *T. annulata* with monophyletic cluster adjacent to *T. lestoquardi*. The recombinant Tams1 protein was cloned and expressed in prokaryotic expression system with pET-30b (+) expression vector. The expressed recombinant protein was purified using Ni-NTA chromatography, checked for immunoreactivity by western blot analysis with *T. annulata* positive serum. Both dot and plate ELISA using recombinant Tams1 protein showed at par diagnostic potential. Seroprevalance of BTT was observed 58.4% in cattle population and 46.5% in buffalo population, with dot-ELISA. Dot ELISA with minimum antigen requirement forms a suitable tool for epidemiological study at field survey levels.

**M.V.Sc.****College of Veterinary Science and Animal Husbandry****1. Evaluation of Antibacterial Activity of *Eucalyptus robusta* Nano-formulation**

The present study was undertaken to investigate the antibacterial effect of *Eucalyptus robusta* leaves extract loaded-solid lipid nanoparticles. *Eucalyptus robusta* leaves extract loaded SLNs was prepared and characterized. The particle size of SLNs was around 200 nm, zeta potential was 566.93 mV and the entrapping efficiency was 81%. Prepared nanoformulation was spherical in shape. *Eucalyptus robusta* leaves extract loaded SLNs did not exhibit any promising antibacterial activity against clinical isolates of *E. coli* and *Staphylococcus aureus* as determined by Agar well diffusion method. Therefore, further studies were undertaken only on crude extract of *Eucalyptus robusta* leaves. Experimental endometritis in rats was developed by inoculating the clinical isolate of *E. coli* ( $1 \times 10^7$  cfu/ml) in to the uterine horns during diestrus stage followed by cervical ligation. Endometritis in rats was confirmed based on presence of visible pus in the uterus, edematous uterine horns, thinning of endometrial lining and presence of bacterial load in uterine tissue homogenate. *Eucalyptus robusta* leaves crude extract (25 mg/ml) and Ciprofloxacin (50 mg/ml) were administered orally found to significantly reduce uterine weight and uterine secretion index. But bacterial load in the uterine tissue homogenate was not significantly reduced by both the treatments. Histopathological lesions in uterus also showed efficient induction of endometritis based on presence of inflammatory cells (neutrophils count) in uterine microscopic sections and their number was markedly reduced after treatment with *Eucalyptus robusta* leaves crude extract and ciprofloxacin. Compared with the effect of ciprofloxacin, *Eucalyptus robusta* produced almost similar curative and protective effects against endometritis. Cyclooxygenase 2 (COX-2) gene expression was found to be markedly reduced after treatment with *Eucalyptus robusta* leaves crude extract as compared with ciprofloxacin treatment. Based on our findings, it may be inferred that *Eucalyptus robusta* leaves crude extract possesses promising anti-inflammatory activity against experimental endometritis in rats and, therefore, it can be exploited in drug development program for treatment of endometritis in animals.

**2. Evaluation of aortic Notch signaling during late phase of sepsis**

Notch signalling is an evolutionary conserved pathway that allows cell communication through

cell to cell interactions. Besides its established role in embryonic development, recent reports have shown its involvement in different infections and inflammations of different body systems including cardiovascular system. Sepsis, a systemic inflammatory response syndrome against microbial infection, causes multiple organ failure resulting in death worldwide in human and animals. Vascular hyporeactivity and reduced peripheral resistance is considered to be the leading cause of death in sepsis. Though Notch signalling has been studied especially in macrophages during inflammation including endotoxaemia, its role in vascular beds in sepsis is yet to be explored. Thus present study was undertaken to evaluate the effect of sepsis on aortic Notch signalling and its involvement in regulating vascular functions during late phase of sepsis. Sepsis was induced by caecal ligation and puncture (CLP) in mice and thoracic aorta was collected for mRNA expression, western blot and immunohistochemical (IHC) study. Functional study on isolated aortic rings from different groups was also performed to assess the vascular reactivity to different vasoconstrictors. The mean survival time of septic animals were significantly ( $p < 0.001$ ) reduced in septic mice ( $19.97 \pm 1.04$  h;  $n = 30$ ) as compared to sham-operated (SO) mice. All the SO mice ( $n = 12$ ) survived during 72 h observation period. Sepsis significantly ( $p < 0.05$ ) down-regulated the aortic mRNA expression of Notch3 receptors along with Jag1 and Dll4 ligands as compared to SO mice. Accordingly, the protein expression of cleaved Notch intracellular domain (NICD) was found to be lower in aortic tissue sections from CLP mice in comparison to SO mice. The expression of mRNA transcript of Hey1, a Notch downstream effector gene, was also attenuated in septic mouse aorta. Unlike Notch3, we did not observe significant change in the mRNA and protein expressions of Notch1 receptors in septic mouse aorta. In addition, the mRNA expression of myosin light chain kinase (MLCK) was significantly ( $p < 0.05$ ) attenuated while myosin phosphatase (MYPT1) expression was increased in septic mouse aorta. Systemic inhibition of Notch signalling by intra-peritoneal administration of DAPT, a  $\gamma$ -secretase inhibitor, in septic mice did not improve CLP-induced vascular hypo-reactivity to nor-adrenaline (NA), CaCl<sub>2</sub> and high K<sup>+</sup> (80 mM) solution (KDS)-induced aortic contraction. Interestingly, DAPT pre-treatment significantly ( $p < 0.05$ ) attenuated the aortic response to NA, CaCl<sub>2</sub> and KDS as compared to the respective SO control. *In vivo* inhibition of iNOS/NO pathway by 1400W, a selective inhibitor of inducible nitric oxide synthase (iNOS), significantly ( $p < 0.05$ ) restored the mRNA

expression of Notch3 receptors in septic mouse aorta, however, it did not improve the CLP-induced down-regulation of Jag1 ligand and MLCK expression in aorta. Based on the above findings, it may be inferred that sepsis significantly attenuated the Notch (especially Notch3) signalling in mouse aorta along with reduction in contractile gene expression and associated vascular reactivity. iNOS/NO pathway, though involved in sepsis-induced down-regulation of Notch3 receptor, have secondary role in vascular hyporeactivity. Further, global inhibition of Notch signalling has serious impact on vascular response during sepsis though produced certain survival benefit.

### 3. Mechanistic studies on antidiabetic activity of *Pterocarpus marsupium* and ITK formulation in rats

The objective of the present study was to explore the therapeutic potential of hot alcoholic (100%), hydroalcoholic (70%) and cold aqueous extracts of *Pterocarpus marsupium* and hot aqueous extract of ITK formulation (mixture of gum acacia, black cumin, wheat and barley) against obese streptozotocin-induced type 2 diabetes in male Wistar rats. In Phase I study, tested extracts were observed to possess carbohydrates, alkaloids, proteins and amino acids, tannins, flavonoids, saponins, fixed oils and resins with additional glycosides in ITK formulation after screening by qualitative tests and further confirmed by semiquantitative analysis (by Gas Chromatography-Mass Spectrometry) to possess active principles having antidiabetic, antioxidant, nephroprotective, cardioprotective and anti-inflammatory properties. The extracts were evaluated for *In vitro* antioxidant (2, 2-Diphenyl-1-picrylhydrazyl (DPPH) and 2, 2'-Azino-bis (3-ethylbenzothiazoline-6-sulphonic acid) (ABTS) radical scavenging assay) and antidiabetic ( $\alpha$ -amylase and  $\alpha$ -glucosidase inhibitory activity) was determined. Aqueous and hydroalcoholic extracts have potent antioxidant and alcoholic extract of *P. Marsupium* showed superior antidiabetic activity over ITK formulation. Further in Phase II study, 48 obese male Wistar rats were divided into seven groups viz. group I (Healthy Control), group II (Obese), group III (Obese Diabetic), group IV (Obese Diabetic + Metformin @ 50 mg/kg b.wt.), group V (Obese Diabetic + ITK @ 435 mg/kg b.wt), group VI (Obese Diabetic + Aqueous *P.marsupium* @ 1 g/kg b.wt) and group VII and VIII were treated with hydroalcoholic and alcoholic @ 300 mg/kg b.wt. by oral gavage continuously for 60 days of *P. marsupium* extracts, respectively consisting six animals in each, were experimentally-induced-diabetes with single dose

of streptozotocin @ 35 mg/kg body weight, intraperitoneally. Increase in feed and water intake, decrease in percent weight gain and anthropometric parameters, reduced total leukocyte count, total erythrocyte count and platelets count while slightly increased percent haemoglobin, significant increase in fasting blood glucose and percent glycated haemoglobin (HbA1C) and C-peptide level was recorded in obese diabetic group rats. Treatment with metformin and tested extracts improved body weight, percent weight gain, feed and water intake and anthropometric parameters, lowered blood glucose, percent HbA1C and increased C-peptide levels, restoration of haematological indices where, alcoholic extract was emerged as a potent hypoglycaemic formulation and was comparable to metformin and superior to ITK formulation. Dyslipidemia (increase in triglycerides, total cholesterol, LDL and 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) was also observed in obese diabetic rats which were partially and significantly restored in rats treated with tested extracts and metformin. Obese diabetic rats revealed a significant increase in MDA and decrease in GSH level, decreased activity of CAT, SOD, GST and GP<sub>x</sub> in liver, kidney and heart whereas, improvement was observed in antioxidant enzymes in all the treatment groups. Histopathological findings and immunohistochemistry revealed degenerated pancreatic islets and acini in obese diabetic group rats, whereas treatment groups reversed the pathological features and showed less degenerative changes in pancreatic architecture and restored the normal histoarchitecture. Immunohistochemistry substantiated our findings that the treatment groups particularly of *P. marsupium* revealed regeneration of pancreatic beta cells. Thus, it can be concluded that, hot alcoholic extract of *P. marsupium* was superior to other extracts and considerable effect of hot aqueous ITK formulation to control hyperglycemia in STZ-induced-obese diabetic rats and to combat free-radical mediated derangements in the body.

### 4. Studies on the mechanism of action of methanolic extract of *Eucalyptus robusta* leaves against resistant bacteria isolated from clinical cases of uterine infections in bovines

Endometritis is one of the leading causes of reproductive inefficiency, infertility and decreased milk yield in high yielding dairy cows and buffaloes as well as in other species of animals and



are associated with severe economic loss. Indiscriminate use of antimicrobial agents has resulted in development of resistance to the available antimicrobials. Plant-derived active principles have promising potential to act as an alternative to conventional antimicrobial agents. In the present study, an attempt was made to investigate the mechanism of action of *Eucalyptus robusta* leaves (ER) extract against resistant bacterial isolates. Out of 70 clinical samples of uterine discharges from cattle and buffaloes having history of uterine infection, we have identified one isolate as methicillin-resistant *Staphylococcus*. As per the CLSI guideline, this isolate (S4) was found to be catalase +ve, oxidase -ve and possess *mecA* and *coaA* genes along with shown resistance to cefoxitin and MIC breakpoint for oxacillin was  $>4$   $\mu\text{g/ml}$ . Methanolic extract of ER reconstituted in water showed presence of eucalyptol (marker compound) along with other major bioactive phytoconstituents following GC-MS analysis. ER extract exhibited marked *In vitro* antibacterial effect against S4 isolate and MRSA (ATCC 33591) as evidenced by agar well diffusion test with MIC value of 0.3125 mg/ml. This antibacterial action of ER extract was shown to initiate at 8 h post-exposure while the complete bactericidal action was shown 16h post-exposure. Additionally, the electron microscopy and fluorescent microscopy studies shown that ER extract produced damage to the bacterial cell wall and loss of cell membrane integrity leading to release of the intra-cytoplasmic contents leading to vacuole formation and cell death. Moreover, 18 h post-exposure to ER extract significantly down-regulated mRNA expression of *NorB* and *NorC* efflux pump in both S4 isolate and reference strain of MRSA. The pathogenicity of S4 was further substantiated by the observation that intra-uterine infusion of S4 isolate produced prominent uterine inflammation after 7 days of surgical induction of endometritis in rats. Oral administration of ER extract (@25 mg/kg b.wt for 5 days after development of endometritis) significantly reduced the uterine secretion index and neutrophil infiltration in the endometrium. Moreover, the cellular damage in terms of destruction of endometrial glands and loss of endometrial lining epithelium was found to be comparatively lesser as compared to endometritic rats. However, *in vivo* oral administration of ER did not produce marked reduction in the uterine bacterial load possibly due to lesser concentration of ER at the site of infection. Surprisingly, combined treatment with cefixime + ER extract did not reduce the uterine inflammation rather the uterine bacterial load was found to be higher in these group suggesting a unwanted

pharmacokinetic interaction between these two agents. Oral administration of ER did not produce any adverse effect on small intestine (site of absorption), liver (organ of metabolism) and kidney (organ of excretion). Based on these above findings, it may be concluded that ER extract have promising antimicrobial potential against methicillin resistant *Staphylococcus* and the bactericidal action of the test extract was possibly mediated by disruption of cell wall and cell membrane and attenuating the expression of efflux pump related genes. Further, ER extract has promising anti-inflammatory activity against endometritis.

### 5. Ultrasonographic and Clinico-Biochemical Studies of Hepatobiliary System in Cattle and Buffaloes

Ultrasonographic and clinico-biochemical studies of hepatobiliary system in cattle and buffaloes (12 normal and 15 clinically affected bovines) were carried out in two parts. In part-I of study, 12 adult apparently healthy non gravid bovines (six cattle of group-I & six buffaloes of group-I) and in part-II of the study, 15 clinical bovine cases (eight cattle of group-II & seven buffaloes of group-II) were subjected to detailed hepatobiliary ultrasonography and liver specific serum enzyme analysis. In both cattle and buffaloes the present study revealed that, the hepatic parenchyma was homogenous coarse echogenic, interspersed with anechoic bands of hepatic vessels, with sharp border and was hyperechoic relative to right renal cortex. It was imaged from just behind the last rib to the 6th ICS. The gallbladder was seen as a pear shaped fluid-filled anechoic structure with hyperechoic wall, whereas distended gall bladder with thickening of its wall was considered a feature for edematous or inflammatory change. The portal vein was seen as a stellate, branching, anechoic structure with hyperechoic wall and the hepatic vein as anechoic tubular structure with anechoic wall within the hepatic parenchyma. The caudal vena cava was imaged as a triangular anechoic structure in transverse view and tubular in longitudinal view. Marked dilatation of caudal vena cava along with hepatomegaly was seen as diagnostic feature for hepatic congestion secondary to pericarditis. Calcified bile duct was seen as an arc shaped hyperechoic intense echogenic structure leaving distal acoustic shadow in the hepatic parenchyma. Hepatic cyst was seen as anechoic, round, unilocular structure with typical posterior acoustic enhancement. Hepatic abscess appeared as the circumscribed structural changes in hepatic parenchyma with variable echogenicity. Increase in



the size of the liver along with rounding of its border, presence of ascitic fluid, presence of calcified bile ducts, presence of cysts and abscess, gall bladder distension with its wall thickness, change in shape of CVC on transverse image, decreased Doppler flow rate of CVC and PV with concurrent increase in AST and GGT were found indicative of primary or secondary liver condition in bovines in this study.

#### 6. Studies on thoracic radiography, electrocardiography and echocardiography in small breed dogs

The present study was conducted in two groups to establish the reference values of various cardiothoracic parameters. In group-I, total six apparently healthy small breed dogs aged 18 - 72 months and body weight 6-15 kg free from cardiothoracic diseases were selected, group-II contained six small breed dogs suffering with cardiothoracic diseases. Positive correlation with age and body weight were observed in cardiosternal contact, and CVC/AO was found. Negative correlation with age and body weight were evident in cardiac height/ $T_3$ - $T_5$  and AO/ $T_4$ . Negative correlation with age and positive correlation with body weight were observed in VHS (Buchanan and Bucheler (1995) and Ljubica *et al.* (2007) method), cardiac height/thoracic height, cardiac width/thoracic height, cardiac width /  $T_3$ - $T_5$ , cardiac height/  $R_3$ - $R_5$ , cardiac width/  $R_3$ - $R_5$ , cardiac height + cardiac width /  $R_3$ - $R_5$ , cardiac height +cardiac width/  $T_3$ - $T_5$ , cardiac height + cardiac width / thoracic height, cardiophrenic contact/cardiac height, tracheal diameter/ $T_4$ , AO/  $R_4$ , cardiac index, 2TD/3, cardiothoracic ratio and right side costophrenic angle was observed. Positive correlation with age and negative with body weight was observed in cardiac inclination angle and left side cardiophrenic contact. Significant positive ( $p \leq 0.05$ ) correlation with age of duration in P wave, S-T segment and highly significant ( $p \leq 0.01$ ) QRS complex duration with age and non significant negative correlation found with body weight. Positive correlation with age and negative correlation of P-R, Q-T, R-R interval and heart rate/min were evident. Negative correlation with age and positive correlation with body weight was observed in amplitude of P wave, Q wave and T wave. Negative correlation with age and body weight was found in amplitude of R wave and positive correlation with age and body weight of S wave was found. In B-mode examinations of animals showed normal structural conformations of various cardiac structures. On M-mode echocardiography, positive correlation with age and body weight were observed in M-mode

echocardiographic measurements of IVSd, EF %, FS %, S %, PW % and stroke volume index (SVI). Negative correlation with age and body weight were observed in M-mode echocardiographic measurements of RDVd and LVDs. Positive correlation with age and negative correlation with body weight were observed in LVDd, EPSS, LA/AO, EDV, ESV, cardiac output (CO) and cardiac output index. Significant negative correlation of left ventricular mass with age and non significant positive correlation with body weight were evident. Negative correlation in Doppler echocardiographic measurements of Peak mitral velocity (ME/A) with age and no correlation with body weight was evident. Negative correlation with age and positive correlation with body weight was observed in Doppler echocardiographic measurements of Peak tricuspid velocity (E peak, T E/A) and aortic velocity. Highly significant positive correlation with age of pulmonary velocity in Doppler echocardiographic measurements was observed.



#### 7. Ultrasonographic Studies on Kidneys in Sahiwal Calves

This study was conducted on 30 apparently healthy Sahiwal calves of either sex which were divided into three groups of ten animals each namely Group I (0-3 months), Group II (3-6 months) and Group III (6-12 months). A thorough clinical examination of all the Sahiwal calves was performed before including them into the study. The right kidney could be scanned in standing position from Cranial-Dorsal part of right paralumbar fossa in animals of all groups. The left kidney in group-I, could be scanned from both

right and left paralumbar fossa, while in group-II and III, the it could be scanned only from right paralumbar fossa. The left kidney was always caudal and ventral to right kidney. The lobulations were discernible in animals of all groups in both longitudinal and transverse ultrasonograms. The capsule and the peri-renal fat were hyperechoic. The corticomedullary tissue was hypoechoic in comparison to the capsule and the tissue surrounding the kidneys and could be easily distinguished into cortex and medulla. The round or oval shaped hypoechoic medullary pyramids were discernible. The renal sinus was hyperechoic in comparison to the corticomedullary tissue. The distance of the right kidney from skin surface was  $0.60 \pm 0.07$  cm,  $0.61 \pm 0.04$  cm and  $0.80 \pm 0.02$  cm in group I, II and III, respectively. The horizontal diameter of kidney was  $6.21 \pm 0.19$  cm,  $7.84 \pm 0.30$  cm and  $8.82 \pm 0.40$  cm in group I, II and III, respectively. The vertical diameter of kidney was  $2.45 \pm 0.14$  cm,  $3.30 \pm 0.07$  cm and  $3.33 \pm 0.19$  cm in group I, II and III, respectively. The thickness of cortex was  $0.49 \pm 0.02$  cm,  $0.66 \pm 0.03$  cm and  $0.68 \pm 0.02$  cm in group I, II and III, respectively. The thickness of medulla was  $0.64 \pm 0.04$  cm,  $0.80 \pm 0.06$  cm and  $0.98 \pm 0.06$  cm in group I, II and III, respectively. The thickness of corticomedullary tissue was measured as  $1.03 \pm 0.06$  cm,  $1.38 \pm 0.10$  cm and  $1.61 \pm 0.10$  cm in group I, II and III, respectively. The diameter of medullary pyramid was  $0.68 \pm 0.05$  cm,  $0.78 \pm 0.01$  cm and  $0.86 \pm 0.05$  cm in group I, II and III, respectively. The horizontal diameter of renal sinus was  $3.51 \pm 0.20$  cm,  $3.73 \pm 0.19$  cm and  $4.59 \pm 0.38$  cm in group I, II and III, respectively. The vertical diameter of renal sinus was  $0.84 \pm 0.08$  cm,  $1.42 \pm 0.05$  cm and  $1.62 \pm 0.10$  cm in group I, II and III, respectively. The distance of the left kidney from skin measured was  $0.72 \pm 0.05$  cm,  $0.72 \pm 0.05$  cm and  $0.80 \pm 0.05$  cm in group I, II and III, respectively. The horizontal diameter was  $7.16 \pm 0.41$  cm,  $7.26 \pm 0.16$  cm and  $7.94 \pm 0.46$  cm in group I, II and III, respectively. The vertical diameter was  $2.87 \pm 0.20$  cm,  $2.93 \pm 0.08$  cm and  $3.02 \pm 0.22$  cm in group I, II and III, respectively. The thickness of cortex was  $0.52 \pm 0.03$  cm,  $0.60 \pm 0.02$  cm and  $0.66 \pm 0.03$  cm in group I, II and III, respectively. The thickness of medulla was  $0.71 \pm 0.04$  cm,  $0.75 \pm 0.03$  cm and  $1.01 \pm 0.10$  cm in group I, II and III, respectively. The thickness of corticomedullary tissue was  $1.18 \pm 0.06$  cm,  $1.35 \pm 0.04$  cm and  $1.61 \pm 0.13$  cm in group I, II and III, respectively. The diameter of medullary pyramid was  $0.70 \pm 0.04$  cm,  $0.58 \pm 0.07$  cm and  $0.90 \pm 0.08$  cm in group I, II and III, respectively. The horizontal diameter of renal sinus was measured as  $2.81 \pm 0.19$  cm,  $3.53 \pm 0.37$  cm and

$4.22 \pm 0.34$  cm in group I, II and III, respectively. The vertical diameter of renal sinus was  $0.87 \pm 0.06$  cm,  $0.98 \pm 0.05$  cm and  $1.24 \pm 0.07$  cm in group I, II and III, respectively. No anaesthesia or sedation was required for the ultrasonographic examination. The cortex, medulla, medullary pyramids and renal sinus could be appreciated and differentiated in all calves. The 5.0 MHz transducer was suitable to display the architecture of the renal parenchyma and sinus, dimensions of the kidney and sinus, medullary pyramids and to identify abnormalities of kidneys.

#### 8. Molecular Characterization of Bovine Intrauterine *Escherichia coli* Isolates and their Pathomorphological Studies in Rat model

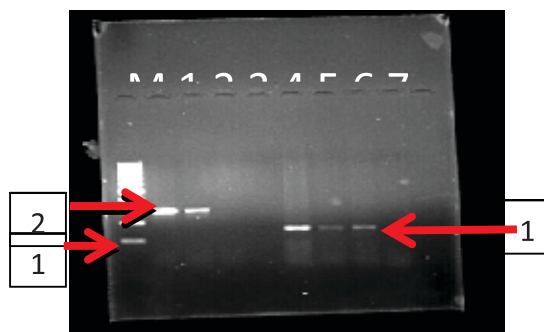
The present study was undertaken to characterize the virulence factors of *Escherichia coli* isolated from bovine clinical endometritis. Further uterine pathology induced by different phylogroups of *E. coli* was compared by *in-vivo* experiment in rat model. A total of 40 *E. coli* isolates that were previously assigned to one of the phylogroups viz; A, B1, C, D, E, F, and *clad1*, were used in the present study. The phenotypic detection for virulence determinants was carried out by; Congo red assay, haemolysin production, and biofilm formation. Out of 40 uterine *E. coli* isolates, 77% (n=31) showed CR binding, while 55% (n=22) were biofilm producers. Haemolysin assay confirmed 68% (n=28) isolates exhibiting  $\beta$ -haemolytic activity on sheep blood agar. Multiplex PCR targeting 11 VF genes viz. *Pap*, *Sfa*, *Afa*, *Hly*, *Cnf1*, *Cnf2*, *eaeA*, *F41*, *Sta*, *csaA*, *csaD* was carried out for all the isolates. One isolate each was positive for the *Pap* gene and *csaD* gene, whereas 3 and 8 isolates were positive for the *F41* gene and *csaA* gene, respectively. PCR assay could not detect *Sfa*, *Afa*, *Hly*, *Cnf1*, *Cnf2*, *eaeA*, and *Sta* gene in any of the isolates. Rats in diestrus were inoculated by virulent *E. coli* culture through intrauterine route. Five experimental groups were formed, where each one of the four groups received pure culture representing one of the four *E. coli* phylogroup viz; A, B1, D and F while one group serves as control. Endometritis in rats was confirmed based on the presence of visible pus in the uterus, edematous uterine horns, thinning of the endometrial lining. No significant difference was observed between different experimental groups with respect to mean uterus/body weight ratio. Histopathological changes noted in all the experimental groups with varying intensity except the control group animals and were characterized by invasion of neutrophils in endometrial superficial epithelium, stratum compactum, uterine

cavity and microabscess formation. Histopathological changes along with grading on the basis of inflammatory cells showed that Experimental group 4 (animals infected with *E. coli* strain phylogroup D) showed the most severe form of endometritis. Gene expression studied for important inflammatory marker (*COX-2* and *iNOS* genes) were undertaken using purified total RNA from uterine tissue of all experimental animals. No statistically significant differences in *COX-2* and *iNOS* genes mRNA expression between different experimental groups were observed. Based on present findings, it may be inferred that the different phylogroups of *E. coli* may exhibit different virulence characteristics, but does not differ significantly in their ability to cause uterine disease in diestrus rats.

#### 9. Isolation and molecular characterization of carbapenem resistant Gram-negative bacteria from livestock in Mathura region

The present study was conducted to obtain the prevalence of carbapenem resistant enterobacteriaceae organisms (CRE) in livestock and companion animals. The study population included non-repetitive 197 animals from Mathura and adjoining region. Pus, milk, fecal and uterine samples collected from various animals were processed in laboratory for isolation of gram negative enterobacteria and further characterized by biochemical test for genus and species determination. Antimicrobial susceptibility tests were performed for initial screening of resistant organism. CRE isolates were identified using phenotypic detection methods (mCarbaNP, CIA and MHT) as well as genotypic method. We were able to identify 6.74 % prevalence of CRE isolates. These CRE isolates were found to have co-localized *bla* VIM and *bla* IMP beta-lactamase. We have identified *bla* Oxa-48 gene from dog and cat, which is first report in India to the best of our knowledge. Higher prevalence (8.88 %) of CRE among companion animals in comparison to livestock (6.01%) was observed in this study. While not included in our initial goal, we also identified ESBL and quinolone resistance producing bacteria among Enterobacteriaceae families. Phenotypic confirmation of ESBL suspected strains were done by combination disc method and double disc method. Multiplex PCR was carried out for ESBL genotyping using TEM, SHV and, CTX-M specific primers. During the study period, a total of 70 isolates were identified as ESBL-producing Enterobacteriaceae, which includes *E. coli* (40.65 %), *Klebsiella* Sp (46.6 %), *Citrobacter* Sp (75.0 %), *Serratia* Sp (50.0 %), *Enterobacter* Sp (14.3%), and *Pseudomonas* Sp

(50.0%). Most of the isolate showed high rate (39.3%) of resistance for three cephalosporin antibiotic (cefotaxime, ceftriaxone, and cefpodoxime) combined.



PCR amplification of *bla*OXA48: 281 bp, *bla*IMP: 139bp, Lane M: 100 bp DNA Ladder, Lane 1-9: Test Isolates

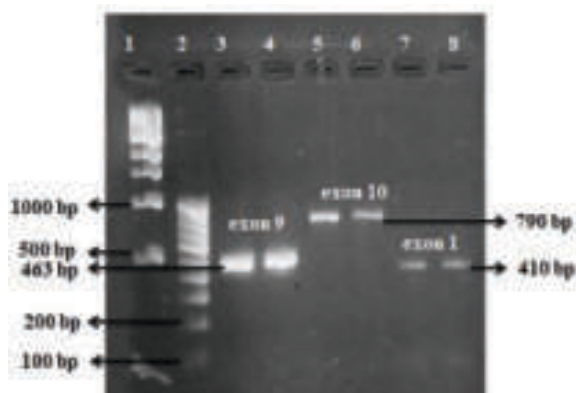
In the present study, *bla* CTX-M was observed as a predominant beta-lactamase type. In present study we found higher prevalence (48.48 %) of ESBL among livestock in comparison to companion animals (13.33%). Plasmid-mediated fluoroquinolone resistance genes were found in 9.55 % isolates. *QnrS* genotype was observed to be most prevalent (52.94%). The prevalence of QR was comparable in livestock (9.84%) with respect to companion animals (8.69%). In conclusion we have observed a very high prevalence of ESBL and low prevalence of CRE and quinolone resistant.

#### 10. Molecular characterization and association studies of CYP19 (aromatase) and estrogen receptor alpha (ERα) allelic variants with reproduction and production traits in Indian cattle breeds

CYP19 (aromatase) and estrogen receptor alpha (ERα) genes are directly related to synthesis and functioning of estrogen hormone. CYP19 gene product i.e. Aromatase is a unique member of the cytochrome P450 super-family. Estrogen hormone regulated cellular activity by interacting with specific intracellular receptor proteins i.e. Estrogen Receptor α. Estrogen receptor α like other members of nuclear receptors superfamily was a transcription factor which bounds to a proper ligand and regulated gene expression. In the present study, for characterization and polymorphism, genomic DNA was isolated from venous blood of Sahiwal and Hariana cattle, maintained at LFC, DUVASU, Mathura where exon 9 and 10 of CYP19 and exon 1 of ERα gene were characterized in both cattle and *PvuII*/PCR-RFLP and *BglII*/PCR-RFLP for 5'UTR region of CYP19 and ERα gene were performed in both the breeds and its associations with reproduction and

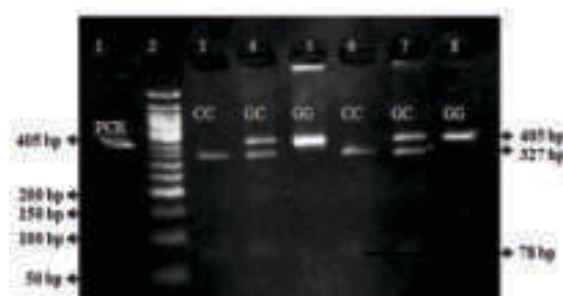


production traits was done. At nucleotide level, for CYP19 gene, studied breeds showed homology of 100% to Nelore and crossbred cattle and 99.8% to *Bostaurus*. At amino acid level, both cattle breeds showed homology of 100% to Nelore and crossbred cattle and 99.4% to *Bostaurus*. Exon 9 and 10 of CYP19 gene of *Bostaurus* contained a non-synonymous (C→G) nucleotide substitution at position 286. At amino acid level, *Bostaurus* had residue “Gly” at position 95 instead of “Ala”. At nucleotide level, exon 1 of ERα gene of Sahiwal cattle breed showed homology of 99.3% to crossbred cattle and *Bostaurus* sequences while, Hariana cattle breed showed homology of 99.5% to crossbred cattle and *Bostaurus* sequences. At amino acid level, both breeds showed homology of 99.3% to crossbred cattle and *Bostaurus* amino acid sequences. Exon 1 of ERα gene of Sahiwal cattle contained a synonymous (A→G) nucleotide substitution at position 48. A non-synonymous (G→A) nucleotide substitution at position 106 was showed by crossbred cattle and *Bostaurus* and one non-synonymous mutation (C→G) at position 175 was found in all cattle breeds. At amino acid level, crossbred cattle and *Bostaurus* had residue “Met” at position 36 instead of “Val”. Sahiwal, Hariana, crossbred and *Bostaurus* cattle had residue “Pro” at position 59 instead of “Ala”. For polymorphic study, blood samples from Sahiwal (n=100) and Hariana (n=100) breeds were isolated. The CYP19/*Pvu*II PCR-RFLP assay revealed three types of genotype namely AA (405 bp), AB (405, 327 and 78 bp) and BB (327 and 78 bp). The AA genotype was more frequent (58.5%) followed by AB (37%) and BB (4.5%) and frequency of allele A (0.77) was more than allele B (0.23). No significant difference was observed with milk production and reproduction traits.



Amplification of PCR products for exon 9 and 10 of CYP19 gene and for exon 1 of ERα, partial CDS of Sahiwal and Hariana cattle. Lane 1-2 (Marker), Lane 3-4 (463 bp product for exon 9 of CYP19), Lane 5-6 (790 bp product for exon 10 of CYP19) and 7-8 (410 bp product for exon 1 of ERα)

Likewise, ERα/*Bgl*II PCR-RFLP assay revealed three types of genotype namely AA (245 bp), AB (245, 168 and 77 bp) and BB (168 and 77 bp). The AB genotype was slightly more frequent (40.5%) than BB genotype (39%) followed by AA genotype (20.5%) and frequency of allele B (0.5925) was more than allele A (0.4075). No significant difference was observed with milk production and reproduction traits except for lactation period in Hariana cattle in which BB genotype showed higher significant ( $P < 0.05$ ) difference than other AB and AA genotypes. The  $\chi^2$  test showed that the screened animals were in Hardy-Weinberg equilibrium for both assays.



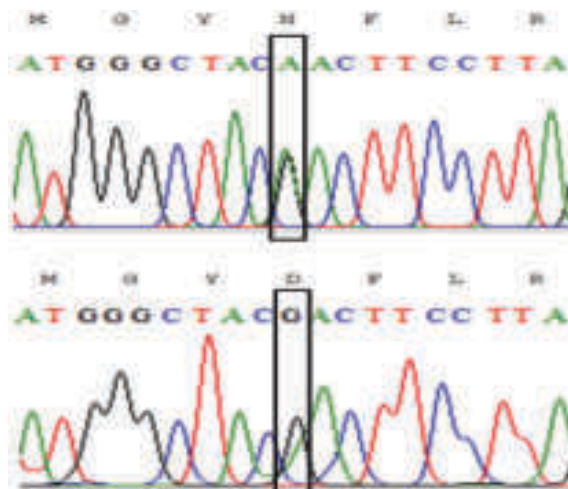
CYP19/*Pvu*II PCR-RFLP pattern for 5'UTR region of Sahiwal and Hariana cattle ran on 2.5% agarose gel electrophoresis. Lane 1 (405 bp PCR product), Lane 2 (50 bp Marker), Lane 3 and 6 (CC genotype), Lane 4 and 7 (GG genotype), 5 and 8 (GC genotype).

#### 11. Molecular characterization of Follicle stimulating hormone receptor (FSHR) and Luteinizing hormone receptor (LHR) genes and their polymorphism studies in Indian cattle breeds

Follicle stimulating hormone (FSH) and luteinizing hormone (LH) are glycoprotein hormones of pituitary origin. In the absence of FSH follicles are unable to grow consequently ovulation doesn't occur. LH causes ovulation and growth of corpus luteum from granulosa cells of ruptured graffian follicle. These hormones act by their respective receptors viz FSH receptor and LH receptor, which are located on target organs such as ovary and testis. These receptors are coded by *FSHR* and *LHR* gene. *FSHR* gene have 10 exons in which 10<sup>th</sup> exon is largest (>1230 bp) and *LHR* gene consists of 11 exons, among them 11<sup>th</sup> exon is largest (>1134 bp). Any mutation in the receptor gene causes over activation and inactivation of receptors so, effective binding of hormones will not take place hence caused reproduction and fertility problems in livestock. Hence, sequence analysis is important to locate mutations in nucleotide and amino acid sequence of both the genes. In the present study, partial CDS of *FSHR* exon 10 and *LHR* exon 11 were cloned and characterized in Sahiwal and Hariana cattle breeds



of India and also investigated DNA polymorphism. Multiple sequence alignment revealed that partial CDS of Sahiwal and Hariana *FSHR* exon 10 gene was 99.3% to 100% similar to exotic cattle breeds at nucleotide and amino acid level. A non synonymous substitution was found in Sahiwal and Hariana at position 1118 (C→G) that caused amino acid change at 373 (Thr→Ser). Phylogenetic analysis clearly indicated that Sahiwal and Hariana cattle were more closely related with yak and *Bostaurus*. Chromatogram study of Sahiwal *LHR* exon 11 revealed mixed peaks at location 107 and 524 which can be considered as heterozygote named as Sahiwal NV and Sahiwal DM. Sequence comparison of *LHR* exon 11 of Sahiwal (NV and DM) and Hariana showed 99.5% to 100% and 98.7% to 100% homology with exotic cattle breeds at nucleotide and amino acid sequence level, respectively. Single nucleotide change mutation found in all the cattle breeds except Sahiwal DM at position 107 G→A caused amino acid change at 36 (Asn→Asp). A non-synonymous mutation found in only Sahiwal DM at 524 (G→A) caused amino acid change at 175 (Val→Met). Phylogenetic tree of sequence of *LHR* exon 11 revealed that the Sahiwal NV was more closely related to Hariana and other exotic cattle breeds than Sahiwal DM. DNA polymorphism study was also conducted in 200 cattle (100 Sahiwal and 100 Hariana) maintained at LFC, DUVASU, Mathura (UP) by using PCR-RFLP. Amplification of *FSHR* exon 10 (C>G) and *LHR* exon 11 (T>C) regions revealed 306 bp and 303 bp PCR products. *FSHR/AluI* PCR-RFLP assay revealed three genotypes viz CC (243 and 63 bp), GG (193, 63 and 50 bp) and GC (243, 193, 63 & 50 bp), where CG genotype was more frequent (45%) than CC (13.5%) and GG (41.5%) and frequency of G allele was higher (0.64) than C allele (0.36) in all the screened animals. Chi square ( $\chi^2$ ) analysis revealed that all the screened animal population was in Hardy-Weinberg equilibrium. Association study of observed genotypes with milk production and reproduction traits revealed significant ( $P < 0.05$ ) difference only with total milk yield where, CC genotype showed higher milk yield than other genotypes. *LHR/HhaI* PCR-RFLP assay revealed three genotypes viz TT (303 bp), TC (303, 155, and 148 bp) and CC (155 and 148 bp), where TT genotype was more frequent (45%) than TC (42.5%) and CC (12.5%) and frequency of T allele was higher (0.66) than C allele (0.34) in all the screened animals.  $\chi^2$  test showed all the screened animals were found in Hardy-Weinberg equilibrium. No significant difference was observed in genotypes on performing association study with milk production and reproduction traits.



Chromatogram of *LHR* Exon 11 sequence showed that heterozygote condition revealed A→G substitution (36 N→D) at position 107

## 12. Efficacy of feeding mineral mixture on production and reproductive health of lactating cows

Present study was conducted to see the efficacy of feeding mineral mixtures on production and reproductive health of lactating cows. In present study, control group was not supplemented with any mineral mixture, T1 and T2 group was supplemented with mineral mixture-1 and mineral mixture-2 respectively, with dose rate of 30 gm/animal/day. Basal diet offered to experimental groups containing 40% concentrate, 30% green berseem and 30% wheat straw. DM was offered to all experimental group at about 3.5% 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) and DMI (kg/100kgBW) remained similar in all experimental groups. In present study, THI varied from 48.71 to 75.13. 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. Nutrient digestibility and digestible nutrient intake were not impacted by supplementation of different mineral mixtures to all treatment groups. However, mean digestibility of CP was significantly ( $P < 0.05$ ) improved in T1 and T2 compared to control group. Average fortnight body weight gain and BCS were similar in all groups. Blood Hb, PCV (%) and blood pH values were not overall impacted in different treatment groups. Biochemical parameters like plasma glucose, NEFA, plasma total protein, plasma albumin, plasma globulin, PUN, ALT, AST and creatinine were found similar in all treatment and control group. Plasma Ca concentration was

significantly high in T1 and T2 group in comparison to control group. However, Plasma P in present study was similar in all the experimental groups. FRAP concentration and total immunoglobulin concentration were found similar in all treatment and control group. Milk yield and milk composition in mineral mixture fed treatment groups were remained statistically non significant as compared to the control group. In the present study it was found that reproductive performance of anoestrus and repeat breeder lactating Sahiwal cows found improve for mineral mixture-2 (T2) fed treatment group compared to mineral mixture-1 (T1) fed treatment group. A net profit of Rs. 0.65/Kg milk/day and Rs. 0.79/Kg milk/day in T1 and T2 groups, respectively, than control group. So, It may be concluded that supplementation of mineral mixtures (1 & 2) improved balance of Ca and digestibility of protein and thus may be supplemented in the diet of lactating cows or reproductive problematic cows.

### 13. Effect of dietary supplementation of dried *Moringa oleifera* leaves on the performance of bucks

The present study was designed to evaluate the effect of dietary supplementation of dried *Moringa oleifera* leaves on growth performance, nutrient utilization, seminal attributes, haematological, blood biochemicals, antioxidant and hormonal parameters of bucks. For this study, 18 experimental bucks were selected from the herd maintained at Department of Physiology, DUVASU, Mathura (U.P.). The animals in Control group were fed on basal diet i.e. concentrate mixture, arhar straw and jowar silage without supplementation of dried *Moringa oleifera* leaves and the group T1 and T2 were fed basal diet along with supplementation of dried *Moringa oleifera* leaves at level 1.5 and 3.0% of DM offered respectively. Nutrient requirement of bucks were fulfilled as per ICAR (2013) recommendations of feeding standard. The experimental feeding was intended for 90 days. At the end of experiment, a digestion trial of seven days was conducted to appraise the effect of *Moringa oleifera* supplementation on nutrient utilization. Blood sample were collected at 0, 30, 60 and 90 days interval, respectively. After the start of experiment, the semen from each buck in a group were collected and pooled (to minimize individual variation). A total of six pooled ejaculates from each group were evaluated at day 0 (from 0-21d) i.e. start of experiment, day 45 (45-66 d) i.e. mid feeding and day 90 (90-111d) i.e. post feeding. A total of 54 semen samples were evaluated. The result revealed no significant ( $P>0.05$ ) difference

in Body weight, DMI, fortnightly weight gain, ADG and feed conversion ratio of bucks. The supplementation of *Moringa oleifera* had shown no significant ( $P>0.05$ ) difference on nutrient intake and digestibility in treatment groups. Digestible nutrient intake was found similar in all the experimental groups. CP, DCP and TDN intake kg/day remained similar in all experimental groups. DMI (kg/100 kg BW), TDN, CP and DCP intake (g/kg  $W^{0.75}$ ) remained similar in all experiment groups during digestion trial. Seminal attributes viz. volume of ejaculated semen (ml), semen colour, seminal pH, spermatozoa concentration ( $10^9$ /ml) and mass motility were found similar in all experimental groups. Whereas, Overall percent progressive motility and viability of spermatozoa was found significantly higher ( $P<0.05$ ) in T2 group as compared to Control group and comparable in T1 group. Overall percent HOST reactive and intact acrosome was found significantly higher ( $P<0.05$ ) in T2 group as compared to Control and T1 group. However, total morphological abnormal percentage of spermatozoa in present study was found similar in both Control and *Moringa oleifera* treated groups. The haematological parameters like haemoglobin and PCV was found significantly higher ( $P<0.05$ ) in *Moringa oleifera* supplemented group. The concentrations of plasma glucose, cholesterol, triglycerides, total protein, albumin, globulin, creatinine and urea did not change significantly ( $P>0.05$ ) in experimental bucks. Overall plasma AST activity of was found significantly higher ( $P<0.05$ ) in Control group as compared to T1 and T2 group and ALT activity was found similar in all experimental group showing no deleterious effect of *Moringa oleifera* supplementation on hepatic metabolism in experimental animal. Overall plasma SOD and Catalase activity of T2 group was found significantly higher ( $P<0.05$ ) than Control and T1 group bucks. Whereas, Overall lipid peroxidation value was found significantly lower ( $P<0.05$ ) in T2 group bucks as compared to Control group bucks. Plasma Overall plasma Cortisol concentration was found significantly lower ( $P<0.05$ ) in T2 group bucks as compared to Control group bucks. Plasma testosterone concentration was found significantly higher ( $P<0.05$ ) in T2 group bucks as compared to Control group bucks. Hence the dried *Moringa oleifera* leaves can be supplement at 3.0 % level without any deleterious effect on blood parameters and hepatic metabolism, it also exhibited stimulatory effect on the antioxidant status, ameliorated stress and improved the seminal attributes and testosterone concentration of experimental bucks.

#### 14. Antioxidant and immunomodulatory studies on calves treated with herbs and probiotics

The aim of this study was to determine the effect of Giloy (*Tinosporacordifolia*) and Shatavari (*Asparagus racemosus*) supplementation on the growth performance, antioxidant status, immune response and other bio-chemical attributes in growing pre-weaned indigenous calves. Eighteen growing pre-weaned indigenous calves were randomly allocated into three groups having six calves in each groups and fed for 90 days. Feeding regimen was similar in all three groups. Giloy and Shatavari unsupplemented group serve as Control. The treatment groups were supplemented with 50 mg of Giloy/kg body weight (BW) (T1) and 50 mg of Shatavari/kg BW (T2). The experimental calves were monitored daily for calf diarrhea, joint ill, calf mortality, fortnightly for body weight gain and monthly for body condition score (BCS), length and height gain. Peripheral blood samples and urinary samples were collected at 0, 30, 60 and 90 days post-treatment 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 and urine parameters. Adding Giloy or Shatavari in the diet of experimental calves did not exert any effect on the growth performance. There was no incidence of calf diarrhea and calf mortality while incidence of joint ill was significantly lower ( $P<0.05$ ) in treatment groups. RBCs count was significantly higher ( $P<0.05$ ) in Shatavari supplement group whereas, Hb concentration and PCV values were higher in Giloy supplemented calves. WBCs, lymphocyte and neutrophil counts showed non-significant effect of treatment. Mean plasma total protein, albumin, A/G ratio and plasma urea nitrogen (PUN) levels did not showed any significant effect between groups. However, mean plasma globulin level was significant ( $P<0.05$ ) higher in Giloy supplemented calves. The plasma cholesterol, triglyceride and lipid peroxide (LPO) levels were found to be significantly lower ( $P<0.05$ ) in Giloy supplemented groups. However, beta hydroxyl butyric acid (BHBA) concentration was lowest ( $P<0.05$ ) in Shatavari supplemented group. Treatment did not exert any effect on plasma glucose and non-esterified fatty acid (NEFA) concentrations. Giloy and Shatavari supplementation did not showed any effect on the biomarkers of liver functions i.e. aspartate aminotransferase (AST), alanine aminotransferase (ALT), alanine phosphatase (ALP) and biomarker of kidney function i.e. creatinine level. The

superoxide dismutase (SOD) activity and total antioxidant status (TAS) were higher in Shatavari supplemented group while Catalase (CAT) activity was similar among all three groups. Adding Giloy and Shatavari to the diet of growing calves increase ( $P<0.05$ ) plasma total immunoglobulin concentrations. Dietary treatment did not exert any effect on urinary attributes. In conclusion, dietary supplementation of Giloy and Shatavari in pre-weaned indigenous calves improves antioxidant status and immunity without any adverse effect on growth performance and liver and kidney functioning.

#### 15. Effect of floor type on performance and behaviour of buffalo heifers

Animal comfort is of great importance, both from welfare & economic prospective. Now a days, farmers and farm owners use various floor types for animal shed such as concrete, bricks, gravels, mattresses, rubber mats, stones, compost etc. Livestock markets then began producing different kinds of flooring mats and bedding materials, which, along with increased demand, claimed to be of utmost significance in cow growth and health. Meager information is available about the effect of floor type on various health and welfare related attributes of buffalo. Keeping these facts in mind the present study was undertaken with the objective to study the effect of different flooring types on feed intake and body weight gain, behavior and hematological and blood biochemical profile of buffalo heifers. With the approval of Institutional Animal Ethics Committee of College of Veterinary Sciences and Animal Husbandry, DUVASU, Mathura experiment was conducted during the months of November 2019 to February 2020 to achieve the goal. A total of 18 healthy buffalo heifers were randomly divided into three groups on the basis of body weight, containing six animals in each group. Treatment 1 (T1) Concrete flooring (Conventional method practiced at LFC) (Control); Treatment 2 (T2) Compost/cow dung bed flooring; Treatment 3 (T3) Rubber mat installed flooring. Drinking water was provided *ad lib* to all the experimental animals thrice a day, scheduled at early morning, afternoon and late evening. The feed was monitored to be given @ 3.5% body weight with calculated constitution of greens, dry fodder and concentrate acc to NRC 2001. For the purpose of investigation of various parameters under different objectives of the present study, blood samples were collected from experimental heifers at 0, 30, 60 & 90 days. The results of the study reveal that the dry matter intake, water intake, body weight, average daily body weight gain, FCR as well as FCE were not



affected by the floor types. The analysis of the results reveals that there was no significant difference in the values of both haemoglobin and PCV among the different treatment groups. The floor type had no significant effect on the plasma concentration of blood urea nitrogen, creatinine, glucose, cholesterol and total albumin. The pooled mean value of total plasma protein concentration were found to be significantly ( $P>0.05$ ) higher in T2 and T3 compared to control group. The overall mean value of total plasma globulin concentration was non significantly different ( $P>0.05$ ) between treatment groups. However at day 30 total plasma globulin concentration was significantly higher in T3 compared to T1 and T2 and significantly higher in T2 compared to T1 and T3 at day 60. The plasma Cortisol, tri-iodothyronine and thyroxine concentration of control and treatment groups were not found to be significantly different ( $P>0.05$ ) at monthly intervals. The 30<sup>th</sup>, 60<sup>th</sup> and 90<sup>th</sup> day observations revealed that the value of standing frequency in T2 treatment group was significantly higher ( $P<0.01$ ) than T3 which was further significantly higher than T1 (Control) group. The overall pooled mean values of standing time during day 8:00a.m –8:00p.m and standing time during night for 12 hrs (min)-8:00p.m-8:00a.m of T1 (Control) group were found to be significantly higher ( $P<0.01$ ) than T2 and T3 treatment groups. The overall mean value of Lying time during day 8:00 a.m to 8:00 p.m, and lying time during night 12 hrs (min)-8:00p.m—8:00a.m was significantly higher ( $P<0.01$ ) in T2 followed by T1 and T3. The 30<sup>th</sup>, 60<sup>th</sup> and 90<sup>th</sup> day observations revealed that the value of head movement while standing as well as while lying of T1 were found significantly higher ( $P<0.01$ ) than T2 and T3 at different observation interval. The overall pooled mean value of lying sternal posture of T2 group was found significantly higher ( $P<0.01$ ) than T1 (Control) and T3 treatment groups. The overall mean value of hygiene score of lower leg zone, udder zone as well as upper leg and flank zone of T1 (Control) was found comparatively higher ( $P<0.05$ ) than T2 and T3 treatment groups. The mean value of hygiene score of upper leg and flank zone of T3 group was found significantly higher than T2 treatment group. The hock score of T1 was found significantly higher ( $P<0.05$ ) than T2 and T3 treatment groups and further for T3 treatment group it was found significantly higher ( $P<0.05$ ) than T2 treatment group. From the results of this study, it may be concluded that cow dung bad was the most comfortable floor for the animals followed by rubber mats.

## 16. Infrared Thermo-graphical Study of Estrus in Dairy Animals

The present investigation was planned to evaluate the usefulness of Infrared thermographical camera for discrimination of various stages of estrus i.e. onset of estrus, standing heat and non estrus conditions in sahiwal cows. It was also validated by observing various physiological, haematological, blood biochemical and endocrine profile. The experiments were conducted on ten healthy, cyclic sahiwal cows maintained at DDD farm of LFC at DUVASU, Mathura. In present study behavioural attributes such as flehmen reaction score of teasure bulls for cows, restlessness and bellowing were observed to be significantly ( $P<0.01$ ) high during onset of estrus, as compared to standing heat and non estrus stages whereas number of mountings and frequency of frequent urination were observed to be significantly ( $P<0.01$ ) high during standing heat condition. The mean values for rectal temperature ( $38.90\pm0.07^{\circ}\text{C}$ ), respiration rate ( $23.20\pm0.42$  per minute), RBC ( $6.79\pm0.10 \times 10^6/\text{mm}^3$ ), WBC ( $10.65\pm0.18 \times 10^3/\text{mm}^3$ ), PCV ( $33.41\pm0.54\%$ ), and haemoglobin ( $11.47\pm0.15 \text{ mg/dl}$ ) of experimental cows were found to be significantly ( $P<0.01$ ) high during standing heat condition as compared to onset of estrus and non estrus stages. Interestingly, no significant difference for any of the bio chemical attribute except alkaline phosphatase in sahiwal cows could be observed during three different stages of estrus. The mean value for alkaline phosphatase was significantly ( $P<0.01$ ) high during standing heat ( $138.78\pm0.27 \text{ IU/L}$ ) condition as compared to other two stages. This finding indicated that none of the bio chemical attribute except alkaline phosphatase is helpful in discrimination of the above said three stages of the estrus in sahiwal cows. The mean plasma concentration of estrogen and cortisol during standing heat stage ( $22.25\pm1.89 \text{ ng/ml}$  and  $12.90\pm0.44 \text{ ng/ml}$ , respectively) of sahiwal cows were significantly ( $P<0.01$ ) high as compared to onset of estrus and non estrus stages of estrus. The mean infrared thermographical temperature of muzzle and vulva of sahiwal cows during standing heat stage ( $34.72\pm0.21$  and  $39.15\pm0.15^{\circ}\text{C}$ , respectively) were found to be significantly ( $p<0.01$ ) high as compared to two other stages of estrus. Thus, from present study it was concluded that infrared thermoradiography may be used as the efficient tool for detection of estrus and its different stages in sahiwal cows.



### **17. Development and quality assessment of fruit pulp incorporated goat milk yogurt**

The present study was conducted to develop and assess the quality characteristics of goat milk yogurt incorporated with fruit pulp and lemon grass leaves powder. First experiment was conducted to standardize the formulation and processing method for preparation of goat milk yogurt in terms of fat content *viz.* 4.0, 5.0 and 6.0 %; culture (NCDC-144) level *i.e.* 3.0, 4.0 and 5.0% and sugar level *i.e.* 20, 25 and 30% respectively. Finally goat milk yogurt with 5.0% fat, 4.0% NCDC-144 culture and 25.0% sugar (GY) was selected as optimized product and compared with Sahiwal milk yogurt (SY) and Haryana milk yogurt (HY) prepared with the similar formulation in second experiment for various physico-chemical and sensory properties. The values of textural parameters as well as flavour, texture, sweetness and overall acceptability scores of GH were significantly ( $P<0.05$ ) lower than SY and HY. Therefore, third experiment was conducted to improve the acceptability of GY with incorporation of fruits pulp *viz.* banana fruit pulp (B1, B2 and B3), sapota fruit pulp (P1, P2, and P3) and mango fruit pulp (M1, M2 and M3) separately at 15, 20 and 25% level. For banana fruit pulp, moisture and ash content, brix values, textural parameters and redness values increased whereas protein and fat content as well as lightness values decreased significantly ( $P<0.05$ ) in treatments. The scores of sensory attributes including overall acceptability were significantly ( $P<0.05$ ) higher in B2 than GY and other treatments. B2- goat milk yogurt with 20% banana fruit pulp was selected among the treatments. For sapota fruit pulp, moisture, ash content, brix values and textural parameters values increased whereas fat content and yellowness values decreased significantly ( $P<0.05$ ) with increased level of sapota fruit pulp. Sensory scores including overall acceptability scores were significantly ( $P<0.05$ ) higher in P3 than GY and other treatments. P3- goat milk yogurt with 25% sapota fruit pulp was selected among the treatments. For mango fruit pulp, pH, protein, fat content and lightness values decreased whereas titratable acidity, moisture, ash content, brix values, textural parameters and yellowness values increased significantly ( $P<0.05$ ) with increased mango fruit pulp. The scores of all sensory attributes were significantly ( $P<0.05$ ) higher in M3 than GY and other treatments. Therefore, M3- goat milk yogurt with 25% mango fruit pulp was selected among the treatments. The selected treatments *viz.* B2, P3 and M3 were further compared with control for various physico-chemical properties and sensory evaluation where

M3- goat milk yogurt with 25% mango fruit pulp was selected as the best treatment. In fourth experiment, goat milk yogurt added with selected fruits pulp (B2, P3 and M3) was further incorporated with lemon grass leaves powder *viz.* BL1, BL2 and BL3; PL1, PL2 and PL3; ML1, ML2 and ML3 at 0.25, 0.50, 0.75% level separately under three sub experiments. For banana fruit pulp and lemon grass leaves powder incorporated goat milk yogurt, pH and brix values, firmness, cohesiveness, work of cohesiveness, lightness and yellowness values decreased whereas ash content increased significantly ( $P<0.05$ ) in treatments. Sensory scores decreased significantly ( $P<0.05$ ) with increased level of lemon grass leaves powder. BL1- goat milk yogurt with 20% banana fruit pulp and 0.25% lemon grass leaves powder was selected as the best treatment. For sapota fruit pulp and lemon grass leaves powder incorporated goat milk yogurt, pH, fat content, firmness, work of cohesiveness, lightness and yellowness values decreased while ash content, brix values and redness values increased significantly ( $P<0.05$ ) in treatments. Sensory scores decreased significantly ( $P<0.05$ ) with increased level of lemon grass leaves powder. PL1- goat milk yogurt with 25% sapota fruit pulp and 0.25% lemon grass leaves powder was selected as the best treatment. For mango fruit pulp and lemon grass leaves powder incorporated goat milk yogurt, pH, fat content, brix values, lightness and yellowness values decreased while titratable acidity and ash content increased significantly ( $P<0.05$ ) in treatments. Flavour, texture, sweetness and overall acceptability scores of M3, ML1 and ML2 showed no significant difference, therefore, ML2- goat milk yogurt with 25% mango fruit pulp and 0.50% lemon grass leaves powder was selected as the best treatment. In fifth experiment, Three treatments (BL1, PL1 and ML2) selected from previous experiment along with GY (control) were stored under refrigeration at  $4\pm 2^{\circ}\text{C}$  and evaluated for physico-chemical, microbiological and sensory properties at every 3 days interval till insipient spoilage was evident. The values of titratable acidity, TBARS, FFA values and microbiological count of control as well as treatments increased significantly ( $P<0.05$ ) whereas pH and scores of all sensory attributes decreased significantly ( $P<0.05$ ) with progression of storage period. The control was not evaluated after 9<sup>th</sup> day due to microbiological spoilage and rejection by sensory panelists, whereas treatments could be evaluated upto 15<sup>th</sup> day. Thereafter, the products were spoiled with presence of slime on the surface and off flavour of product. Among the treatments, ML2 had higher oxidation stability and lower

microbiological count along with significantly ( $P<0.05$ ) higher overall acceptability scores till the end of the storage. It was concluded that well acceptable goat milk yogurt could be prepared by 5.0% fat, 4.0% NCDC-144 culture and 25% sugar content. The acceptability of goat milk yogurt was further improved with 25% mango fruit pulp and 0.50% lemon grass leaves powder in terms of flavour, nutrients and shelf life. This product was within safe limit in terms of fat oxidation and microbiological parameters and was well acceptable upto 15<sup>th</sup> day of storage under refrigeration at  $4\pm 2^{\circ}\text{C}$ .

#### 18. Development and quality assessment of goat milk shrikhand incorporated with fruit pulp

Goat milk shrikhand with 5.0% fat, 2.5% NCDC-159 culture and 30.0% sugar (GH) was formulated and compared with Sahiwal milk shrikhand (SW) and Haryana milk shrikhand (HR) for physico-chemical and sensory properties. The values of textural parameters as well as flavour and acceptability scores of GH were significantly ( $P<0.05$ ) lower than SW and HR. Further, incorporation of fruits pulp viz. apple (A1, A2, A3), papaya (P1, P2, P3) and strawberry (B1, B2, B3) at 15, 20 and 25% level separately was done in GH. For apple fruit pulp, pH, protein and fat content decreased whereas titratable acidity, moisture, ash content, water activity, brix values, textural and colour (except lightness) parameters as well as scores of all sensory attributes increased significantly ( $P<0.05$ ) with increased level of apple fruit pulp. A3-goat milk shrikhand with 25% apple fruit pulp was selected. For papaya fruit pulp, protein and fat content decreased whereas ash content, water activity, brix values, all textural parameters and yellowness as well as scores of all sensory attributes increased significantly ( $P<0.05$ ) with increased level of papaya fruit pulp. P3-goat milk shrikhand with 25% papaya fruit pulp was selected. For strawberry fruit pulp, pH, protein and fat content decreased whereas titratable acidity, moisture, ash content, water activity, brix values, all textural parameters and redness increased significantly ( $P<0.05$ ) with increased level of strawberry fruit pulp. B2-goat milk shrikhand with 20% strawberry fruit pulp was selected among the treatments. A3, P3 and B2 were further incorporated with tulsi leaves powder viz. AT1, AT2 and AT3; PT1, PT2 and PT3; BT1, BT2 and BT3 at 0.4, 0.6 and 0.8% level separately. For apple fruit pulp and tulsi leaves powder incorporated goat milk shrikhand, pH and brix values decreased whereas ash content increased significantly ( $P<0.05$ ) with increased level of tulsi

leaves powder. The scores of all sensory attributes decreased significantly ( $P<0.05$ ), however AT1 had significantly ( $P<0.05$ ) higher overall acceptability scores than AT2 and AT3. AT1- goat milk shrikhand with 25% apple fruit pulp and 0.4% tulsi leaves powder was selected. For papaya fruit pulp and tulsi leaves powder incorporated goat milk shrikhand, titratable acidity and ash content increased whereas fat content and brix values, all textural and colour parameters values (except redness) as well as scores of all sensory attributes significantly ( $P<0.05$ ) decreased with increased level of tulsi leaves powder. PT1- goat milk shrikhand with 25% papaya fruit pulp and 0.4% tulsi leaves powder was selected. For strawberry fruit pulp and tulsi leaves powder incorporated goat milk shrikhand, ash content increased whereas brix values, all colour and textural parameters values except consistency and cohesiveness and scores of all sensory attributes decreased significantly ( $P<0.05$ ) with increased level of tulsi leaves powder. BT1-goat milk shrikhand with 20% strawberry fruit pulp and 0.4% tulsi leaves powder was selected. AT1, PT1 and BT1 along with GH (control) were stored under refrigeration at  $4\pm 2^{\circ}\text{C}$  and evaluated for physico-chemical, microbiological and sensory properties at every 4 days interval till insipient spoilage was evident. The values of titratable acidity, TBARS, FFA values and microbiological count of control as well as treatments increased significantly ( $P<0.05$ ) whereas pH and scores of all sensory attributes decreased significantly ( $P<0.05$ ) with progression of storage period. The control was not evaluated after 12<sup>th</sup> day due to spoilage whereas treatments could be evaluated upto 16<sup>th</sup> day. Among the treatments, AT1 had higher oxidation stability and lower microbiological count along with significantly ( $P<0.05$ ) higher overall acceptability scores till the end of the storage. The product was well acceptable upto 16<sup>th</sup> day of storage under refrigeration at  $4\pm 2^{\circ}\text{C}$ .

#### 19. Development and quality assessment of fiber fortified enrobed turkey meat cutlets

The present investigation was conducted to develop and assess the quality characteristics of fiber fortified phyto-antioxidant rich enrobed turkey meat cutlets. First experiment was carried to optimize the processing technology of turkey meat cutlets using four different cooking methods viz. deep frying (DF), shallow frying (SF), microwave (MW) and microwave with shallow frying (MS). Turkey meat cutlets prepared by microwave cooking at 740 MHz for 10 minutes followed by shallow frying (MS) were found optimum. Second experiment was conducted to evaluate the effect of

different enrobing materials *i.e.* bread crumbs (BR), corn flour (CF) and egg liquid (EL) on physico-chemical and sensory properties of turkey meat cutlets. Coking yield and protein content as well as flavour, texture, juiciness, mouth coating, meat flavour intensity and overall acceptability scores of EL were significantly ( $P<0.05$ ) higher than control and other treatments. Therefore EL-turkey meat cutlets enrobed with egg liquid were selected as the best treatment and used as control in next experiment. In third experiment, an attempt was made to improve fiber content of enrobed turkey meat cutlets with incorporation of three fiber rich vegetables *viz.* capsicum powder (CP1, CP2, and CP3), carrot powder (CA1, CA2 and CA3) and jackfruit powder (JF1, JF2 and JF3) separately at 5.0, 10.0 and 15.0% level. For capsicum, carrot and jackfruit powder, pH, cooking yield, moisture, ash content, water activity, chewiness and redness values increased however hardness, springiness and lightness values decreased significantly ( $P<0.05$ ) with increased level of capsicum, carrot as well as jackfruit powder. In jackfruit powder incorporated turkey meat cutlets, gumminess values were also significantly ( $P<0.05$ ) higher in JF2 and JF3 than EL and JF1. The scores of all sensory attributes decreased significantly ( $P<0.05$ ) with increased level of vegetables powder except saltiness. There was no significant difference between CP1 and CP2 for various sensory attributes including overall acceptability; however in carrot powder incorporated enrobed turkey meat cutlets, CA1 had significantly ( $P<0.05$ ) higher overall acceptability scores than CA2 and CA3. There was no significant difference in colour and appearance, texture, juiciness and overall acceptability scores between EL, JF1 and JF2. Therefore, CP2- enrobed turkey meat cutlets incorporated with 10% capsicum powder; CA1- enrobed turkey meat cutlets incorporated with 5% carrot powder and JF2- enrobed turkey meat cutlets incorporated with 10.0% jackfruit powder were selected. The selected treatments *viz.* CP2, CA1 and JF2 were further compared with control (EL) for various physico-chemical properties and sensory evaluation where JF2- enrobed turkey meat cutlets incorporated with 10.0% jackfruit powder were selected as the best treatment and used as control in next experiment. In fourth experiment, fiber fortified enrobed turkey meat cutlets were incorporated with natural phyto-antioxidants *viz.* anise (AN1, AN2 and AN3), oregano (OR1, OR2 and OR3) and cardamom (CR1, CR2 and CR3) powder separately at 0.5, 1.0 and 1.5% level. For anise powder, pH, protein content, hardness,

springiness and lightness values decreased however ash content and chewiness values increased significantly ( $P<0.05$ ) with increased level of anise powder. AN1 had significantly ( $P<0.05$ ) higher sensory scores including overall acceptability than AN2 and AN3. Therefore, AN1-fiber fortified enrobed turkey meat cutlets with 0.5% anise powders were selected. For oregano powder, pH, cooking yield, moisture content, water activity chewiness and redness values increased whereas hardness and springiness values decreased significantly ( $P<0.05$ ) at higher level of oregano powder incorporation. Flavour, juiciness and overall acceptability scores increased significantly ( $P<0.05$ ) with increased level of oregano powder in turkey meat cutlets. OR3- fiber fortified enrobed turkey meat cutlets with 1.5% oregano powder were selected. For cardamom powder, protein content decreased while ash content, gumminess, chewiness and redness values increased significantly ( $P<0.05$ ) with increased level of cardamom powder. The scores of all sensory attributes decreased significantly ( $P<0.05$ ) in treatments except saltiness, however there was no significant difference between CR1 and CR2 for overall acceptability. Therefore, CR2- fiber fortified enrobed turkey meat cutlets with 1.0% cardamom powder were selected. In fifth experiment, these selected treatments (AN1, OR3 and CR2) from previous experiment along with JF2 (control) were stored under refrigeration at  $4\pm 2^{\circ}\text{C}$  and evaluated for various quality characteristics at every 4 days interval. The values of pH, TBARS, FFA and microbiological count of control as well as treatments increased significantly ( $P<0.05$ ) whereas scores of all sensory attributes decreased significantly ( $P<0.05$ ) with progression of storage period. The control was not evaluated after 12<sup>th</sup> day due to incipient signs of spoilage, whereas treatments could be evaluated upto 20<sup>th</sup> day. Among the treatments, OR3 had higher oxidation stability and lower microbiological count along with significantly ( $P<0.05$ ) higher overall acceptability scores followed by CR2 and AN1 maintained till the end of the storage. It is concluded that well acceptable turkey meat cutlets were prepared by microwave cooking at 740 MHz for 10 minutes followed by shallow frying. The acceptability of product was improved by enrobing with egg liquid, incorporation of 10% jackfruit powder as natural fiber and 1.5% oregano powder as natural phyto-antioxidant. This product was well acceptable upto 20<sup>th</sup> day of storage under refrigeration at  $4\pm 2^{\circ}\text{C}$  from oxidation and microbiological safety point of view.



## 20. Diagnostic Relevance of Serum Cystatin-C and SDMA in Detection of Early Renal Dysfunction associated with Canine Ehrlichiosis

In present investigation total 35 dogs were screened for ehrlichiosis, based on observation of 2-3 classical clinical symptoms of ehrlichiosis in dogs. All screened dogs underwent for blood smear examination to confirm the disease status. On blood smear examination 4 dogs were positive for ehrlichiosis; primary PCR revealed 9 positive dogs, however nested PCR confirmed 30 dogs positive for ehrlichiosis of all screened dogs. Important clinical symptoms exhibited by the CME positive dogs in decreasing frequency were fever and mucosal pallor followed by lymphadenomegaly, melena, depression, tick infestation and weight loss. Clinical symptoms with moderate frequency were epistaxis, ascites, ecchymotic and petechial hemorrhages, hind limb/scrotal/facial edema, ocular abnormalities, icterus and vomiting. Symptoms with least frequency were hematuria, hematemesis and CNS signs. Vital parameter like heart rate, rectal temperature, respiration rate were elevated with significant decrease in total leucocyte count, total erythrocyte count, haemoglobin, platelets, packed cell volume, however the mean values of neutrophils was significantly increased with decrease in lymphocytes. Mean values of monocytes, eosinophil, MCV, MCH, MCHC were non-significant from the control. The mean values of ALT, AST, ALP and BUN were elevated while total protein, albumin were decreased in ehrlichiosis affected dogs. Mean values of globulin and serum creatinine were non-significant from the control. Percentage positivity of ehrlichiosis was recorded on the basis of age, breed, sex and season. Age group with highest positivity was category 3 (1 year) with a positivity of 63.33 %, breed with highest positivity was German shepherd (36.67 %), sex with highest positivity was male (60 %) and season with maximum incidence of cases was summer (79.74%). In present study it was found that there was significant increase in serum cystatin C and serum symmetric dimethylarginine (SDMA) in both the treatment groups of dogs in comparison with control. However there was non-significant decrease in serum cystatin C and SDMA on day 14 post-treatment in both the treatment groups. In terms of improvement among both the treatment groups of dogs, best recovery was seen in group which was treated with conventional treatment combined with Papaya Leaf Extract, *Tinospora cordifolia*, *Withania somnifera*, Elemental Iron, Folic Acid, Copper, Cobalt, Vitamin B12 and Vitamin C followed by the group which was

treated only with conventional treatment along with *Tinospora cordifolia* and *Carica papaya* extract.

## 21. Role of endocannabinoid receptors (CB<sub>1</sub> and CB<sub>2</sub>) in mediating non-genomic signalling of hormone progesterone receptor in bull spermatozoa

Non-genomic progesterone (P4) signalling is fast, involving multiple intracellular messengers and is mediated through membrane receptors of spermatozoa during the terminal parts of sperm journey in the female genital tract. Non-genomic signalling of P4 results in capacitation, hyperactivity and acrosome reaction (AR). Cannabinoid receptors and their agonist Anandamide (AEA) mediate sperm dissociation from oviductal epithelium and induce sperm hypermotility and AR. Looking to the common terminal functions of endocannabinoids and P4, it was hypothesised that, there may be possible interplay between these in regulating capacitation and AR. To validate this hypothesis, *In vitro* trials were conducted in 64 semen ejaculates collected from 4 *Haryana* bulls under controlled laboratory conditions using sperm dilution medium simulating to the *in vivo* conditions. During the entire study, sperm concentration was maintained at  $10 \times 10^6/\text{mL}$  and all the drugs used in the study were dissolved in their respective solvents. Pair trial control and vehicle studies were carried out and results showed non-significant effect of vehicle on sperm attributes. Spermatozoa were treated with 1 pM, 1 nM and 1  $\mu\text{M}$  P4 and 1 pM P4 was found to be the best concentration of P4 for induction of capacitation and 1  $\mu\text{M}$  P4 was found to be the best concentration for AR. Selective blocking of CB<sub>1</sub> was carried out using SR141716A @ 1  $\mu\text{M}$  and CB<sub>2</sub> using SR144528 @ 1  $\mu\text{M}$ . AEA was used at 1  $\mu\text{M}$  and 1 nM as agonist for both CB<sub>1</sub> and CB<sub>2</sub>. Selective agonist for CB<sub>1</sub>, M-186 @ 1 nM and CB<sub>2</sub>, J4252 @ 1 nM were used, respectively. Selective blocking of CB<sub>1</sub> alone, CB<sub>2</sub> alone, CB<sub>1</sub> + CB<sub>2</sub> significantly ( $P < 0.05$ ) decreased the P4 signalling in spermatozoa regulating motility, capacitation and AR. AEA @ 1  $\mu\text{M}$  was found inhibitory for motility, capacitation and AR ( $P < 0.05$ ), whereas, 1 nM was found to enhance above functions ( $P < 0.05$ ). Interestingly, in the study, response of selective agonists at the used concentrations failed to produce any significant effect. Sorting and tracking experiments showed that P4 at all concentrations increase VCL, ALH and reduce LIN indicating hyperactivity in spermatozoa ( $P < 0.05$ ); while blocking of CB<sub>1</sub> and CB<sub>2</sub> resulted in reverse effects with or without P4 indicating interplay between cannabinoid receptors

and P4. Sorting trials indicated existence of sperm sub-populations in semen which are differentially reactive to P4 and all other drugs used in the study ( $P < 0.05$ ). Further, downstream signalling of P4 and cannabinoid receptors in regulating sperm capacitation and AR were evaluated by targeting five intracellular messengers. cAMP was blocked using its selective blocker KH7 @ 10 $\mu$ M; PKA using 1 $\mu$ M H-89, TRPV1 using 10  $\mu$ M Capsazepine, IP3 using 10 $\mu$ M LY294002, MEK inhibitor 1  $\mu$ M PD-184352, L-type calcium channel blocker 3  $\mu$ M Nifedipine and T-type calcium channel blocker 3  $\mu$ M NNC-55-0396 followed by their treatment with 1 pM P4 for capacitation and 1  $\mu$ M P4 for AR. Results showed, that alone blocking of any of the above messengers showed significant ( $P < 0.05$ ) reduction in induction of capacitation and AR; however, blocking of all these followed by treatment with P4 resulted in complete absence of capacitation and AR indicating the complex interplay between these signalling cascades and P4 along with CB1 and CB2 regulating sperm function. In conclusion- the study predicted existence of sperm sub-populations with differential reactivity to hormones and drugs and there is existence of possible intracellular pathways between cannabinoid receptors and P4 in regulating capacitation and acrosome reaction.

## 22. Expression of miRNA during heat stress in buffaloes

The present experiment was aimed to study differential expression of miRNAs and their target mRNAs during heat stress in buffalo heifers. Twelve healthy Murrah buffalo heifers aged between 1.5 to 2.0 years, weighing 250 to 300 kg, reared at the Livestock Farm Complex of the university were used as experimental animals. Experimental buffaloes were randomly assigned into two equal groups of six animals each for experiment purpose. The study was conducted in 2 phases i.e., Thermo-neutral (TN) and Heat-stress (HS) conditions in psychrometric chamber simulating the environmental conditions for 21 days in each phase. The animals were kept for six hours every day between 1000 and 1600 hours. During each phase of the experiment, physiological parameters viz. pulse rate (PR), respiratory rate (RR) and rectal temperature (RT) were recorded at 1500 hours on day -5, -3, -1, 0, +1, +3, +5 with respect to blood sampling. The blood sampling was done at 1500 hours on 15<sup>th</sup> day of the experiment. Blood was used for hematological analysis, plasma separation for biochemical examination and for isolation of blood mononuclear cells (PBMCs). PBMCs were used for extraction of miRNAs and total RNA using mirVana<sup>TM</sup> miRNA isolation Kit.

The first strand cDNA was synthesized from the isolated miRNA and total RNA using miScript II RT Kit and Revert Aid First Strand cDNA Synthesis Kit respectively, following manufacturer's instructions in thermal cycler. qPCR was performed with PowerUp<sup>TM</sup> SYBR<sup>TM</sup> Green Master Mix for relative gene expression studies. Physiological (PR, RR and RT), hematological (erythrocytic indices), biochemical (triglycerides, urea, ALT, AST, LDH), redox (SOD, ROS) and endocrine parameters ( $T_4$ ) altered significantly ( $p < 0.05$ ) during HS as compared to TN. However, TLC, lymphocyte and neutrophil; total protein and creatinine; MDA concentration and,  $T_3$  and cortisol did not change significantly ( $p > 0.05$ ) during HS as compared to TN. Out of eight target miRNAs only four were expressed in buffalo heifers. The relative expression of bta-mir-142, bta-mir-1248 and bta-mir-2332 was significantly ( $P < 0.05$ ) up-regulated whereas expression of bta-mir-2478 was significantly ( $P < 0.05$ ) down-regulated during HS as compared to TN. The relative expression of *HSF1*, *HSP60*, *HSP70*, *HSPA8* and *HSP90* was significantly ( $P < 0.05$ ) up-regulated whereas *HSF4* expression was significantly ( $P < 0.05$ ) down-regulated during HS as compared to TN condition. It can be concluded that a THI of 87-90 could lead to a moderate heat stress in buffalo heifers. On the basis of miRNA expression studies, it can be concluded that expression of miRNAs changes during HS as compared to TN condition and consequently the expression of their target mRNAs also alters.

## 23. Effect of dietary supplementation of graded levels of *Murraya koenigii* leaf meal on the performance of coloured chicken

An experiment was designed to study the effect of *Murraya Koenigii* leaf meal on the performance of coloured chicken with the objectives. To study the effect of feeding *Murraya koenigii* leaf meal on growth performance, immune competence, blood biochemical attributes and carcass quality of coloured chicken. A total of ( $n=180$ ), day old straight run coloured chicken were distributed into six dietary treatments: T1- basal diet, T2-T1+ 0.3% *Murraya koenigii* leaf meal (MLM), T3- T1+0.6% MLM, T4- T1+0.9% MLM, T5- T1+1.2% MLM, T6-T1+1.5% MLM having three replicates each. There was no significant difference in body weight among the treatment groups during 0-6 weeks of age. However, during 7<sup>th</sup> and 8<sup>th</sup> week, T3 birds had significantly higher ( $P < 0.01$ ) body weight than T2, T4 and T5. T3 had significantly higher ( $P < 0.01$ ) body weight gain than (g) T2, T4 and T5 during 4-

8 weeks of age. Further, T3 birds had apparently higher body weight gain than T1 and T6 birds during 4-8 weeks of age. In addition, during 0-8 weeks of growth phase, T3 had significantly higher ( $P<0.01$ ) body weight gain (g) than T2, T4 and T5 and apparently higher body weight gain than T1 and T6. During 0-4 weeks growth phase, T1, T3 and T5 had significantly better ( $P<0.01$ ) feed conversion ratio than T6. During 4-8 weeks growth phase, T1, T2, T3, T4 and T6 had significantly better ( $P<0.01$ ) feed conversion ratio than T5. Further, FCR was apparently better in T3 than other treatment groups. No significant differences were observed in IgG and foot web index response to 1% SRBC (log2 titre) among the treatment groups. However, total immunoglobulins were significantly higher ( $P<0.01$ ) in T1, T2, T3, T4 and T6 than T5. Plasma protein values were apparently higher in all the treatment groups compared to the control group. Uric acid levels of T2, T3 and T5 group was significantly higher ( $P<0.05$ ) than T1. Plasma cholesterol level was significantly higher ( $P<0.05$ ) in T1 than T2, T3, T4, T5 and T6. Percent calcium of breast muscles was significantly higher ( $P<0.01$ ) in T3 and T4 than T1, T2, T5 and T6 respectively. Percent phosphorous of breast muscle of T3 and T6 was significantly higher ( $P<0.01$ ) than T1, T2, T4 and T5. Further, percent calcium and phosphorous of breast and thigh meat was significantly higher ( $P<0.01$ ) in all the curry leaf meal supplemented groups compared to the control group. Thus, it may be concluded that dietary supplementation of 0.6% *Murraya koenigii* leaf meal in coloured chicken resulted in better growth performance after 4 weeks of age and lead to increase in percent calcium and phosphorus of breast and thigh meat cuts in coloured chicken.

#### 24. Effect of dietary supplementation of ferrous sulphate on the performance of turkey poults

The present study was conducted to assess the effect of dietary supplementation of ferrous sulphate on the performance of turkey poults. Day old turkey poults ( $n=96$ ) were distributed into four treatment groups, having three replicates of 8 birds each. The study was conducted in turkey poults during 0-8 weeks of age. Poults were fed T1 (control) basal diet, T2- supplemented with  $\text{FeSO}_4$  @ 80 mg/kg diet, T3- supplemented with  $\text{FeSO}_4$  @ 120 mg/kg diet, T4- supplemented with  $\text{FeSO}_4$  @ 160 mg/kg diet. Weekly body weight was significantly higher in T4 at 6<sup>th</sup> ( $P<0.05$ ), 7<sup>th</sup> ( $P<0.01$ ) and 8<sup>th</sup> week ( $P<0.01$ ) than T1 and T2. Further, weekly body weight was apparently higher in T4 than other treatment groups throughout the

experiment. Weekly body weight gain was also significantly higher in T4 than T1 and T2 and numerically higher than T3 at 6<sup>th</sup> ( $P<0.01$ ) and 7<sup>th</sup> week ( $P<0.05$ ). Phase wise body weight gain was also significantly higher ( $P<0.05$ ) in T4 than T1 and T2 and apparently higher than T3 during 4 to 8 weeks and significantly higher ( $P<0.01$ ) in T4 than T1, T2 and T3 during 0 to 8 weeks. Weekly feed intake was significantly higher ( $P<0.05$ ) in T1 than other treatment groups at 6<sup>th</sup> week of age. Phase wise feed intake was also significantly higher in T1 during 4-8 weeks ( $P<0.01$ ) and 0-8 weeks ( $P<0.05$ ) than other treatment groups. However, no significance difference was observed in feed intake during 0-4 weeks. FCR of T4 group was significantly better ( $P<0.01$ ) at 6<sup>th</sup> week and 7<sup>th</sup> week than T1 and T2 and comparatively better than T3. Weekly FCR was comparatively better with increasing  $\text{FeSO}_4$  supplementation. No significant difference was observed in the phase wise FCR among the different treatment groups. Humoral immune response was apparently higher in T4 than other treatment groups. T4 had significantly higher ( $P<0.05$ ) foot web index compared to T1 and T2 groups and comparatively higher than T3 group. No significant difference was observed in serum cortisol, IgG and IgM levels, blood biochemical attributes, development of digestive organs and lymphoid organs, carcass quality traits, yield of giblet and cut up parts. However, all the iron supplemented groups had significantly higher ( $P<0.01$ ) dressing percent compared to control. No significant difference was observed in the chemical composition of breast and thigh meat except for Fe. T4 had apparently higher deposition of Fe in breast muscle and significantly higher ( $P<0.05$ ) deposition of Fe in thigh muscle as compared to other treatment groups. Thus, it may be concluded that dietary supplementation of ferrous sulphate @ 160mg/kg resulted in better growth performance, immunity, significantly higher dressing percent and significantly higher deposition of iron in thigh meat cuts.

#### 25. Effect of dietary supplementation of L-valine on the performance of turkey poults

The present study was conducted to assess the effect of supplementation of L-valine on performance turkey poults. Day old turkey poults ( $n= 96$ ) were distributed into four dietary treatment groups, having three replicates of 8 birds each. The study was conducted in turkey poults during 0 - 8 weeks of age. Turkey poults of the control group (T1) were fed a basal diet, while T2 group- basal diet was supplemented with 0.04% L-valine, T3 group- basal diet was supplemented with 0.08% L-valine and T4 group- basal diet was supplemented



with 0.12% L-valine. No significance difference observed in average weekly body weight and body weight gain of birds throughout experimental period except at 7<sup>th</sup> week where birds in T2 and T3 poult had a significantly higher ( $P<0.05$ ) body weight and body weight gain than T1 and T4 treatment group. There was no significant difference in the average weekly feed consumption and feed consumption during different phases of growth of birds. No significance difference observed in FCR of birds during the entire experimental period except at 7<sup>th</sup> week where FCR was significantly better ( $P<0.05$ ) in T2 and T3 as compared to T1 and T4 group. HA titre was significantly higher ( $P<0.05$ ) in T3 as compared to T1 and T2 and numerically higher than T4. There was no significant difference observed in IgG, IgM titre and cell mediated immune response (foot web index values) among treatment groups. There was no significant difference observed in serum concentration of IgG, IgM, cortisol and blood biochemical parameters (cholesterol, HDL, uric acid, ALP, AST/GOT, ALT/GPT, SOD, ROS and LPO) except for plasma protein. Total plasma protein was significantly higher ( $P<0.05$ ) in T4 as compared to the other treatment groups. There was no significant difference observed in the development of digestive organs, lymphoid organs, various carcass quality traits, percent yield of giblet and cut-up-parts of turkey poult at 8 weeks of age among the different treatment groups. Percent breast weight was significantly higher ( $P<0.05$ ) in T3 group as compared to T1 and T2 group. Percent crude protein level in breast muscle of turkey poult was significantly higher ( $P<0.05$ ) in T3 as compared to T1. It was concluded that supplementation of L-valine @ 0.04% and 0.08% resulted in better growth performance in turkey poult. However, there was significantly better humoral immune response in birds supplemented with 0.08% valine. Further, dietary supplementation of L-valine @ 0.08% lead to increase in percent breast yield and higher percent crude protein level in breast meat.

## 26. Studies on effect of curcumin on cryopreservation of Haryana bull spermatozoa

The present study was designed to determine the effect of curcumin as an additive in tris-egg yolk-based extender in Haryana bull semen opted for cryopreservation. The study evaluated physico-morphological properties (individual progressive motility, viability, HOS response, acrosomal integrity, sperm kinematic (CASA) spermatozoa.), capacitation status and *In vitro* fertility test (BCMPT) after equilibration and thawing. Post-

thaw oxidative stress (protein carbonyl) and sub-cellular components (HMTMP, P-BSA-FITC, DNA fragmentation, Annexin-V-FITC, Immunolocalization of tyrosine phosphorylated protein and *In vitro* capacitation response) also evaluated. Eight ejaculates collected from four Haryana bull were divided into five aliquots. Aliquot diluted in egg yolk tris glycerol (EYTG), Group I: control (without addition of curcumin), Group II: treated with 10  $\mu$ M CUR, Group III: treated with 25  $\mu$ M CUR, Group IV: treated with 50  $\mu$ M CUR, Group V: treated with 75  $\mu$ M CUR/100 $\times$ 10<sup>6</sup> spermatozoa. Semen evaluated after equilibration and post-thaw stage showed supplementation of 10  $\mu$ M CUR in semen significantly ( $p<0.05$ ) increased viability %, acrosomal integrity %, HOS response %, F- Pattern %, vanguard spermatozoa (mm/h). 10  $\mu$ M CUR and 25  $\mu$ M CUR significantly ( $p<0.05$ ) increased motion and kinematic parameters in both stages. Supplementation of 10  $\mu$ M CUR and 25  $\mu$ M CUR significantly ( $p<0.05$ ) decreased oxidative stress and 10  $\mu$ M CUR protect sub cellular components of Haryana bull spermatozoa.

## M.Sc.

### College of Biotechnology

#### 1. Myostatin (MSTN) gene molecular characterization and polymorphic studies in Muzaffarnagari sheep

Development of muscles and parameters of meat quality is controlled by large number of genes. One of them is MSTN, which has an essential role in the development of embryo and regulation of tissue homeostatis. Due to the important role of the MSTN gene in muscle growth, it is considered as one of the important candidate genes in meat quality and quantity traits in domestic animals. Sequence variation in the MSTN gene can alter its expression and produce a non functional protein, which might lead to double muscling phenomenon in many species. In the present study, CDS sequence of MSTN gene had been cloned and characterized in Muzaffarnagari sheep breed (Accession No. MT038361) and DNA polymorphism study of 5'UTR and Exon 3 region of MSTN gene in Muzaffarnagari sheep was performed. Multiple sequence analysis of Muzaffarnagari sheep CDS MSTN revealed 100% similarity with Indian Nilgiri & other exotic sheep breeds, while 99.9% similarity with Indian Bandur breed at nucleotide level, whereas, 99.7% similarity with Indian Nilgiri and other exotic sheep breeds, while 99.5% similarity with Indian Bandur breed at amino acid level. Further sequence comparison revealed similar synonymous nucleotide substitutions at positions 126 (TC),

189 (AG) and 904 (CT) in studied Muzaffarnagari sheep, Indian sheep (Nilgiri, Bandur) breeds and exotic sheep (American and Norway) breeds. However, a non-synonymous (AT) nucleotide substitution at position 821 was shown by Bandur sheep breed that lead to presence of residue “V (Valine)” at position 274 instead of “E (Glutamic acid)”. 5'UTR (MSTN)/ DraI PCR-RFLP assay revealed monomorphic pattern with only BB genotype (no deletion of TTTTA) and B allele in Muzaffarnagari sheep and no association

study could not be performed. Exon 3 (MSTN)/MspI PCR-RFLP assay revealed polymorphic pattern with two types of genotypes (MM and Mm) with genotypic frequency of MM as 86.0% and allelic frequency of M as 0.93, while genotypic frequency of Mm as 14.0% and allelic frequency of m as 0.07. The  $\chi^2$  test showed that the population was in Hardy Weinberg equilibrium. There was no significant difference observed between Exon 3 (MSTN)/MspI genotypes for the growth traits.





Extension



## EXTENSION

### 1. DIRECTORATE OF EXTENSION

#### A. Trainings Organized in College of Veterinary Science and Animal Husbandry

Sl.No.	Theme of Training	Duration	Number of Trainees	Beneficiaries	Type of Beneficiary
1.	Refresher Training Programme on “Capacity Building of Veterinary Officers for effective delivery of Critical Services”	04 <sup>th</sup> -06 <sup>th</sup> Mar, 2021	16	Veterinary Officer	Uttar Pradesh Veterinary council
2.	Training on Scientific Dairy Farming, by ATMA Bharatpur (Rajasthan)	08 <sup>th</sup> -12 <sup>th</sup> Mar, 2021	30	Farmers	ATMA, Bharatpur (Rajasthan)



Refresher Training Programme on  
“Capacity Building of Veterinary Officers for effective delivery of Critical Services”



Training to the Farmers on Scientific Dairy Farming

**B. Visits of Farmers/Students/Officials**

S. No.	Date of Visit	Number & Address of Farmer	Sponsoring Agency	Remarks
1.	13.12.2020	30 Farmers under the leadership of Dr Radhey Shyam Singh from SMS, Deputy Director Agriculture, Agra	Agricultural Department, Uttar Pradesh	Provided literature and information about the dairy farming, health management and composting. Visit of PGC and Dairy and delivered the lecture on Dairy breed and their management of dairy animals at various stages of life.
2.	03.01.2021	25 Farmers under the leadership of Mr. Sonu from Aligarh (Uttar Pradesh)	Om Gaura Seva Samiti, Aligarh	Visit of Dairy farm and PGC, Distribution of literature to the farmers about the animal husbandry practices and delivered lectures on Heifer management & Health management of Dairy Animals.
3.	21.01.2021	45 Farmers under the leadership of Dr Santosh Kumar, Deputy Director Agriculture Sitapur	Agricultural Department, Uttar Pradesh	Provided hands on training, information and literature about dairy and goat farming. Visit of PGC, Goat unit and Dairy.
4.	22.01.2020	01 Farmers Krishna Mohan Rawat from CRPF Unit, New Delhi	Self	Provided basic information about the Dairy farming, loan and layout of ideal dairy farm with literature
5.	30.01.2020	85 Farmers under the leadership of Shri Rakesh Pandey from Shahjahanpur Uttar Pradesh	Saraswati Education Welfare Society	Visit of Dairy farm and PGC, Distribution of literature to the farmers about the animal husbandry practices and delivered the lecture on care & management of Dairy Animals.
6.	05.02.2021	67 Farmers under the leadership of Mr. Rohit Singh (TA) from Shahjahanpur (Uttar Pradesh)	Bhawana Sewa Sansthan	Visit of Dairy farm and PGC, Distribution of literature to the farmers about the animal husbandry practices and delivered the lecture on Milking management of Dairy Animals, Health management of Dairy Animals.
7.	18.02.2021	30 Farmers under the leadership of Mr. Sonu from Aligarh (Uttar Pradesh)	Om Gaura Seva Samiti, Aligarh	Visit of Dairy farm and PGC, Distribution of literature to the farmers about the animal husbandry practices and delivered the lecture on Scientific management of Dairy Animals.
8.	22.02.2021	30 Farmers under the leadership of Dr Harishanker (VAS) from Jamgaon (Durg, Chhatisgarh)	Animal Husbandry Department, Chhatisgarh	Visit of Dairy farm and PGC, Distribution of literature to the farmers about the animal husbandry practices and delivered the lecture on Milking management of Dairy Animals.
9.	22.02.2021	15 Farmers under the leadership of Dr Ponna Lal Sahu (VAS) from Durg block (Durg, Chhatisgarh)	Animal Husbandry Department, Chhatisgarh	Visit of Dairy farm and PGC, Distribution of literature to the farmers about the animal husbandry practices and delivered the lecture on care and management of Dairy Animals.

10.	22.02.2021	50 Farmers under the leadership of Shri Gopal Prashad, Agriculture Department, Maharajganj (Uttar Pradesh)	Agricultural Department, Maharajganj, Uttar Pradesh	Provided hands on training, information and literature about dairy and goat farming. Visit of PGC, Goat unit and Dairy.
11.	03.03.2021	12 Farmers under the leadership of Ramvir Singh (Director) Agriculture Firozabad (Uttar Pradesh)	Agricultural Department, Firozabad, Uttar Pradesh	Provides hands on training, information and literature about dairy and goat farming. Visit of PGC, Goat unit and Dairy.
12	13.03.2021	22 Woman Farmers under the leadership of Shri Omvir Singh (DD, ATMA) Agriculture Aligarh (Uttar Pradesh)	ATMA, Aligarh (Uttar Pradesh)	Visit of Dairy farm and PGC, Distribution of literature to the farmers about the animal husbandry practices and delivered the lecture on Scientific management of Dairy Animals and solve their desires.





## C. Training Manual Published: 02

1. Vaigyanic Padhhati Se dudharu Pashuwon Ka Prabhandhan
2. Refresher Training Manual on “Capacity Building of Veterinary Officers for effective delivery of Critical Services”

## D. Involvement on Dissemination of Technology through Kissan Mela: 01

Put the stall of DUVASU, Mathura in 03 days Krishi Mela/Kissan Gosthi and provide expert services and Lectures to farmers at village-Bateshwar, Tehsil- Bah, District- Agra on the occasion of Birth Anniversary of Bharat Ratna Late Atal Bihari Bajpai ji, Ex. Prime Minister of India on 06.03.2021



## 2. DEPARTMENT OF VETERINARY AND ANIMAL HUSBANDRY EXTENSION

The mandate of this department is to provide information and innovative knowledge to livestock owners by adopting improved technologies that may enhance their skills, increase their productivity, provides more employment

opportunities and thereby making them economically sound. The department also provides under-graduate and post-graduate teaching to the students to equip them with new methodologies to diffuse innovative researches among livestock owners in order to make them economically viable.

### 1. Exposure visit of the farmers conducted

S. No.	Department/Agency	Date	Number of beneficiaries
1.	Exposure visit of farmers from Etawah under ATMA through Animal Husbandry Department	25 <sup>th</sup> Sept., 2020	47
2.	Exposure visit of farmers from Aligarh under ATMA through Animal Husbandry Department	02 <sup>nd</sup> Nov., 2020	50
3.	Exposure visit of farmers from Gwalior under ATMA through Animal Husbandry Department	13 <sup>th</sup> Mar., 2021	12

### 2. Trainings organized

- Two days training program of farmers in collaboration with NGO - Om Gaura Sewa Sansthan, Aligarh from 18<sup>th</sup> -19<sup>th</sup> Dec., 2020
- Thirty Days training program of Multi Purpose Artificial Insemination Technicians in Rural India (MAITRI) trainees in collaboration with UPLDB, Lucknow from 20<sup>th</sup> Jan. to 18<sup>th</sup> Feb., 2021
- Thirty Days training program of Multi Purpose Artificial Insemination Technicians in Rural India (MAITRI) trainees in collaboration with UPLDB, Lucknow from 08<sup>th</sup> Mar. to 04<sup>th</sup> Apr., 2021
- Two days training program of farmers in collaboration with NGO – Gram Pragati Sansthan, Tundla, Firozabad from 02<sup>nd</sup> -03<sup>rd</sup> Mar., 2021
- Two days training program of farmers in collaboration with NGO - Om Gaura Sewa Sansthan, Aligarh from 13<sup>th</sup> -14<sup>th</sup> Mar., 2021.
- Two days training program of farmers in collaboration with NGO – Jan Kalyan Sansthan, Merrut from 15<sup>th</sup> -16<sup>th</sup> Mar., 2021.

### 3. EXTENSION ACTIVITIES PERFORMED BY VARIOUS DEPARTMENTS OF COLLEGE OF VETERINARY SCIENCE AND ANIMAL HUSBANDRY

#### a. Extension trainings organized by various departments

S. No.	Theme of Training	Duration	No. of Trainees	Beneficiaries	Organizers
1.	Training on “Newer concepts in diagnosis and management of surgical cases” was organized under All India Network Programme on Diagnostic Imaging and Management of Surgical Conditions in Animals (AINP-DIMSCA)	01 <sup>st</sup> -06 <sup>th</sup> Feb., 2021	9	Veterinary Officers	Department of Veterinary Surgery and Radiology
2.		08 <sup>th</sup> -13 <sup>th</sup> Mar., 2021	10		
3.	Training programme on “Dugdh utpadon ki gunvatta ka mulyankan” under RKVY project entitled “Establishment of referral laboratory for quality evaluation of milk and milk products”	17 <sup>th</sup> -19 <sup>th</sup> Feb., 2021	20	Food Safety Officers	Department of Livestock Products Technology
4.	Entrepreneurship training organized under RKVY funded project on “Pashu aahar udyog- Grameen yuvaon hetu udyamita ka naya aayam”	15 <sup>th</sup> -17 <sup>th</sup> Mar., 2021		Rural youth	Department of Animal Nutrition
5.	Entrepreneurship training under RKVY funded project on “Grameen yuvaon ke swarozgar hetu Pashu aahar udyog- Ek Naveen vikalp”	20 <sup>th</sup> -22 <sup>nd</sup> Mar., 2021			
6.	Training programme on “Control of subclinical parasitism in dairy animals” organized under RKVY funded project	08 <sup>th</sup> -10 <sup>th</sup> Feb., 2021	10	Veterinary Officers	Department of Veterinary Parasitology
7.	Scientific Training on Goat Management	12 <sup>th</sup> -14 <sup>th</sup> Oct., 2020	34	Pashu Sakhi and Women Farmers	Department of Veterinary Parasitology
8.	Scientific Training on Goat Management	06 <sup>th</sup> -10 <sup>th</sup> Nov., 2020	05	Farmers	
9.	Artificial Insemination in Goat	01 <sup>st</sup> -03 <sup>rd</sup> Dec., 2020	10	AI workers	
10.	Artificial Insemination In Goat	14 <sup>th</sup> -20 <sup>th</sup> Dec., 2020	10	Veterinary officers of Madhya Pradesh	
11.	Scientific training on Goat management	26 <sup>th</sup> -30 <sup>th</sup> Dec., 2020	22	Farmers	
12.	Artificial insemination in Goat	01 <sup>th</sup> -06 <sup>th</sup> Jan., 2021	16	AI Workers	
13.	Artificial insemination in Goat	01 <sup>st</sup> -03 <sup>rd</sup> Feb., 2021	08	AI Workers	
14.	Scientific training on Goat management	16 <sup>th</sup> -20 <sup>th</sup> Feb., 2021	18	Farmers	
15.	Artificial insemination in Goat	01 <sup>st</sup> -03 <sup>rd</sup> Mar., 2021	19	AI Workers	



Training of Veterinary officers by Department of Veterinary Surgery and Radiology



Training of Food Safety Officers at Department of Livestock Products Technology



Training for rural youth under RKVY project by Department of Animal Nutrition



**b. Extension training lectures/publications by various departments**

Sl.No.	Title of the lecture	Published in	Authors
1.	Common adulterants and preservatives in milk and milk products	Training manual on “Quality Evaluation of milk and milk products” in 3 Day’s Training programme on “ Dugdh utpadon ki gunvatta ka mulyankan” organized under RKVY project by Department of Livestock Products Technology from 17 <sup>th</sup> -19 <sup>th</sup> Feb., 2021	Prof. Vikas Pathak, Dr Meena Goswami Awasthi and Dr Sanjay Kumar Bharti
2.	Food safety regulations related to milk and milk products		Prof. Vikas Pathak, Dr Meena Goswami Awasthi and Dr Sanjay Kumar Bharti
3.	Determination of mineral content in milk using Atomic absorption spectroscopy (AAS)		Dr Meena Goswami Awasthi, Prof. Vikas Pathak and Dr Sanjay Kumar Bharti
4.	Estimation of fatty acid profile in milk and milk products using Gas chromatography		Dr Meena Goswami Awasthi, Prof. Vikas Pathak and Dr Sanjay Kumar Bharti
5.	Amino acid profile of milk and milk products using Ultra Performance Liquid Chromatography (UPLC)		Dr Sanjay Kumar Bharti, Prof. Vikas Pathak, Dr Meena Goswami Awasthi
6.	Compositional and quality evaluation of milk and milk products		Dr Sanjay Kumar Bharti, Prof. Vikas Pathak, Dr Meena Goswami Awasthi
7.	Endoscopy in veterinary practice–Principles, instrumentation and clinical application	Training on “Newer concepts in diagnosis and management of surgical cases” organized under All India Network Programme on “Diagnostic Imaging and Management of Surgical Conditions” in Animals (AINP-DIMSCA) from 01 <sup>st</sup> -06 <sup>th</sup> Feb., 2021 and 08 <sup>th</sup> -13 <sup>th</sup> Mar., 2021	Prof. R.P. Pandey, Prof. S. Purohit and Dr G. Kumar
8.	Radiography in veterinary practice–Principles, instrumentation and clinical application		Dr Gulshan Kumar
9.	Ultrasonography in veterinary practice–Principles, instrumentation and clinical application		Prof. Sanjay Purohit
10.	Common and special surgical interventions in goats		Prof. R.P. Pandey
11.	Guidelines for certain procedures in bovine		Prof. R.P. Pandey, Prof. S. Purohit and Dr G. Kumar
12.	Bovine foot lameness and its impact on fertility		Prof. R.P. Pandey and Dr Gulshan Kumar
13.	Haematological examination in animal disease diagnosis	Training manual on “Diagnostic interpretation and hands on training of animals diseases” organized by Department of Surgery and Radiology from 1 <sup>st</sup> Feb., -6 <sup>th</sup> Feb., 2020.	Dr Neeraj Kumar Gangwar
14.	Importance of mineral mixture in increasing productivity	MAITRI (Multi-Purpose A.I. technician in Rural India) Training programme from 20 <sup>th</sup> Jan., -18 <sup>th</sup> Feb., 2021	Prof. Vinod Kumar
15.	Methods to improve the quality and utilization of poor quality roughages		Dr Avinash Kumar
16.	Basic aspects of nutrition and concept of ration balancing		Dr Muneendra Kumar
17.	Economically important diseases and their prevention through timely vaccination, various available vaccines, vaccination schedules and		Dr Barkha Sharma



	importance of maintaining cold chain		
18.	Animal health care: Diagnostics for control and eradication of diseases FMD, HS, PPR & Avian Diseases		
19.	Vaccination schedule of bovine animals		Dr Udit Jain
20.	Importance of proper nutrition including feeding of vitamins and minerals mixtures and deworming in fertility management with emphasis on the adverse impact of macro and micronutrients deficiencies on fertility status/ reproductive health of animal		Dr Raju Kushwaha
21.	स्वच्छ दूध उत्पादन से थनैला रोग की रोकथाम		Dr Parul
22.	Production, processing & packaging clean and hygienic milk		Dr Meena Goswami Awasthi
23.	पाश्चरीकरण: महत्व एवं दुग्ध अपमिश्रण, संरक्षण उपयुक्तता		Dr Sanjay Kumar Bharti
24.	Female Reproductive Organs and Their Functions		Dr Varsha Gupta
25.	Effect of balanced ration on dairy animal productivity and health	In 05 days Masters training programme organized by Directorate of Extension, DUVASU, Mathura from 10 <sup>th</sup> -14 <sup>th</sup> Feb., 2020	Prof. Vinod Kumar, Dr Muneendra Kumar, Dr Raju Kushwaha, Dr Shalini Vaswani, Dr Avinash Kumar
26.	Balanced animal nutrition	In Training programme under RKVY project organized by department of Animal Nutrition	Prof. Vinod Kumar
27.	Bakriyon ka khadhye prabadhan. Unnat bakri palan.	In training manual published under RKVY project organized by department of Veterinary Physiology	Dr Shalini Vaswani and Prof. Vinod Kumar
28.	डेरी पशुओं में होने वाली मेटाबोलिक तथा पोडोशन बीमारियाँ	Training on 'Scientific management of dairy animals'- ATMA sponsored- organized by DOE DUVASU, Mathura from 8 <sup>th</sup> -12 <sup>th</sup> March, 2021.	Dr Ashish Srivastava
29.	Pashuon ke pramukh pashujanyarog evam unke bachao ke tarike		Dr Udit Jain
30.	दुग्ध प्रसंस्करण एवं शीतलन तकनीकियाँ		Dr Meena Goswami Awasthi
31.	The cause of abortion and its management in female animals		Dr Anuj Kumar
32.	Causes and treatment of infertility and importance of AI		Dr Jitendra Agrawal
33.	Reproductive management in cattle and buffalo for calf a year		Dr Vikas Sachan
34.	Veterinary malpractice and dealing with vetero-legal cases		Dr Ashish Srivastava
35.	Brucellosis and its vaccination		Dr Udit Jain
36.	Zoonotic diseases of Importance	Training on 'capacity building of veterinary officers for effective delivery of critical services' organized by DOE, DUVASU, Mathura from 4 <sup>th</sup> -6 <sup>th</sup> March, 2021	Dr Parul
37.	Methodology to be adopted to increase conception rate in dairy animals		Dr Anuj Kumar

38.	Handling of LN <sub>2</sub> container, thawing procedure and loading of AI gun		Dr Jitendra Agrawal
39.	Extension strategies and management of transition period in dairy animals	Rrefresher training organized on 'Management of modern dairies' under Agri-clinics and agri-business centers scheme by NDRI on 25 <sup>th</sup> -27 <sup>th</sup> Feb, 2021	Dr Amit Singh
40.	Common diseases of dairy animals: their symptoms control and preventive measures		Dr Ashish Srivastava
41.	An Evaluation of <i>In vitro</i> and <i>in vivo</i> techniques alongside with molecular techniques used for detection of anthelmintic resistance	Training under RKVY project organized by Department of Veterinary Parasitology from 08 <sup>th</sup> -10 <sup>th</sup> Feb., 2021	Dr Jitendra Tiwari and Dr Vikrant Sudan
42.	Diagnosis of endoparasites through conventional methods		Dr Vikrant Sudan and Dr Jitendra Tiwari
43.	Demonstration Of Vectors And Vector Borne Diseases		Dr Pradeep Kumar and Dr Amit Kumar Jaiswal
44.	भारत में स्वदेशी गाय की महत्ता एवं उसका व्यवसायिक उपयोग	ई-पशुपालन, अंक 3 संस्करण 2, मार्च 2021	डा. संजय कुमार मिश्र डा. रेखा शर्मा डा. दीप नारायण सिंह
45.	वर्षा ऋतु में मुर्गीपालन	पोल्ट्री मंच वर्ष 6, अंक 3 पेज सं. 24-28, 2020	प्रो. पी.के. शुक्ला डा. अमिताव भट्टाचार्य डा. डी.एन. सिंह डा. रजनीश सिरोही
46.	बैकयार्ड शूकर पालन स्वरोजगार का एक उत्तम उपाय	ई-पशुपालन, अंक 1 संस्करण 1, जनवरी 2021	डा. संजय कुमार मिश्र डा. दीप नारायण सिंह
47.	कोविड-19 का भारतीय पोल्ट्री उद्योग पर प्रभाव	पोल्ट्री मंच वर्ष 6, अंक 6 पेज सं 22-24	प्रो. पी.के. शुक्ला डा. अमिताव भट्टाचार्य डा. डी.एन. सिंह डा. रजनीश सिरोही
48.	एमू अंडे का औषधीय उपयोग	कृषक दूत सेहतनामा (2021) 2 से 8 मार्च 2021 पेज 12. 14	यश भार्गव डॉ संदीप कौर डॉ प्रदीप कुमार अभिषेक मिश्र
49.	Coccidiosis in small ruminants	Livestock Technology (2020). 10(5):44-45	Dr Alok Kumar Singh Dr Pradeep Kumar Dr A.K. Jayraw Dr J. Jaylakshmi
50.	Coccidiosis: A threat in Poultry Community	Poultry Technology (2020). 6: 56-58	Dr Alok Kumar Singh Dr Pradeep Kumar Dr Shailendra Singh Dr Arpana Raikwar
51.	Bakri palan ko aise banaye labhkari vyavasay	DUVASU, Pashudhan Patrika, July, 2020. Page-14.	Dr Neeraj Kumar Gangwar Dr Kavisha Gangwar Dr Avantika Srivastav
52.	Application of nanotechnology in poultry: A bird's eye view	Poultry Planner (2020). pp-14-21.	Dr A. Bhattacharyya Prof. P.K.Shukla
53.	Impact of COVID-19 on Indian poultry sector	Poultry Punch (2020). pp-40-42.	Prof. P.K. Shukla Dr A. Bhattacharyya
54.	Role of essential oils in poultry nutrition	Poultry Planner (2020). pp-8-10.	Dr A. Sharma Dr A. Bhattacharyya Prof. P.K. Shukla Dr V.K. Singh





55.	Indian poultry today and tomorrow	Poultry Technology (2020) pp-38-42.	Prof. P.K. Shukla Dr S. Nayak Dr A. Bhattacharyya
56.	Gut health management strategies in antibiotic free poultry production	Poultry Planner (2020). pp-20-24.	Dr V.K. Singh Prof. P.K. Shukla Dr A. Bhattacharyya Dr A. Sharma
57.	Role of betaine in poultry production.	Poultry Planner (2020). pp-8-12.	Dr P.R. Jadhav Dr A. Bhattacharyya Prof. P.K. Shukla.
58.	Poultry management in rainy season: Key points	Poultry Punch. August (2020)	Prof. P.K. Shukla Dr A. Bhattacharyya
59.	An overview of Brucellosis.	Livestock Line (2020). 14(4):4-7	Dr Gourab Basak Dr Udit Jain
60.	Birdflu: Kukkut udhyog se jude logon ke liye jatil samasya	epashupalan.com Jan, 2021.	Dr Udit Jain Dr Parul Dr Barkha Sharma Dr Gourab Basak
61.	Machhro ke katne se manushyon main hone wale vishanu janit rog evam bachav	e-pashupalan in month of December 2020.	Dr Udit Jain Dr Sanjay Mishra
62.	Pashuon se manushyon main athva Manushyon se pashuon main hone wale rogon (zoonotic rog) ke karan, lakshan evam unse bachao	Pashudhan praharee (2020).	Dr Sanjay Kumar Mishra Dr Udit Jain
63.	गाय या भैंस में मेसिरेशन ऑफ फीटस	पशुधन प्रहरी, Sep, 2020	डा. संजय मिश्र डा. विकास सचान
64.	पशुओं में गर्भाशय ग्रीवा का शोथ/ सर्विसाईटिस	पशुधन प्रहरी, Jun, 2020	डा. संजय मिश्र डा. विकास सचान
65.	कृतिम गर्भाधान से सम्बन्धित सामान्य समस्याएं एवं उनका निदान	पशुधन प्रहरी, Jun, 2020	डा. संजय मिश्र डा. विकास सचान
66.	पशुओं में अनुत्पादकता एवं कम उत्पादकता के कारण एवं निवारण	epashupalan-Jan, 2021	डा. संजय मिश्र डा. विकास सचान प्रो० अतुल सक्सेना
67.	भारत में कृतिम गर्भाधान की वर्तमान स्थिति एवं महत्त्व	खेती, Mar, 2021	डा. विकास सचान
68.	दुधारू पशुओं में लिंग वर्गीकृत वीर्य (सेक्सड सीमेन) से गर्भाधान: सुझाव	पशु सन्देश, Feb, 2021	डा. अरुनीश कुमार सिंह डा. विकास सचान
69.	Care of female animals after delivering calf.	www.epashupalan.com 2021	Dr S.K. Mishra Dr J.K. Agarwal Dr Vikas Sachan Dr Anuj Kumar Prof. Atul Saxena
70.	Main productive diseases/ Hypocalcemia in dairy animals after parturition.	www.epashupalan.com 2021	Dr S.K. Mishra Dr Avneesh Kumar Singh Dr Anuj Kumar Prof. Atul Saxena Dr Ambika Sharma
71.	Diagnosis and treatment of fetal maceration in cow and buffalo.	www.epashupalan.com 2021	Dr S.K. Mishra Dr Anuj Kumar Dr J.K. Agarwal Prof. Atul Saxena
72.	Pregnancy and parturition management in goat	Pashu sandesh, may, 2020	Dr Vikas Sachan, Dr Jitendra K Agrawal

73.	Right time for artificial insemination: a prediction	Pashudhan praharee, july, 2020	Dr Vikas Sachan and Dr Abhishek kumar
74.	Upkeepment of semen and ai equipments	Pashudhan praharee, july, 2020	Dr Vikas sachan
75.	मादा पशुओं में गर्भाधान के समय ध्यान रखने योग्य बातें	पशुपालक मित्र, Apr, 2021	डा. विकास सचान
76.	पशु के ब्याने के पश्चात गर्भाशय का संक्रमण: पियुरपेरल मेट्रीटीस	ई-पशुपालन जनवरी 2021	डा. संजय कुमार मिश्र डा. जीतेन्द्र कुमार अग्रवाल
77.	जैव तकनीक से पशु प्रजनन भ्रूण प्रत्यारोपण	मध्य भारत कृषक भारती वर्ष 15 अंक 04, जुलाई 2020	डा. जीतेन्द्र अग्रवाल डा. अनुज कुमार डा. विकास सचान प्रो. अतुल सक्सेना
78.	प्रशवोपरांत पशुओं में जेर का ना गिरना: एक गंभीर समस्या	पशुधन प्रकाश अंक 11, वर्ष 2020	डा. आशुतोष बसेड़ा डा. जीतेन्द्र अग्रवाल प्रो. अतुल सक्सेना
79.	पशुओं में नवजात मृत्युदर: समस्या एवं बचाव	पशुधन प्रहरी. 26 जून 2020	डा. अवीनीश कुमार सिंह डा. जीतेन्द्र अग्रवाल डा. विकास सचान

### C. Public Awareness Activities performed by various Departments of College of Veterinary Science and Animal Husbandry:

1. Department of Animal Nutrition performed an activity under RKVY funded project “Establishment of Small-Scale Feed Processing Demonstration Unit to Promote Rural Youth Entrepreneurship” was conducted by department of Animal Nutrition on topic “Pashuon ke uttam swastha evam utpadan mein santulit aahar ki mehta” on 25-12-2020. The chief guest of the programme was Dr O.P. Chaudhary, Joint Secretary, NLM, Ministry of Fisheries, Animal husbandry and Dairying Government of India. About 25 farmers and 12 women farmers attended the programme. On account of birth anniversary of our former Prime Minister Shri Atal Bihari Bajpayee, the live address by our Hon’ble Prime Minister Shri Narendra Modi Ji was also attended by all the participants. The chief guest of the day mentioned in detail about the schemes and policies about to launch by GOI and also discussed about the advantages of balanced ration for livestock.

Under the project all the newly constructed units viz. Feed Processing Unit, Mineral mixture and Feed Block Unit, Silage unit were shown to the participants by Project Investigator and Organizing Secretary Dr Shalini Vaswani and other faculty members of the department. The detail knowledge of the objectives and working of units were imparted to them. Dr Vinod Kumar, Professor & Head, Animal Nutrition Department explained about the preparation of concentrate mixture and balanced nutrition of livestock to the participants. The team of Animal Nutrition

department distributed related literature, reference material and mineral mixture to all the participants. The certificate of successful completion of activity was also issued to participants.



2. Department of Animal Nutrition performed an activity under RKVY funded project “Establishment of Small-Scale Feed Processing Demonstration Unit to Promote Rural Youth Entrepreneurship” was conducted on topic “Vagyanik padyati se pashu-aahar prabhandhan” on 12-03-2021.

3. Department of Veterinary Public Health organised Brucellosis & Zoonoses awareness, infertility camp and sanitation kit distribution programme at under OPZD project SCSP programme at Barari village, Farah (Farmers of 3 villages of block Farah participated - Dhana shamshabad, Dhanateja and Barari) on 6<sup>th</sup> March 2021 in collaboration with gynecology and surgery departments. More than 100 farmers have participated in this camp.



Pic showing camp organizing for awareness programme of brucellosis in dairy animals, sanitation kit distribution programme and infertility checkup in diary animals organized under ICAR-OPZD project (SCSP component) by VPH department in collaboration with DIMSCA project in Veterinary Surgery & radiology department and AICRP project in Veterinary Gynecology & Obstetrics department at Barari village (Farah block) on dated 06-03-2021. 112 farmers participated in this programme.

## D. Exposure Visits of Dignitaries, Veterinary Officers, Students and Farmers

S.No.	Date	Exposure visit of farmers, students, Veterinary Officers, Dignitaries
1.	24.09.20	Dr Avishek Biswas (Senior Scientist), Division of Animal Nutrition & Feed Technology, Central Avian Research Institute, Bareilly (UP) visited the Department of Poultry Science.
2.	25.09.20	Forty seven (47) nos. of farmers of Agriculture Skill Development Programme organized by Animal Husbandry Department Etawah district (UP) along with Dr R.K. Tiwari (Asst. Veterinary Surgeon) and her assistant, visited the Department of Poultry Science.
3.	30.09.20	Dr R. Pourouchottamane (Principal Scientist (LPM) & Nodal Officer, HRD Cell), Animal Physiology and Reproduction Division, ICAR-Central Institute for Research on Goats Makhdoom, Farah, Mathura (UP) visited the Department of Poultry Science.
4.	26.10.20	Dr Samir Majumdar (Principal Scientist & Head), Poultry Housing and Management Section, Central Avian Research Institute, Bareilly (UP) visited the Department of Poultry Science.
5.	13.12.20	Dr Radheshyam (Deputy Director-Agriculture), Agricultural Department of district Agra, Uttar Pradesh along with 30 farmers visited the Department of Poultry Science.
6.	03.03.21	Mr. Bhim Singh (Chief Project Coordinator, Lupin HWRF Bharatpur, Rajasthan) along with three official member, visited the Department of Poultry Science.
7.	25.03.21	Dr Amit Barnawal (Scientist, KVK, Pratapgarh, U.P.) visited the Dept. of Poultry Science



#### 4. Krishi Vigyan Kendra

##### 1. Training Programmes

Clientele	No. of Courses	Male	Female	Total participants
Farmers & farm women	89	1969	432	2401
Rural youths	09	128	51	179
Extension functionaries	06	295	34	329
Total	104	2392	517	2909

##### 2. Frontline demonstrations

Enterprise	No. of Farmers	Area (ha)	Units/Animals
Oilseeds (Mustard)	130	57.2	-
Cereals (Wheat, Paddy)	246	135.2	-
Vegetables (Cauliflower & Brinjal)	20	10	-
Other crops (Berseem)	55	4	-
Hybrid crops (Bajra)	16	5	-
Pulse (Greengram)	130	50	-
Total	597	261.4	-
Livestock & Fisheries	17	-	17
Grand Total	614	261.4	17



Barseem seed distribution under Front line demonstration

##### 3. Technology Assessment & Refinement

Category	No. of Technology Assessed & Refined	No. of Trials	No. of Farmers
Technology Assessed			
Crops	8	47	47
Livestock	1	4	4
Total	9	51	51

##### 4. Extension Programmes

Category	No. of Programmes	Total Participants
Extension activities	221	9389
Total	221	9389



## 5. Mobile Advisory Services

Name of KVK	Message Type	Type of Messages						
		Crop	Livestock	Weather	Marketing	Awareness	Other enterprise	Total
	Text only	20	-	2	-	4	-	26
	Total Messages	20	-	2	-	4	-	26

## 6. Seed & Planting Material Production

Name of items	Quintal/Number	Value Rs.	Distributed to No. of farmers
Seed (q)	650.00	24.70 Lac Approx.	Supply to IARI, New Delhi
Planting material (No.)	40370	3433	208
Bio-Products (kg)	1970	2850	23

## 7. Soil, water & plant Analysis

Name of sample	No. of Samples	No. of Beneficiaries	Value Rs.
Soil	720	604	5040
Water	48	48	-
Total	768	652	5040

## 8. Publications

S. No.	Category	Number
1	Kisan Bills- 3	2000
2	Crop Residue Management -4	7000
3	Technical advisories during lockdown-12	12



### 9. Activities under Crop Residue Management (CRM)

Sl.No.	Name of Activity	No. of activities	No. of Participants
1.	Village level gosthi & meeting	13	490
2.	Wall painting	60 points	-
3.	Advertisement	2	-
4.	Radio Zingle	2 (For one month)	-
5.	Demonstrations	125 ha.	223
6.	Village level awareness programme	5	522
7.	College student mobilization	3	302





## UNIVERSITY FARMS

### A. Livestock Farm Complex (LFC)

At LFC Mathura, the total number of animals on 31.03.2021 was 692. It included Haryana cattle (265), crossbred cattle (75), Sahiwal cattle (265), Murrah buffalo (81) and Nili Rvai buffalo (06). During 2020-21, total milk production at the farm was 234987.50 liters, out of which, the production of cow milk was 197458.50 liters, buffalo milk was 37529.00 liters. During the financial year 2020-21 the revenue generated at LFC was Rs. 74,78,558.00/- (Seventy four lac seventy eight thousand five hundred fifty eight). Out of which

Rs. 72,40,880.00/- (Seventy two lac forty thousand eight hundred eighty) was generated through the sale of milk coupons, Rs. 4100.00/- (four thousand one hundred) through the sale of dung fertilizer and Rs. 2, 33, 578/- (two lac thirty three thousand five hundred seventy eight) through the auction of animals.

### B. Poultry Farm

The Department of Poultry Science has maintained different species, breeds and varieties of birds in University poultry farm during 2020-21.

S.No.	Species, Breeds and Varieties	Flock Population (nos.)
1.	Layers	190
2.	Cockerels	11
3.	Chabro/CHD breeders	203
4.	Chabro chicks	905
5.	Other breeds chicks	490
6.	Turkey poult	158
7.	Turkey	10
8.	Aseel birds	41
9.	Kadaknath birds	98
10.	Naked Neck	19
11.	Japanese quail	1,451
12.	Guinea fowl	18
13.	Emu	2
14.	Other breeds (Black Rock, White Rock, Red Cornish, Delham Red, Barred Rock, Punjab Brown, CHD Broiler, PB Broiler, PB Layer, CHD Black, PB 1 Layer)	89
15.	Chabro birds	685
Grand Total		<b>4,370</b>

During FY 2020-21, the farm generated a revenue of Rs. **9,06,265.00/-** (nine lac six thousand two hundred sixty five) from sale of different birds and eggs. Additionally, a sum of Rs. **6,74,886.00/-** (six lac seventy four thousand eight hundred eighty

six) and Rs. **1,92,593.00/-** (one lac ninety two thousand five hundred ninety three) was generated from sales of poultry products under Experiential Learning Unit (ELU) and Revolving funds respectively in Poultry Science Department.

### DIRECTORATE OF FARMS

#### 1. Madhuri Kund Agriculture Farm

The zonewise production of Kharif 2020 (150 Acre of land) & Rabi crops 2020-21 (425 Acre of land) during FY- 2020-21

#### Seed Production

S. No.	Zone	Name of Crop	Variety	Area (in Acre)	Production (in Quintal)	Utilization	Income (in Rs) (Approximate)
01	A	Wheat	HD 2967	100	1710 Q	Seed supplied to NSC Agra	1710 Q X 1775/- Q = 30,35,250.00
	B	Wheat	HD 2967	100	(Approx)		
	Total (Rabi Crop 2020-21)			<b>200</b>	<b>1710 Q</b>		<b>30,35,250.00</b>
02	A	Oat	Kent	28	176.86 Q	Seed supplied to NSC Agra	176.86 Q X 3000/- Q = 5,30,580.00
	B	Oat	Kent	27	(Approx)		
	Total (Rabi Crop 2020-21)			<b>55</b>	<b>176.86 Q</b>		<b>5,30,580.00</b>

**Commercial Production**

S.No	Zone	Name of Crop	Variety	Area (in Acre)	Production (in Quintal)	Utilization	Income (in Rs) (Approximate)
01	A	Barley	-	85	1100 Q (Approx)	Supplied to Physiology deptt., ILFC Dairy farm & MKD Dairy farm, DUVASU, Mathura	1100 Q X 2295/- Q = 25,24,500.00
	B	Barley	-	85			
Total (Rabi Crop 2020-21)				170	1100 Q		25,24,500.00
02	A	Paddy	PB 1509	50	701.29 Q	Auctioned at MKD farm)	701.29 Q X 1861/- Q = 13,05,101.00
	B	Paddy	PB 1509	50			
Total (Kharif Crop 2020)				100	701.29 Q		13,05,101.00
03	A	Dhencha	-	25	-	Green Mannuring for MKD Farm	
	B	Dhencha	-	25	-		
Total (Kharif Crop 2020)				50	-		
04 (Bhusa)				-	300 Q (Approx)	Approximately 300 Quintals of wheat straw was prepared at the farm and provided to the Dairy animals at MKD farm.	300 Q X 669/- Q = 2,00,700.00
Total (Rabi Crop 2020-21)							2,00,700.00

c. The revenue generated in Kharif season 2020 from Paddy was Rs. 13,05,101.00/- (Thirteen lac five thousand one hundred one only) and approximate Revenue generated Rabi season 2020-21 from Wheat, oats, Barley and Bhusa was Rs. 62,91,030.00 (Sixty two lac ninety one thousand thirty only). Thus total revenue generated during the financial year (2020-21)

at Madhurikund farm was Rs. 75,96,131.00/- (Seventy five lac ninety six thousand one hundred thirty one only).

d. Rabi Crops 2020-21 before harvesting (Barley) 21 Acre is write off by Committee after approval by University Competent authority.





# Human Resource Development



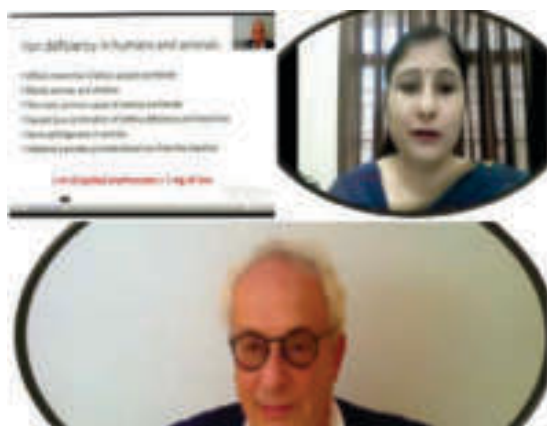
## HUMAN RESOURCE DEVELOPMENT

### INTERNATIONAL EVENT

#### DEPARTMENT OF VETERINARY BIOCHEMISTRY

##### International Webinar on “Iron Metabolism and its Disorders: from Anemia to hemochromatosis”

Department of Veterinary Biochemistry, College of Veterinary Science and Animal Husbandry, DUVASU, Mathura organized an International Webinar under the NAHEP flagship on 31<sup>st</sup> August 2020 on the topic “**Iron metabolism and its disorders: from anemia to hemochromatosis**”. The guest speaker for the webinar was Dr Tomas Ganz, Distinguished Professor of Medicine and Pathology, David Geffen School of Medicine, University of California, Los Angeles (UCLA). More than 450 participants attended the webinar from reputed institutes of India and abroad countries. The webinar was a grand success in terms of knowledge exchange in scientific community as a part of institutional development program strengthening quality of education for students as well as faculty. Organizing Secretary of the webinar was Dr Ambika Sharma, Assistant Professor of the Department. Dr Vijay Pandey, Associate Professor and Dr Pawanjit Singh, Assistant Professor were the Co-Organizing Secretaries.



### NATIONAL EVENTS

#### DEPARTMENT OF ANIMAL GENETICS AND BREEDING

##### National Webinar on “Modern Genetic Approaches for Improvement of Indigenous Cattle”

Department of Animal Genetics and Breeding organized a webinar entitled “**Modern genetic**

**approaches for improvement of indigenous cattle**” under Interactive Session for Students with Industry and Academic Programme within NAHEP project on July 29, 2020. Dr K.P. Ramesha, Principal Scientist & Head, Southern Campus of NDRI Adugodi, Bangalore was the Guest Speaker on the aforementioned topic. Nearly 700 individuals registered in the webinar, out of which more than 300 individuals actively participated online on the due date and time and interacted with the guest speaker. Dr Ramesha emphasized on the importance of indigenous cattle for our country in the current times and described in detail the various aspects that should be undertaken for improvement of indigenous cattle.

#### DEPARTMENT OF VETERINARY ANATOMY

##### National Webinar on “Conceptualization of Modern Anatomy: Theory & Practice”

A National Webinar on “Conceptualization of Modern Anatomy: Theory & Practice” was organized by the Department of Veterinary Anatomy, College of Veterinary Science & Animal Husbandry, DUVASU, Mathura on 4<sup>th</sup> and 5<sup>th</sup> August, 2020 under NAHEP. In this webinar total five lectures were delivered by the eminent scientists of the country specialized in their respective fields. On the day one, the first lecture was delivered by Prof. T.S. Chandrashekhar Rao, Dean, Faculty of Veterinary Sciences, Shri Venkateswara University Tirupati, Andra Pradesh on “Reticular Formation of the Brain Stem”. The second lecture was delivered by Prof. S.B. Banubakode, Head, Deptt. of Veterinary Anatomy & Histology, Nagpur Veterinary College, Nagpur, Maharashtra on “Museum: An Essential Component of Anatomy Teaching and Research. On second day of the Webinar, the first lecture was delivered by Prof. R.S. Sethi, Head, Deptt. of Animal Biotechnology, College of Animal Biotechnology, GADVASU, Ludhiana, Punjab on “Anatomical Basis of Biotechnology”. The second lecture was delivered by Prof. R.S. Chauhan, Head, Deptt. of Veterinary Pathology, G.B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand on “Role of Lymphocytes in Disease Management”. The third lecture of the day was delivered by Prof. Sabiha Hayath Basha, Professor, Deptt. of Veterinary Anatomy & Histology, Madras Veterinary College, Chennai, Tamilnadu. In the concluding remarks, Hon’ble

Vice Chancellor Prof. G.K. Sing appreciated the efforts of organizing team and the topic chosen for the webinar. This webinar was attended by 220 participants, which include scientists, academicians, research scholars and students from the different Veterinary colleges of the country.

### **National E-quiz Competition on Developmental Anatomy on Celebration of 104<sup>th</sup> Birth Anniversary of Pandit Deen Dayal Upadhyaya**

A National E-Quiz Competition on Developmental Anatomy was organized by Department of Veterinary Anatomy, College of Veterinary Science & Animal Husbandry, DUVASU, Mathura on Celebration of 104<sup>th</sup> Birth Anniversary of Pandit Deen Dayal Upadhyaya on 25<sup>th</sup> September, 2020 under NAHEP. The competition was open for the undergraduate and postgraduate students of Veterinary Science, Medical Science and Biomedical sciences. In this competition, 1697 participants registered from different parts of the country. Out of 1697 registered participants, 702 successfully submitted their response within time frame of 30 minutes. Shri Ruthrakumar of VCRI, Nammakal scored 46/50 and attained first rank. Four students, N. Hemavathi (MVC, TANUVAS), Preethiram (Ntr CVSc. Gannavaram), Akshara Babu (CVAS, Pookode) and Srikanth Vallabhaneni (Sri Venkateswara Veterinary University, Tirupathi) scored 44/50 and achieved second rank. The third rank was scored by eight students named Karnam Mohan Sujana (Tirupati), Maha Ganesa Moorthy (Orathanadu, Tamilnadu), Navjot Singh Thakur (Palampur), Nitheeswaran (Thanjavur), Talupuru Sai Urmila (Tirupati), P. Dharani (TANUVAS), Garima Singh (Mathura) and Nahush Roop Bansal (Ludhiana). Their score was 43/50.

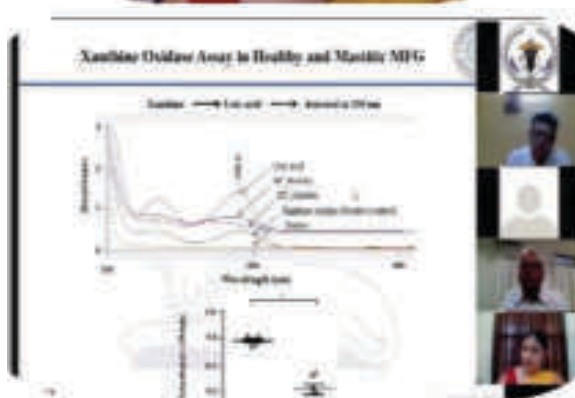
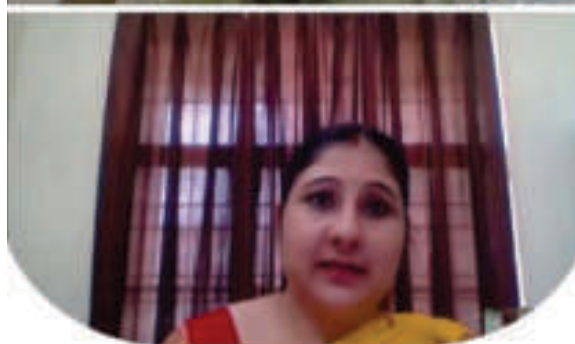
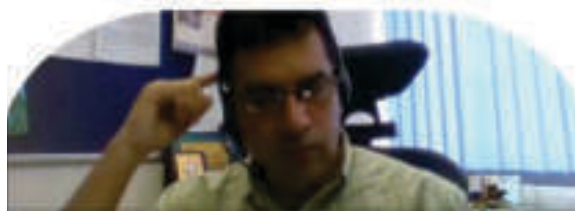
### **National E-quiz Competition on Microscopic Anatomy on the Occasion of the 72<sup>nd</sup> Republic Day of India**

National E quiz on Microscopic Anatomy was organized by the Department of Anatomy on 26<sup>th</sup> January 2021 on the occasion of the 72<sup>nd</sup> Republic day of India under NAHEP. This quiz was open for all biomedical students. In this quiz, 398 candidates participated from all over India. The participants were of different streams like Veterinary Science, Medical science, and Paramedical science students. Miss Chandani A.R.M. from IVRI secured the highest score of 48 out of 50 and received a cash prize of Rs.2000/-. The second position holder student was from Namakkal and secured 47 marks. Four students were ranked third with 46 marks. Out of these four students, three were from DUVASU, Mathura.

### **DEPARTMENT OF VETERINARY BIOCHEMISTRY**

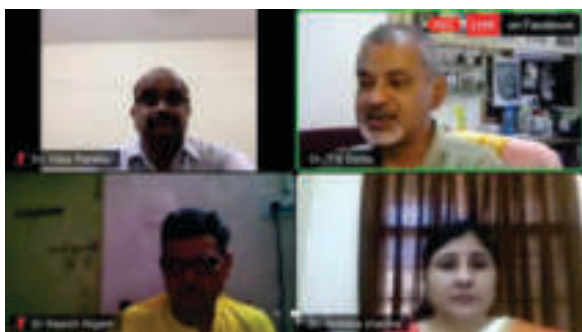
#### **National Webinar on “In-Depth Bovine Milk Analysis to Unearth Goldmine Beneficial for Health Applications”.**

Under the NAHEP flagship, Department of Veterinary Biochemistry, College of Veterinary Science and Animal Husbandry, DUVASU, Mathura organized a National Webinar on 14<sup>th</sup> August 2020 on the topic “**In-depth bovine milk analysis to unearth goldmine beneficial for health applications**”. The guest speaker for the webinar was from a premier Institute of India IIT, Roorkee: Dr Srinivas Kiran Ambatipudi working as an Associate Professor in the Department of Biotechnology. Organizing Secretary of the webinar was Dr Ambika Sharma, Assistant Professor of the Department. Dr Vijay Pandey, Associate Professor and Dr Pawanjit Singh, Assistant Professor were the Co-Organizing Secretaries. The talk delivered by Dr Kiran was appreciated by all the panelists and attendees as it was useful for students, faculty, stakeholders, researchers etc. More than 200 participants attended the webinar from all over the country.



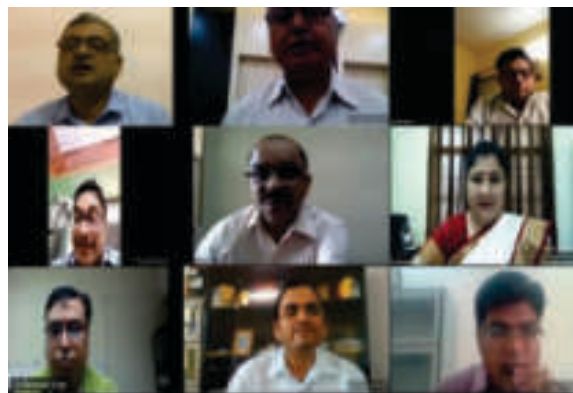
### National Webinar on “Igniting Young Minds Towards Science”

Department of Veterinary Biochemistry, College of Veterinary Science and Animal Husbandry, DUVASU, Mathura organized a National Webinar on “*Igniting Young Minds towards Science*” on 22<sup>nd</sup> August 2020 under National Agriculture Higher Education Project (NAHEP) of the University. The eminent scientist Dr T.K. Datta, Principal Scientist of Animal Biotechnology Centre, National Dairy Research Institute (NDRI), Karnal was guest speaker for the occasion. The talk of Dr Datta was exceptionally motivational for the students and young faculty and scientists and webinar as a whole was well appreciated by most of the participants.



### 5<sup>th</sup> Annual Convention of SVBBI, India and National Symposium on “Current Challenges for Animal Biochemists and Biotechnologists for Improving Animal Health and Production in POST COVID Scenario”

Department of Veterinary Biochemistry, College of Veterinary Science, Mathura organized 5<sup>th</sup> Annual Convention of Society of Veterinary Biochemists and Biotechnologists of India (SVBBI) and National Symposium on “*Current challenges for Animal Biochemists and Biotechnologists for improving Animal Health and Production in Post COVID scenario*” from March 24-25, 2021 in virtual (online) mode. The conference was inaugurated by Prof. G.K. Singh Hon’ble Vice Chancellor, DUVASU, Mathura on March 24, 2021. An e-Compendium of 10 lead papers and 63 abstracts was also released by the dignitaries during inaugural session. Around 110 scientists, academicians, and students from all over the Nation participated in the e-Conference and presented their lead and research papers. In two days of e-Conference, four technical sessions were held out of which one oral and one poster session was exclusively for post-graduate students for encouraging the participation of young budding scientists in the scientific conferences and symposia. This pioneer effort of the organizing committee was well appreciated by all the participants from all over the country.



### DEPARTMENT OF VETERINARY EPIDEMIOLOGY

Department of Veterinary Epidemiology organized a Webinar on ‘Revisiting Package of Practices for the Control of Brucellosis’ on 24<sup>th</sup> Sept, 2020.

### DEPARTMENT OF LPT

### National Webinar ON “FUNCTIONAL FOODS OF ANIMAL ORIGIN: ROLE IN HEALTH PROMOTION AND DISEASES PREVENTION”

Department organized two days National webinar on “Functional foods of animal origin: role in health promotion and diseases prevention” on 06-07<sup>th</sup> August, 2020 in which eminent speakers from different parts of country Dr P.K. Shukla, Professor and head, Poultry science, DUVASU, Mathura, Dr S.K. Mendiratta, Principal scientist and Head, Division of LPT, IVRI, Izatnagar, Dr M.K. Chatli, professor and Head, Department of LPT, GADVASU, Ludhiana, Dr Bimlesh Mann, Principal Scientist and Ex Head, Division of Dairy Chemistry, NDRI, Karnal and Dr M. Muthukumar, Senior Scientist, at NRC on Meat delivered their lectures on different aspects of functional foods of animal origin.

### National Webinar on “Current Practices and Innovations in the Packaging of Meat and Poultry Products”

Department organized one day National webinar on “Current practices and innovations in the packaging of meat and poultry products” on 12<sup>th</sup> February, 2021 under “Interactive session for students with Industry and Academic programme” component of IDP-NAHEP project in which 485 faculty members, students and persons from industry participated. Renowned speaker Dr B. D. Sharma, Retd. Principal Scientist and Head, Division of LPT, IVRI, Izatnagar shared his views on recent technical advancement in area of meat and poultry products packaging.



## DEPARTMENT OF VETERINARY MEDICINE

### Online Training Programme on “Basics of Electrocardiography in Dogs”

Department of Veterinary Medicine organized 7 days online training programme on “Basics of electrocardiography in dogs” at DUVASU, Mathura in collaboration with Veterinary Internal and Preventive Medicine Society (VIPM). The organizing secretary was Dr Mukesh Kr. Srivastava.

## DEPARTMENT OF PARASITOLOGY

### Training Programme on “Control of Subclinical Parasitism in Dairy Animals”

A three days training programme on “Control of subclinical parasitism in dairy animals” for 10 Veterinary Officers of Uttar Pradesh was organized by Department of Parasitology under Rashtriya Krishi Vikas Yojna (RKVY) from 08-10 February 2021.

## Department of Microbiology

A National Webinar on “Current Concepts in Clinico-therapeutic management of Snake bite in Animals” was organized by Department of Microbiology under IDP-NAHEP project on 20<sup>th</sup> March, 2021 in online mode.

## DEPARTMENT OF VETERINARY SURGERY & RADIOLOGY

### Training Program

Two six days training on “Newer concepts in diagnosis and management of surgical cases” was organized under All India Network Programme on Diagnostic Imaging and Management of Surgical Conditions in Animals (AINP-DIMSCA) for veterinary officers of Animal Husbandry Department of U.P. from 01 Feb. – 06 Feb, 2021 and 08 March – 13 March 2021. The first and second trainings were attended by 9 and 10 veterinary officers, respectively. Total 8 theory lectures and 8 Hands on training were conducted. Basic principal of diagnostic imaging techniques (Prof R. P. Pandey), Diagnosis and management of reproductive emergencies in animals (Prof Atul Saxena), Diagnosis and surgical management of abdominal diseases (Dr S. Purohit), Basic concept of general and local anesthesia in veterinary practice (Dr Gulshan Kumar), Basic concept of direct digital radiography in veterinary practice (Dr Ilayaraja S), Diagnostic interpretation and hands on training of haematological parameters in veterinary practice (Dr Neeraj Gangwar), Diagnostic interpretations and hands on training of biochemical parameters in veterinary (Dr Ashish Srivastava) and Basic

concept of electrocardiography (ECG) and familiarization of ECG machine and lead system in veterinary practice (Dr M.K. Srivastava) were main focus of the training. The training was highly fruitful to veterinary officers and they further recommend specialized training of orthopedic and ophthalmic affections.



Department of Veterinary Pharmacology and Toxicology

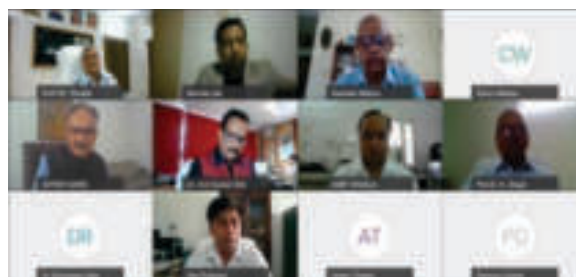
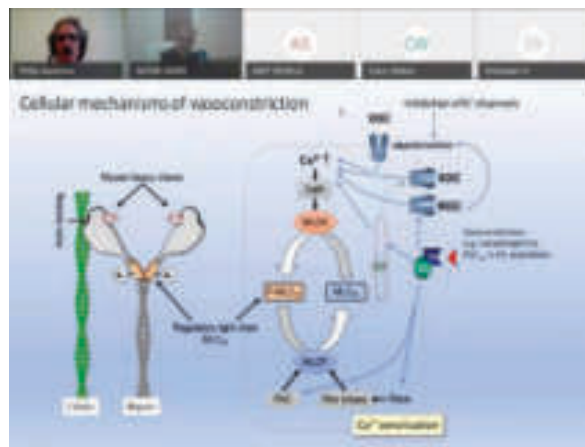
### Hands on Training on “Bioprospecting of Phytoconstituents to Combat Antimicrobial Resistance”

Department of Veterinary Pharmacology and Toxicology organized Hands on Training on “Bioprospecting of Phytoconstituents to Combat Antimicrobial Resistance” w.e.f. 6<sup>th</sup> - 15<sup>th</sup> March, 2021 under SCSP of ICAR All India Network Programme on Ethno-Veterinary Medicine.



## 20<sup>th</sup> Annual Conference of ISVPT and International Webinar on “Receptor Dynamics in Cell Signalling”

20<sup>th</sup> Annual Conference of Indian Society of Veterinary Pharmacology & Toxicology (ISVPT) as Virtual Conference (e-Conference) and International Webinar on “Receptor Dynamics in Cell Signalling” and National Webinar on “Translational Approaches in Herbal Drug Development” was organized on 4-5<sup>th</sup> Oct, 2020.



## DEPARTMENT OF POULTRY SCIENCE National Webinar on “ATMA Nirbhar Indian Poultry in New Normal”

National webinar was organized by Department of Poultry Science on the topic ‘Atma Nirbhar Indian Poultry in New Normal’ from 9<sup>th</sup>-11<sup>th</sup> August, 2020 from 11.00 am to 12.30 pm IST. The webinar was a conclave of Academia, Industry and Policy Makers. Dr P.K. Shukla, Professor and Head, Department of Poultry Science was the organizer of the event. The eminent speaker were Mr. Tarun Sridhar, Former Secretary, Animal Husbandry and Dairying, Govt. of India, Mr. Suresh Chitturi, Chairman, International Egg Commission and Dr P.S. Mahesh, Director, CPDO and T.I.



## PARTICIPATION OF FACULTY MEMBERS IN INTERNATIONAL AND NATIONAL E-CONFERENCES/SYMPOSIA

S. No.	Name of the faculty member	Title of the event	Date
<b>A. International</b>			
1.	Dr Vikas Pathak	Online International Webinar on “Predictive Microbiology In Food Safety” organized by Department of Basic and Applied Sciences, NIFTEM	27 <sup>th</sup> Jun., 2020
2.	Dr Vijay Pandey	International Webinar on “challenges in animal disaster management in COVID-19 pandemic” organized by College of Veterinary Science and Animal Husbandry, NDVSU, Rewa (MP)	1 <sup>st</sup> Jul., 2020
3.	Dr Ambika Sharma	International Webinar on ‘Human- Animal-Environment Interface: Recent Approaches for Containing the Global Zoonotic Burden, organized by IVA- CVAS, Mannuthy Unit, MTU- KVASU and AMSTI	6 <sup>th</sup> -8 <sup>th</sup> Jul., 2020
4.	Dr Raju Kushwaha	International Webinar on “Animal Health, Production & Entrepreneurship Development in Post COVID-19 Scenario” at WBUAS Kolkata	7 <sup>th</sup> -8 <sup>th</sup> Jul., 2020
5.	Dr Raju Kushwaha	International Webinar on Role of Poultry Sector in Boosting the Post COVID Indian Economy - organized by College of Avian Sciences and Management, Kerala Veterinary and Animal Sciences University, Thiruvazhamkunnu, Palakkad, Kerala	28 <sup>th</sup> -30 <sup>th</sup> Jul., 2020
6.	Dr Vijay Pandey	International Webinar on “Technological advances to revolutionize cancer diagnosis” organized by Veterinary Physiology and Biochemistry Department College of Veterinary Science and A.H., Anjora, Durg (Chhattisgarh)	7 <sup>th</sup> Aug., 2020
7.	Dr Shriprakash Singh Dr Abhinov Verma	International E conference on “Immunology in 21st century for improving One health” organized by College of Biotechnology, SVPUA& T Meerut and Department of Animal Husbandry Govt of India New Delhi	7 <sup>th</sup> -8 <sup>th</sup> Aug., 2020
8.	Dr Deep Narayan Singh	Online International webinar on “COVID Pandemia: Herbal Solutions for Health care of Livestock and Poultry” held at Tamilnadu Veterinary and Animal Sciences University	13 <sup>th</sup> Aug., 2020
9.	Dr Deep Narayan Singh	Online International webinar on “Post Pandemic Challenges and opportunities in animal Health” held at College of Veterinary Science & Animal Husbandry, SVPUAT, Meerut	14 <sup>th</sup> Aug., 2020
10.	Dr Deep Narayan Singh	Online International webinar on “Wildlife and Human conflict: A long journey ahead” held at College of Veterinary Science & Animal Husbandry, DUVASU, Mathura	16 <sup>th</sup> Aug., 2020
11.	Dr Deep Narayan Singh	Online International Webinar on “Emerging Viral Threats from wildlife & Role of Vets in Preventing Future Pandemics” held at MAFSU and Forest Department Corporation Ltd, Nagpur	20 <sup>th</sup> Aug., 2020



12.	Dr Raju Kushwaha	International Webinar on “Nutritional Intervention for Improving Production Performance of Dairy Animals” organized by Department of Animal Nutrition, College of Veterinary Science & A.H., Anjora, Chhattisgarh Kamdhenu Vishwavidyalaya, Durg. (C.G.) INDIA	20 <sup>th</sup> Aug., 2020
13.	Dr Deep Narayan Singh	Online International Web Conference on “Biodiversity in vegetable crops for Healthier life and livelihood” held at Bihar Agricultural University, Sabor	27 <sup>th</sup> -28 <sup>th</sup> Aug., 2020
14.	Dr Vijay Kumar	International Webinar on Steps to Sustainable Livestock in COVID and post COVID Era, organized by IVA Kerala Pookode Unit and Directorate of Entrepreneurship, KVASU	27 <sup>th</sup> Aug., 2020
15.	Dr Archana Pathak Dr Deepak Sharma Dr Rajneesh Sirohi Dr Deep Narayan Singh Dr S.P. Singh Dr Avneesh Kumar Dr Mamta	International webinar on “Iron metabolism and its disorders: From anemia to hemochromatosis” organized by Department of Veterinary Biochemistry, College of Veterinary Science & Animal Husbandry, Mathura	31 <sup>st</sup> Aug., 2020
16.	Dr Vijay Pandey	International Webinar on “Diagnosis & management of chronic Kidney diseases” organized by Veterinary Physiology and Biochemistry Department College of Veterinary Science and A.H., Anjora, Durg (Chhattisgarh)	15 <sup>th</sup> Sept., 2020
17.	Dr Amit Kumar Jaiswal	Three days International webinar Novel approaches and emerging issues in parasitic disease of veterinary and medical importance	16 <sup>th</sup> -18 <sup>th</sup> Sept., 2020
18.	Dr Vinod Kumar Dr Muneendra Kumar Dr Raju Kushwaha Dr Avinash Kumar	International webinar on “Nutritional Interventions for Environmentally Sustainable Livestock Production” organized by Bihar Animal Sciences University, Patna, India	29 <sup>th</sup> -30 <sup>th</sup> Sept., 2020
19.	Dr Raju Kushwaha	International Webinar on "Climate Smart Livestock and Poultry Production Through Nutritional Interventions" organized by the Institute of Animal Nutrition, Directorate of Centre for Animal Production Studies, Tamil Nadu Veterinary and Animal Sciences University	23 <sup>rd</sup> -24 <sup>th</sup> Nov., 2020
20.	Dr Neeraj Kr. Gangwar Dr Shyama N. Prabhu Dr Renu Singh	Online International Veterinary Pathology Congress – 2020-Role of veterinary pathology in controlling emerging and re-emerging diseases of livestock and poultry: An one health approach	26 <sup>th</sup> -29 <sup>th</sup> Dec., 2020
21.	Dr Ambika Sharma	Virtual International Conference on “Promising Genetic and Genomic Technologies – Frontier In Selection and Animal Improvement” jointly organized by the Department of Animal Genetics and Breeding, VCRI, Orathanadu (TANUVAS) Tamilnadu & Department of Animal Genetics and Breeding, COVAS, Pookode, Wayanad, Kerala (KVASU)	27 <sup>th</sup> -28 <sup>th</sup> Jan., 2021
22.	Dr Ruchi Tiwari Dr Meena Goswami Awasthi	4 <sup>th</sup> International conference on “Current Approaches in Agricultural, Animal Husbandry and Allied Sciences for Successful Entrepreneurship (CAAAAHASSE-2021)” organized by Agro Environmental Development Society (AEDS) and Centre for Agribusiness Incubation and Entrepreneurship, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior (Madhya Pradesh), India	13 <sup>th</sup> -15 <sup>th</sup> Mar., 2021



B. National			
1.	Dr Vikas Pathak	1 <sup>st</sup> meeting of the Working Group on cell-based meat (cultured meat) organized by Food Safety and Standards Authority of India (FSSAI), Ministry of Health & Family Welfare, Government of India	20 <sup>th</sup> May., 2020
2.	Dr Deep Narayan Singh	National webinar on “Implications of COVID-19 on Animal Health and Food Security” held at College of veterinary science and animal husbandry, Mhow (MP)	28 <sup>th</sup> -29 <sup>th</sup> May., 2020
3.	Dr Mukul Anand	Artificial insemination in Goat, Goat Kid Nursery: Profitable Rural Enterprises held by International Institute of Goat Management	29 <sup>th</sup> May., 2020
4.	Dr Deep Narayan Singh	National webinar on “Contemporary issue in teaching and extension during COVID-19 pandemic” held at College of veterinary science and animal husbandry, Mhow (MP)	30 <sup>th</sup> -31 <sup>st</sup> May 2020
5.	Dr Vijay Pandey	National Workshop on “Improvement of livestock productivity and food security through milk and milk products” organized by College of Veterinary Science and Animal Husbandry, NDVSU, Rewa (MP)	01 <sup>st</sup> Jun., 2020
6.	Dr Deep Narayan Singh	National Webinar by Eminent Speakers Dr Nino Macetic, Dr Goran Basic, Dr Masa Effendic from Croatia held at Nanaji Deshmukh Veterinary Science University, College of Veterinary Science and Animal Husbandry, Jabalpur, (M.P.)	01 <sup>st</sup> -3 <sup>rd</sup> Jun., 2020
7.	Dr Deep Narayan Singh	National webinar on “Canine hip disorders & their management” held at Nanaji Deshmukh Veterinary Science University, College of Veterinary Science and Animal Husbandry, Jabalpur, (M.P.)	04 <sup>th</sup> -6 <sup>th</sup> Jun., 2020
8.	Dr Deep Narayan Singh	National webinar on “Biodiversity in relation to ecohealth” held at College of Veterinary Science & Animal Husbandry, ANDUAT, Kumarganj, Ayodhya	05 <sup>th</sup> Jun., 2020
9.	Dr Deep Narayan Singh Dr Meena Goswami Awasthi	National webinar on “Impact of COVID-19 on dairy industry” organized by Warner College of Dairy Technology, Sam Higginbottom University of Agriculture, Technology and Science	08 <sup>th</sup> Jun., 2020
10.	Dr Deep Narayan Singh	National webinar on “Body language of dogs” held at Nanaji Deshmukh Veterinary Science University, College of Veterinary Science and AH, Jabalpur, (M.P.)	09 <sup>th</sup> Jun., 2020
11.	Dr Archana Pathak	National webinar on “Taxidermy as an art vis-à-vis science” organized by Nanaji Deshmukh Veterinary University, Jabalpur	10 <sup>th</sup> -11 <sup>th</sup> June, 2020
12.	Dr Deep Narayan Singh	National webinar on “Impact of COVID-19 on farmers” held at KPS Degree college, Kakaruwa (Maheshpura), Lalitpur	22 <sup>nd</sup> Jun., 2020
13.	Dr Deep Narayan Singh	Online Workshop of “All India Fodder Production Officers: Kharif” held at ICAR-Indian Grassland and Fodder Research Institute Jhansi-284 003 (UP)	23 <sup>rd</sup> -26 <sup>th</sup> Jun., 2020
14.	Dr Rajneesh Sirohi	National webinar organized on “Career in small animal practice” held at DUVASU, Mathura	23 <sup>rd</sup> Jun., 2020
15.	Dr Deep Narayan Singh	Online Elephant conference 3 held at Elephant Research Centre (ERC) & Pharmacology Clug, Department of Pharmacology, School of Pharmaceutical Sciences, Vels Institute of Science, Technology & Advanced Studies (VISTAS), Pallavaram, Chennai, Tamil Nadu	24 <sup>th</sup> Jun - 7 <sup>th</sup> Jul., 2020

16.	Dr Vijay Pandey Dr Ambika Sharma Dr Vinod Kumar	Two days Virtual Colloquium on 'COVID-19 pandemic and animal agriculture: interactions, threats, and economic impacts' organized by the Faculty of Veterinary Science, SKUAST, Jammu	25 <sup>th</sup> -26 <sup>th</sup> Jun., 2020
17.	Dr Deep Narayan Singh	Online webinar on " <i>Tips to improve anaesthesia in practice</i> " held at Pet Natural Remedies in association with PPAK	26 <sup>th</sup> Jun.,2020
18.	Dr Jitendra Tiwari	Webinar on COVID-19: Changing Scenario of Dairy Industry Organised by National Productivity Council at New Delhi	26 <sup>th</sup> Jun., 2020
19.	Dr Vijay Pandey Dr Rajneesh Sirohi Dr Yajuvendra Singh Dr Deep Narayan Singh Dr Muneendra Kumar	National webinar on prospects of animal husbandry sector in milieu of aatmanirbhar bharat organized by College of Veterinary Science & Animal Husbandry, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (UP)	27 <sup>th</sup> Jun., 2020
20.	DrVikas Pathak	National Webinar- Industry Academia Students interface on, "Technological Innovations and Entrepreneurship in Animal Industry By-products" organized by Department of Livestock Products Technology, College of Veterinary Science, GADVASU, Ludhiana	27 <sup>th</sup> Jun., 2020
21.	Dr Rajneesh Sirohi	National webinar organized on " <i>Enhanced livestock productivity for food security through advanced genetics and reproductive technologies</i> " held at DUVASU, Mathura	28 <sup>th</sup> Jun.,2020
22.	Dr Vikas Pathak	Brainstorming Session on "Potential of Non-bovine Milk" organized by National Academy of Agricultural Sciences	29 <sup>th</sup> Jun.,2020
23.	Dr Rajneesh Sirohi	National webinar organized on " <i>Future prospects and planning after graduation in veterinary sciences</i> " held at DUVASU, Mathura	30 <sup>th</sup> Jun., 2020
24.	Dr Rajneesh Sirohi	National webinar organized on " <i>Art of public speaking</i> " held at DUVASU, Mathura	30 <sup>th</sup> Jun., 2020
25.	Dr Muneendra Kumar Dr Yajuvendra Singh	Webinar on covid-19: immunopathology, clinical manifestations and therapeutic measurements Organized by Department of Zoology and Internal Quality Assurance Cell (IQAC), Govt. Madhav Science P.G. College, Ujjain (MP)	30 <sup>th</sup> Jun., 01 <sup>st</sup> Jul., 2020
26.	Dr Deep Narayan Singh	Online webinar on "Electrocardiography in Companion Animals- Basics to Practice" held at NanaJi Deshmukh Veterinary Science University, Jabalpur	04 <sup>th</sup> Jul., 2020
27.	Dr Rashmi Singh	National Webinar- Celebration of World Zoonosis Day 2020-APHV, Kolkata	6 <sup>th</sup> Jul.,2020
28.	Dr Jitendra Tiwari	Online national seminar on Public health interventions in India Slowed the spread of COVID-19 epidemic dynamics Organized by college of veterinary science and AH, Mhow, NDVSU	6 <sup>th</sup> Jul., 2020
29.	Dr Muneendra Kumar Dr Shalini Vaswani Dr Avinash Kumar	National Webinar on "Functional food of animal origin: Role in health promotion and disease prevention" organized by Department of Livestock Products Technology, College of Veterinary Science and Animal Husbandry, U.P. DUVASU, Mathura	06 <sup>th</sup> -07 <sup>th</sup> Jul., 2020





30.	Dr Yajuvendra Singh	Online International webinar on “Animal Health, Production & Entrepreneurship Development in post COV ID-19” held at Directorate Research Extension & Farms, West Bengal University	07 <sup>th</sup> -8 <sup>th</sup> Jul.,2020
31.	Dr Deep Narayan Singh	Online National webinar on “One Health as a Comprehensive Solution to Emerging and Re-emerging Zoonosis” held at NanaJi Deshmukh Veterinary Science University, Jabalpur	07 <sup>th</sup> Jul.,2020
32.	Dr Rajneesh Sirohi Dr Avinash Kumar	Online National webinar on “Kadakhnath Farming present status to future prospect” held at Krishi Vigyan Kendra, Jhabua (MP)	09 <sup>th</sup> Jul., 2020
33.	Dr Rajneesh Sirohi	Online National webinar on “Postpartum Uterine Infection: Approach for its Diagnosis and Treatments in Large Ruminant” held at Continuing Veterinary Education- Alembic Pharmaceuticals Ltd.	11 <sup>th</sup> Jul.,2020
34.	Dr Deep Narayan Singh	Online National webinar on “Nanotechnology in Veterinary Practice: Opportunity and Challenges” held at Indian Society of Veterinary Medicines in collaboration with Zydus AHL	11 <sup>th</sup> Jul., 2020
35.	Dr Deep Narayan Singh	Online National webinar on “An Approach to wildlife Anaesthesia, surgery and Management” held at College of Veterinary Science & Animal Husbandry, Rewa, NanaJi Deshmukh Veterinary Science University, Jabalpur	11 <sup>th</sup> -13 <sup>th</sup> Jul., 2020
36.	Dr Deep Narayan Singh	Online National webinar on “Small Animal Laboratory Interpretations” held at HATVET Pharma	12 <sup>th</sup> -13 <sup>th</sup> Jul., 2020
37.	Dr Rajneesh Sirohi	Online National webinar on “Art of Public Speaking” held at DUVASU, Mathura	15 <sup>th</sup> Jul.,2020
38.	Dr Rajneesh Sirohi	Online National webinar on “Rescued wild animal management: A task for the veterinarian” held at DUVASU, Mathura	17 <sup>th</sup> Jul., 2020
39.	Dr Muneendra Kumar	Online National Seminar on “Feed Additives for Improving the Efficiency and Sustainability of Milk Production in Dairy Animals” organized by the Department of Animal Nutrition, College of Veterinary Science and Animal Husbandry, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, Gujarat	20 <sup>th</sup> -21 <sup>st</sup> Jul., 2020
40.	Dr Rashmi Singh	National Webinar-Surveillance of rabies in animals and initiation in control, SKAUST-Jammu	21 <sup>st</sup> Jul., 2020
41.	Dr Deep Narayan Singh	Online International webinar on “Canine Sports Medicines & Rehabilitation” held at MAFSU and KNP college of Veterinary Science, Shirwal, Maharashtra	23 <sup>rd</sup> -27 <sup>th</sup> Jul., 2020
42.	Dr Yajuvendra Singh	Online National webinar on “Simplifying IPR and Patent Filing” held at Bharati Vidyapeeth’s Institute of Computer Applications and Management, (BVICAM), New Delhi	24 <sup>th</sup> Jul.,2020
43.	Dr Ambika Sharma	AMS workshop-2 days NAHEP Online Workshop on Academic Management System	24 <sup>th</sup> -25 <sup>th</sup> Jul., 2020
44.	Dr Ambika Sharma	National Webinar on “Eggs and poultry meat in New Normal” conducted by College of Veterinary Science & A.H., Rewa, NDVSU (M.P.)	26 <sup>th</sup> Jul., 2020

45.	Dr Deep Narayan Singh	Online National webinar on “Bio-waste Management” held at University of Agricultural Sciences, Dharwad and NAHEP, ICAR, New Delh	27 <sup>th</sup> Jul., 2020
46.	Dr Deep Narayan Singh	Online National webinar on “Impact of E-Waste on Environment” held at University of Agricultural Sciences, Dharwad and NAHEP, ICAR, New Delhi	28 <sup>th</sup> Jul., 2020
47.	Dr Jitendra Tiwari	National Webinar on Current scenario and future strategies for management of parasites in animals organized by CVSc&AH, Sardarkrushinagar	28 <sup>th</sup> to 29 <sup>th</sup> Jul., 2020
48.	Dr Deep Narayan Singh	Online National webinar on “Prospects & challenges of extension education system in veterinary & allied science during COVID-19 pandemic scenario of India” held at Directorate of Research, Extension & Farms, West Bengal University of Animal & Fishery Sciences	28 <sup>th</sup> -29 <sup>th</sup> Jul., 2020
49.	Dr Yajuvendra Singh	Online National webinar on “Eggs and poultry meat in new normal” held at Nanaji Deshmukh Veterinary Science University Jabalpur- 486001, M.P.	29 <sup>th</sup> Jul., 2020
50.	Dr Rajneesh Sirohi Dr Vijay Pandey Dr Vijay Kumar	Online National webinar on “Modern genetic approaches for improvement of indigenous cattle” held at DUVASU, Mathura	29 <sup>th</sup> Jul., 2020
51.	Dr Deep Narayan Singh	Online National webinar on “Homeopathy in Veterinary Medicine” held at Nanaji Deshmukh Veterinary Science University Jabalpur- 486001, M.P.	29 <sup>th</sup> Jul., 2020
52.	Dr Vijay Pandey	National Webinar on ‘Eggs and poultry meat in new normal’ conducted by College of Veterinary Science and Animal Husbandry, NDVSU, Rewa (MP)	31 <sup>st</sup> July 2020
53.	Dr Mukul Anand	National Webinar- Industry Academic Student-Farmer Interphase on Entrepreneurship in Goat Farming held at GADVASU	1 <sup>st</sup> Aug., 2020
54.	Dr Rajneesh Sirohi Dr Deep Narayan Singh	Online National webinar on “Eggs and Poultry Meat in New Normal” held at College of Veterinary Science & Animal Husbandry, Rewa, NanaJi Deshmukh Veterinary Science University, Jabalpur	01 <sup>st</sup> Aug., 2020
55.	Dr Deep Narayan Singh	Online National webinar on “Prospects and Challenges in Poultry Sector: Small Scale Farming to Large Commercial Enterprises” held at College of Veterinary Science & Animal Husbandry, Rewa, NanaJi Deshmukh Veterinary Science University, Jabalpur	01 <sup>st</sup> Aug., 2020
56.	Dr Rashmi Singh Dr Deepak Sharma Dr Vijay Pandey Dr Rajneesh Sirohi Dr Ambika Sharma Dr Deep Narayan Singh Dr S.P. Singh Dr Shriprakash Singh Dr Vijay Kumar Dr Pradeep Kumar Dr Avneesh Kumar Dr Abhinov Verma	Two days National webinar on Conceptualization of modern anatomy- theory and practice organized by Department of Veterinary Anatomy, College of Veterinary Science and Animal Husbandry, U.P. Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go-Anusandhan Sansthan (DUVASU) Mathura	04 <sup>th</sup> -05 <sup>th</sup> Aug., 2020



57.	Dr Yajuvendra Singh	Online National Workshop on “Climate-smart Livestock Production in India” held at Department of Veterinary Physiology, Faculty of Veterinary & Animal Sciences, West Bengal University of Animal & Fishery Sciences Kolkata, West Bengal, India	05 <sup>th</sup> -7 <sup>th</sup> Aug.,2020
58.	Dr Vikas Pathak Dr Vijay Pandey Dr Rajneesh Sirohi Dr Ambika Sharma Dr Deep Narayan Singh Dr Meena Goswami Awasthi Dr Sanjay Kumar Bharti Dr Abhinov Verma	Two days National Webinar on “Functional food of animal origin: Role in health promotion and disease prevention” organized by Department of Livestock Products Technology, College of Veterinary Science and Animal Husbandry, U.P. Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go-Anusandhan Sansthan (DUVASU) Mathura	06 <sup>th</sup> -07 <sup>th</sup> Aug., 2020
59.	Dr Barkha Sharma	‘Management of Parasitic Diseases in Domestic Animals: A novel Approach organized by Dept of Parasitology, COVAS, Jabalpur, MP	7 <sup>th</sup> Aug.,2020
60.	Dr Yajuvendra Singh	Online National Workshop on “Prospects and Challenges in Poultry Sector Small Scale Farming to Large Commercial Enterprises” held at Nanaji Deshmukh Veterinary Science University Jabalpur-486001, M.P.	07 <sup>th</sup> Aug., 2020
61.	Dr Deep Narayan Singh	Online International webinar on “Technological Advances to revolutionize Cancer Diagnosis” held at College of Veterinary Science & Animal Husbandry, Anjora, Durg (Chhattisgarh)	07 <sup>th</sup> Aug., 2020
62.	Dr Deep Narayan Singh	Online International webinar on “Immunology in 21 <sup>st</sup> Century for Improvising one health” held at College of Veterinary Science & Animal Husbandry, SVPUAT, Meerut	07 <sup>th</sup> -8 <sup>th</sup> Aug., 2020
63.	Dr Rajneesh Sirohi	Online National webinar on “Preparation of civil services examinations for veterinary graduates” held at DUVASU, Mathura	10 <sup>th</sup> Aug., 2020
64.	Dr Ambika Sharma Dr Yajuvendra Singh Dr Deep Narayan Singh	Online Indian Poultry Review Annual Conclave 2020	8 <sup>th</sup> Aug., 2020
65.	Dr Muneendra Kumar Dr Shalini Vaswani	National Webinar on “Eggs and Poultry Meat in New Normal” conducted by College of Veterinary Science & Animal Husbandry, Rewa (M.P.)	10 <sup>th</sup> Aug., 2020
66.	Dr Vikas Pathak Dr Archana Pathak Dr Deepak Sharma Dr Vijay Pandey Dr Rajneesh Sirohi Dr Ambika Sharma Dr Shriprakash Singh Dr Varsha Gupta Dr Abhinov Verma Dr Avinash Kumar Dr Yajuvendra Singh Dr Deep Narayan Singh Dr S.P. Singh Dr Vijay Kumar Dr Avneesh Kumar	National Webinar on “Atmanirbhar Indian Poultry in New Normal” conducted by Department of Poultry Science, College of Veterinary Science & Animal Husbandry, Mathura (U.P.)	9 <sup>th</sup> -11 <sup>th</sup> Aug., 2020



67.	Dr Rajneesh Sirohi Dr Deep Narayan Singh	Online National webinar on “Animal Production Medicine in Anthropocene Epoch” held at Veterinary Internal and Preventive Medicine Society with INTAS	13 <sup>th</sup> Aug., 2020
68.	Dr M.M. Farooqui Dr Archana Pathak Dr Deepak Sharma Dr Varsha Gupta Dr S.P. Singh Dr Yajuvendra Singh Dr Deep Narayan Singh Dr Avneesh Kumar	National Webinar on “In-depth bovine milk analysis to unearth goldmine beneficial for health applications” conducted by Department of Veterinary Biochemistry, College of Veterinary Science & Animal Husbandry, Mathura	14 <sup>th</sup> Aug., 2020,
69.	Dr Muneendra Kumar	Webinar on “Post Pandemic challenges and opportunities in Animal Health” organized by College of Veterinary & Animal Sciences, Meerut, Uttar Pradesh	14 <sup>th</sup> Aug., 2020
70.	Dr Ambika Sharma Dr Deep Narayan Singh	National Webinar on “Biotechnology Approaches for Ensuring Nutritional and Health Security during post COVID-19 Era” organized by college of Biotechnology, DUVASU, Mathura, U.P.	17 <sup>th</sup> Aug., 2020
71.	Dr Archana Pathak Dr Shriprakash Singh Dr Varsha Gupta Dr Abhinov Verma	International webinar- conceptual framework entwining transitional anatomy with veterinary clinical sciences organized by department of veterinary anatomy and histology, Kerala veterinary and animal sciences university KVASU	19 <sup>th</sup> -20 <sup>th</sup> Aug., 2020
72.	Dr Amit Kumar Jaiswal Dr Pradeep Kumar	National webinar on Strategies for sustainable control of parasites of livestock, poultry and wild life and their public health significance	21 <sup>st</sup> -23 <sup>rd</sup> Aug., 2020
73.	Dr Vijay Pandey Dr Deepak Sharma Dr Avneesh Kumar Dr Rajneesh Sirohi Dr Yajuvendra Singh Dr Deep Narayan Singh Dr Ambika Sharma Dr Vijay Kumar Dr S.P. Singh	National Webinar on “Igniting Young Mind Towards Science” organized conducted by Department of Veterinary Biochemistry, College of Veterinary Science & Animal Husbandry, Mathura (U.P.)	22 <sup>nd</sup> Aug., 2020
74.	Dr Rajneesh Sirohi Dr Deep Narayan Singh	Online National Webinar on “Infrared Thermography: A Novel Remote Examination Tool in Captive Elephant” held at College of Veterinary Sci. & A.H., Navsari Agricultural University, Navsari, Gujarat	23 <sup>rd</sup> Aug., 2020
75.	Dr Deep Narayan Singh	Online National Webinar on “Metabolic diseases of Importance in Dairy Animals” held at Veterinary Internal & Preventive Medicine Society, Department of Veterinary Medicine, PGIVER, Jaipur with INTAS	27 <sup>th</sup> Aug., 2020
76.	Dr Rashmi Singh	Virtual Brain Storming Session on “Antimicrobial Resistance” organized by National Academy of Agricultural Sciences through webinar.	29 <sup>th</sup> Aug., 2020
77.	Dr Vikas Pathak	Brainstorming Session on “Antimicrobial Resistance” organized by National Academy of Agricultural Sciences	29 <sup>th</sup> Aug., 2020
78.	Dr Deep Narayan Singh	Online National Webinar on “Blending Local and Global Knowledge and Innovation System Translating NEP (New Education Policy) Goals into Practice:” held at Centre of Post Graduate Institute of Veterinary Education & Research, Jaipur (RAJUVAS)	29 <sup>th</sup> Aug., 2020



79.	Dr Deep Narayan Singh Dr Vijay Kumar Dr Pradeep Kumar	Online National Webinar on “Microbiome, Immunity and Vaccines” held at Indian Association of Veterinary Microbiologists, Immunologists & Specialists in Infectious Diseases	30 <sup>th</sup> Aug.,2020
80.	Dr Shriprakash Singh	National webinar on Bio availability of nutrients and Ion channels: An anatomical approach held organized by Nanaji Deshmulh Veterinary University Jablpur.	7 <sup>th</sup> Sep., 2020
81.	Dr Vijay Pandey	Webinar on “Anti microbial resistance (AMR): Revisited” jointly organized by DUVASU, Mathura and Brooke Hospitals for Animals (India).	8 <sup>th</sup> Sept., 2020
82.	Dr Varsha Gupta	TANUVAS-Global Veterinary Imaging Sciences Webinar Series-2020, organized by director of clinics, TANUVAS	16 <sup>th</sup> -17 <sup>th</sup> Sep., 2020
83.	Dr Varsha Gupta	National webinar on “Applications of Electron Microscopy in Life Sciences Research” organized by College of Veterinary and Animal Sciences, Parbhani,	17 <sup>th</sup> Sep., 2020
84.	Dr Vijay Pandey Dr Ambika Sharma Dr Vijay Kumar	National Webinar on “A pragmatic solution to emerging and re-emerging zoonoses” organized by Department of Veterinary Public Health, College of Veterinary Science and Animal Husbandry, DUVASU, Mathura.	24 <sup>th</sup> Sep., 2020
85.	Dr M.M. Farooqui	National Webinar on “Biosafety issues related to COVID-19 Testing and zoonotic diseases” conducted by Department of VPH, CVSc & A.H., DUVASU, Mathura	24 <sup>th</sup> Sep., 2020
86.	Prof. Satish K Garg Dr Atul Prakash Dr Soumen Choudhury Dr Rajkumar Singh Yadav Dr Amit Shukla	20 <sup>th</sup> Annual Conference of Indian Society of Veterinary Pharmacology & Toxicology (ISVPT) as Virtual Conference (e-Conference) and International Webinar on “Receptor Dynamics in Cell Signalling” and National Webinar on “Translational Approaches in Herbal Drug Development” (4-5 <sup>th</sup> Oct, 2020) organised by Department of Pharmacology and Toxicology, Veterinary College, DUVASU, Mathura.	4 <sup>th</sup> -5 <sup>th</sup> Oct.,2020
87.	Dr Abhinov Verma	2 <sup>nd</sup> International Webinar Organised by N.T.R. College of Veterinary Science, Gannavaram, Sri Venkateswara Veterinary University.	13 <sup>th</sup> Oct.,2020
88.	Dr Deep Narayan Singh	National Webinar on “Revisiting Backyard and Small scale Poultry Production in India with Industrial Approach” held at Indian Society of Animal Production and Management, UBA Regional Co-ordinating Institution, SVVU, Tirupati	20 <sup>th</sup> Oct.,2020
89.	Dr Archana Pathak Dr Varsha Gupta	National web conference on advances in teaching and research in veterinary anatomy in India, organized by department of veterinary anatomy, NTR college of Veterinary science, Gannavaram	27 <sup>th</sup> - 29 <sup>th</sup> Oct., 2020
90.	Dr Rashmi Singh	Webinar-Vaccine Development Challenges and opportunities for budding Veterinarians-IDP-Cell, GADVASU	5 <sup>th</sup> Nov., 2020
91.	Dr Varsha Gupta	National webinar on topographic anatomy of abdomen of bovine in relation to clinical interventions, organized by GADVASU	26 <sup>th</sup> Nov., 2020
92.	Dr Amit Kr Jaiswal	e-Conference on Insights in to the diagnosis and control of parasitic disease for enhanced livestock production	7 <sup>th</sup> -8 <sup>th</sup> Dec., 2020

93.	Dr Ambika Sharma	IAWV XVI National Online Conference “Sustainable contribution of Atmanirbhar Women Veterinarians in Enrichment of Production Potential in Livestock through Applications of Modern Technologies” organized by Department of Veterinary Pharmacology & Toxicology, CoV&AS, Parbhani, MAFSU, Nagpur, India	9 <sup>th</sup> -10 <sup>th</sup> Dec.,2020
94.	Dr Vikas Pathak	2 <sup>nd</sup> meeting of the Working Group on cell-based meat (cultured meat) organized by Food Safety and Standards Authority of India (FSSAI), Ministry of Health & Family Welfare, Government of India	4 <sup>th</sup> Jan.,2021
95.	Dr Pradeep Kumar	Webinar on Recent advances in Ecto & Endo parasite control in livestock”	17 <sup>th</sup> Jan., 2021
96.	Dr Vikas Pathak	15 <sup>th</sup> 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	18 <sup>th</sup> Jan.,2021
97.	Dr Vikas Pathak Dr Meena Goswami Awasthi Dr Sanjay Kumar Bharti	National webinar on” current practices and innovations in the packaging of meat and poultry products” at DUVASU, Mathura	12 <sup>th</sup> Feb., 2021
98.	Dr Arun Kumar Madan Dr Brijesh Yadav Dr Dilip Kumar Swain	XXIX Annual conference on “Recent approach to escalate livestock productivity under current socio-economic scenario”	25 <sup>th</sup> -26 <sup>th</sup> Feb., 2021
99.	Dr Ambika Sharma	Webinar on “Deciphering the biochemical conundrum of COVID-19” organized by Association of Clinical Biochemists of India (ACBI)	26 <sup>th</sup> Feb., 2021
100.	Dr Ambika Sharma	National webinar on “Women in leadership: achieving an equal future in a COVID-19 world”, organized by the Indian Association of Women Veterinarians (Assam Chapter), College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India	8 <sup>th</sup> Mar., 2021
101.	Dr Rashmi Singh	National Webinar on National Vaccination Day – Corona vaccine: facts and myths, COVS, Rampuraphul, GADVASU.	16 <sup>th</sup> Mar.,2021
102.	Dr Ambika Sharma Dr Pradeep Kumar	NAHEP- National webinar on “Current concepts in clinico-therapeutic management of snake bite in bovines”, organized by Department of Veterinary Microbiology, College of Veterinary Science & Animal Husbandry, DUVASU, Mathura (U.P.)	20 <sup>th</sup> Mar., 2021
103.	Dr Rashmi Singh	Webinar- COVID 19 control strategies: where we stand and challenges ahead, IDP Cell, GADVASU	24 <sup>th</sup> Mar., 2021
104.	Dr Brijesh Yadav Dr Ambika Sharma Dr Dilip Kumar Swain Dr Vikrant Sudan	V <sup>th</sup> Annual Convention of Society of Veterinary Biochemists and Biotechnologists of India (SVBBI) and National Symposium on ‘Current Challenges for Animal Biochemists and Biotechnologists for Improving Animal Health and Production in Post COVID Scenario’	24 <sup>th</sup> -25 <sup>th</sup> Mar.,2021



## PARTICIPATION OF FACULTY MEMBERS IN TRAININGS/ WORKSHOPS

S. No.	Name of the faculty member	Title of the event	Date
1.	Dr Vijay Pandey	8 weeks online NPTEL Certification course on “Enhancing soft skills and personality” organized by IIT, Kanpur under the project of National Program on Technology Enhanced Learning (NPTEL) in association with NASSCOM funded by Ministry of Human Resource Development, Government of India.	15 <sup>th</sup> Feb -15 <sup>th</sup> Apr., 2020
2.	Dr Vijay Kumar	21 days training course on “Skill development on advanced Bioinformatics in Genome Analysis of Livestock and Pets” organized by College of Biotechnology and PMU-CRC-GADVASU, Ludhiana.	2020 5 <sup>th</sup> -25 <sup>th</sup> Mar., 2021
3.	Dr Rajneesh Sirohi Dr Ambika Sharma Dr Deep Narayan Singh	MOOC on Psychology of Learning, ICAR-NAARM, Hyderabad	1 <sup>st</sup> -15 <sup>th</sup> May., 2020
4.	Dr Shanker K. Singh	Six weeks Online International Training: “Comprehensive disaster risk management framework” Conducted by National institute of disaster management (NIDM), Ministry of Home Affairs, Government of India, New Delhi in collaboration with the World Bank (GFDRR)	13 <sup>th</sup> May-24 <sup>th</sup> Jun., 2020
5.	Dr Ambika Sharma	21 days virtual national training course (NTC-2020) on “Preparing and Management of Result Oriented Research Projects in Agriculture, Horticulture, Animal Husbandry and Allied Sectors, National Agriculture Development Co-operative Ltd.	26 <sup>th</sup> May-15 <sup>th</sup> Jun., 2020
6.	Dr Archana Pathak	Three Days online training on “ Research supports tools: Effective e-learning with smart tools and techniques” organized by College of Agriculture, Powarkheda, Hoshangabad	28 <sup>th</sup> -30 <sup>th</sup> May., 2020
7.	Dr Meena Goswami Awasthi	One day national workshop on “Improvement of livestock productivity and food security through milk and milk products” conducted by Nanaji Deshmukh Veterinary Science University, Jabalpur (M.P.)	1 <sup>st</sup> Jun., 2020
8.	Dr Jitendra Tiwari Dr Muneendra Kumar	National Workshop on An insight to research proposals, statistical techniques and Intellectual property rights organised by CVSc&AH, Mhow	26 <sup>th</sup> -28 <sup>th</sup> Jun., 2020
9.	Dr Udit Jain	Online one day International workshop on “Holistic Approach towards Diagnosis and Management of canine cardiac disorders” organized by NDVSU, Jabalpur (MP).	20 <sup>th</sup> Jul., 2020
10.	Dr Udit Jain	15 days online workshop with distinction on “ABC of scientific writing” during 22 <sup>nd</sup> July to 5 <sup>th</sup> August 2020, organised by KVK Santhapur and ICAR-NRRI, Cuttack.	22 <sup>nd</sup> Jul.,- 5 <sup>th</sup> Aug., 2020
11.	Dr Udit Jain	Online 4 days National workshop on “Footprints of Ideal Research Methodology” organized by NDVSU, Jabalpur (MP).	11 <sup>th</sup> Aug. to 14 <sup>th</sup> Aug, 2020

12.	Dr Neeraj Kumar Gnagwar Dr Shyama N. Prabhu Dr Renu Singh	“Online elephant conference 3 elephant research center school of pharmaceutical sciences held at Vets institute of science, Technology and Advanced studies, pallavaram, Chennai, TN, India	24 <sup>th</sup> -07 <sup>th</sup> Jul., 2020
13.	Dr Vinod Kumar Dr Vijay Pandey Dr Ambika Sharma Dr Jitendra Tiwari Dr Vikrant Sudan Dr Pradeep Kumar Dr Amit Jaiswal Dr Neeraj Kumar Gangwar Dr Muneendra Kumar Dr Raju Kushwaha Dr Shalini Vaswani Dr Avinash Kumar Dr Amit Singh Dr Rashmi Dr Deep Narayan Singh Dr Shyama N. Prabhu Dr Renu Singh	Massive Open Online Course (MOOC) on “Designing e-learning content” organized by ICAR-NAARM, Hyderabad	1 <sup>st</sup> - 31 <sup>st</sup> Jul., 2020
14.	Dr Mukesh Srivastava	Immunology in 21 <sup>st</sup> century for improvising one health. International E-Conference of society of immunology and immunopathology Organized by SBPUAT, Meerut and department of animal husbandry and dairying, Gov. of India, New Delhi.	7 <sup>th</sup> -8 <sup>th</sup> Aug., 2020
15.	Dr Abhinov Verma Dr Varsha Gupta	Online International Training Programme on "Fundamentals of Equine Locomotion, Foot Disorders and It's Therapeutics: A Farriery Approach" conducted by College of Veterinary Science & A.H., Rewa (M.P.)	17 <sup>th</sup> -20 <sup>th</sup> Aug. 2020
16.	Dr Yajuvendra Singh Dr Deep Narayan Singh	Online training programme on “Smart Dairy Farming: Boosting Productivity through Innovations” held at ICAR-NAHEP-CAAST, Navsari Agricultural University, Gujarat	18 <sup>th</sup> -22 <sup>nd</sup> Aug., 2020
17.	Vijay Pandey	E-Course on “Wildlife: Rescue techniques and care” organized by Directorate of Human Resource Development, RAJUVAS, Bikaner.	27 <sup>th</sup> -29 <sup>th</sup> Aug., 2020
18.	Dr Deep Narayan Singh Dr Rajneesh Sirohi	21 Days online Training Organized by ICAR-IGFRI, Regional Research Station, Srinagar (UT of J&K) “Advances in Fodder Production, utilization and conservation for improving Livestock Health, Productivity and Environmental sustainability”	20 <sup>th</sup> Aug – 11 <sup>th</sup> Sep., 2020
19.	Dr Ambika Sharma	5 days Online faculty development program on “Creating online courses using open educational resources” CABM, GBPUAT, Pantnagar (U.K.)	18 <sup>th</sup> -22 <sup>nd</sup> Sep., 2020
20.	Dr Ambika Sharma	10 days online training on ‘Updates on biochemical mechanisms and its interpretations in Veterinary and Animal Sciences for veterinary clinical applications’ organized by College of Veterinary and Animal sciences, Parbhani, Maharashtra	21 <sup>st</sup> -30 <sup>th</sup> Sep., 2020
21.	Dr Deep Narayan Singh	5 Days online Training “Wildlife Conservation & Management” College of Forestry, Dr Panjab	2 <sup>nd</sup> -10 <sup>th</sup> Oct., 2020



		Rao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra	
22.	Dr Ruchi Tiwari Dr Vijay Kumar	Online 21 Days National Training Course on “Technology Interventions Towards Transformation Agriculture, Sericulture, Animal Husbandry and Allied Sectors into Sustainable Enterprises for Atmanirbhar Bharat” by AEDS	11 <sup>th</sup> -31 <sup>st</sup> Oct., 2020
23.	Dr Pawanjit Singh Dr Amitav Bhattacharyya	21 Days online Training on “Physio-Biochemical and Biotechnological Approaches for Optimization of Health and Reproduction in Animals” organized by College of Veterinary Science & AH Mhow (MP)	01 <sup>st</sup> -21 <sup>st</sup> Dec., 2020
24.	Dr Vikas Pathak	National Workshop on “Scientific Interventions and Policies for Strengthening of Buffalo Meat Sector: Catalyst for Boosting India's Agro-Economy” organized by ICAR-National Research Centre on Meat in collaboration with ICAR-NAARM; NAAS, Hyderabad Chapter and Indian Meat Science Association (IMSA)	19 <sup>th</sup> Jan., 2021
25.	Dr Shriprakash Singh Dr Varsha Gupta Dr Abhinov Verma	International virtual training on “Advanced microscopic techniques in Biomedical Research organized by Department of Anatomy, NTR College of Veterinary Sciences Gannavaram S.V.V.U.&T., Tirupati	28 <sup>th</sup> -30 <sup>th</sup> Jan., 2021
26.	Dr Ambika Sharma	Five days MANAGE training program on “Intellectual Property Rights for Agri Startups”	8 <sup>th</sup> -12 <sup>th</sup> Feb., 2021
27.	Dr Parul	“Recent Advances in Quality Assurance of Meat and Meat Products” Mumbai Veterinary College, Parel, Mumbai, 400 012 Maharashtra Animal and Fishery Sciences University, Nagpur (M.S.), INDIA	1 <sup>st</sup> - 5 <sup>th</sup> Feb., 2021
28.	Dr Udit Jain Dr Parul	“Application on of Novel Methods in Prevention and Control of Zoonoses and Ensuring Food Safety” College of Veterinary Science & Animal Husbandry, NDVSU, Jabalpur (M.P.)	18 <sup>th</sup> Feb-10 <sup>th</sup> Mar., 2021
29.	Dr Brijesh Yadav	Second Australia-India Council Workshop on "Transfer of Mitigation Technologies for Heat Stress in Farm animals"	18 <sup>th</sup> -19 <sup>th</sup> Feb., 2021
30.	Dr Barkha Sharma Dr Ambika Sharma Dr Deep Narayan Singh Dr Yajuvendra Singh Dr Ruchi Tiwari Dr Amit Singh Dr Rashmi Dr Meena Goswami Awasthi Dr Sanjay Kumar Bharti	14 days online Faculty development program on "Entrepreneurship in Livestock and Veterinary Sciences" sponsored by Department of Science and Technology (DST), organized by ICAR-NRC on Meat, Hyderabad	9 <sup>th</sup> -22 <sup>nd</sup> Feb., 2021
31.	Dr Ambika Sharma	2-weeks comprehensive online “Patent Information Course” organized by Turnip Innovations	2 <sup>nd</sup> -15 <sup>th</sup> Mar., 2021



## STUDENTS WELFARE

### National Cadet Corps

During 2020-2021, 26 and 44 cadets appeared in 'B' and 'C' certificate examination respectively. During the period under report, 26 cadets participated in CATC-38 camp held from 9<sup>th</sup> February 2021 to 11<sup>th</sup> February 2021. Forty-four cadets of NCC participated in CATC-38 camp from 9<sup>th</sup> February 2021 to 13<sup>th</sup> February 2021. Six cadets of NCC participated in 6<sup>th</sup> Phase of online Ek Bharat Shreshtha Bharat (EBSB) held from 22<sup>nd</sup> March, 2021 to 27<sup>th</sup> March, 2021. Cadet Praveen Kumar participated in a camp at IMA-Dehradun held from 21<sup>st</sup> December 2020 to 8<sup>th</sup> January 2021. NCC cadets gave Guard of Honour and escorted as pilot to the Hon'ble Governor of Uttar Pradesh, Smt. Anandi Ben Patelji on 22<sup>th</sup> February 2021 on the occasion of 10<sup>th</sup> Convocation ceremony held at the University auditorium. Dr Rajneesh Sirohi actively engaged himself and participated in a Refresher course, NCCORT-23 wherein he helped imparting training to different ANO's from NCC units of the various parts of the country wef 1<sup>st</sup> December 2021 to 30<sup>th</sup> December 2021. He was

awarded with an appreciation letter for working as an Associate NCC officer in compliance to the orders from Director General, National Cadet Corps, New Delhi. NCC cadets also escorted and gave 'Guard of Honour' to the Hon'ble Vice-Chancellor of the University on Independence Day 2020 and Republic Day 2021.

### LITCUL 2020

The outbreak of COVID-19 led to worldwide closure of school and university. However, notwithstanding these obstacles, the University took timely steps to continue its academic and co-curricular activities. LITCUL 2020 was organized online to provide a platform to the students to explore new culture dimensions and talents in various ambits. Under the umbrella of LITCUL, Debate, Extempore, Elocution, Essay (Hindi & English), Painting & Drawing, Poster making, Dance and Song competitions were organized using online platforms. The results of different competitions are as:

Name of Competition	Position	Name of Student	Class
<b>Extempore (Hindi)</b>	I	Dr Prabha Sharma	M.V.Sc. 2nd Year (Surgery)
	II	Mr. Aditya Maheshwari	B.V.Sc. & A.H. 1st Year
	III	Ms. Prabha Dixit	B.Sc. Biotech, 1st Year
<b>Extempore (English)</b>	I	Ms. Mohini Sharma	B.V.Sc. & A.H. 4th Year
	II	Mr. Abhishek Mishra	B.V.Sc. & A.H. 4th Year
	III	Ms. Shreya Singh	B.V.Sc. & A.H. 1st Year
<b>Essay Competition (Hindi)</b>	I	Ms. Garima Singh	B.V.Sc. & A.H. 2nd Year
	II	Ms. Niharika Pal	B.V.Sc. & A.H. 3rd Year
	III	Ms. Geeta Kumari	B.V.Sc. & A.H. 3rd Year
<b>Essay Competition (English)</b>	I	Ms. Simran Josan	B.V.Sc. & A.H. 3rd Year
	II	Ms. Shruti Gupta	B.V.Sc. & A.H. 3rd Year
	III	Ms. Nikita Soni	B.V.Sc. & A.H. 2nd Year
<b>Dance Competition (Classical/semi-classical/folk)</b>	I	Ms Jaya	Diploma in Veterinary Pharmacy 2nd Year
	II	Ms. Isha Agnihotri	B.V.Sc. & A.H. 4th Year
	III	Ms. Anupama Verma	B.V.Sc. & A.H. 4th Year
<b>Dance Competition (Western/Bollywood)</b>	I	Ms. Akansha Sharma	B.V.Sc. & A.H. 1st Year
	II	Mr. Veerpal Anuragi	B.V.Sc. & A.H. 3rd Year
	III	Ms. Bhumika Pal	B.V.Sc. & A.H. 1st Year
<b>Drawing Competition</b>	I	Ms. Sonam Kumari	B.V.Sc. & A.H. 3rd Year
	II	Ms. Nikita Soni	B.V.Sc. & A.H. 2nd Year
	III	Mr. Gaurav Kumar Verma	B.V.Sc. & A.H. 1st Year

<b>Painting Competition</b>	I	Ms. Purna Tomar	B.V.Sc. & A.H. 1st Year
	II	Ms. Sonam Kumari	B.V.Sc. & A.H. 3rd Year
	III	Ms. Rajul Jain	B.V.Sc. & A.H. 1st Year
<b>Poster Competition</b>	I	Ms. Sonam Kumari	B.V.Sc. & A.H. 3rd Year
	II	Ms. Mohini Sharma	B.V.Sc. & A.H. 2nd Year
	III	Ms. Purna Tomar	B.V.Sc. & A.H. 1st Year

### Webinars

The following webinars were organized by the office of Dean Students Welfare, DUVASU, Mathura for the students of the University under

Interactive Sessions for Students with Industry and Academia of Institutional Development Plan (IDP)-National Agricultural Higher Education Project granted to this University.

1.	July 15, 2020 Time: 11.00 A.M.	“Art of Public Speaking”	Prof. Birendra Kumar 1. Ex-Dean, College of Agribusiness Management Pantnagar 2. Ex-Director Residential Instruction-cum-Dean PGS Bihar Agriculture University, Sabour 3. Director Communication, Professor & Head Agricultural Communication at G.B. Pant University, Pantnagar 4. Visiting Professor at Alernaya University (Now Harmaya University), Ethiopia
2.	July 17, 2020 Time: 11.00 A.M.	“Rescued wild animal management: A task for the veterinarian”	Dr S. Ilayaraja Deputy Director-Veterinary Services Wildlife SOS, India
3.	July 28, 2020 Time: 06.00 P.M.	“Veterinary Education in Global Perspective”	Dr Dinesh K. Singh Professor of Microbiology Winston-Salem State University
4.	August 10, 2020 Time. 03:00 P.M.	“Preparation of Civil Services Examination for Veterinary Graduates.”	Dr Raj Kamal Yadav I.A.S



Release of student magazine-THE MIRROR/दर्पण

## OTHER HIGHLIGHTS AND ACTIVITIES

### Entrance examination

University conducted Pre-Veterinary Test-2020 in eleven different centers of five districts of Uttar Pradesh. 2787 applicants applied for the Prelim held on 20<sup>th</sup> September 2020 out of which 728 candidates qualified for PVT-Mains examination which was held on 11<sup>th</sup> October 2020 at two centers of Mathura. Total 393 candidates qualified the PVT-Mains examination. The Pre-Diploma test for admission in Institute of Para-veterinary Science was held on 27<sup>th</sup> September 2020 at Mathura. Total 234 candidates appeared in the entrance examination. Entrance examination for Postgraduate (M.V.Sc. and Ph.D.) of College of Veterinary Science & AH was held on 15<sup>th</sup> November 2020 in which 141 candidates appeared and 83 candidates qualified for admission.

### Independence Day



The 74<sup>th</sup> Independence was celebrated with great enthusiasm and respect by the senior officers, faculty members, staff and students of the University. The celebration started with hoisting of national flag by Professor (Dr) G.K. Singh Hon'ble Vice-Chancellor DUVASU and 'Chief Guest' of the occasion followed by hoisting of national flag. A beautiful rendition of the National Anthem was done by our choir. Floral tributes were offered to the 'Father of the Nation' Mahatma Gandhi. The

chief guest addressed the gathering about Independence Day and also highlighted the achievements of the University. Tree plantation drive was also organized to sensitize people towards the need to preserve our environment and ecology.

### Gandhi Jayanti

The University celebrated Mahatma Gandhi 151<sup>st</sup> Birth Anniversary on 2<sup>nd</sup> Oct, 2020. All the officers, teachers, students & staff attended the event. Dr P.K. Shukla, Registrar and Dean, College of Veterinary Science & A.H., DUVASU was 'Chief Guest' of the occasion. The unveiling of the portrait of Gandhi ji was done followed by offering of floral tribute.



Investiture Ceremony for Grant of "Honorary Colonel Commandant" of NCC Prof. (Dr.) G.K. Singh, Vice Chancellor, DUVASU, Mathura



### Republic day

"Saare jahan se accha, Hindustan hamara, Hum bulbuleain hain iski, ye gulsitan hamara....."

DUVASU celebrated the joy and happiness of 72<sup>th</sup> Republic day on 26<sup>th</sup> January 2021. Hon'ble Vice-Chancellor, Prof. G.K. Singh unfurled the National flag. The teaching, non-teaching staff of the university and the students gathered in front of



the main building in a festive mood. On the occasion, Hon'ble Vice-Chancellor along with higher officials of the university paid floral tributes to Mahatma Gandhi. The six non-teaching staff of the University were felicitated for their exceptional devotion and dedication towards the work assigned. As trees help to keep the ecological balance supplying oxygen, the celebration ended with plantation of saplings in the campus followed by distribution of sweets. A blood donation camp with the collaboration of blood bank, District Hospital, Mathura was also organized on this occasion in which 38 blood bags were collected from teaching, non-teaching and student of the university. A medical health checkup camp exclusively for female students, faculty and non-teaching women of the University was also organized on this occasion as directives given by Hon'ble Governor/Chancellor of the University.



## Pt. Deen Dayal Upadhyaya Jayanti

DUVASU, Mathura paid homage to well-known thinker and philosopher Pt. Deen Dayal Upadhyaya celebrating 104<sup>th</sup> birth anniversary of Panditji on 25<sup>th</sup> September 2021. On this occasion floral tributes were offered to his portrait and Hon'ble Vice chancellor of the University Professor G.K. Singh, Registrar & Dean Professor P.K. Shukla and other higher officials of the University. Hon'ble Vice chancellor of the University Professor G.K. Singh speaking on the occasion recalled the path shown by Deen Dayal ji. The name of this university is also related with this great ma. Honorable Vice Chancellor, Dean and other Deans and Directors paid floral tribute to Pt. Deen Dayalji. Prof. (Dr) G.K. Singh addressed the gathering and remembered the ideology of Pt. Deen Dayalji “एकात्म मानववाद” and expressed his desire to follow his path of Honorable Vice Chancellor appealed that every person of this University should give their services for the betterment of the society and Nation.

### Amdedkar Jayanti

The birth anniversary of the principal architect of the Indian Constitution Bhimrao Ambedkar was celebrated on 14<sup>th</sup> April 2021. Tribute was paid to Baba Sahib by teaching, non-teaching staff and students of the university with flower offerings. Hon'ble vice chancellor extended the words of inspiration from Baba Saheb's life.

### Basant Panchami

Dedicated to Devi Saraswati Basant panchami festival was celebrated at the main hall of the University library in the morning of 16<sup>th</sup> February 2021. Honorable Vice Chancellor Professor G.K. Singh, teaching and non-teaching staff participated in the reverence of goddess of knowledge for the blessings.



### DUVASU, Mathura celebrates Agriculture Education Day-2020 an awareness programme for school students

DUVASU, Mathura celebrated the Agriculture Education Day on 3<sup>rd</sup> December 2020 to commemorate the Birth Anniversary of Bharat Ratna, Dr Rajendra Prasad, the first Agriculture Minister of the country and First President of Independent India. The motto behind this celebration was to create awareness and develop interest among school students in agriculture and veterinary science. Professor P.K. Shukla, Dean, College of Veterinary science & Animal Husbandry shared that farmers and animal owners are the backbone of the Nation and our resources depends upon them, their growth, prosperity which will help them deaden poverty. Moreover, he guided the coordinators Dr Ambika Sharma and Dr Pawanjit Singh that school students should be motivated towards veterinary education as these students in future will help building Nation if they get an overview of the agriculture and veterinary science. DUVASU organized an essay and a quiz competition for the Symbiosis school for excellence students on the theme: "Importance of Agriculture in the present scenario."

### Virtual orientation programme for BVSc & AH First Professional students

College of Veterinary Science & Animal Husbandry, DUVASU, Mathura organized a virtual orientation programme on 2<sup>nd</sup> December 2020 for the 76 students' batch of newly admitted students of Bachelor of Veterinary Science and Animal husbandry. Welcoming the fresher's Coordinator of the programme, Dr Ambika Sharma, Assistant Professor, Veterinary Biochemistry handed over the digital platform to Dr Muneendra Kumar, Assistant Professor, Animal Nutrition and Deputy Registrar of the College for introducing the fresher's with the curriculum of the course and an overview of the present regulations. Capt. (Dr) Rajneesh Sirohi, ANO, UP 1 R&V Squad encouraged the new entrants with the scope and future prospects of NCC and its role in maintaining health and benefits throughout their life. Meanwhile the students were invited to introduce themselves to the faculty one by one. Dr Dilip Swain, Assistant Professor, Veterinary Physiology, Dr Ajay Pratap, Assistant Professor, Veterinary Microbiology, Dr R.K. Yadav, Assistant Professor, Veterinary Pharmacology and Toxicology, Dr A.K. Tripathi, Assistant Professor, Department of Preventive Medicine; the class teachers of each professional year briefed about the courses. Professor R.P. Pandey, Director of Clinics introduced the clinics of DUVASU. Internship programme was detailed out by Dr Gulshan Kumar, Assistant Professor, Surgery & Radiology. Dr Pawanjit Singh, Assistant Professor and In charge, Training & Placement cell encouraged fresher's with the vast prospects of veterinary science and various avenues. Dr Vinod Kumar, Associate Professor, Animal Nutrition updated the students with the games, sports and gymnasium facilities available in the hostels and University. DSW of the University, Professor Vikas Pathak, Professor and Head, LPT narrated the fresher's with the rules and regulations of the hostels and college, Do's and Don'ts of the campus. Professor P.K.Shukla, Dean of the college blessed and motivated the students. He concluded the orientation programme with his ever encouraging and valuable insights.

### 20<sup>th</sup> Foundation Day

DUVASU celebrated its 20<sup>th</sup> Foundation Day on 25<sup>th</sup> October 2020 in an online-offline mode looking towards the precautions to be taken during COVID-19 pandemic. The programme was organized in the University auditorium with a brief invocation about the University history, followed by Lighting of lamp and garlanding of Maa



Saraswati by Honorable Vice-Chancellor Professor G.K. Singh, Registrar of the University and Dean of the College of Veterinary Science & Animal Husbandry, Professor P.K. Shukla, Dean, College of Biotechnology, Professor Rajesh Nigam and other higher officials of the University. It was followed by University song. Welcoming the gathering, Registrar of the University congratulated DUVASU family on its 20<sup>th</sup> Foundation day as well as Vijayadashmi. University journey since its inception till date was presented in terms of various landmarks, achievements and progress of the University.

The most overwhelming and blissful was the remarks video clip of the previous administrators who took reins of the University for its establishment. Professor S.N. Maurya, Founder Officer on Special duty conveyed best wishes for the 20<sup>th</sup> Foundation Day celebration. Professor D.P. Singh, Second OSD of the University expressed his feelings towards this University. He also appreciated the tireless efforts of then NCC officer Professor P.K. Shukla, present Dean of the College of Veterinary science and Animal husbandry during those tough days. He mentioned his contribution regarding getting recognition of this proud institution in ICAR. Professor Shri Krishna Garg, Founder Vice-Chancellor congratulated DUVASU on its 20<sup>th</sup> foundation day appreciated all regarding the visible progress. He requested the state and central Government to give central recognition to this University so that it can excel in teaching, resources and extension activities. Professor M.L. Madan, Former Vice-Chancellor wishing good luck expressed his strong attachment to this University and emphasized that the approach to education, teaching, student-teaching relationship and the methodology for conveying science to students and in turn students ability to learn out of them has also been changed. Professor A.C. Varshney, wishing DUVASU family on its foundation day appreciated the progress. DUVASU made this Foundation day a historic event when for the first time the reflection of the students was compiled as a treasure form of Student magazine- THE MIRROR/दर्पण and its CD was released by the Vice-Chancellor of the University Professor G.K. Singh and Dean of the College of Veterinary Science & Animal Husbandry, Professor P.K. Shukla along with the editorial board members. To encourage the students of the University, few best online performances were played-solo songs, solo dances, group dance etc. on the occasion to give them an impulse to their creativity. Moreover, under the DIMSCA project running in the department of

Surgery and Radiology, few SC beneficiaries of the nearby villages were distributed “Kits” containing mineral mixture prepared by the University, first-aid materials, medicines, immunity enhancers by Honorable Vice-Chancellor of the University, Dean, college of Veterinary science and Animal husbandry and Director, Clinics Professor R.P. Pandey. Honorable Vice-Chancellor congratulated and blessed the gathering correlating the progress of this knowledge gaining platform with the festival of Vijayadashmi removing darkness and moving towards light enlightening, disseminating education thus serving the society. The programme ended with Vote of thanks by DSW, Professor Vikas Pathak followed by National Anthem.

### World Rabies Day 2020

DUVASU, Mathura celebrated World Rabies Day on 28<sup>th</sup> September 2020. On this occasion free rabies vaccination camp was organized at VCC of the university. The program was inaugurated by Honorable Vice Chancellor of the university Professor G.K. Singh in the gracious presence of Police Officer (Traffic) Shri Nawal Kishore and Col. Vijay Rao. Fifty dogs of Mathura district were vaccinated. An interaction program was organized in which Prof. G.K. Singh, Dean, COVSc & AH, Prof. P.K. Shukla, Director Research Prof. Atul Saxena, Director Clinics, Prof. R.P. Pandey, Dean, COB, Prof. Rajesh Nigam, DSW, Prof. Vikas Pathak and other Professors, faculty members were present.

### 10<sup>th</sup> Convocation of DUVASU



10<sup>th</sup> Convocation of DUVASU, Mathura was organized at University Auditorium on 23<sup>rd</sup> February, 2021. Convocation function was presided over by the Hon'ble Governor of Uttar Pradesh and Chancellor of U.P. Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Evam Go Anusandhan Sansthan Mathura Smt. Anandiben Patel ji. Dr. A.K. Misra, Chairman, ASRB, New Delhi was the Chief Guest of the occasion and



Dr. B.N. Tripathi, DDG (Animal Science), ICAR, New Delhi was the Guest of Honour. Proceedings of the Convocation commenced with the lighting of lamp, Saraswati Vandana followed by University song. The convocation was declared open by the Hon'ble Governor of Uttar Pradesh. Hon'ble Vice chancellor presented the University progress report. Hon'ble Chancellor conferred degrees to 128 students. Out of these 60 students received undergraduate degree of B.V.Sc. and A.H., 40 students received M.V.Sc. and five students received their Ph.D. degree in College of

Veterinary Science and A.H. In College of Biotechnology 14, 1 and 5 students received their B.Sc., MSc. and Ph.d degree respectively. Hon'ble Chancellor blessed and congratulated the degree recipients.

On this occasion Hon'ble Governor Uttar Pradesh Smt. Anandiben Patelji laid the foundation stone of girl's hostel through virtual mode. She released University Publications and distributed inspirational books, fruits and sweets to the students of primary school.





## Awards and Honour/Achievements

## AWARDS AND HONOUR/ACHIEVEMENTS

S. No.	Name	Name of award	Event	Date
1.	Prof. Vikas Pathak	Vice-President	Indian Meat Science Association (IMSA)	2018-21
2.		Member	Working group on Cell based meat, Food Safety & Standards Authority of India, Ministry of Health and Family Welfare	4 <sup>th</sup> May, 2020
3.		Lead speaker	National Webinar- Industry Academia Students interface on, "Technological Innovations and Entrepreneurship in Animal Industry By-products" organized by Department of Livestock Products Technology, College of Veterinary Science, GADVASU, Ludhiana	27 <sup>th</sup> June, 2020
4.		Panellist	Brainstorming Session on " Potential of Non-bovine Milk" organized by National Academy of Agricultural Sciences	29 <sup>th</sup> June, 2020
5.	Prof. Archana Pathak	Appreciation Certificate	Invited Lecture on "Topographic Anatomy of Abdomen of Bovines in relation to Clinical interventions" conducted by IDP-Cell, GADVASU, Ludhiana	26 <sup>th</sup> Nov, 2020.
6.	Prof. Rashmi Singh	Member	Assessment committee of CAS, NDVSU, Jabalpur	23 <sup>rd</sup> Dec, 2020
7.		Member	Screening and Assessment committee of CAS, ASRB, New Delhi	20 <sup>th</sup> -21 <sup>st</sup> Aug, 2020
8.		Nodal Officer	COVID-19 Testing Lab, DUVASU, Mathura	Since 2020
9.		Expert Lecture	National Webinar on COVID 19 control strategies: where we stand and challenges ahead, IDP Cell, GADVASU	24 <sup>th</sup> Mar, 2021
10.		Key Speaker	National Webinar on National Vaccination Day-Corona vaccine: facts and myths, COVS, Rampuraphul, GADVASU	16 <sup>th</sup> Mar, 2021
11.		Expert Lecture	National Webinar on Vaccine Development Challenges and opportunities for budding Veterinarians-IDP-Cell, GADVASU	5 <sup>th</sup> Nov, 2020
12.	Prof. Rashmi Singh Dr Barkha Sharma Dr Udit Jain Dr Jitendra Tiwari Dr Neeraj Gangwar Dr A.P. Singh Dr Soumen Chaudhary Dr Ruchi Tiwari Dr R.K Yadav Dr V.K. Singh Dr Vikrant Sudan Dr Parul		Appreciation Letter for working in COVID-19 Testing Lab, DUVASU, Mathura	2020





13.	Dr Udit Jain	All India Monthly writing competition-Winner award	Awarded for the article writing on Bird flu by epashupalan.com	Jan, 2021
14.		National level create video competition winner award	World food safety day By dept. of LPT & meat technology unit, KVASU, Mannuthy, Thrissur	07 <sup>th</sup> June, 2020
15.	Dr Neeraj Kr. Gangwar	Zonal Secretary	North zone of the IAVP society, India	2019-22
16.	Dr Barkha Sharma	Member of Editorial Board	Pashupatrika.com	2021
17.			Acta Scientific Veterinary Sciences	2021
18.		Winner All India monthly article	writing competition by Pashupalan.com	2021
19.	Dr Rajneesh Sirohi	DG NCC Commendation Card	Republic Day Camp NCC	2021
20.	Dr Shriprakash Singh	Best Hindi article Award	e-pashupalan	Dec, 2020
21.		Poultry Academic Award 2020	Padam Shree Dr B.V. Rao Poultry entrepreneurs Global by Pashudhan Prahree	Oct, 2020
22.	Dr Ruchi Tiwari	Best PhD thesis award	In 4 <sup>th</sup> International conference on “CAAAAHASSE-2021” organized by AEDS and Centre for Agribusiness Incubation and Entrepreneurship, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior (Madhya Pradesh), India	13 <sup>th</sup> -15 <sup>th</sup> Mar, 2021
23.	Dr Meena Goswami Awasthi	Young Scientist Award		
24.		Executive Member	Indian Meat Science Association (IMSA)	2018-21
25.	Dr Vijay Pandey	Certificate of Appreciation	International Journal Livestock Research	31 <sup>st</sup> Mar, 2021
26.		Member, Scientific Advisory Board		
27.	Dr Ambika Sharma	InSc Research Excellence Award	Best Research Paper published	5 <sup>th</sup> Oct, 2020
28.	Dr Barkha Sharma Dr Ambika Sharma Dr Mukesh Srivastava Dr Meena Goswami Awasthi	National Excellence Award	“Ram Singh Memorial National Animal welfare Award 2020” by Pashudhan Praharee RNI No. JHAHIN/2012/46453, ISBN: 2319-6971	29 <sup>th</sup> July, 2020
29.	Dr Ambika Sharma	Best Oral Paper Presentation Award	5 <sup>th</sup> Annual Convention of Society of Veterinary Biochemists and	24 <sup>th</sup> - 25 <sup>th</sup> Mar,
30.	Dr Vikrant Sudan	Best Oral Presentation	Biotechnologists of India at DUVASU, Mathura	2021

31.	Dr Dilip Kumar Swain	Two Best Paper Award and Appreciation Award		
32.	Dr Brijesh Yadav	Best Paper Award and Appreciation Award		
33.	Dr Barkha Sharma Dr Ambika Sharma Dr Meena Goswami Awasthi Dr Parul	Inspiring Lady Veterinarian Award	International Women's Day by Pashudhan Praharee	8 <sup>th</sup> Mar, 2021
34.	Dr Renu Singh	II <sup>nd</sup> prize in poster presentation	Online elephant conference at elephant research center school of pharmaceutical sciences at Vels institute of science, Technology and Advanced studies, pallavaram, Chennai, TN, India	24 <sup>th</sup> -07 <sup>th</sup> July, 2020
35.	Dr Dilip Kumar Swain	Best Paper Award	XXIX SAPI Annual conference on "Recent approach to escalate livestock productivity under current socio-economic scenario" organized by Bihar Animal Science University, Patna	25 <sup>th</sup> -26 <sup>th</sup> Feb, 2021
36.	Dr Brijesh Yadav	Letter of appreciation and recognition	Reviewer of 1. The International Journal of Biometeorology 2. Asian Research Journal of Gynaecology and Obstetrics 3. Journal of Animal Physiology and Animal Nutrition	2020
37.	Dr Dilip Kumar Swain	Letter of appreciation and recognition	Editorial Board Member- 01 (Animal Reproduction Science, Elsevier/Science Direct) Distinguished Reviewer (Only International Journals with impact factor)	2020
38.	Dr Deep Narayan Singh	Young Scientist Award	ISAO 2020 International Scientist Awards on Engineering, Medicine and Science conference	12-13 <sup>th</sup> Sept, 2020
39.		Research Excellence Award	EEA conference, 2020	21 <sup>st</sup> Nov, 2020
40.		Yashashwi Samman by RASSA	RASSA National Webinar	1 <sup>st</sup> Nov, 2020
41.		Dr C.M. Singh National Award of Excellence	National Level Essay writing competition	30 <sup>th</sup> Nov, 2020
42.		Dr R.K. Memorial Award of Excellence		
43.		Prani Mitra Award 2021	Significant and outstanding contribution in field of Animal welfare	16 <sup>th</sup> Feb, 2021



## Research Publications



## RESEARCH PUBLICATIONS

1. Agrawal, H., Jaiswal, M. and Tripathi, A.K. (2020). Successful management of trypanosomiasis in a dog. *Indian Journal of Veterinary Medicines*. 40(2): 35-36.
2. Agrawal, H., Jaiswal, M., Nisha, A. and Tripathi, A.K. (2020) Mastitis with subsequent abscessation in a pony mare. *Indian Journal of Veterinary Medicines*. 40(2): 39-40.
3. Agrawal, S., Singh, A.P., Singh, R., Saikia, R., Choudhury, S., Shukla, A., Prabhu, S.N. and Agrawal, J., 2021. Molecular characterization of extended-spectrum  $\beta$ -lactamase-producing *Escherichia coli* isolated from postpartum uterine infection in dairy cattle in India. *Veterinary world*, 14(1), p.200.
4. Ansari, H., Purohit, S., Chaurasia, M.K. and Pandey, R.P. (2020). Comparative evaluation of midazolam-ketamine-xylazine and propofol-ketamine combinations for maintenance of anaesthesia by constant rate infusion in canine: haemodynamic study. *Indian Journal of Veterinary Surgery*. 41(1):59-61.
5. Basak, G., Sharma, B., Parul, S., Jain, U., Mishra, R.P. and Srivastava, M.K. (2021). Strategies for food safety: a contemporary approach. *Journal of Entomology and Zoological Studies*. 9(1): 117-122.
6. Basera, A., Pasha, A., Yadav, B.K., Agrawal, J. and Saxena, A. (2020). Management Of Vaginal Prolapse In Late Gestation Associated With Difficult Birth In A Young Bitch. *Research Journal of Veterinary Practitioners*. 8(3): 26-28
7. Basera, A., Yadav, B.K., Singh, A.K., Agrawal, J. and Saxena, A. (2020). A Rare Case of Maceration with Pyometra in Labrador Retriever Bitch: A Surgical Approach. *International Journal of Science, Environment and Technology*. 9(4): 573-576
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12. Chappalwar, A., Pathak, V., Goswami, M. and Verma, A.K. (2020). Development of functional chicken patties with incorporation of mango peel powder as fat replacer. *Nutrition and Food Science*. 50(6): 1063-1073.
13. Deepanka, Singh, A., Singh, S.K., Singh, Y. and Rashmi (2021). Factors Influencing Adoption of Scientific Dairy Farming Technologies by Dairy Women Entrepreneurs. *Indian Research Journal of Extension Education*. 21(1): 35-42.
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26. Kumar, A., Singh, A.K., Gupta, S., Agrawal, J., Sachan, V., Kumar, A. and Saxena, A. (2020). Surgical Management of Dystocia in a Rabbit. *Veterinary Clinical Science*. 8(2): 48-49.
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# Estate and Maintenance Organization



## NEW CONSTRUCTIONS/RENOVATION AND REPAIR WORKS DONE BY ESTATE OF UNIVERSITY DURING 2020-21

S. No.	Details of work	Total sanctioned amount (in lacs)	Status of work
1.	Repair and renovation work of Vice Chancellor's room located in administrative block of University	09.34	Completed
2.	Repair and renovation work of Dissection Hall of Anatomy department	20.79272	Completed
3.	Essential repair/renovation, tiling and aluminium partitioning in the office of finance officer.	04.78	Completed
4.	Widening of existing road and work of interlocking tiles in front of IDP-NAHEP project building	09.58	Completed
5.	Land leveling, removal of waste grass and land filling work in goat farm.	07.06	Completed
6.	Brick work, plastering, painting, chain linking and T-guard work at goat farm.	04.51	Completed
7.	Work of interlocking pavement tiles, steel railing and granite work at goat farm.	06.69	Completed
8.	To mark the IDP-NAHEP building, LED light board of the project was put on the building.	03.66	Completed
9.	Repair and correction of slant of IDP-NAHEP parking, approach road and footpath	06.52	Completed
10.	Establishment of COVID-19 laboratory	09.91	Completed
11.	Extension of inner circle road located in front of LPT building to join it with external circle road.	13.38	Work in progress
12.	Construction of paver drain for water drainage of type-A and type-B houses of new campus.	20.93	Work in progress
13.	M.S. fencing work on either side of boundary wall between vermicompost area and poultry farm.	11.11	Work in progress
14.	Construction of wall, jalidar fencing and iron gates (as per requirement) from main gate to vermicompost area.	16.82	Work in progress
15.	Construction of railing between IDP-NAHEP building and road for IDP project.	04.84	Work in progress
16.	Construction of one room in the 15 quarters of laboratory assistants of University	34.58	Work in progress
17.	Repair and renovation work in 20 quarters of Class -4 employees located in the main campus of University	67.26	Work in progress
18.	Boring and replacement of old submersible water source with new one located behind the old building of FMD	13.01	Work in progress
19.	Renovation work in the laboratories of college of biotechnology located on the first floor.	09.38	Work in progress
20.	Construction of paver drain for water drainage of C-type houses located in the main campus of University.	13.07	Work in progress
21.	Construction of shed in front of shed no. 3 at livestock farm to protect the animals from adverse effect heat, cold, and water during summer, winter and rainy season.	02.81	Work in progress
22.	Construction of shed for the for the protection of animals from heat during treatment, artificial insemination and vaccination at livestock farm of the University	06.01	Work in progress
23.	Construction of New girls hostel	646.90	Work in progress

**Financial Status***(Rs in lacs)*

Budget	Salary	Contingency	Total
State government	4602.00	1754.50 323.49	6356.20
ICAR development Grant	-----	-----	-----
KVK	130.00	65.80	195.80
Other projects IDP (NAHEP)	-----	251.17	251.17
RKVY	-----	198.52	198.52
University Receipt	-----	400.00	400.00
		<b>TOTAL</b>	<b>7725.18</b>

**Right to information act**

In compliance of Govt. of Uttar Pradesh and provision of RTI Act, 2005, received **50** applications out of which **39** applications were cleared and rest are under consideration.







**Shri Karinda Singh Member of Uttar Pradesh Legislative Assembly Goverdhan, in the closing ceremony of 3 Days Training programme on Artificial Insemination in Goat**



**Shri Mahesh Kumar Gupta, Additional Chief Secretary Rajbhawan visiting goat Farm**







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