



# वार्षिक प्रतिवेदन

## ANNUAL REPORT

2019 - 2020

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

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





**Smt. Anandiben Patel Ji, Hon'ble Governor of Uttar Pradesh**



**Shri Giriraj Singh, Minister of Animal Husbandry,  
Dairying And Fisheries**





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## FOREWORD

It is indeed a matter of immense pleasure and satisfaction to present Annual Report 2019-20 of U.P. Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go Anusandhan Sansthan (DUVASU), Mathura, which illustrates the shared commitment of advancing excellence in teaching, research and extension activities as well as achievements of students and faculty of the University and ensures it all gets put together in a pretty format. The basic mandate of the University is to address basic, strategic and applied issues related to animal health and production along with human resource development along with Government and National agencies and overall socio-economic upliftment of farmers and livestock owners.



During the reporting year, 25 extramural and 01 intramural projects were running in various departments of College of Veterinary Science and Animal Husbandry. Out of these, 06 projects by ICAR, 12 projects by RKVY, 01 project by DBT, GOI, 01 NIF –DBT, 01 by NIF (DST) 01 by DADF and 03 projects funded by Private companies. Existing hostels and University residential area were renovated to ensure better facilities and comfort to students as well as to faculty/staff members. Various literary, cultural and sports activities were organized throughout the year for overall personality development of the students. Many cleanliness and plantation drives were carried out throughout the year with the help of students, teachers and University staff to make the “Campus Clean and Green”.


I feel happy in reporting that with the upgraded diagnostic and treatment, especially imaging and surgical facilities in Veterinary Clinical Complex, we are serving the livestock and pet owners of Mathura and adjoining districts and states and providing them adequate facilities. The experiential learning programmes running in various departments of college of Veterinary and Animal Sciences are providing training to the farmers, animal owners and youths for their self sustainability. These units are also playing important role in providing Hands on trainings to the undergraduate and postgraduate students for entrepreneurial practice. I am immensely happy to share that our students brought laurels to the University by winning many national level competitions and teachers that were honoured with several prestigious awards and academic accomplishments at national and international level including foreign travels. Publication of nearly 114 research articles in national and international peer reviewed journals reflects the quality of research work being undertaken at the University.

Directorate of extension with the support of faculty of Veterinary College and KVK organized several trainings for knowledge upgradation of farmers/farm women, field veterinarians and unemployed rural youth. First Annual convention of VIPM, XIV National Biennial Conference of APHV & National Symposiums, one ICAR sponsored 10 days short course training programme, one brainstorming session several trainings and workshops were also successfully organized by the University that would definitely bring about sea change and would have long-term beneficial impact on the academic career of veterinary professionals.

I seize the opportunity to express my special debt of gratitude to Government of Uttar Pradesh, RKVY, DST, DBT, ICAR, New Delhi and Government of India (GOI) for timely and adequate financial support to the University. The support has helped us for continuously progressing with commitment to enhance livestock productivity and production, food safety and nutritional security, efficient utilization of resources, sustaining human and animal health through sanitary and phytosanitary measures, disease diagnosis and treatments, proper management and efficient utilization of livestock.

I am extremely thankful to Principal Secretary to Hon'ble Governor and Principal Secretary, Animal Husbandry, Govt. of Uttar Pradesh for their support in terms of infrastructure and administrative back up for this Institution. This acknowledgement would be incomplete without mentioning the sincere efforts and contributions made by all the University Officers, Heads and Incharges of the departments, teaching fraternity, technical, non-technical, administrative, supportive staff and students for their dedication towards their work and discipline. Their everlasting hard work, sincerity and cooperation helped us in achieving the set targets, objectives and mandates.

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

  
(G. K. Singh)



उ.प्र. पंडित दीन दयाल उपाध्याय पशु चिकित्सा विज्ञान विश्वविद्यालय एवं गो अनुसंधान संस्थान (दुवासू), मथुरा, की वार्षिक रिपोर्ट 2019-20 प्रस्तुत करना निसंदेह अत्यंत हर्ष और संतुष्टि का विषय है, जोकि संस्थान के शिक्षण, अनुसंधान और प्रसार गतिविधियों के साथ-साथ विश्वविद्यालय के छात्रों और शिक्षकों की उत्कृष्टता की ओर अग्रसर उपलब्धियों को साझा करने की प्रतिबद्धता को दर्शाता है। विश्वविद्यालय का जनादेश पशुपालकों के समग्र सामाजिक-आर्थिक उत्थान के साथ-साथ पशुओं के स्वास्थ्य और उत्पादन से जुड़े बुनियादी, रणनीतिक और व्यावहारिक मुद्दों पर ध्यान देना है।



रिपोर्टिंग वर्ष के दौरान भारत सरकार के अधीन 06 आईसीएआर, 12 आरकेवीवाई, 02 डीबीटी, 01 एनआईएफ (डीएसटी) और 01 डीएडीएफ परियोजनाएं विश्वविद्यालय में निर्गत की गईं। इसके अतिरिक्त, 03 परियोजनाएं प्रतिष्ठित निजी एजेंसियों द्वारा भी प्रयोजित की गईं।

विश्वविद्यालय आवासीय क्षेत्र और छात्रावासों को छात्रों और शिक्षकों / कर्मचारियों के सदस्यों को बेहतर सुविधा और आराम प्रदान करने के लिए पुनर्निर्मित किया गया। छात्रों के समग्र व्यक्तित्व विकास के लिए, विश्वविद्यालय द्वारा विभिन्न साहित्यिक, सांस्कृतिक और खेल गतिविधियों का आयोजन किया गया। मुझे यह साझा करने में बहुत खुशी हो रही है कि हमारे छात्र कई अंतर विश्वविद्यालय राष्ट्रीय स्तर की प्रतियोगिताओं को जीतकर विभिन्न खेलों और साहित्यिक गतिविधियों में उत्कृष्ट प्रदर्शन कर रहे हैं। “कैम्पस क्लीन एण्ड ग्रीन” बनाने के लिये छात्रों, शिक्षकों और विश्वविद्यालय के कर्मचारियों की मदद से पूरे साल कई सफाई और वृक्षारोपण अभियान चलाए गए।

मुझे यह साझा करने में प्रसन्नता हो रही है कि विश्वविद्यालय, मथुरा और आस-पास के जिलों के पशुपालकों और पालतू पशुओं को उन्नत नैदानिक और उपचार सुविधाओं के साथ सेवा प्रदान कर रहा है। अनुभवात्मक अधिगम कार्यक्रम पशु चिकित्सा और पशु विज्ञान महाविद्यालय के विभिन्न विभागों में संचालित हैं, जोकि छात्रों, किसानों, पशु पालकों और युवाओं को उनके आत्मनिर्भरता के लिए प्रशिक्षण प्रदान कर रहे हैं। पशु चिकित्सा महाविद्यालय के संकायों एवं केवीके के सहयोग से प्रसार निदेशालय ने किसानों / कृषक महिलाओं, क्षेत्र पशु चिकित्सकों और बेरोजगार ग्रामीण युवाओं के ज्ञान उन्नयन के लिए कई प्रशिक्षण कार्यक्रम आयोजित किए।

VIPM का पहला वार्षिक अधिवेशन, APHV का चौदहवाँ राष्ट्रीय द्विवार्षिक सम्मेलन व राष्ट्रीय संगोष्ठी, एक ICAR प्रायोजित 10 दिनों के लघु पाठ्यक्रम, एक बुद्धयोत्तेजक सत्र, तथा कई अन्य प्रशिक्षणों और कार्यशालाओं का विश्वविद्यालय द्वारा सफलतापूर्वक आयोजन किया गया जो पशु चिकित्सा व्यवसाय में निश्चित रूप से बड़ा प्रभावकारी बदलाव लाएगा। राष्ट्रीय और अंतर्राष्ट्रीय, उच्च समीक्षा से गुजरने वाली पत्रिकाओं में लगभग 114 शोध लेखों का प्रकाशन विश्वविद्यालय में किए जा रहे शोध कार्यों की गुणवत्ता को दर्शाता है। कई शिक्षकों को, राष्ट्रीय और अंतर्राष्ट्रीय स्तर पर, कई प्रतिष्ठित पुरस्कारों और अकादमिक उपलब्धियों से सम्मानित किया गया, जिसमें विदेशी यात्राएं भी शामिल थीं।

मैं उत्तर प्रदेश सरकार, आरकेवीवाई, डीएसटी, डीबीटी, आईसीएआर, नई दिल्ली और भारत सरकार को विश्वविद्यालय के लिए समय पर और पर्याप्त वित्तीय सहायता के लिए अपना विशेष आभार व्यक्त करना चाहूंगा जिनके समर्थन ने हमें पशुधन उत्पादकता और उत्पादन, खाद्य और पोषण सुरक्षा, संसाधनों के कुशल उपयोग, स्वच्छता और पादप संबंधी उपायों, रोग निदान और उपचार, उचित पशुधन प्रबंधन और कुशल उपयोग के माध्यम से मानव और पशु स्वास्थ्य को बनाए रखने के लिए प्रतिबद्धता के साथ निरंतर प्रगति के लिए सहायता प्रदान की है।

मैं माननीय राज्यपाल के अतिरिक्त मुख्य सचिव और प्रधान सचिव, पशुपालन, उत्तर प्रदेश सरकार का इस संस्थान के लिए आधारभूत संरचना और प्रशासनिक सहयोग के लिए उनका बहुत आभारी हूँ। यह आभार ज्ञापन विश्वविद्यालय के सभी अधिकारियों, विभागाध्यक्षों और विभागों द्वारा किए गए निरंतर प्रयासों और योगदानों का उल्लेख किए बिना अधूरा रहेगा जो शिक्षकगण, तकनीकी, गैर-तकनीकी, प्रशासनिक, सहायक कर्मचारियों और छात्रों को उनके काम और अनुशासन के प्रति समर्पण का सिंचन करते हैं। उनकी कड़ी मेहनत, ईमानदारी और सहयोग से हम निर्धारित लक्ष्यों, उद्देश्यों और जनादेशों को प्राप्त करने में सफल होते रहे हैं।

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

(जी.के. सिंह)

## CONTENTS

Foreword	iii
प्राक्कथन	iv
Executive Summary	vii
कार्यकारी सारांश	xiii
University Mission & Vision & Mandate	xviii
University Challenges and Targets	xix
Introduction	1
Organizational Setup	2
A. Authorities of the University	2
B. Organizational Meetings	5
C. Officers of the University	5
Teaching & Education	6
A. College of Veterinary Science and Animal Husbandry	6
B. College of Biotechnology	6
C. Institute of Paraveterinary Sciences	6
D. Activities of College of Veterinary Science and Animal Husbandry	7
E. Experiential Learning Programme	7
F. Other Academic Services / Facilities	8
Research	10
A. Extra-mural Projects	10
B. Infra-mural Research Projects	11
Projects of Post Graduate Students completed during 2019-20	19
A. Ph.D Veterinary Science	19
B. Ph.D Biotechnology	19
C. M.V.Sc. Veterinary Science	20
D. MSc. Biotechnology	21
Extension	56
1. Directorate of Extension	56
2. Department of Veterinary and Animal Husbandry Extension	59
3. Other Extension Activities by College of Veterinary Science and A.H.	59
4. Krishi Vigyan Kendra, DUVASU, Mathura	66



University Farms	71
A. Livestock Farm complex (LFC)	71
B. Poultry Farm	71
C. Directorate of Farms	72
1. Madhuri Kund Agriculture Farm	72
2. Pasture Unit	72
Human Resource Development	74
A. Trainings Organized	74
B. Participation of Faculty Members in International and National Conferences /Symposia	79
C. Participation of Faculty Members in Trainings/workshops	81
Students's Welfare	83
Other Highlights and Activities	87
Awards and Honors / Achievements	91
Research Publications	94
Details of New Con./Reno. work done during financial Year 2019-20	102
Financial Status	104
Right to Information Act	104

## EXECUTIVE SUMMARY

### Teaching

- During 2019-20, College of Veterinary Science and Animal Husbandry admitted 75 students in B.V.Sc. & AH programme out of which 30.66% were girls. In M.V.Sc. and PhD programmes, 31 and 03 students, respectively, were admitted out of which in M. V. Sc. and Ph. D. 32% and 33% respectively were girls students.
- 08 students received their PhD, 28 their M.V.Sc. and 40 students received their B.V.Sc. & A.H. degree from the College of Veterinary Science and Animal husbandry.
- During the year, College of Biotechnology admitted 25 and 08 students to B. Sc. Biotechnology and B.Sc. Industrial Microbiology programmes respectively. In the same year 04, 04 and 10 Students received their Ph.D., M.Sc. and B.Sc. degrees, respectively from the College of Biotechnology.
- During 2019-20, 60 students were admitted in each programme viz; Diploma in Veterinary Pharmacy (DVP) and Diploma in Livestock extension (DLE) programmes, respectively and 39 and 25 Students completed their DLP and DLE programmes, respectively. In the same year, three months Internship programme for 39 students of Diploma in Veterinary Pharmacy students of 2017 batch was also organized.
- Veterinary Clinical complex (VCC) is well equipped with modern facilities which include small and large animal operation theatres, ICU for pets, imaging diagnostic unit, small animal dentistry unit, operating microscope, laproscopic surgery unit, orthopaedic surgery instruments, eye surgery instruments, diathermy, multiparameter monitors, phacoemulsification with intraocular lens implantation, coloured Doppler, USG machine and flexible laparoscopy, oxygenators, nebulizers and general unit for large and small animals. During 2019-20, the clinical complex has handled 14,143 clinical cases and this number was 1.5% more than that of previous year. The total revenue generated by VCC during this period was Rs. 7,61,235/- (seven lac sixty one thousand two hundred thirty five only).
- Disease diagnostic laboratory of VCC is well equipped with semi-automatic blood and biochemistry analyzer, urine analyzer, electrolyte analyzer and slide based dry chemistry analyzer. During 2019-20, the laboratory processed total 2015 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, thus generating a revenue of Rs. 1,00,190/- (one lac one hundred ninety only).
- During the year under report, the clinical services were provided by the faculty members and post graduate students at farmer's doorstep through clinical camps organized at various villages of Mathura district and its adjoining districts.
- 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 on poultry farming and entrepreneurship. The total revenue generated from experiential learning was Rs. 6, 59,726.00/- (six lac fifty nine thousand seven hundred twenty six only).
- Experiential Learning Programme on “Milk & meat processing” 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, 6170.0 liters of milk was processed into 852.07 kg of Paneer and 95.25 kg of Khoa. Value added meat products like meat nuggets, meat patties and meat pickle were also processed.



- The department of Animal Nutrition imparted training to the students and farmers on preparation of compound animal feed and to the urea mineral molasses blocks. The department also provided ample amount of feed to the animals of University dairy farms. This year (2019-20) departmental sale of mineral mixture earned revenue of Rs 6.0 lacs.
- University Library has 35,499 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.
- During the year 2019-20, 08, 03 and 01 students of B.V.Sc. & A.H. were placed at Alaknanda Pet Clinic, Delhi, Noida 18 Pet clinic and Sugna Poultry Feed Ludhiana respectively. Through campus placement, 05 students of DLE/DVP were also placed at Alaknanda Pet Clinic Delhi.

### Research

- During the reporting year, 25 externally funded projects were running in various departments of College of Veterinary Science and Animal Husbandry. Out of these, ICAR funded 06 projects, 12 projects were funded by RKVY, 01 project was funded by Department of Biotechnology (DBT), GOI, 01 project was funded by NIF-DBT, 01 project was funded by NIF (DST), GOI, 01 project was funded by DADF, Ministry of Agriculture and Farmers Welfare, 01 project by Indian Herbs Pvt. Ltd., 01 project was funded by Himalaya Drug company, 01 project was funded by Ms. Datt Mediproducs Pvt. Ltd. Gurgaon, Haryana and 01 project was funded by Aindhri Innovation Pvt. Ltd. Hyderabad. One intramural, University funded project was running in Department of Veterinary Microbiology.
- During 2019-20, 08 Ph.D. and 27 M.V.Sc. thesis were submitted in College of Veterinary Science and Animal Husbandry in various disciplines. In College of Biotechnology 06 PhD and 02 M.Sc. thesis were submitted as per academic.
- During the year under report, University published 114 research publications.

### Extension

- During 2019-20, Directorate of Extension with the assistance of faculty of College of Veterinary Science and Animal Husbandry organized seven trainings on the campus, twelve visits of farmers, animal owners and others in Pashu Gyan Chaupal. Through these trainings and visits, 75 Veterinary Officers, 269 farmers/ livestock owners and 48 internship students of College of Veterinary Science and Animal Husbandry, Junagarh Agricultural University (Gujrat) were trained and exposed to latest managemental and entrepreneurial skills.
- Training manuals, leaflets and popular articles in the form of booklets were developed by Directorate of Extension for the benefit of farmers and animal owners.
- Consultation services were also provided to large number of farmers about animal husbandry and poultry farming practices.
- Department of Veterinary and Animal Husbandry Extension conducted eight exposure visits in which 124 farmers were benefitted.
- During year 2019-20, various departments of College of Veterinary Science and Animal Husbandry has also organized training programme. The Department of Anatomy organized six, three days training programmes on “मृत पशुओं के अंगों के व्यावसायिक उपयोग पर ग्रामीण युवाओं के लिये कौशल विकास प्रशिक्षण” under RKVY project from Nov., 2019 to Mar., 2020 through which hands on training were given to 118 youths on preparation of specimen. Department of Veterinary Parasitology also conducted training on “Control of subclinical parasitism in dairy animals” under RKVY project. Department of Veterinary Physiology also conducted 02 training programmes and 01 workshop under RKVY project.



- During this year, total of 102 trainings were conducted by KVK scientists for 2816 participants. Out of these, 82 trainings were for farmers/ farm women, 14 for rural youths, and 06 for extension functionaries through which 2215 farmers/farm women, 272 rural youths and 329 extension functionaries were trained.
- To demonstrate the production potential of various proven technologies, the frontline demonstrations on farmers field were conducted in which 689 farmers and livestock owners were participated.
- To test the suitability of technology under local environment and farming system, 15 on Farm Testings and 96 on Farm Trials were also conducted by Scientists of KVK.
- In year 2019-20, KVK produced 860.88 quintal of seeds which has generated a revenue of Rs. 32,03,926.00/- . It has also produced flowers and vegetables crops through the sale of which revenue of Rs. 20, 200.00/- was generated.
- KVK has also produced 2084 quintals of bio products which included 634 quintals of Vermi-compost and 1450 quintals of NADEP compost. The total revenue generated through the sale of these bio products was Rs. 3170.00/- (three thousand one hundred seventy only) during the year 2019-20.
- Gosthies, Diagnostic visits, Kisan Melas, Kisan Samman Diwas were organized for improving communication with farmers. During this year, Soil and Water Testing Laboratory of KVK analyzed 735 soil and 22 water samples and on the basis of result, they have given recommendation for balance fertilization and watering to 624 beneficiaries.

#### **University Farms**

- During 2019-20, total milk production at LFC was 2, 15, 281.00 liters, out of which, the production of cow milk was 1, 89, 745.50 liters and that of buffalo milk was 25,835.50 liters.
- Poultry farm of Veterinary College maintained variety of species and breeds including layers, Chabro, Aseel Peela, Kadaknath, Naked neck, Japanese quail,

Turkey, Guinea fowl and Emu. During FY 2019-20, the farm generated a revenue of Rs. 5, 63, 782.00/- (five lac sixty three thousand seven hundred eighty two only) from the sale of different birds and eggs.

- The revenue generated from wheat and oat was Rs. 36,25,525.00/- (thirty six lac twenty five thousand five hundred twenty five only) and from barseem was Rs. 1,40,000.00/- (one lac forty thousand only). Thus total revenue generated during the financial year (2019-20) at Madhuri Kund farm was Rs. 37,65,525.00/- (thirty seven lac sixty five thousand five hundred twenty five only).
- During FY 19-20, total wheat seed production of fodder research section of the Pasture unit was 305.90 quintals. Total revenue generated by the unit throughout the FY was Rs. 11,96,680.00/- (eleven lac ninety six thousand six hundred eighty only).
- The farm at LFC produced 11,799.81 quintals of green fodder, 211.70 quintals of straw, 45.75 quintals of oats grain/seed and 302.20 quintals of barley grain/seed during this period.

#### **Human Resource Development**

- First Annual convention of Veterinary Internal and Preventive Medicine Society (VIPM) & National Symposium on “Sustainable Improvement in Animal Health and Production Bridging Science and Policy for Economic Upliftment of Farmers” jointly organized by Department of Veterinary Medicine, DUVASU, Mathura, U.P. and ICAR-CIRG, Farah, Makhdoom, Mathura, U.P. from 08<sup>th</sup> to 09<sup>th</sup> Nov., 2019.
- Department of Veterinary Physiology organized one day Brainstorming session on 'Climate Change, Animal Health and Production: Way Forward' on 11<sup>th</sup> Dec., 2019.
- Department of Veterinary Pharmacology and Toxicology organized one day Workshop cum Ghosthi 'To promote use of Indigenous drugs in the treatment of animals and to augment animals health and productivity' under SCSP of ICAR-EVM project on 08<sup>th</sup> Jan., 2020.

- Department of Veterinary surgery and Radiology organized a six days training on “Application of diagnostic imaging technology and management of surgical conditions in animals” under All India Network Programme on Diagnostic Imaging and Management of Surgical Conditions in Animals (AINP-DIMSCA) for 10 Veterinary Officers of Animal Husbandry Department of U.P. from 27<sup>th</sup> Jan. -12<sup>th</sup> Feb., 2020.
- Department of Veterinary Physiology organized two days workshop under RKVY funded project on 'Productivity enhancement in goats through artificial insemination: scopes, challenges and strategies' on 13<sup>th</sup>-14<sup>th</sup> Jan., 2020.
- Department of Veterinary Microbiology organized National Symposium on “Public Health challenge mitigation strategies at the confluence of one health approaches” and XIV National Biennial Conference of Association of Public Health Veterinarians (APHV) on 24<sup>th</sup> and 25<sup>th</sup> Jan., 2020.
- Department of Veterinary Pharmacology and Toxicology organized 10 days ICAR sponsored training under SCSP budget head of ICAR-EVM project on “Application of analytical and molecular tools for characterization and identification of plants based drugs and their targets” from 15<sup>th</sup> -24<sup>th</sup> Feb., 2020.
- Two Training programs on 'Artificial Insemination in goats' for 28 Veterinary Officers of Uttar Pradesh were organized from 24<sup>th</sup> to 27<sup>th</sup> Feb., 2020 and for 20 Veterinary Officers from 4<sup>th</sup> to 7<sup>th</sup> Mar., 2020.
- Various faculty members of College of Veterinary Science and Animal Husbandry participated in International and National trainings/workshops and seminars/symposiums/conferences.

#### **Students' Welfare**

- During 2019-20, 48 cadets appeared in “B” Certificate examination. 09 cadets participated in CATC camp-39 at Atrauli, Aligarh, 13 cadets participated in CATC camp-43 held at Fatehgarh and 25 girls cadets participated in CATC camp-42 at Hathras. Cadets Ishika Rajput and Arpan Chauhan represented Directorate of Uttar Pradesh in Republic day camp. Two girls cadets Sonam Kumari and Ishika Rajput were selected in the Prestigious exchange programmes.
- Literary and cultural events were organized by DUVASU in which students from College of Veterinary Science and A.H., College of Biotechnology 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. Overall Champion of the LITCUL FEST 2019 was Ms. Vaishali Gupta form 5<sup>th</sup> year BVSc & AH.
- 60 students (32 boys and 28 girls) of 4<sup>th</sup> Year B.V.Sc & A.H went on South India Educational Tour from 23<sup>rd</sup> Jun., to 10<sup>th</sup> Jul., 2019.
- 18<sup>th</sup> Annual Sports Meet of the University was held on 19<sup>th</sup> -20<sup>th</sup> Feb., 2020. Inter-class competition and individual in-door and out-door games like table-tennis, badminton, volley-ball, chess, kho-kho, kabaddi, hockey, cricket, races, jumps, javelin throw, shot-put and cycling races were organized.
- During 2019-20, students of the University actively participated and excelled in various national/inter-university competitions and events such as National Youth Conclave and National Debate (Youth Awakening Festival, YUVA) organized by G.B. Pant University of Agriculture & Technology, Pantnagar on 20<sup>th</sup> -23<sup>rd</sup> Feb., 2020, 20<sup>th</sup> All India Inter-Agricultural University Youth Festival, AGRUNIFEST 2019-20 organized by Indira Gandhi Krishi Vishwavidyalaya, Raipur (Chhattisgarh) on 8<sup>th</sup> -12<sup>th</sup> Feb., 2020.
- The University organized a Workshop cum presentation on Motivational Program by Col. Virendra Kumar for the students on 15<sup>th</sup> Feb., 2020. A series of presentations and

demonstrations on the road to excellence, anger management, goal setting, team building, and personal effectiveness were made to motivate the students.

### **Other Highlights And Activities**

- University conducted Pre-Veterinary Test-2019 on 31<sup>st</sup> May 2019, Pre-Diploma Entrance Examinations-2019 on 28<sup>th</sup> July 2019 and Postgraduate (M.V.Sc. and Ph.D.) Entrance Examinations-2019 on 17<sup>th</sup> July 2019. Selected candidates were admitted to different degree and diploma programmes in the College of Veterinary Science & Animal Husbandry and Institute of Para Veterinary Sciences for session 2019-20.
- Newly admitted students in the degree programme of B.V.Sc. & A.H. and B.Sc. Biotechnology and Diploma programme of Para Veterinary Sciences were warmly welcomed by 2<sup>nd</sup> year students along with senior students, faculty and staff members.
- DUVASU celebrated its foundation day on 25<sup>th</sup> October, 2019 with various cultural programmes. The celebration concluded with prize distribution to the winners of literary, cultural and fine arts competitions by chief guest and other higher officials of university.
- The 9<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 Patel Ji.
- University celebrated Ambedkar Jayanti, Independence Day, Pt. Deen Dayal Upadhyaya birthday, Gandhi Jayanti, Republic Day, International Yoga Day and Basant Panchmi with great enthusiasm.

### **Awards And Honour / Achievements**

- Prof. S. K. Yadav acted as Keynote speaker at Global Conference on Infectious Diseases” at Flora Grand Hotel, UAE, Dubai.
- Prof. Vikas Pathak became Member of Scientific Panel for 'Meat and Meat Products including Poultry for Food Safety and Standards Authority of India (FSSAI),

Ministry of Health & Family Welfare, Government of India.

- Prof. Archana Pathak and Dr. Vinod Kumar Singh received Reviewer Excellence Award from Agricultural Research Communication Center.
- Prof. Rashmi Singh was Organizing Secretary of National Symposium and XIV Biennial Conference of APHV.
- Dr. Amitav Bhattacharyya received Fellow Indian Poultry Science Association at XXXVI Annual Conference and National Symposium of Indian Poultry Science Association (IPSA) at College of Veterinary Science and Animal Husbandry, Chhattisgarh Kamdhenu Vishwavidyalaya, Durg.
- Dr. Vijay Pandey received Silver Medal in 4 weeks online NPTEL Certification course on “Functional Genomics” 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, Govt of India.
- Dr. Barkha Sharma was elected member of Editorial board of Indian Journal of VPH, the official journal of APHV.
- Dr. Vijay Pandey, Dr. Udit Jain, Dr. Amitav Bhattacharyya, Dr. Mukesh Srivastava, Dr. Ashish Srivastava, Dr. Arvind Tripathi, Dr. Amit Kumar Jaiswal, Dr. Neeraj Kumar Gangwar, Dr. Barkha Sharma, Dr. Shanker Kumar Singh, Dr. Sanjay Kumar Bharti, Dr. Shyama N. Prabhu and Dr. P N Panigrahi received best oral presentation award at various National and International symposiums and conferences.
- Dr. Neeraj Kumar Gangwar, Dr. Mukesh Srivastava, Dr. Ashish Srivastava, Dr. Arvind Tripathi, Dr. Ajay Pratap Singh, Dr. P N Panigrahi, Dr. Jitendra Tiwari, Dr. Rajneesh Sirohi, Dr. Dilip Kumar, Dr. Shalini Vaswani, Dr. Sanjay Kumar Bharti received Best poster presentation award at various National and International symposiums and conferences.
- Dr. Neeraj Kumar Gangwar, Dr. Sanjay Kumar Bharti, Dr. Avneesh Kumar received Best Ph.D thesis award



- Dr. Neeraj Kumar Gangwar, Dr. Vikrant Sudan, Dr. Sanjay Kumar Bharti and Dr. P N Panigrahi received Young Scientist award.
- Dr Parul and Dr. Barkha Sharma received Dr Ram Raksha-Kiran Shukla Gold Medal for best oral presentation National Symposium and XIV Biennial Conference of APHV.
- Dr. Shyama N. Prabhu and Dr. Renu Singh received Appreciation award at National symposium and first Annual Convention of VIPM.
- Dr. Vinod Kumar received ACIAR grant from Govt. of Australia to attend 7<sup>th</sup> International Conference on Sustainable Animal Agriculture for Developing Countries (SAADC-2019) organized by Nepal Veterinary Association. He also received one professional certificate from Biorisk Management from International Federation of Biosafety Associations, Ontario, Canada. He also received Reviewing for outstanding contribution in International Journal of Livestock Research, Pashupati Foundation India. He also received IFBA certification exam Scholarship from Workers Safety Foundation, Ltd. (Frontline Foundation), TX, USA.

#### **Finance And Budget**

- During 2019-20, University received total Rs. 6119.77 lacs from Govt. of Uttar Pradesh, out of which Rs. 4602 lacs was under salary head and Rs. 1517.77 lacs was under contingency head.
- Indian Council of Agricultural Research, New Delhi granted Rs. 217.45 lacs as development grant.
- During the year, KVK received Rs. 166.99 lacs out of which Rs.152.00 lacs was under salary head and Rs. 15.99 was under contingency head.
- University received contingency of Rs. 1173.71 lacs from RKVY for various projects running in the University.
- During 2019-20, University received Rs. 114.46 as contingency for other projects.
- During the year, total receipt generated by the University was Rs. 453.86 lacs.

#### **Estate And Maintenance Organization**

- During the financial year 2019-20, University received sum of Rs 134.98 lacs in ICAR Developmental Grant under different heads. This sum was utilized for the renovation work in Lab of VPH, AGB, Veterinary Medicine, Gynaecology and obstetrics Departments and for the renovation of museum of pathology department. In addition to this the grant was utilized for repair of back side boundary. barbed wire fencing and construction of security room at Gautam Hostel, construction of CC Pathway and Soak Pit at Sarojini Hostel to kasturba Hostel, Shashtri Girls Hostel and for the Anti termite treatment of Auditorium at new campus.
- University also received Rs 409.34 lacs as government aid which was used for the various renovation work in the university, for constructing Interlocking paver tiles roads, brick roads, parking shed, damaged soak pits, boundary wall and barbed wire fencing and for roof construction etc.

#### **Right To Information Act**

- In compliance of the order of Govt. of Uttar Pradesh and provision of RTI Act, 2005, PIO received 35 applications out of which 33 applications were cleared and 02 are under consideration.

### पाठ्यक्रम

- वर्ष 2019-20 के दौरान 75 विद्यार्थियों ने पशु चिकित्सा विज्ञान एवं पशुपालन स्नातक कार्यक्रम में प्रवेश प्राप्त किया जिसमें 30.66 प्रतिशत छात्राओं ने प्रवेश प्राप्त किया। पशु चिकित्सा विज्ञान स्नातकोत्तर तथा विद्या वाचस्पति कार्यक्रम में क्रमशः 31 और 03 विद्यार्थियों ने प्रवेश प्राप्त किया।
- इसी सत्र में पशु चिकित्सा विज्ञान स्नातकोत्तर तथा विद्या वाचस्पति में क्रमशः 08 और 28 विद्यार्थियों ने पशु चिकित्सा एवं पशु पालन के विभिन्न विषयों में उपाधि प्राप्त की। साथ ही 40 विद्यार्थियों ने पशु चिकित्सा विज्ञान एवं पशुपालन स्नातक की उपाधि प्राप्त की।
- वर्ष 2019-20 में जैव प्रौद्योगिकी महाविद्यालय में 25 विद्यार्थियों ने जैव प्रौद्योगिकी स्नातक कार्यक्रम तथा 08 विद्यार्थियों ने औद्योगिकी सूक्ष्म जीव विज्ञान स्नातक कार्यक्रम में प्रवेश प्राप्त किया। इसी सत्र में जैव प्रौद्योगिकी में 04, 04 एवं 10 विद्यार्थियों ने क्रमशः विद्या वाचस्पति, स्नातकोत्तर एवं स्नातक की उपाधि प्राप्त की।
- वर्ष 2019-20 में वैटरिनरी फार्मसी एवं पशुधन प्रसार में डिप्लोमा के लिए क्रमशः 60 और 60 विद्यार्थियों ने प्रवेश लिया जबकि 39 तथा 25 विद्यार्थियों ने क्रमशः वैटरिनरी फार्मासिस्ट डिप्लोमा तथा पशुधन प्रसार में डिप्लोमा प्राप्त किया। डिप्लोमा वैटरिनरी फार्मसी के 39 विद्यार्थियों ने तीन माह के इंटर्नशिप कार्यक्रम को भी पूर्ण किया।
- वी0 सी0 सी0 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 आई0 सी0 यू0 एक्स-रे तथा अल्ट्रासाउण्ड यूनिट, दन्त चिकित्सा यूनिट, शल्य अणुविक्षण यंत्र, लैपरोस्कोपिक शल्य क्रिया यूनिट, आर्थ्रोपेडिक शल्य क्रिया यूनिट, नेत्र शल्य क्रिया यूनिट हेतु उपकरण तथा नेबुलाईजर की सुविधा उपलब्ध है। वर्ष 2019-20 के दौरान 14,143 रोगी पशुओं का उपचार किया गया। इन सेवाओं से वी0 सी0 सी0 को रु0 761235.00 (सात लाख इकसठ हजार दो सौ पैंतीस रूपयों) का राजस्व प्राप्त हुआ।
- वी0 सी0 सी0 की रोग निदान प्रयोगशाला अर्धस्वचालित ब्लड एनालाइजर, बायोकेमिकल एनालाइजर, यूरिन एनालाइजर उपकरणों से सुसज्जित है। वर्ष 2019-20 में 2015 नमूनों का परीक्षण किया गया जिनमें सामान्य खून जाँच, बायोकेमिकल एनालिसिस, तथा मूत्र एवं दुग्ध के नमूने जाँचे गए। इन सेवाओं से वर्ष 2019-20 में रु-100190.00 (एक लाख एक सौ नब्बे रूपयों) का राजस्व प्राप्त हुआ।
- वर्ष 2019-20 में पशुचिकित्सा संकाय के शिक्षकों एवं स्नातकोत्तर विद्यार्थियों के द्वारा पशुओं के लिए मथुरा जिले के आस पास के गांवों में तथा उससे लगने वाले जिलों 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 प्रबन्धन व अण्डे सेवन सम्बन्धित विषयों का व्यवहारिक ज्ञान प्रदान करने में महत्वपूर्ण भूमिका निभाई गई। प्रायोगिक प्रशिक्षण यूनिट द्वारा विश्वविद्यालय को रु0 59,726.00 (उनसठ हजार सात सौ छब्बीस 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 6170.0 लीटर दूध को 852.07 किलो पनीर एवं 95.25 किलो खोआ में प्रसंस्करित किया गया। विभिन्न मूल संवर्धित मॉस उत्पाद जैसे चिकिन नगेट, चिकिन पेटिज, चिकन अचार इत्यादि भी बनाये गये।
- 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 2019-20 में विभाग ने खनिज मिश्रण को बेच कर 6.0 लाख रुपये का राजस्व प्राप्त किया।
- 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 सर्कुलेशन 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।

- वर्ष 2019–20 में, B.V.Sc. & A.H. के 08,03 एवं 01 विद्यार्थी का चयन अलकनंदा पेट क्लिनिक दिल्ली, नोएडा 18 पेट क्लिनिक तथा सुगना पोल्ट्री फीड लुधियाना में हुआ। साथ ही डिप्लोमा के 05 विद्यार्थी भी अलकनंदा पेट क्लिनिक दिल्ली में नौकरी के लिए कैपस प्लेसमेंट द्वारा चयनित हुए।

## अनुसंधान

- वर्ष 2019–20 में विश्वविद्यालय के पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय के विभिन्न विभागों में 25 बाह्य वित्त पोषित परियोजनाएँ चल रही हैं, जिसमें से 06 भारतीय कृषि अनुसंधान परिषद् द्वारा, 12 राष्ट्रीय कृषि विकास योजना द्वारा, 01 डी बी टी, भारत सरकार के अनुदान द्वारा, 01 कृषि एवं किसान कल्याण मंत्रालय द्वारा, 01 इंडियन हर्ब्स प्राइवेट लिमिटेड द्वारा, 01 हिमालय ड्रग्स कंपनी द्वारा, 01 मैसर्स दत्त मेडीप्रोडक्ट्स प्राइवेट लिमिटेड, हैदराबाद द्वारा पोषित है। एक अन्तःसंस्थानिक परियोजना जीवाणु एवं विषु विभाग में चल रही हैं।
- वर्ष 2019–20 में विभिन्न विभागों में किये जाने वाले अनुसंधानों पर 08 पी0एच0डी0, 27 एम0वी0एस0सी0 पशु चिकित्सा एवं पशु पालन विज्ञान संकाय में एवं 06 पी0एच0डी0 और 02 एम0एस0सी0 जैव प्रौद्योगिकी संकाय में शोधग्रंथ पूर्ण किए गए।
- वर्ष 2019–20 में विश्वविद्यालय द्वारा 114 शोध पत्र प्रकाशित किये गये।

## प्रसार

- वर्ष 2019–20 में प्रसार निदेशालय ने पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय के सहयोग से विश्वविद्यालय के प्रांगण में 07 प्रशिक्षण तथा पशु ज्ञान चौपाल में 17 भ्रमण किसानों, पशुपालकों एवं अन्य के लिये आयोजित किए। इन प्रशिक्षण कार्यक्रमों द्वारा लगभग 75 पशु चिकित्सक, 269 किसान एवं पशु चिकित्सा एवं पशुपालन विज्ञान विश्वविद्यालय जूनागढ़ (गुजरात) के 48 इन्टर्नशिप छात्र लाभान्वित हुए तथा इन्हें नवीनतम प्रबंधन तथा उद्यमशील कौशल का तकनीकी प्रशिक्षण दिया गया।
- 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 द्वारा किसानों को पशु एवं मुर्गी पालन से सम्बंधित परामर्श सेवा उपलब्ध कराई गयी।
- पशुचिकित्सा एवं पशुपालन प्रसार विभाग द्वारा 08 एक्सपोजर विजिट आयोजित किये गए जिसमें 124 किसान लाभान्वित हुए।
- वर्ष 2019–20 में, पशु चिकित्सा एवं पशु पालन महाविद्यालय के विभिन्न विभागों द्वारा कई प्रशिक्षण कार्यक्रमों को आयोजित किया। पशु चिकित्सा शरीर रचना विज्ञान विभाग ने RKVY वित्त पोषित परियोजना के अंतर्गत 06 तीन दिवसीय प्रशिक्षण “मृत पशुओं के अंगों के व्यवसायिक उपयोग पर ग्रामीण युवाओं के लिये कौशल विकास प्रशिक्षण” विषय पर आधारित प्रशिक्षण नवंबर 2019 से मार्च 2020 तक आयोजित किया जिसके तहत 118 ग्रामीण युवाओं को नमूना बनाने का प्रशिक्षण दिया गया। पशु चिकित्सा परजीवी विभाग द्वारा भी RKVY वित्त पोषित परियोजना के अंतर्गत प्रशिक्षण आयोजित किया। पशु चिकित्सा जैव क्रिया विभाग ने भी RKVY परियोजना के अंतर्गत 02 प्रशिक्षण एवं 01 वर्कशॉप का आयोजन किया।
- कृषि विज्ञान केंद्र द्वारा आयोजित कुल 102 प्रशिक्षणों में 2816 लोगों ने प्रतिभाग किया जिनमें क्रमशः 82 प्रशिक्षण द्वारा 2215 पुरुष/महिला कृषकों को, 14 द्वारा प्रशिक्षण 272 ग्रामीण युवकों को एवं 06 प्रशिक्षण द्वारा 329 प्रसार कार्यकर्ताओं को लाभ प्राप्त हुआ।
- कृषकों एवं पशुपालकों के ईलाकों में उत्पादन क्षमता बढ़ाने वाली विभिन्न सिद्ध तकनीकियों को प्रदर्शित किया गया 689 कृषक लाभान्वित हुए।
- स्थानीय पर्यावरण एवं कृषि व्यवस्थाओं में नवीन प्रद्योगिकी की उपयुक्ता की जाँच के सन्दर्भ में कृषि विज्ञान केंद्र के वैज्ञानिकों द्वारा 15 खेतों में परीक्षण एवं 96 खेतों में जाँच शिविर आयोजित किये गए।
- वर्ष 2019–20 में, कृषि विज्ञान केंद्र ने 860.88 कुंतल बीज एवं फूल/सब्जी उत्पादित किया जिससे की क्रमश रुपए 32,03926.00 (बत्तीस लाख तीन हजार नौ सौ छब्बीस बीस हजार) तथा रुपए 20,200.00 (बीस हजार दो सौ) का राजस्व प्राप्त हुआ।
- के वी के ने 2084 कुंतल जैवउत्पाद उत्पादित किया जिसमें की 634 कुंतल वर्मीकम्पोस्ट तथा 1450 कुंतल नाडेप कम्पोस्ट सम्मिलित था. इस उत्पादन की बिक्री से कुल रुपए 3170.00 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 735 मृदा एवं जल के नमूनों की जाँच मृदा एवं जल जाँच प्रयोगशाला में की गयी, जिनकी रिपोर्ट के आधार पर 624 लाभार्थियों को संतुलित खाद एवं पानी डालने की क्रिया बताई गयी।

### विश्वविद्यालय प्रक्षेत्र

- वर्ष 2019–20 में, एल0एफ0सी0 के डी.डी.डी. फार्म पर 215281.00 लीटर दुग्ध का उत्पादन हुआ जिसमें की गाय का दूध 189745.50 लीटर तथा भैंस का दूध 25836.50 लीटर 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 563782.00/- (पाँच लाख तिरैसठ हजार सात सौ ब्यासी) रूपयों का राजस्व प्राप्त हुआ।
- माधुरी कुंड फार्म में गेहूँ एवं जई की बिक्री द्वारा रुपए 36,25,525.00/- (छत्तीस लाख पचीस हजार पाँच सौ पचीस) तथा बरसीम की बिक्री से रुपए 1,40,000.00/- (एक लाख चालीस हजार) का राजस्व प्राप्त हुआ। अतः वर्ष 2019–20 में कुल रुपए 37,65,525.00/- का राजस्व प्राप्त हुआ।
- चरागाह एवं चारा शोध अनुभाग द्वारा वर्ष 2019–20 में गेहूँ बीज उत्पादन से रुपए 11,96,680.00/- (ग्यारह लाख छियानबे हजार छह सौ अस्सी) का राजस्व प्राप्त हुआ।
- एल एफ सी फार्म द्वारा 11799.81 क्विंटल हरा चारा, 211.70 क्विंटल भूसा, 45.75 क्विंटल जई बीज एवं 302.20 क्विंटल जौ बीज उत्पादित किया गया।

### मानव संसाधन विकास

- पशु चिकित्सा विभाग, दुवासु, मथुरा एवं ICAR-CIRG फराह, मखदूम द्वारा VIPM का प्रथम वार्षिक सम्मलेन एवं राष्ट्रीय संगोष्ठी का आयोजन “Sustainable Improvement in Animal Health and Production Bridging Science and Policy for Economic Upliftment of Farmers” विषय पर 08,09,2019 नवम्बर को किया गया।
- पशु चिकित्सा जैव क्रिया विभाग ने 'Climate Change, Animal Health and Production: Way Forward' पर आधारित एक दिवसीय ब्रेन स्टॉर्मिंग सत्र का आयोजन 11 दिसंबर 2019 को किया।
- पशु चिकित्सा भैषज्य एवं विष विज्ञान विभाग द्वारा भा0कृ0अ0प0-EVM के SCSP के अंतर्गत 'To

promote use of Indigenous drugs in the treatment of animals and to augment animals health and productivity' शीर्षक पर एक दिवसीय वर्कशॉप-गोष्ठी का आयोजन 08 जनवरी 2020 को किया।

- पशु शल्य चिकित्सा एवं रेडियोलोजी विभाग द्वारा AINP-DIMSCA के अंतर्गत उत्तर प्रदेश के पशु पालन विभाग के 10 पशु चिकित्सा अधिकारियों को छह दिवसीय प्रशिक्षण 27 जनवरी –12 फरवरी 2020 को “Application of diagnostic imaging technology and management of surgical conditions in animals” विषय पर दिया गया।
- पशु चिकित्सा जैव क्रिया विभाग ने RKVY परियोजना के अंतर्गत 'Productivity enhancement in goats through artificial insemination: scopes, challenges and strategies' पर 02 दिवसीय वर्कशॉप का आयोजन 13–14 जनवरी 2020 को किया।
- पशु चिकित्सा सूक्ष्म जीवी विभाग द्वारा APHV की XIV द्विवार्षिक सम्मेलन एवं “Public Health challenge mitigation strategies at the confluence of one health approaches” विषय पर राष्ट्रीय संगोष्ठी का आयोजन 24–25 जनवरी 2020 को किया।
- पशु चिकित्सा भैषज्य एवं विष विज्ञान विभाग द्वारा भा0कृ0अ0प0-EVM के अंतर्गत SCSP प्रायोजित 10 दिवसीय लघु कोर्स “Application of analytical and molecular tools for characterization and identification of plants based drugs and their targets” का आयोजन 15–24 फरवरी 2020 को किया गया।
- पशु चिकित्सा जैव क्रिया विभाग द्वारा 'Artificial Insemination in goats' पर उत्तर प्रदेश के पशु पालन विभाग के 28 एवं 20 पशु चिकित्सा अधिकारियों को क्रमशः 24–27 फरवरी एवं 04–07 मार्च, 2020 प्रशिक्षण दिया 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 2019–20 में 30 छात्रों ने 'B' सर्टीफिकेट हेतु परीक्षा दी। 09 कैडेट्स ने अतरौली, अलीगढ़ में आयोजित एन.सी.सी. के CATC कैंप 39 शिविर में, 13 कैडेट्स ने फतेहगढ़ में CATC कैंप 43 एवं 25 छात्रा कैडेट्स ने हाथरस में CATC कैंप 42 में भाग लिया। कैडेट ईशिका राजपूत तथा कैडेट अर्पण चौहान ने गणतंत्र दिवस शिविर 2020 में उत्तर प्रदेश निदेशालय का प्रतिनिधित्व करते हुये भाग

लिया। 02 छात्रा कैडट्स सोनम कुमारी तथा ईशिका राजपूत का चयन एन.सी.सी. के प्रतिष्ठित Youth exchange programme में हुआ।

- वर्ष 2019-20 में साहित्यिक एवं सांस्कृतिक कार्यक्रमों का आयोजन हुआ, जिसमें पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय, जैव प्रौद्योगिकी महाविद्यालय एवं डिप्लोमा के छात्रों ने भाग लिया। LITCULFEST 2019 में मिस वैशाली गुप्ता को ओवरऑल चौपियन चयनित किया गया।
- बी0वी0एस0सी एण्ड ए0एच0 चतुर्थ वर्ष के 60 विद्यार्थी दिनांक 23 जून से 10 जुलाई, 2019 तक दक्षिण भारत शैक्षणिक भ्रमण पर गये।
- 19 से 20 फरवरी 2020 को 18वाँ वार्षिक खेल-कूद प्रतियोगिता आयोजित की गई जिसमें टेबल टेनिस, बैडमिंटन, वॉलीबॉल, शतरंज, खो-खो, कबड्डी, हॉकी, क्रिकेट, दौड़-कूद, जेवलिन, शॉर्ट पुट एवं साइकल रेस शामिल थे।
- वर्ष 2019-20 में विश्वविद्यालय विद्यार्थियों ने विभिन्न राष्ट्रीय/अंतर विश्वविद्यालय प्रतियोगिताओं में भाग लिया जैसे की 20-23 फरवरी, 2020 में गोविंद बल्लभ पंत कृषि एवं प्रौद्योगिकी विश्वविद्यालय, पंतनगर द्वारा आयोजित राष्ट्रीय अंतर विश्वविद्यालय वाद विवाद प्रतियोगिता (Youth Awakening Festival, YUVA), 20 वाँ आल इंडिया इंटर एग्रीकल्चर यूनिवर्सिटी यूथ फेस्टिवल (AGRIUNIFEST-2019-20) में 08-12 फरवरी, 2020 को भाग लिया।
- विश्वविद्यालय ने कर्नल वीरेंदर कुमार के सहयोग से विद्यार्थियों के लिए एक प्रेरणादायक वर्कशॉप का आयोजन 15 फरवरी, 2020 में किया।

### अन्य झलकियाँ एवं कार्यक्रम

- विश्वविद्यालय द्वारा प्री वेंटररी परीक्षा-2019, 31 मई 2019 को आयोजित की गई, जबकि प्री-डिप्लोमा प्रवेश परीक्षा-2019 तथा स्नातकोत्तर (एम.वी.एस.सी. तथा पी.एच.डी.) प्रवेश परीक्षा-2019 क्रमशः 28 जुलाई तथा 17 जुलाई 2019 को आयोजित की गई। चयनित छात्राओं ने पशुचिकित्सा विज्ञान एवं पशुपालन महाविद्यालय तथा परा-पशुचिकित्सा विज्ञान संस्थान के विभिन्न डिग्री एवं डिप्लोमा कार्यक्रम में सत्र 2019-20 में प्रवेश लिया।
- पशुचिकित्सा विज्ञान एवं पशु पालन स्नातक, जैव प्रौद्योगिकी स्नातक तथा परा-पशुचिकित्सा विज्ञान डिप्लोमा कार्यक्रम में नव चयनित छात्रों का द्वितीय वर्ष के विद्यार्थियों द्वारा स्वागत किया गया।
- दुवासू ने 25 अक्टूबर 2019 को विभिन्न सांस्कृतिक कार्यक्रमों द्वारा अपना स्थापना दिवस मनाया। इस

कार्यक्रम का समापन मुख्य अतिथि तथा विश्वविद्यालय के उच्च अधिकारियों द्वारा साहित्यिक, सांस्कृतिक एवं कला प्रतियोगिताओं के विजेताओं को पुरस्कृत करके किया गया।

- दुवासू मथुरा का नवम दीक्षान्त समारोह 28 अगस्त 2019 को आयोजित किया गया। इस कार्यक्रम की अध्यक्षता उ0प्र0 के माननीय राज्यपाल व विश्वविद्यालय के कुलाधिपति श्रीमती आनंदी बेन जी द्वारा की गई।
- 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

- डॉ. नीरज कुमार गंगवार, डॉ. संजय कुमार भारती, डॉ. विक्रान्त सूदन, डॉ. पाणिग्रही डॉ. नीरज कुमार गंगवार, डॉ. विक्रान्त सूदन, डॉ. पाणिग्रही को उभरते हुए वैज्ञानिक पुरस्कार (Young Scientist award) से सम्मानित किया गया।
- डा0विजय पांडे को मानव संसाधन विकास मंत्रालय, भारत सरकार द्वारा पोषित भारतीय प्रौद्योगिकी संस्थान कानपुर एवं NASSCOM के अंतर्गत NPTEL परियोजना द्वारा आयोजित ऑनलाइन NPTEL प्रमाणपत्र कोर्स हेतु रजत पदक से सम्मानित किया गया।
- डा0 विकास पाठक को स्वास्थ्य एवं परिवार कल्याण मंत्रालय, भारत सरकार के अंतर्गत भारत की खाद्य सुरक्षा और मानक प्राधिकरण द्वारा माँस, माँस उत्पाद एवं कुक्कुट के सन्दर्भ में वैज्ञानिक समिति का सदस्य बनाया गया।
- डा0 अमिताव भट्टाचार्य, डा0विजय पांडे डॉ. नीरज कुमार गंगवार, डा0 बृजेश यादव,, डा0 शंकर कुमार सिंह डा0 डॉ. विजय पांडेय, डॉ. उदित जैन, डॉ. मुकेश श्रीवास्तव, डॉ. आशीष श्रीवास्तव, डॉ. अरविन्द त्रिपाठी, डॉ. अमित कुमार जैस्वाल, डॉ. बरखा शर्मा, डॉ. संजय कुमार भारती, डॉ. अजय प्रताप सिंह, डॉ. जितेन्द्र तिवारी, डॉ. रजनीश सिरौही, डॉ. दिलीप कुमार, डॉ. शालिनी वासवानी एवं डॉ. पाणिग्रही को विभिन्न सम्मेलनों/संगोष्ठियों में उत्कृष्ट पेपर/पोस्टर के लिए सम्मानित किया गया।
- डॉ. नीरज कुमार गंगवार, डॉ. संजय कुमार भारती एवं डॉ. अरुण कुमार को इस वर्ष सर्वश्रेष्ठ शोध ग्रन्थ पुरस्कार से सम्मानित किया गया
- डॉ. बरखा शर्मा को इंडियन जर्नल ऑफ वेटेरनरी पब्लिक हेल्थ का निकाय सदस्य चयनित किया गया

- डॉ. पारुल एवं डॉ. बरखा शर्मा को डॉ. राम रक्षा किरण शुक्ल गोल्ड मैडल बेस्ट ओरल पेपर अवार्ड दिया गया
- प्रोफेसर अर्चना पाठक एवं डा० विनोद कुमार सिंह को एग्रीकल्चर रिसर्च कम्युनिकेशन सेंटर द्वारा उत्कृष्ट आलोचक पुरस्कार से सम्मानित किया गया ।

### निर्माण एवं अनुरक्षण

- सत्र 2019–20 में भारतीय कृषि अनुसंधान परिषद विकास अनुदान द्वारा विभिन्न मदों में विश्वविद्यालय को रु० 134.98 लाख की धनराशि प्राप्त हुई। इस धनराशि का उपयोग VPH विभाग, पशु अनुवांशिकी एवं प्रजनन विभाग, औषधि विभाग, मादा रोग विभाग की विभिन्न प्रयोगशालाओं एवं पैथोलॉजी विभाग के संग्रहलय के पुनःनिर्माण एवं मरमत हेतु व्यय किया गया । इसके अतिरिक्त बकरी फार्म में प्रशिक्षण केंद्र, गौतम छात्रावास की चारदीवारी की मरमत एवं कांटेदार तार की बाढ़, सोखते गड्ढे का निर्माण एवं विश्वविद्यालय के सभागार का दीमक विरोधी उपचार करने हेतु व्यय किया गया ।
- वर्ष 2019–20 में शासकीय अनुदान द्वारा विश्वविद्यालय को 409.3 लाख राशि प्राप्त हुई जिसका व्यय विभिन्न पुनःनिर्माण कार्यों, टाइलों को लगवाने हेतु, खड़जा सड़क बनवाने हेतु, पार्किंग शेड, सोखता गड्ढा, कांटेदार तार द्वारा चारदीवारी बनवाने हेतु, इंटरलॉकिंग पेवर टाइल्स लगवाने हेतु तथा छतों को बदलवाने इत्यादि में व्यय किया गया ।

### वित्त एवं बजट

- वर्ष 2019–20 में विश्वविद्यालय को उ०प्र० सरकार द्वारा कुल रु. 6119.77 लाख बजट प्राप्त हुआ जिसके तहत वेतन मद में रु. 4602 लाख एवं कंटीजैन्सी मद में रु. 1517.77 लाख बजट प्राप्त हुआ ।
- भारतीय कृषि अनुसंधान परिषद, नई दिल्ली द्वारा रु. 217.45 लाख की वित्तीय सहायता विकास एवं सुदृढीकरण के लिए प्रदान की गई ।
- इस वित्तीय वर्ष में, कृषि विज्ञान केंद्र ने रु. 167.99 लाख प्राप्त किये, जिसके तहत वेतन मद में रु. 152.00 लाख एवं कंटीजैन्सी मद में रु.15.99 लाख बजट प्राप्त हुआ ।
- इस वर्ष विश्वविद्यालय को RKVY परियोजनाओं को सुचारु रूप से चलने हेतु कुल रु. 1173.71 लाख कंटीजैन्सी मद में प्राप्त हुए ।
- वर्ष 2019–20 में विश्वविद्यालय को अन्य परियोजनाओं को चलने हेतु कुल रु. 114.46 लाख कंटीजैन्सी मद में प्राप्त हुए ।
- इस वर्ष विश्वविद्यालय को कुल रु. 453.86 लाख राजस्व की प्राप्ति हुई ।

### जनसूचना अधिकार

- उत्तर प्रदेश सरकार के निर्देशों तथा आर० टी० आई० एक्ट 2005 के अनुपालन के क्रम में 35 प्रार्थना पत्र प्राप्त हुए, जिनमें से 33 का निस्तारण किया गया तथा 02 विचाराधीन हैं ।



## MISSION

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

## VISION

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

## UNIVERSITY TARGETS

- ❖ Revamp teaching programmers and “Teaching Methodologies”, set up e-learning class-rooms, introduce net-based “virtual class-rooms” and promote e-teaching and learning;
- ❖ Set up “State of the Art” Instructional Livestock Farms, Demonstration Units, Veterinary Clinical Complex, Disease Investigation and Research Laboratories;.
- ❖ To achieve at least 15 per cent increase per annum in the number of University graduate and postgraduate students qualifying for national competitive examinations;
- ❖ To produce competent and skilled clinicians, entrepreneurs and livestock business managers and team leaders;
- ❖ Faculty up-gradation, filling vacant teaching posts and creating faculty positions in newer proposed faculties in the University;
- ❖ Encourage faculty members to garner more financial assistance from outside agencies through externally funded research projects and support at least 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. 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.

## 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.

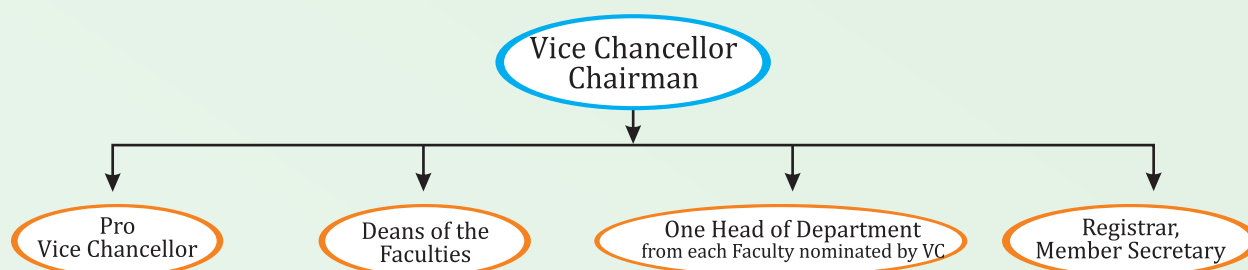
### A. Authorities of the University

#### 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..

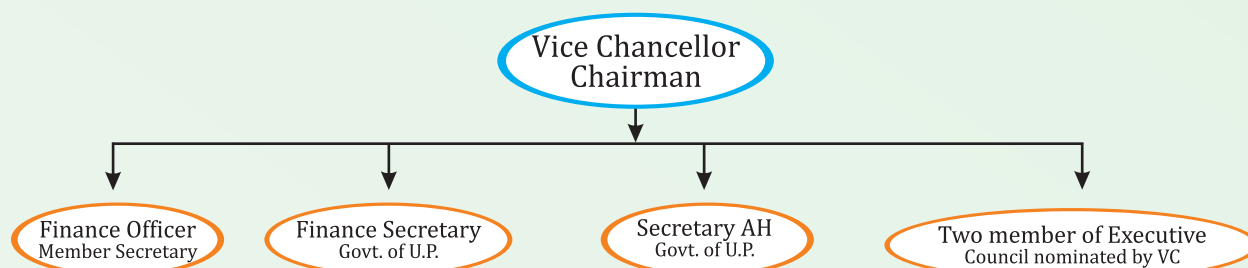
#### 2. Academic Council

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 :



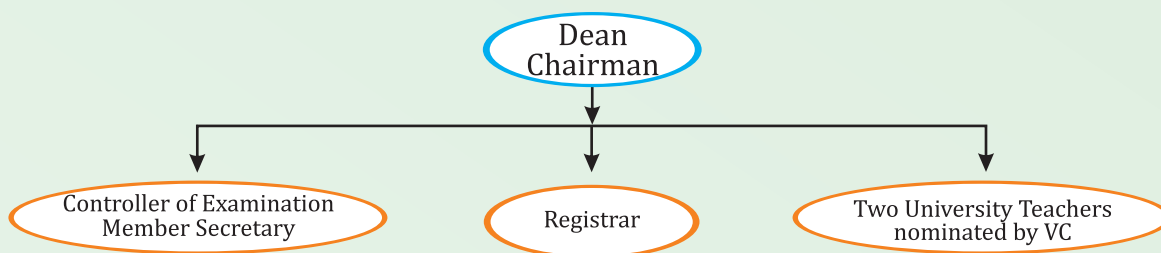
#### 3. Finance Committee

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 examinations of the University including pre veterinary Test (PVT), appointment of examiners, tabulation and moderation of results and make recommendations to the Academic Council for improvement in examination system. the flow chart of the composition of the examination committee is presented below:

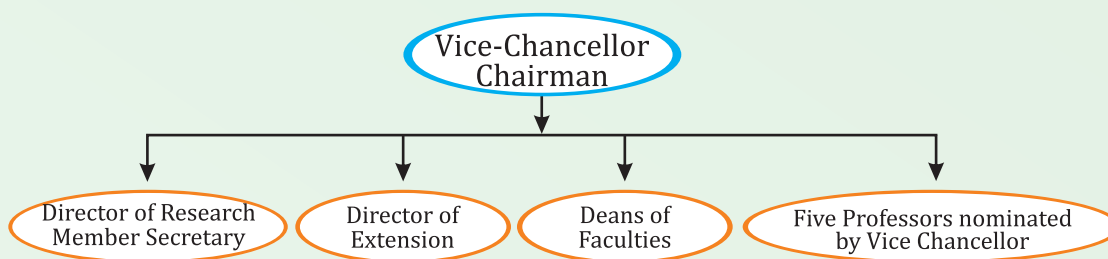


## 5. Board of Faculty

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

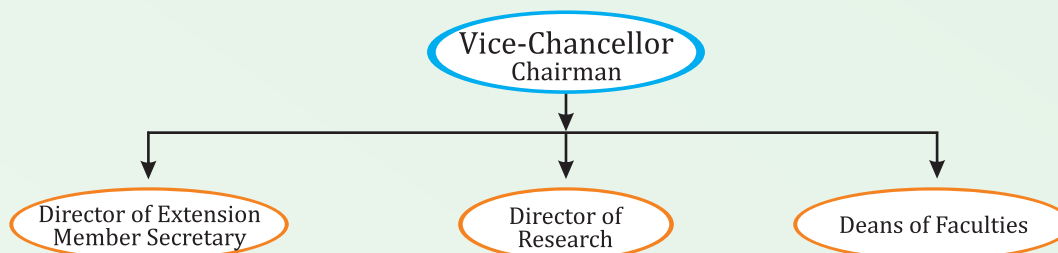
## 6. Research Advisory Committee

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



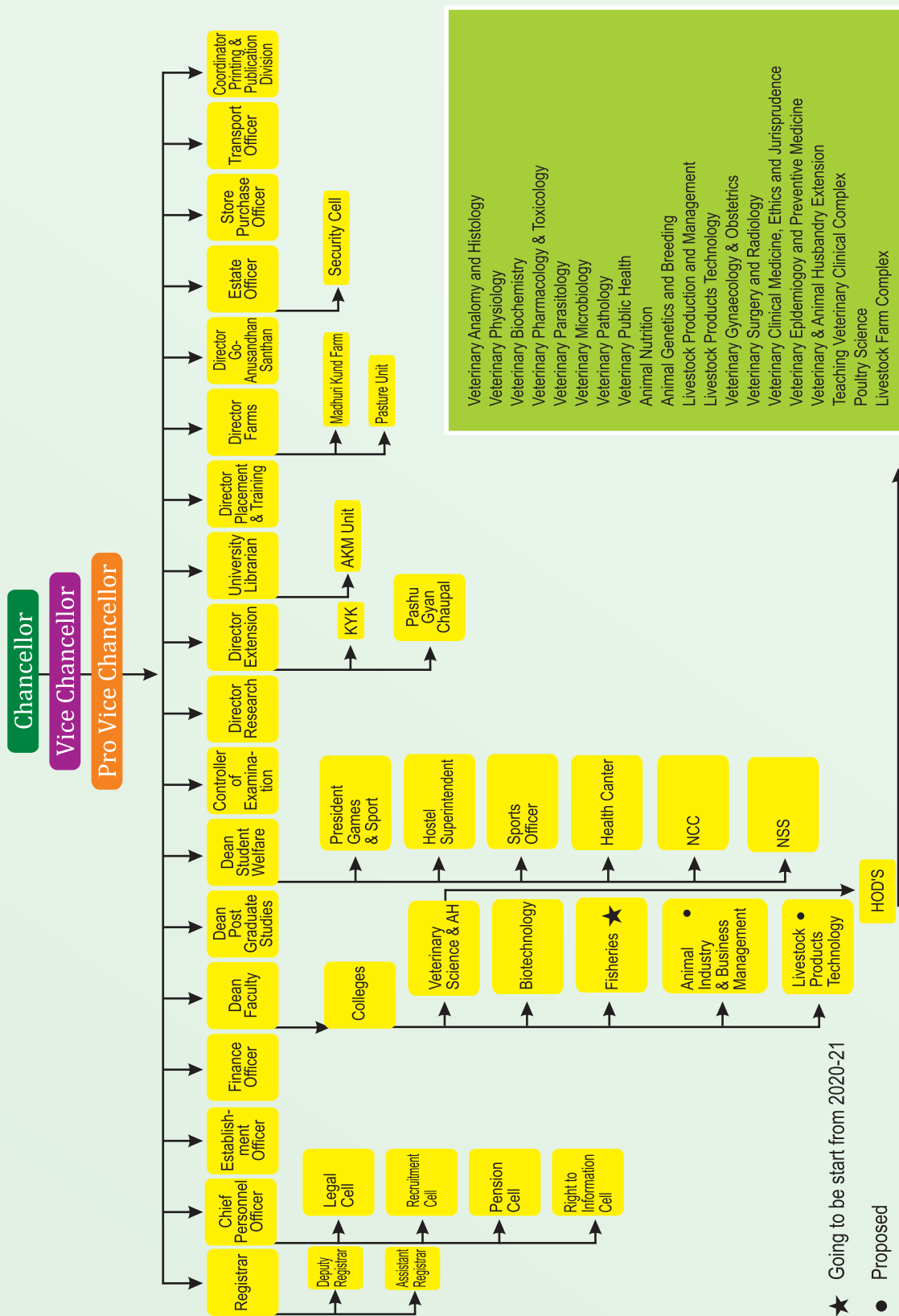
## 7. Extension Advisory Committee

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



# ORGANIZATIONAL STRUCTURE

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





## B. Organizational Meetings

### Executive Council

S. No.	Meeting	Date	Venue
1.	36 <sup>th</sup>	17-06-2019	DUVASU, Mathura
2.	37 <sup>th</sup>	27-08-2019	DUVASU, Mathura

### Academic Council

S. No.	Meeting	Date	Venue
1.	74 <sup>th</sup>	05-08-2019	DUVASU, Mathura
2.	75 <sup>th</sup>	22-08-2019	DUVASU, Mathura
3.	76 <sup>th</sup>	11-02-2020	DUVASU, Mathura

## C. Officers of the University

S. No.	Name of The Project	Name of the Officer	Date	
			From	To
1.	Chancellor	Hon'ble Smt. Anandi Ben Patel Ji, 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, C.V.Sc. & A.H.	Prof. Satish K. Garg	June 30, 2009	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 Go-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 & EDUCATION

DUVASU has two constituent colleges: College of Veterinary Science and Animal Husbandry and College of Biotechnology. Both colleges are running their degree programmes. The University has also one 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 various disciplines and Doctor of Philosophy (Ph.D.) in fifteen disciplines as per ICAR academic regulations for higher agricultural education with a strong faculty strength of 82 during the year 2019-2020. The faculty from College 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	75	52	23
2.	M.V.Sc.	36+15 (ICAR)	31	21	10
3.	Ph.D	08+06 (ICAR)	03	02	01

### B. College of Biotechnology

There are two academic programmes 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	25	13	12
2.	B.Sc. (H) Industrial Microbiology	15	08	02	06

### C. Institute of Paraveterinary Sciences

There are two diploma programmes running under Institute of Para Veterinary Sciences established in the year 2013; Diploma in Livestock Extension (DLE) and Diploma in Veterinary Pharmacy (DVP). The teaching is taken care of by the qualified veterinary postgraduates 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	57	03
2.	Diploma in Veterinary Pharmacy (DVP)	60	60	51	09

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

### 1. Veterinary Clinical Complex (VCC) Kothari Veterinary Hospital

VCC, the erstwhile Kothari veterinary hospital, is a multi-specialty veterinary clinic. TVCC 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. TVCC 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 animal ICU for dogs, loading and unloading platform and indoor units for small and large animals. A total of 14,143 clinical cases were treated during the year 2019-2020 and the total revenue generated during this year was Rs. 7, 61,235/- (Rupees seven lac sixty one thousand two hundred and thirty five only). Final year students undergo a rotatory internship programme in the TVCC.

### 2. Diagnostic Laboratory

VCC has a very well equipped Veterinary Diagnostics laboratory to provide diagnostic facilities to serve the animal owners having advance instrumentation for proper diagnosis of diseases on no-profit-no-loss basis and serve as important learning unit for students. The laboratory is having Digital microscope, Dry chemistry analyzer, Hematology analyzer and Electrolyte analyzer. During 2019-2020, the laboratory processed total 2015 samples for various blood parameters, histopathology tests, milk and urine samples and generated a revenue of Rs. 100190/- (Rupees one lakh one hundred ninety only).

### 3. Ambulatory Services And Clinical Camps

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

## E. Experiential Learning Programme

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.

- Further, they were also imparted hands on training on rearing of Chabro birds and layers in these sub units of ELU during the internship training. In addition, the students were also trained on the hatchery operations and various farm activities like feeding, watering and management of poultry.
- The sub units have also been used to cater the training needs of the para-military forces 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.
- 17,729 day old coloured chicks (Chabro) and 528 day old turkey poults were obtained during this period. Further, 1<sup>st</sup> year and internship students of B.V.Sc. & A.H. and P.G students of the department were given hands on training on hatchery management.

### 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. During the reporting period, 6170.0 liters of milk was processed into 852.07 kg of Paneer and 95.25 kg of Khoa. Value added meat products like meat nuggets, meat patties and meat pickle were also processed.

### 3. Feed Production and Processing

Under the experiential learning on “Feed production and Processing” Department of Animal Nutrition is imparting training to students and farmers. Moreover, University has ample amount of feed to meet the requirement of feed for its farm animals, and no purchasing from outside sources is required. Feeds produced from this unit is also available to farmers and goshala during Kisan melas and farmers training. Urea molasses mineral block unit is preparing UMMB which are good source of mineral and readily soluble carbohydrates and nitrogen to ruminants during lean period. Various practical trainings are given to the students to make them self reliant and it can serve as microenterprise for students to start their ventures after B.V.Sc. & A.H. Experiential learning on feed production and processing is very successful asset with University. Unit also prepares area specific mineral mixture about 100 quintal/yr and provides to the farmers on nominal cost. During 2019-20 through the sale of mineral mixture was about 100 quintal which cost Rs 6 lacs (six lacs).

## 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 every working days. 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 2019-20.

#### i. Campus interviews:

Students were placed at different work stations to serve the society after campus interview by reputed firms like Sugna poultry feed Ludhiana (Punjab), Noida 18 pet clinic, Alaknanda pet clinic Delhi etc. Under the institutional development students were regularly informed about the various job opportunities in different sectors like feed, pharmaceutical companies, slaughter houses, Educational institutes etc.

#### ii. Classes organized:

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

#### iii. Campus placement of students

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

S. No.	Degree/Diploma	Number of students selected	Name of the firm /company
1.	BVSc & AH	08	Alaknanda pet clinic Delhi
2.	DLE/DVP	05	
3.	BVSc & AH	03	Noida 18 pet clinic
4.	BVSc & AH	01	Sugna poultry feed Ludhiana

## 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.	Enterpreneurial promotion by preparation of specimens from fallen animals	Prof. Archana Pathak Prof. Ajay Prakash Prof. M.M. Farooqui Dr. Abhinov Verma Dr. Neeraj Gangwar	RKVY	59.50
A2.	Establishment of referral laboratory for quality evaluation of milk and milk products	Prof. Vikas Pathak Dr. Meena Goswami Awasthi Dr. S. K. Bharti	RKVY	183.40
A3.	Demonstration unit for silage making and popularization of low cost silage technology for year round fodder availability for small scale farmers	Dr. Shalini Vaswani Dr. Vinod Kumar Dr. Muneendra Dr. Raju Kushwaha	RKVY	90.91
A4.	Establishment of small scale feed processing demonstration unit to promote rural youth entrepreneurship	Dr. Shalini Vaswani Dr. Sanjeev Kumar Dr. Amit Singh	RKVY	236.27
A5.	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.	Dr. Mukul Anand Prof. Sarvajeet Yadav Prof. Arun K Madan Prof. Atul Sexana Dr. Anuj Kumar Dr. Jitendar K Agrawal	RKVY	743.51
A6.	Establishment of modernized goat farm for strengthening goat husbandry practices in state of uttar pradesh. (Part-1 & 2)	Dr. Mukul Anand	RKVY	612.00
A7.	Strengthening of semen analytical laboratory for semen certification and quality assurance of breeding buck semen. (Part -1 & 2)	Dr. Mukul Anand Prof. Sarvajeet Yadav Prof. A.K. Madan Prof. Brijesh Yadav Dr. Dileep Swain Dr. Mukul Anand	RKVY	169.00
			RKVY	138.80
A8.	Propagation of insemination techniques in goats and establishment of semen bank for enhanced productivity and socioeconomic upliftment in state of U.P.	Dr. Mukul Anand	RKVY	5.65
A9.	Strengthening of clinical facilities at university referral clinic for benefit of farmers and livestock owners	Dr. Sanjay Purohit Dr. Mukesh Srivastava Dr. Shankar Singh Dr. Vikas Sachan	RKVY	233.20
A10.	Establishment of Environment control chamber and A calorimetric unit to enhance the productivity of livestock in scenario of climate change in Uttar Pradesh	Dr. Brijesh Yadav Dr. Mukul Anand Dr. Rajneesh Sirohi Prof. Sarvajeet Yadav Prof. A.K. Madan	RKVY	260.14
A11.	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 Swain Dr. Soumen Chaudhary	Department of Biotechnology (DBT), Govt. of India	84.98

A12.	All India Network Programme on Diagnostic imaging and management of surgical conditions of animals	Dr. Sanjay Purohit Dr. Gulshan Kumar	ICAR, New Delhi	15.45 (for year 2019-20)
A13.	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
A14.	Outreach programme on Ethno-Veterinary Medicine "Pharmacological studies and development of polyherbal formulation for reproductive disorders in	Dr. Soumen Chauduary	ICAR, New Delhi	5.05
A15.	ICAR-AICRP-FMD Project	Dr. Ajay Pratap Singh	ICAR, New Delhi	3.00
A16.	ICAR-FMD-CP Project	Dr. Ajay Pratap Singh	ICAR, New Delhi	2.00
A17.	Evaluation of antiviral and immunomodulatory potential of polyherbal formulation	Dr. Neeraj Kumar Gangwar Dr. Ajay Pratap Singh	India Hrbs Pvt. Ltd.	6.85
A18.	Study on the Efficacy of feeding Mineral mixtures (Min Mix) on production and reproduction parameters, repeat breeding and silent anestrus of lactating dairy cows	Dr. Vinod Kumar	The Himalaya Drug Company	5.00
A19.	Strategic control of subclinical parasitism for better animal health and enhanced productivity in UP	Dr. Daya Shankar Dr. Jitendra Tiwari Dr. Vikrant Sudan	RKVY	124.31
A20.	Evaluation and Popularization of Indigenous Acaricidal Medication Against Tick Infestation in Regions of Uttar Pradesh	Dr. Jitendra Tiwari Dr. Vikrant Sudan Dr. Sanjiv Singh	NIF, Autonomous Body of DST, Govt. of India	6.38
A21.	Outreach Programme on Zoonotic Diseases	Dr. Udit Jain	ICAR, New Delhi	5.59
A22.	AICRP on Nutritional and Physiological Interventions for enhancing reproductive efficiency in animals	Dr. Atul Saxena (Project Shared by three department I.E. Gynaecology, Physiology and Nutrition)	ICAR, New Delhi	Non-Funding Center
A23.	Integrated indigenous cattle centre for conservation and improvement of indigenous milch breeds of cows (Gokul Gram Project)	Dr. Yajuvendra Singh	DADF, Ministry Agriculture & Farmers Welfare, GOL	421.00
A24.	Evaluation of the efficacy of velgraft / velvert in reconstitutions of surgical wounds in goats.	Dr. Amit Shukla	M/s. Datt Mediproducs Pvt. Ltd. Gurgaon, Haryana	5.95

## B. Intra-mural Research Projects

S. No.	Name of The Project	Name of PI and Co-PI	Funding Agency	Total Budget (Rs in lacs)
B1.	Study on Immunomodulatory Potential of Indigenous Cows Urine	Dr. Ajay Pratap Singh	DUVASU Mathura	0.76



## PROJECT REPORTS

### A. Extra-mural Project

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

During 2019-20, in R.K.V.Y project the extension and renovation of laboratory was completed. Bone and Meat cutting machine, pressure cooker (sterilizer), cooking utensils, chemicals, plastic wares and specimen jars were procured. To promote awareness and entrepreneurship among the youths, six training programmes on “मृत पशुओं के अंगों के व्यवसायिक उपयोग पर ग्रामीण युवाओं के लिये कौशल विकास प्रशिक्षण” were organized. In each training programme 20 youths except in II (18) and VI (19) participated from different districts of the Uttar Pradesh. In each training programme five lectures were delivered to the participants and Hands on training were given on “कंकाल बनाने हेतु अस्थियों को साफ करने की प्रक्रिया का प्रशिक्षण”, खाल को चमड़े में परिवर्तित करने की तकनीक, सिलिकॉन द्वारा पशुओं के फेफड़े का कास्ट बनाने की विधि का प्रशिक्षण, पेट एवं आँतों को साफ करने की प्रक्रिया का प्रशिक्षण एवं पेट में गुब्बारे की मदद से पढ़ने योग्य नमूना बनाने का प्रशिक्षण. In each training programme one guest lecture was delivered by an expert invited from the different Veterinary Institutes of India. The manual comprising of lectures and practicals were also distributed to the participants in each training programme. In addition to these many dry and wet museum and teaching specimens were prepared by using various techniques.

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

Referral laboratory for quality evaluation of milk and milk products was established under RKVY project and several equipments were procured viz. Ultra performance liquid chromatography (UPLC), Gas chromatography (GC), Digital Butyrometer, online IPS 5Kva and 10Kva during 2019-20.

#### **Project-A3 Demonstration unit for silage making and Popularization of low cost silage**

#### **technology for year round fodder availability for small-scale farmers**

The construction work is completed, purchase of instrument is made and all the instruments are functional. The silage of jowar, maize sugarcane and pea peels is prepared in bunker and silo pack machine. Three MVSc trials have been done with the prepared silage. The workshop is conducted and the technology of silage preparation is demonstrated to about 500 farmers.

#### **Project-A4 Establishment of small-scale feed processing demonstration unit to promote rural youth entrepreneurship**

The construction work proposed under the project is now completed. Erection and commissioning of Cattle pellet feed plant and mineral mixture plant is completed. The purchase and installation of almost all proposed instruments are completed. The workshops and training will be conducted shortly.

#### **Project-A5 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**

#### **Project-A6 Establishment of modernized goat farm for strengthening goat husbandry practices in state of Uttar Pradesh (Part-1 & 2)**

#### **Project-A7 Strengthening of semen analytical laboratory for semen certification and quality assurance of breeding buck semen (Part-1&2)**

#### **Project-A8 Propagation of insemination techniques in goats and establishment of semen bank for enhanced productivity and socio-economic upliftment in state of U.P.**

- Established Goat Cryopreserved Semen Production centre and produced more than 30,000 frozen semen doses (FSD). The FSD is being supplied to animal husbandry

departments/NGOs associated with goat breeding in Uttar Pradesh, Rajasthan, Haryana, West Bengal, Chhattisgarh, and Central Sheep Breeding Farm, Hisar for breed improvement.

- Hands-on training has been provided on AI in Goats to more than 50 Veterinary officers from districts of Agra Mathura, Etawah, Aligarh, Hathras and Firozabad of Uttar Pradesh.
- MOU with Goat trust of India for working on improving Goat Husbandry in Country

#### **Project-A9 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, construction of large animal operation theater, establishment of hemodialysis unit at Kothri Veterinary Hospital along with procurement of large-animal ventilator, x-ray machine, auto-analyzer, Blood gas analyzer etc.

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

In the year 2019-20, all the civil work of laboratory has been completed which includes a state of art molecular laboratory besides a climatic chamber for six adult cattle/buffalo. Six calorimetric units have been installed both for large as well as small animals. Under this project several instruments related to genomics, proteomics and biochemical analysis have been purchased and installed. An automatic weather station has also been installed to provide weather data for research purposes. For the measurement of gases exhaled from the animals, a continuous gas analysis monitoring system has also been installed. Under this project an infra-red camera has also been procured which helps in monitoring and measuring the body surface temperature of animals. One MVSc student from Department of Veterinary Physiology has worked on buffaloes for her thesis research using the facilities of climate chamber.

Students from different departments have also availed the facility of this laboratory to complete their thesis research work. The faculty of department of Veterinary Physiology has sent research proposals to DST and ICAR on the basis of the available facilities in the laboratory.

#### **Project-A11 Mechanistic insights into the signal transduction pathways of Progesterone in regulating functional dynamics in bovine and caprine spermatozoa [BT/PR27446/AAQ/1/717/2018]**

- Progesterone at a concentration of 1 pM was validated for induction of capacitation and at a concentration of 1  $\mu$ M was validated for induction of acrosome reaction in bull and goat spermatozoa.
- cAMP-PKA, IP3, CatSper, TRPV1, CB1, CB2, GABA, MAPK and Hv1 pathways in regulating progesterone mediated non-genomic signalling for capacitation and acrosome reaction have been established in bull and goat spermatozoa.

#### **Project-A12 All India Network Programme on Diagnostic imaging and management of surgical conditions of animals**

During 2019-20, Total budget Rs 15.45 lakhs was received from ICAR in 5 instalments. A six days training on “Application of diagnostic imaging technology and management of surgical conditions in animals” was organised under All India Network Programme on Diagnostic Imaging and Management of Surgical Conditions in Animals (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.

#### **Project-A13 Clinical evaluation of indigenous technologies against mastitis among cattle and buffaloes**

Prevalence of clinical and subclinical mastitis was carried out at 1- ILFC, DUVASU, 2- Hasanand Gaushala, Vrindavan 3- Kanha

Gaushala Vrindavan and 4- Govind Gostham Gaushala, Gokul Mathura. Twenty animals with clinical mastitis were analyzed for antimicrobial culture and sensitivity test along with somatic cell count and subsequently treated with indigenous medicine gel provided by National Innovation Foundation. In other group 20 clinical cases of clinical mastitis were treated standard routine treatment to compare the efficacy of the indigenous medicine. Rest of work was stopped due to covid-19 lockdown, but now has been started and expected to be complete by September-2020.

**Project-A14 Outreach programme on Ethno-Veterinary Medicine “Pharmacological studies and development of polyherbal formulation for reproductive disorders in animals”**

1. The *in vivo* efficacy of *E. robusta* leaves extracts against resistant clinical isolates of *Staph. aureus* were evaluated in surgically induced endometritis in rats. The histopathological finding revealed that rats treated with *E. robusta* leaves methanolic extract showed lesser degree of inflammatory reaction as evidenced by lesser infiltration of inflammatory cells with mild inflammatory changes, fibrosis and hyperplastic endometrial lining epithelium. In cefixime treated group relatively more infiltration of inflammatory cells throughout the stroma with complete destruction of endometrial glands along with loss of endometrial lining was observed.
2. Endometritic rats treated with *E. robusta* leaves extracts also showed significantly reduced expression of inflammatory COX-2 mRNA expression in uterus as compared to endometritis animals.
3. Based on our earlier observation on the promising antibacterial and anti-inflammatory potential of *Eucalyptus robusta* leaves extract, we attempted to prepare a nano-based herbal formulation for treating uterine infection in the large animals. The nano-based herbal formulation containing *E. robusta* leaves extract was having 81.33 % entrapment efficiency and size of 188.6 nm.

4. Though the nano-based herbal formulation had satisfied all the criteria for its characterization (zeta size, zeta potential, SEM shape), the *in vitro* antibacterial efficacy against both Gram + ve (*Staph. aureus*) and Gram –ve (*E. coli*) organisms was found to be lesser than the crude extracts.

**Project-A15 ICAR-AICRP-FMD Project**

**Project-A16 ICAR-FMD-CP Project**

1. A total of 14970 pre-vaccination and 15000 post-vaccination serum samples were received at the centre processed and dispatched to FMD-CP LABORATORY, DFMD, IVRI Campus, Bengaluru for testing.
2. The pre-vaccination serum antibody titre was observed to be 17.2%, 12.4% and 17.5% for serotype O, A and Asia 1 respectively. The post vaccination serum antibody titre showed significant upward trend with 38.6 %, 33.7% and 40.2 % of vaccine animals protected against O, A and Asia 1 respectively
3. A total of 14,550 pre-vaccination and 13,920 post-vaccination serum samples were processed at the centre and dispatched to FMD-CP LABORATORY, DFMD, IVRI Campus, Bengaluru for testing.

**Project-A17 Evaluation of antiviral and immunomodulatory potential of polyherbal formulation**

Experiments	Duration	Type of Study	Technical Report
Experiment 1	2 Months	In-vitro Study	1. Cell line has been established and rest work under progress.
Experiment 2	4 Months	In-vivo Study	1. In vivo study has been completed and doing molecular work.

1. The project work is in two phases, in which In Vitro and In vivo study
2. *In-vivo* study has been completed.
3. *In-vitro* study is in under progress, in which cell lines has been established.



**Project-A18 Study on the Efficacy of feeding Mineral mixtures (Min Mix) on production and reproduction parameters, repeat breeding and silent anestrus of lactating dairy cows**

**Project-A19 Strategic control of subclinical parasitism for better animal health and enhanced productivity in UP**

Under this project a three days training programme on “Control of subclinical parasitism in dairy animals” was organized for 20 Veterinary Officers of U.P. from 24-26 February 2020. Lectures and hands-on training was provided by the experts of DUVASU and CIRG Makhdoom to the participants on various aspects subclinical parasitism and its management.

**Project-A20 Evaluation and Popularization of Indigenous Acaricidal Medication Against Tick Infestation in Regions of Uttar Pradesh**

In the present year neem and nirgundi leaves decoction and aqueous extracts were trialed through in vitro tests like Adult Immersion Test, Larva Packet Test, Syringe Test. Results of the trials were found encouraging with high mortality of different life cycle stages of Ticks.

**Project-A21 Outreach Programme on Zoonotic Diseases**

**Brucellosis:**

1. A total of 2640 samples were collected comprising 1218 milk samples of cattle(652) and buffalo(566), 520 serum samples of cattle(336) & buffalo(184), 135 from sheep, 113 from goat, 559 from human serum and 95 samples received from outbreak (Jhansi, Jalaun & Lalitpur).
2. A total of 1218 milk samples were collected from cattle and buffalo from 5 districts viz. Mathura, Agra, Hathras, Kasganj and Aligarh.
3. The number of milk samples positive by I-ELISA was more in cattle 6.13% in comparison to Buffalo 4.77%
4. A total of 520 serum samples were collected from cattle and buffalo. 50(9.61%) samples positive by I-ELISA.

5. A total of 248 serum samples from sheep(135) and goats(113) were collected. The percent positivity were 1.48% (2/135) in sheep, 10.61% (12) in goat serum samples.
6. 559 Human sera samples were collected. 21/559 were found positive with 3.75%.
7. Female Abattoir workers was found 8.33%(1/12) positive and in male abattoir workers(6.66%).
8. In Agra and Hathras districts, the prevalence of brucellosis were 7(14.58%) and 8(18.60%) due to poor hygiene & lack of awareness.
9. In Mathura district, the prevalence was more in Gaushalas of Vrindavan i.e.28(9.42%) due to gaushalas owner follows natural service practices and improper disposal of aborted materials.
10. Received samples from Government state farms like State livestock cum agriculture farm, Bharari Jhansi, the percent positivity of brucellosis in cow milk (24.07%) and cow serum (50.0%) were found very high. It shows the outbreak like condition. Proper screening of all animals should be required.
11. Govt sheep and Goat farm Orai, Jalaun, 10 serum were received and tested for brucellosis. Out of 10, 5 were found positive by I-ELISA (NIVEDI, Bengaluru Kit). Verocytotoxic *E.coli* (VTEC)
  - During the period under report, a total of 296 samples comprising 96 poultry farm samples & 200 clinical samples. Comprising of Poultry cloacal swab (60) and its environmental sources samples (36), Animal clinical samples (fecal, Pus, Urine) (70) and Human clinical samples (fecal, Pus, Urine) (65) & Environmental sources (Hand, Table, Trevis, Instrument swabs) (65), were collected and processed for detection of *E.coli*, VTEC and antimicrobial resistance & biofilm production (Congo red dye assay & molecular method by LuxS gene).
  - Overall Percent positivity of VTEC was 2.02%(6/296).

- In Poultry samples- Overall percent positivity was 4.16% (4/96) {samples collected from Poultry Farm of Shonkh, Adeeg, Baad, DUVASU, Farah and Goverdhan}
- Overall percent positivity in clinical samples of animal, human & their environment samples was 1.00% (2/200) (Intestinal & extra intestinal)
- In Animal clinical samples- 2.85% (2/70), comprising of 3.33% (1/30) positive in Animal fecal & 5.00 % (1/20) in Animal urine. VTEC was absent in pus samples (20) VTEC were also absent in all Human & Environmental sources.
- Drugs which were found sensitive- Imipenem (100%) and drugs which were found Resistance- 100% resistance in Oxacillin, Ampicillin, Vancomycin, Cefotaxime and Linezolid.
- Pathogenecity results: Conjured dye binding ability of VTEC isolates - 4/6 (66.66%) and other *E.coli* (Non-VTEC) isolates, showing biofilm production -7/12- (58.33%)
- All 60 *E.coli* also tested for NdvB (gene responsible for antibiotic resistance in biofilm producing *E. coli* isolates), *rfbO111* and *rfbO157* genes. All were found negative after molecular confirmation.
- All 60 *E.coli* further tested for LuxS genes (biofilm production), 18 isolates were found positive.( These 18 isolates comprising of 6 VTEC isolates and 12 Non VTEC isolates)
- Submission of 21 Verotoxic *E.coli* at NC-VTC, ICAR-NRC on Equines, Hisar (2017-18) and got accession no's of 17 VTEC isolates(2018-19).15 genes were submitted to NCBI GenBank in the year 2017-18, we got accession no. of 8 VTEC genes in this year.
- 35 *E.coli* isolates were submitted for serotyping to National Salmonella and Escherichia center, CRI, Kasauli, H.P. 15 genes were submitted for sequencing to Invitrogen Bioservices India Pvt Ltd, Gurgaon, Haryana

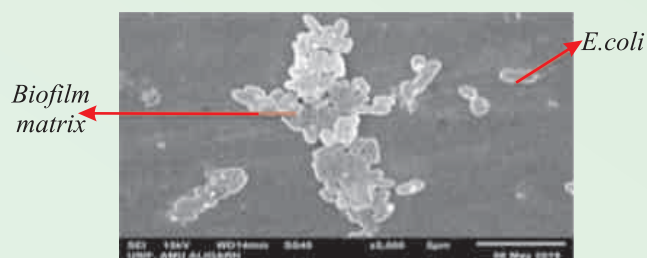


Figure 9 (c) : Scanning Electron microscopic micrograph showing the maturation of *E.coli* biofilm of table surface sample

## Project-A22 AICRP on Nutritional and Physiological interventions for enhancing reproductive efficiency in animals

### Activity 1:

- To revalidate the work of Bypass fat & ASMM in anestrus heifers.

### Methodology

- Fifteen anoestrus heifers, comprising of nine (09) haryana and six (06) sahiwal animals were formed in two groups as G1 & G2. Group 1 (n=09) animals were fed orally with 100 g / animal / day of By-pass fat whereas Group 2 (n=06) were fed orally ASMM@ 50 g / animals / day, for a period up to 60 days in addition to daily ration as per the farm practice. During treatment period, animals were observed for estrus morning-evening using a teaser. The animals reported in heat were inseminated using frozen thawed semen.

### Conclusion

- As a result of treatments, 88.88% (8/9) Group 1 animals & 100% (6/6) Group 2 animals were reported in oestrus at a mean time interval of 48.44 & 91 days. The pregnancy percentage at induced estrus were 75% (6/8) for Group 1 and 50%(3/6) for Group 2

### Activity 2:

- To assess the supplementation of *T. cordifolia* on growth performance of Sahiwal heifers.
- To evaluate the haematology and blood biochemical parameters of Sahiwal heifers on supplementation with *T. cordifolia*.

## Conclusion

The results indicate that the nutrient intake and digestibility of Sahiwal heifers was not affected by the guduchi supplementation at the dose rate of 0.5 and 1.0% of total DMI. However, the increased levels of antioxidant defence enzyme SOD and lower levels of LPO along with higher concentration of IgG in T2 group are suggestive of antioxidant and immune stimulating activity of *Tinospora-cordifolia* at the level of 1.0% supplementation in Sahiwal heifers.

## Activity 3:

- Progesterone hormone binding as a marker to predict fertility status of cryopreserved bull and buffalo semen of different production potential.

## Conclusion

The degree of P4 receptor binding with the ligand was higher in bull compared to caprine spermatozoa. Loss of P4 receptors was observed in frozen-thawed spermatozoa indicating reduction in P4 binding sensitivity. Frozen-thawed bull spermatozoa showed 65% P4 reactivity whereas goat spermatozoa showed 45%. Low fertile bulls showed 45% sensitivity to P4 and high fertile bulls showed 75% after freezing-thawing. Similar effect was also observed in low fertile buffalo spermatozoa against high fertile (33% vs 54%). Based on the results, it can be concluded that sensitivity to Progesterone can be used as a predictor of fertilizing potential as well as quality of frozen-thawed spermatozoa.

## Project A23 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. Under this project presently a multipurpose cow shed is under construction at LFC. The main mandate of the project was to conserve and propagate the elite germplasm of Sahiwal and Haryana cattle. This year we could propagate these germplasm as per following table:

Name of Organization/ Institute/ Gosala	Sahiwal		Haryana		
	Female		Male	Female	
	Heifers	Cows		Heifers	Cows
RPCAU Pusa, Samastipur, Bihar	16	04	02	-	02

## Project A24 Evaluation of the efficacy of velgraft/velvert in reconstitutions of surgical wounds in goats

Department of Veterinary Pharmacology and Toxicology has received the project from M/S Datt Mediproducts Pvt. Ltd. Gurugram, India. The aim of the project is evaluate the wound healing potential of two pharmaceutical products viz. Velgraft and Velvert in reconstituted wound models in goats. All the experiment was conducted after seeking the ethical approval from CPCSEA, Government of India. The reconstituted wounds were created ethically in the animals and application of two of the aforesaid products was done on the lesioned site. The wound healing efficacy was compared with soframycin. The assessment of wound healing was done with gross digital imaging and measurement of wound contraction area along with biochemical assay involving DNA estimation, Hydroxyproline assay, cytokine assay etc. to assess the strength of healed tissue. Further the study was cemented with histopathological examination and special staining with Masson Trichome to undermine the status of healed tissue. The molecular mechanism was also studied by targeting different proteins such as Vascular endothelial growth factor (VEGF-A), Transforming growth factor Beta (TGF beta) and CD 31. The study revealed significant improvement in wound closure and wound healing on the basis of gross, histopathological and molecular analysis in velgraft treated group as compared to velvert treated group. The study also revealed significant involvement of Vascular endothelial growth factor (VEGF-A), Transforming growth factor Beta (TGF beta) and CD 31. Velgraft application noticeably enhanced wound closure by Day 21 which was confirmed through restoration of normal skin architecture via his to pathological examination whereby complete regeneration of epidermal layers,



collagen fibers, blood capillaries and hair follicular formation was seen till Day 28. Stimulation of angiogenesis markers was also observed at different time-points post-Velgraft application suggestive of improved angiogenesis and vasculogenesis. Up regulation of TGF- $\beta$ 1 revealed significant fold change as compared to sham operated and soframycin treated group advocating velgraft induced chemotaxis and endothelial cellular migration. Present study ensures the application of velgraft facilitates wound healing through augmenting wound closure, enhancing collagen synthesis and deposition, trichosis development and promoting revascularization with, epidermal layers restoration thus aiding tissue repair and remodeling. In case of velvert application, wound closure results showed almost complete wound healing in Velvert application group by Day 21 of the study period and responded significantly as compared to soframycin. Histological sections demonstrated re-epithelization, vascularization, hair follicles and collagen fibers formation till Day 28 after Velvert application at the wound site. Also, presence of growth factors viz. CD31, VEGF and TGF- $\beta$ 1,

essential for wound healing was noted in Velvert-applied group. Velvert facilitated healing by increasing IL-1 $\beta$  cytokine at initial and IL-2 levels at later time-points. In conclusion, Velvert shows potential as an antiinflammatory, anti-microbial, plant-based, scar free skin wound management regimen for future clinical applications in tissue regeneration.

## **B. Intra-mural Research Projects**

### **Project-B1 Study on Immunomodulatory Potential of Indigenous Cows Urine**

To study on Immunomodulatory potential of indigenous cows urine, cow urine distillate was administered to the different group of mice. The HMI and CMI response was accessed using standard protocol. For HMI response, titration of anti-sheep RBC antibody following S-RBC inoculation in was carried out in CUD treated and control animals. CMI response of CUD treated and control animals were compared using Phytohamglutinin inoculation in PAW and Plethysmometer measurement for paw oedema. For further gene expression studies, spleen and paw tissue are processed for RNA extraction and gene expression studies.



## PROJECTS OF POST GRADUATE STUDENTS COMPLETED DURING 2019-20

### 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
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#### A. Ph.D: Veterinary Science

1.	A study on purification and characterization of urinary antimicrobial peptides in different seasons from indigenous and crossbred cows	Dr. Ambika Sharma	Prof. Rajesh Nigam	Veterinary Biochemistry
2.	Modulation of Growth & Immunity by dietary supplementation of Sea buckthorn leaf meal in coloured breeder and their post hatch chicks in different seasons	Dr. D.N. Singh	Prof. P.K. Shukla	Livestock Production and Management
3.	Development of starch based edible film incorporated with essential oil for enhancing shelf life of chicken nuggets	Dr. Sanjay Kr. Bharti	Prof. Vikas Pathak	Livestock Products Technology
4.	Development and quality assessment of functional chicken patties	Dr. Anita M Chappalwar	Prof. Vikas Pathak	Livestock Products Technology
5.	Effect of maternal supplementation of organic trace minerals (OTM) on immune status of periparturient goats and neonatal goat kids	Dr. Arvind Kumar Tripathi	Dr. Ashok Kumar	Veterinary Medicine
6.	Studies on Immuno-Ophthalmopathy of Bovine Tropical Theileriosis in Calves with Special Reference to Immunomodulatory effect of Injectable Trace Mineral Complex Supplementation	Dr. Pradeep K. Ram	Dr. S K Singh	Veterinary Medicine
7.	Genotyping and characterization Studies on sarcocysts of buffalo origin	Dr. Vikrant Sudan	Prof. Daya Shankar	Veterinary Parasitology
8.	Prevalence and risk factor analysis associated with bovine brucellosis and its public health significance especially in peri-urban areas of Brij Region of Uttar Pradesh	Dr. Raghvendra P. Mishra	Dr. Udit Jain	Veterinary Public Health

#### B. Ph.D: Biotechnology

1.	Isolation, Characterization and Standardization of culture of goat spermatogonial stem cell	Manisha Pathak	Dr. S.D. Kharche	Animal Biotechnology
2.	Molecular mapping of biofilm related genes and accessory gene regulator (agr) typing in <i>Staphylococcus aureus</i>	Lalita Shamra	Prof. Sharad Kr. Yadav	Animal Biotechnology
3.	Development of Multiplex PCR & Hydrolysis probe based molecular assays for diagnosis of viral enteritis in neonatal goat kids	Sapna Prajapati	Dr. Ashok Kumar	Animal Biotechnology
4.	Functional and molecular studies and associated signaling pathways of mercury-induced deleterious effects on spermatozoa of bucks	Bhawna Kushawaha	Prof. Satish Kr. Garg	Animal Biotechnology
5.	Development of omp31 protein-based ELISA for diagnosis of ovine and caprine brucellosis	Ajay Singh	Prof. Rajesh Nigam	Animal Biotechnology
6.	Development of sodium polyacrylate nanoparticles based combined mastitis vaccine and assessment of its efficacy in mice model	Shalini Yadav	Prof. Sharad Kr. Yadav	Animal Biotechnology

### C. M.V.Sc.: Veterinary Science

1.	Effect of inorganic and nano zinc supplementation on performance and immune response in growing heifers	Dr. Sharish Kumar	Dr. Vinod Kumar	Animal Nutrition
2.	Effect of different organic acids and their combination on silage quality, intake and growth performance of indigenous heifers	Dr. Vivekanand	Dr. Muneendra Kumar	Animal Nutrition
3.	Effect of green fodder replacement with corn silage on residual metabolizable feed consumption (RMFC) in growing cattle	Dr. Ashwani K Verma	Dr. Muneendra Kumar	Animal Nutrition
4.	Effect of replacing protein source in concentrate mixture with dried Moringa oleifera meal on performance of Barbari buck	Dr. Anuj Dubey	Dr. Shalini Vaswani	Animal Nutrition
5.	Seroepidemiology and Comparison of a PCR Assay in whole blood. Milk and serum specimens for Brucellosis diagnosis in bovines with reproductive disorder	Dr. Krishna Govind Bohre	Dr. Barkha Shamra	Veterinary Epidemiology & Preventive Medicine
6.	Effect of floor type on performance of Sahiwal heifers	Dr. Akansha Gurgung	Dr. Rajneesh Sirohi	Livestock Production and Management
7.	Development of shelf stable chicken pickle incorporated with humectants and acidulants as hurdles	Dr. Shubha Singh	Dr. Meena Goswami Awasthi	Livestock Products Technology
8.	Studies on coagulation profile clinical relevance of canine C-reactive protein and oculoopathies related to Ehrlichiosis in dogs	Dr. Jaydeep Singh	Dr. Mukesh Kr. Srivastava	Veterinary Medicine
9.	Studies on Ameliorative Potential of Polyherbal Formulation on Expression of Skin Barrier Proteins and Cytokines in Dogs with Atopic Dermatitis	Dr. Sarita Kanwal	Dr. S K Singh	Veterinary Medicine
10.	Evaluation of Ameliorative Potential of a Polyherbal formulation on Toll-like Receptors and Cytokines expression in Peripheral Blood Mononuclear Cells and Lesional Skin of dogs with Generalised Demodicosis	Dr. Sandeep P. Soman	Dr. S K Singh	Veterinary Medicine
11.	Studies on purinergic signalling in vascular hyporeactivity in septic mice	Dr. Jagadeesh T	Prof. Satish K Garg	Veterinary Pharmacology
12.	Studies on testicular activity of type 2 diabetic rats following concurrent pre-exposure to arsenic and chromium	Dr. Abhishek Pathak	Dr. Atul Prakash	Veterinary Pharmacology
13.	Effect of organic, inorganic and nano selenium particles on the performance of turkey on poults	Dr. Abhishek Verma	Dr. Amitav Bhattacharyya	Poultry Science
14.	Influence of graded levels of Moringa leaf meal on the performance of colored chicken	Dr. Mahendra Kumar Patel	Dr. Amitav Bhattacharyya	Poultry Science
15.	Effect of Various levels of mint leaf on the performance of coloured chicken	Dr. Amit Kumar	Prof. P.K. Shukla	Poultry Science
16.	Effect of dietary supplementation of glutamine on the performance of turkey poults	Dr. Dheeraj Kumar Singh	Prof. P.K. Shukla	Poultry Science
17.	Effect of organic, inorganic and nano chromium particles on the performance of turkey poults	Dr. Deshmukh Abhishek Avinashrao	Dr. Amitav Bhattacharyya	Poultry Science

18.	Effect of Quercetin on sperm characters, capacitation like changes and seminal antioxidant status in cryopreserved Barbari buck semen	Dr. Richa Shamra	Dr. Mukul Anand	Veterinary Physiology
19.	Studies on seroprevalence of brucellosis and molecular detection of organisms causing reproductive disorders in ruminants	Dr. Gaurab Basak	Dr. Udit Jain	Veterinary Public Health
20.	Echocardiography and Cardiac biometry in Muzaffarnagari sheep	Dr. Anil Singh	Prof. R.P. Pandey	Veterinary Surgery & Radiology
21.	Studies on ultrasonography of the pancreas in dogs	Dr. Pradeep Kumar	Dr. Gulshan Kumar	Veterinary Surgery & Radiology
22.	Echocardiography of anaesthetised dogs undergoing surgical procedure	Dr. Amolak Shamra	Dr. Gulshan Kumar	Veterinary Surgery & Radiology
23.	Studies on Thoracic Radiography, Electrocardiography and Echocardiography in canine	Dr. Mamta Mishra	Dr. Sanjay Purohit	Veterinary Surgery & Radiology
24.	Studies on effect of quercetin on freezability of Haryana bull spermatozoa	Dr. Amit Kumar Yadav	Prof. Atul Saxena	Veterinary Gynecology & Obstetrics
25.	Studies on effect of Taurine on cryopreservation of Haryana bull spermatozoa	Dr. Alok Kumar Rathore	Prof. Atul Saxena	Veterinary Gynecology & Obstetrics
26.	Studies on effect of egg yolk powder on freezability of Haryana bull spermatozoa	Dr. Arun Kumar	Dr. Anuj Kumar	Veterinary Gynecology & Obstetrics
27.	Studies on effect of IGF – 1 on cryopreservation of Haryana bull spermatozoa	Dr. Gyanveer	Dr. Anuj Kumar	Veterinary Gynecology & Obstetrics

#### D. MSc: Biotechnology

1.	Isolation, identification and virulence typing of <i>Escherichia coli</i> from clinical cases (animals and humans) and their surroundings	Mini Kanchan	Dr. Udit Jain	Animal Biotechnology
2.	Isolation and characterization of Extended-Spectrum-β-Lactamase producing organism from bovine female reproductive tract with special reference to <i>Escherichia coli</i>	Samiksha Agrawal	Dr. Ajay Pratap Singh	Animal Biotechnology

## THESES ABSTRACTS

### A. Ph.D

#### College of Veterinary Science and Animal Husbandry

##### **1. A study on purification and characterization of urinary antimicrobial peptides in different seasons from indigenous and crossbred cows**

Prevalence and risk factor analysis associated with bovine brucellosis and its public health significance especially in peri-urban areas of Brij Region of Uttar Pradesh. The present study was undertaken to extract and characterize urinary antimicrobial peptides from healthy indigenous and crossbred cows in three different seasons. In this study, fresh urine samples were collected from 10 healthy, non-pregnant cows of both the breeds in three different season's winter, summer and rainy and physicochemical analysis of urine samples was carried out for assessing any abnormality in the urine samples. The urine samples were pooled together, vacuum filtered using 0.2  $\mu$  membrane filter and stored at 4°C till further analysis. The samples were dia-filtered and concentrated using 10 kDa Amicon-4 ultra-centrifugal filters. After dia-filtration, proteins were extracted by ion-exchange chromatography. Cationic peptides were extracted from dia-filtered urine using weak cationic exchanger. Both the anionic and cationic fractions were quantified in terms of protein recovery using Bradford method and subjected to two dimensional gel electrophoresis (2-D GE), gel image analysis revealed 40 and 15 protein spots in anionic and cationic fractions, respectively. Urinary cationic fractions of both the breeds in different seasons were analyzed by acid urea polyacrylamide gel electrophoresis (AU-PAGE) using HBD-1 as standard. Fractions which migrated similarly to HBD-1 standard were pooled together and further purified by RP-HPLC. A total of sixty fractions after HPLC were collected. RP-HPLC purified fractions were again analyzed by AU-PAGE with a standard 10kDa HBD-1. AU-PAGE gel image analysis using ImageLab5.1 revealed a single band for each sample. A total of 14 bands were excised and subjected MALDI-TOF coupled with PMF. Peptides or proteins were identified

using SWISSPROT protein database. Of 14 excised and digested bands, 12 were successfully identified as antimicrobial peptides and proteins. Gene Ontology (GO) by PANTHER 11.0 bioinformatics software platform was used for functional characterization of identified peptides which showed that all the identified peptides belonged to the defense/immunity protein class. Cytoscape along with ClueGO used to create protein-protein interaction network identified pathways for all peptides linked to the antimicrobial/antibacterial humoral response and innate mucosal response in mucosa mediated by AMPs. Four bands from AU-PAGE gels were analyzed by Q-TOF MS/MS for amino acid sequencing. These four bands match with three different antimicrobial peptides, namely neutrophil defensin-4, beta defensin-127 and cathelicidin-4 as 97, 99 and 144 amino acids chain. The RP-HPLC fractions were also assessed for their antimicrobial and cytotoxic potential. The antimicrobial potential of urinary peptides was determined using RDA and microtitre broth dilution assay to determine minimal inhibitory concentration (MIC). The cytotoxic potential was tested using MTT assay with human embryonic kidney cell line (HEK cells). Antibacterial activities of urinary peptides were tested against *Staphylococcus aureus*, *Bacillus cereus*, *Streptococcus agalactiae*, *E. coli*, and *Pseudomonas aeruginosa*. Urinary peptides exhibited significant activity against these microbes. It exhibited high activity index (AI) against both groups of pathogens viz., Gram negative bacteria (AI-3.3), and Gram positive bacteria (AI-2.5). Lowest MIC was recorded against the fungi *Aspergillus niger* at 28  $\mu$ g/ml. The results of the study clearly concluded cow urine as an effective antimicrobial and cytotoxic agent and a promising source of highly potent antimicrobial peptides for therapeutic applications.

##### **2. Modulation of Growth & Immunity by dietary supplementation of Sea buckthorn leaf meal in coloured breeder and their post hatch chicks in different seasons**



The present study was conducted at the poultry farm of U.P. Pt. Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwa vidyalaya Evam Go-Anusandhan Sansthan, Mathura. The basic aim of this research was to assess the modulation of growth and immunity of coloured chabro breeder birds and their post hatch chicks by dietary supplementation of sea buckthorn leaf meal in summer and winter seasons. Total four experiments were conducted to achieve this goal. The first and fourth experiments were conducted to assess the production performance and immune status of chabro breeder birds by dietary supplementation of sea buckthorn leaf meal during summer and winter seasons, respectively. Ninety coloured breeder (Chabro) hens and eighteen viable cocks in 1:5 sex ratio were randomly distributed into three treatment groups: Control (Basal), standard breeder diet (BIS, 2007); basal+0.5% and basal+1.0%SBTLM. Throughout the experimental period the birds were offered fixed weighed quantity (110g/day) feed (adequate in all nutrients) as per BIS (2007) and water *ad lib*. The dry matter, crude protein, ether extract, crude fiber, total ash, calcium and phosphorus content of dried sea buckthorn leaf meal (SBTLM) were recorded as 90.46%, 12.33%, 7.13%, 16.86, 8.19%, 1.49% and 1.14%, respectively in summer season and almost similar composition were observed during winter season. Basal diet+1.0%SBTLM supplemented group had significantly higher ( $P<0.05$ ) Hen House Egg Production (HHEP) as compared to control group during phases of 4-8 weeks, 8-12 weeks and 0-12 weeks (Overall) of experimentation in summer season. The weekly FCR on egg weight basis and egg dozen basis were significantly better ( $P<0.05$ ) in basal diet+1.0%SBTLM supplemented group during 4-8 weeks, 8-12 weeks and 0-12 weeks (overall) as compared to control group during summer season while Phase wise and overall HHEP, FCR (egg weight basis) and FCR (egg dozen basis) were significantly better ( $P<0.05$ ) in both SBTLM supplemented groups during winter season. Response to 1% SRBC (log2 titre) and cell mediated immune response to PHA-P (foot web index) were apparently better in both SBTLM supplemented groups as compared to control group during both summer and winter seasons.

The shape index and shell thickness were significantly higher ( $P<0.05$ ), whereas the Haugh unit were comparatively better in both SBTLM supplemented groups as compared to control during both summer and winter season. Percent fertility and percent hatchability were comparatively better in both SBTLM supplemented group as compared to the control group in both the seasons. Cost of feed consumed per kg egg production (Rs.) was significantly lower ( $P<0.05$ ) in basal diet+1.0%SBTLM supplemented group as compared to control group during phases of 4-8 weeks, 8-12 weeks and overall (0-12 weeks) experimental feeding. The second and fourth experiment was performed for assessment of growth performance and immune status of post hatch coloured chicks by dietary supplementation of sea buckthorn leaf meal during summer and winter seasons. Two hundred seventy chicks were obtained from fertile eggs of Experiment No.1 and 2, respectively. Ninety chicks from each breeder groups were further subdivided into three groups: Control (Basal), Broiler starter till 4 weeks, broiler finisher till 8 weeks of age, BIS 2007; basal+0.5% and basal+1.0% supplementation of SBTLM supplementation. Dietary supplementation of SBTLM in breeder diet as well as post hatch diet on resulted in significantly higher ( $P<0.05$ ) body weight and body weight gain in post hatch chicks in 0.5%SBTLM supplemented group as compared to control group both during summer and winter season. Similarly, supplementation of 0.5% SBTLM in breeder and post hatch diet resulted in a synergistic effect pertaining to body weight of coloured breeder in both the season. The overall FCR (0-8 weeks) was significantly better ( $P<0.05$ ) in 0.5%SBTLM supplemented groups in breeder diet, post hatch diets and breeder  $\times$  post hatch diet among the various dietary treatment groups. In post hatch dietary groups, the haemoglobin concentration, packed cell volume (PCV) and total leucocyte count were significantly higher ( $P<0.01$ ) in both SBTLM supplemented groups during both summer and winter season. The value of cholesterol, triglycerides were significantly lower ( $P<0.05$ ) in both SBTLM supplemented groups as compared to control group where as the HDL was significantly higher ( $P<0.05$ ) in

BP+0.5%SBTLM supplemented groups in post hatch diet during both summer and winter seasons. No significant differences were recorded in slaughter traits, cut-up parts and development of digestive organs except the percent dressing, eviscerated weight, heart weight and wing weight were significantly higher ( $P<0.05$ ) in BP+0.5%SBTLM supplemented group as compared to control group during summer season, while processing shrinkage, eviscerated weight, heart weight, wing weight were significantly higher in BP+0.5% SBTLM group during winter season. Histological study showed that supplementation of SBTLM in various post hatch dietary groups, (BB+0.5%SBTLM) + (BP+0.5%SBTLM) had some immune-stimulatory potential resulting in proliferation of lymphoid tissues in various lymphoid organs during summer and winter season. The fold changes in expression of growth related genes (IGF1 and IGF2) were better in (BB+0.5% SBTLM)+(BP+0.5% SBTLM) group whereas as expression of immunity related genes (IL2) were better in (BB+0.5% SBTLM)+(BP+1.0% SBTLM) as compared to BB+BP during both summer and winter seasons. The overall (0-8 week) feeding cost per kg body weight gain in breeder diet as well as in post hatch diet were significantly lower ( $P<0.05$ ) in 0.5%SBTLM supplemented group as compare to control group during experimentation in both summer and winter seasons.

### **3. Development of starch based edible film incorporated with essential oil for enhancing shelf life of chicken nuggets**

The present study was undertaken to develop biodegradable edible film from sweet potato, arrowroot and tapioca starch using casting technique for preserving chicken nuggets. Preliminary trails were carried out to standardize the ingredients and processing conditions for edible film production. On the basis of physico-chemical properties, 4% (sweet potato) & 3.5% (arrowroot and tapioca) starch and 1.5% carrageenan were found optimum. Film forming solution (FFS) was incorporated with glycerol at 5-15% level separately and formed films were characteristically analyzed. The mean pH, moisture content and tensile strength decreased significantly ( $P<0.05$ ) with increasing

concentration of glycerol. The films thickness measurement exhibited uniformity. The moisture absorption of the films increased highly significantly ( $P<0.01$ ). The L (lightness parameter) and transparency value significantly ( $P>0.05$ ) decreased with increasing glycerol concentration. On the basis of physico-chemical, mechanical, barrier and optical properties, 3.5% tapioca starch, 1.5% carrageenan and 10% glycerol were found optimum. Three essential oils (EO) viz. anise, caraway and nutmeg were selected and optimized at 0.5%, 1%, 2% and 3% on the basis of minimum inhibitory concentration by tube dilution method. Dynamic oscillatory measurements of FFS showed 'weak gel' like behavior. The film's moisture content, moisture absorption, solubility, transparency and haze value shown highly significant ( $P<0.01$ ) difference. The film thickness, pH, swelling measurement showed non-significant difference ( $P>0.05$ ), however tensile strength, L values decreased significantly ( $P<0.05$ ) with increased EO concentration. Based on the results of antimicrobial activity and sensory scores, three films containing EOs viz. anise 0.5, caraway and nutmeg 1% were selected for detailed storage stability studies of chicken nuggets for 15 days at refrigeration temperature ( $4\pm1^{\circ}\text{C}$ ). The pH, peroxide, FFA and TBA value of treatments were significantly ( $P<0.05$ ) lower than control. The treated products revealed significantly ( $P<0.05$ ) higher DPPH activity. The total plate count, psychrophilic and yeast and mold count were significantly ( $P<0.01$ ) lower in treatments, whereas, coliforms were not detected throughout the storage period. All sensory attributes except saltiness of samples were significantly influenced by the storage time ( $P<0.05$ ). The treated samples were found well acceptable during whole storage period of 15 days however the control group showed to be the most perishable group during the storage. Reduction in overall acceptability with storage time was much pronounced in control than C1, T1, T2 and T3. Retail cost of chicken nuggets was estimated to be R 242 per kg of product with packaging by sweet potato starch R 274, arrowroot R 276 and tapioca starch film R 280.

### **4. Development and quality assessment of functional chicken patties**

The present study was envisaged to develop and assess the quality characteristics of functional chicken patties. Optimization of cooking and formulation was done. Low fat chicken patties were prepared by replacing 50% fat in the formulation by incorporating three fat replacers viz. lemon albedo, mango peel and banana peel powder at 1.0, 2.0 and 3.0% level. The values of pH, emulsion stability, fat and cholesterol content decreased, however moisture and fat retention values increased significantly ( $P<0.05$ ) in treatments. Mineral content, textural and color parameters showed significant ( $P<0.05$ ) effect on addition of different fat replacers. Chicken meat patties incorporated with lemon albedo at 1%, mango peel at 2% and banana peel powder at 2% level were found optimum and these variants were further compared to select the best variant. Patties containing with 1% lemon albedo were adjudged best and used as control in further studies. Further, low fat chicken patties were fortified with green banana pulp, apple pomace and pine apple pomace at 2, 4 and 6% level. Mineral content, textural and color parameters showed significant ( $P<0.05$ ) effect on addition of different fruit pulp. Chicken meat patties incorporated with green banana pulp at 2%, apple pomace at 4% and pine apple pomace at 4% level were found optimum on the basis of sensory evaluation, however, low fat fiber fortified chicken patties containing 2% green banana pulp were finally selected after comparing optimal variants. Functional chicken meat patties were further incorporated with natural antioxidants viz pomegranate rind powder, orange rind powder and grapefruit rind powder each at 0.50%, 0.75% and 1% level in the following experiment. Pomegranate rind powder had highest phenolic activity and DPPH values followed by grapefruit rind powder and orange rind powder respectively. Chicken meat patties incorporated with pomegranate rind powder at 0.75%, orange rind powder at 0.75% and grapefruit rind powder at 0.50% level were found optimum on the basis of sensory evaluation, however, functional chicken patties incorporated with pomegranate rind powder at 0.75% were selected after comparing the three variants. The selected variant was further incorporated with extracts of natural antimicrobials viz, aloe vera

gel, lemongrass and lime peel at 0.25%, 0.50% and 0.75% after scrutinizing antimicrobial activity against various pathogenic organisms. Aloe vera gel extract exhibited significantly ( $P<0.05$ ) higher antimicrobial activity followed by lemongrass and lime peel extract respectively. Functional chicken patties incorporated with 0.75% aloe vera, 0.75% lemon grass and 0.5% lime peel extract were selected on the basis of antimicrobial and sensory properties. The selected variants were kept under refrigeration along with control to assess storage stability. The values of pH, peroxide, TBA, FFA and microbial count of functional chicken patties were significantly ( $P<0.05$ ) lower than control during storage. Control patties were not evaluated after 12<sup>th</sup> day due to incipient spoilage, whereas treatments were acceptable upto 28<sup>th</sup> days from microbiological and sensory point of view. Among the treatments, functional chicken patties treated with 0.75% aloe vera gel extract had significantly ( $P<0.05$ ) higher overall acceptability scores till the end of storage. It can be concluded that well accepted functional chicken meat patties may be prepared with incorporation of 1% lemon albedo powder as fat replacer replacing 50% added fat in formulation; 2% green banana pulp as natural fiber; 0.75% pomegranate rind powder as natural antioxidant and 0.75% aloe vera gel extract as natural microbial and this product may be acceptable under refrigeration storage upto 28<sup>th</sup> day on the basis of micro- biological studies and sensory evaluation.

### **5. Effect of maternal supplementation of organic trace minerals (OTM) on immune status of periparturient goats and neonatal goat kids**

The present study was designed to evaluate the effect of maternal supplementation of organic trace mineral on immune parameters of periparturient goats and neonatal goat kids. In the first step of the study comparative variations of trace minerals status in blood at different stages of periparturient periods and colostrum and milk, colostrum immunoglobulin's and disease incidence/morbidity and mortality were also evaluated in various recognised breeds of goats maintained at organized farms of CIRG in comparison to the non-descript goats maintained at farmers field flock . The results



reveal that blood, colostrum and milk levels of zinc (Zn), copper (Cu), iron (Fe) manganese (Mn) and cobalt (Co) were found to be significantly lower at different stages of periparturient period in the Non-descript breed of goats. The colostrum immunoglobulin's (IgG, IgM and IgA) were also found to be lowest in the non-descript breed of goats than recognized breeds of goats. The morbidity and mortality were found to be highest in goat kids born of non-descript breed of goats during pre weaning period in comparison to the recognized breeds. To evaluate the effect of maternal supplementation of OTM the organic salts of Cu and Zn were supplemented at minimum and mean level dose as recommended by NRC. The effect of maternal supplementation of OTM on periparturient goats, trace minerals (Cu and Zn) levels, immune parameters such as humeral and cell mediated immune status and biochemical parameters viz. total proteins, albumins, globulin, A/G ratio and total antioxidant capacity (TAC) were also estimated in Jamunapari goats of various treated groups. The values of Cu and Zn in the goats of treatment group II found to be significantly high in comparison to control and treatment group-I at the time of parturition and one month post-partum stages of periparturient period. Humeral immunity in terms of the levels of IgG, IgM and IgA and cell mediated immunity in terms of the T-lymphocyte stimulation/blastogenesis were found to be significantly higher in the treatment group II during periparturient period than control and treatment group I. The level of serum total protein and serum globulin, serum insulin like growth factor (ILGF) and total antioxidant capacity (TAC) were found to be significantly high in treatment group II goats during periparturient period in comparison to the control group and treatment group I. It was also observed that the serum cortisol level of treatment group II goats was found to be significantly low at periparturient period under study in comparison to the control group and treatment group I goats. In another study the effect of selected organic trace minerals (Cu and Zn) in pregnant does on quality of colostrum and immune status, disease susceptibility, birth weight and overall growth and vitality of full

term kids were evaluated and results reveal that trace minerals viz. Cu and Zn levels, colostrum immunoglobulin's and colostrum antimicrobial proteins were found to be significantly high in treatment group II in comparison to control and treatment group I. the passive transfer of immunity was very efficient in goat kids born from goats of treatment group II as levels of various serum immunoglobulins, serum total protein, globulin, insulin like growth factor and total antioxidant capacity and blood levels of Cu and Zn were found to be significantly higher in the goat kids born from treatment group II in comparison with control and treatment group I, however the level of cortisol was found to be significantly low. Lowest degree of sepsis was observed in the goat kids born from goats of treatment group II than control and treatment group I kids, the cytokines viz. TNF- $\alpha$ , IFN- $\gamma$  level (pro-inflammatory cytokines) and IL-10 (anti-inflammatory cytokine) were found to be significantly low in treatment group II kids both pre LPs and post LPS (02 hrs) in the kids of treatment group II goats in comparison to the control and treatment group I. Average daily weight gain (ADWG) was found to be significantly higher in the treatment group II kids in comparison to control and treatment group I. Lowest disease incidence/morbidity and mortality was recorded in kids born of treatment group II goats in first month, second month and third month in comparison to the control group and treatment group I kids.

## **6. Studies on Immuno-Ophthalmopathy of Bovine Tropical Theileriosis in Calves with Special Reference to Immunomodulatory effect of Injectable Trace Mineral Complex Supplementation**

The calves detected positive for Theileria were categorised into two groups, eg. Calves with theileriosis and absence of exophthalmia (n=30) and calves with theileriosis and the presence of exophthalmia (n=13). Sixteen healthy, free from any haemoprotozoal infection, have served as healthy controls. For therapeutic regimens plan, the calves with theileriosis were allocated into Group 2 (BUPA) (n=9), Group 3 (BUPA+OXY) (n=10), Group 4 (BUPA+ITM) (n=10), and Group 5 (BUPA+OXY+ITM) (n=14). The clinical manifestation of exophthalmia was observed in approximately every third calf with theileriosis.



In the present study the results of haemograms, and serum biochemical panels were found to be significantly altered in calves with theileriosis as compared to healthy calves. Theileria infected calves with- and without exophthalmia had marked elevation in circulatory content of both proinflammatory cytokine, TNF- $\alpha$ , and immunosuppressive cytokine, IL-10 than that of healthy controls. Interestingly, the Theileria infected calves having exophthalmia had also revealed significantly elevated levels of TNF- $\alpha$  and IL-10 as compared to the Theileria infected calves having no exophthalmia. Moreover, the immunostimulatory cytokine, IFN- $\gamma$ , was markedly lowered in Theileria infected calves with- and without exophthalmia as compared to healthy controls. The combination BUPA+OXY was found to have a better therapeutic potential than that of BUPA alone. However, the calves treated with BUPA+ITM revealed the highest per cent improvements in the haemograms followed by the calves treated with BUPA+OXY+ITM. On day 14 post-therapy, the calves treated with BUPA+ITM and BUPA+ OXY+ITM had revealed a marked reduction in IL-10 levels. Moreover, the calves treated with BUPA+ ITM and BUPA+ OXY+ITM had revealed a marked elevation in circulating level of immuno-stimulatory cytokine, IFN- $\gamma$ , levels. The calves treated with BUPA+OXY and BUPA+OXY+ITM had revealed a marked reduction in TNF- $\alpha$ , while the other two groups could not achieve significant reduction. In conclusion, tropical theileriosis results in major dents over the haemograms of newborn calves, but, no alterations in the leukograms, except to the eosinophilia. Exophthalmia is a paramount clinical manifestation of theileriosis and could be the result of an overproduction of TNF- $\alpha$ , rather, the increased IOP. Reduced systemic production of IFN- $\gamma$  and overproduction of IL-10 could be the strategies of the parasite to escape the host-immunity. Injectable trace mineral (ITM) has the potential to augment the circulatory contents of IFN- $\gamma$  (immuno-stimulatory) and curb the circulatory contents IL-10 (immuno-suppressive) in calves with theileriosis. BUPA+OXY+ITM can be recommended for the holistic therapeutic management of tropical theileriosis in newborn calves.

## 7. Genotyping and characterization studies on Sarcocysts of buffalo origin

Sarcocystosis is a common parasitic entity affecting wide range of ruminants with cosmopolitan distribution. Tissue samples from oesophagus, tongue and heart were collected from buffaloes slaughtered at the local slaughter house of Mathura, organized slaughter houses at Unnao and Aligarh alongside those brought for post mortem at Department of Pathology, DUVASU, Mathura. Tissue samples were screened for the presence of sarcocysts. The average size of the macroscopic sarcocysts varied from 5.0-29.5 x 3.1-7.3 mm. The cysts were thin walled (2.0-2.5  $\mu$ m) with average size of bradyzoite ranging from 15.0-16.5 x 3.5-4.3  $\mu$ m. The average size of microscopic cysts in the heart varied from 0.2-1.0 x 0.15-0.5 mm. The micro sarcocysts found in heart were also thin walled with average size of bradyzoite ranging from 9.3-10.8 x 3.0-4.1  $\mu$ m. Based on morphological features, the macroscopic sarcocysts were identified as *S. fusiformis* while the microscopic sarcocysts were identified as *S. levinei*. On histopathological examination, both the macroscopic as well as microscopic cysts were found to be having characteristic thin wall structure. Histopathological findings revealed muscle fiber degeneration with mild degenerative changes like loss of striations of muscle fibers around all those macrosarcocysts. None of inflammatory cells were observed around the intact cysts. No hyalinization of muscle fibrils was seen. Three DNA isolation protocols were compared to find out the most suitable protocol for DNA isolation from sarcocysts. All the three protocols showed good results with regards to DNA extraction yield as well as DNA purity. However, 18S based PCR was able to detect *Sarcocystis* spp. DNA from maximum number of samples isolated with kit with modification. A total of 88 sequences were generated in the present study. Wide nucleotide variations were noticed within the studied isolates of various *Sarcocystis* spp. as well as with other isolates across the globe for all the studied genes. Studied sequences of *S. fusiformis* showed 99.1-100.0%, 99.2-100.0%, 99.2-100.0% & 99.1-100.0% nucleotide homology within themselves and 44.6-95.5%, 77.9-99.9%, 97.3-99.9% & 98.2-99.8% nucleotide homology with isolates across the globe for 18S, cox 1,

28S and ITS 1 genes, respectively. Alongside, the studied sequences of *S. buffalonis* showed 99.3-99.9 %, 99.8-100.0 %, 99.9-100.0 % & 100.0 % nucleotide homology within themselves for 18S, cox 1, 28S and ITS 1 genes, respectively. During present study an attempt was made to find seroprevalence of brucellosis in bovine milk, serum, aborted fetal tissue and human serum sample from different peri urban places of four districts of Brij region which include Mathura, Agra, Hathras and Kasganj. A total of 1860 samples comprising of 700 bovine milk samples, 567 bovine serum sample, 84 aborted fetal tissue sample and 509 human serum sample were processed. Out of 1860 samples, in 700 milk sample species wise prevalence of brucellosis in 450 cattle milk sample was found to be 05.78 % (26/450) and 08.45% (38/450) positive by MRT and I-ELISA respectively. On the other hand in buffaloes milk the prevalence of brucellosis in 250 milk sample was found to be 07.20% (18/250) and 09.02% (23/250) positive by MRT and I-ELISA respectively. In 567 animal serum sample the prevalence of brucellosis in 391 cattle was found to be 07.93% (31/391), 08.69% (34/391) and 10.74% (42/391) shows positive by RBPT, STAT and I-ELISA respectively and in 176 buffaloes tested serum sample the seroprevalence was found to be 09.66% (17/176), 10.79% (19/176) and 12.5% (22/176) positive by RBPT, STAT and I-ELISA respectively. Out of 509 tested human serum sample (male 394 and female 115), the seroprevalence of human brucellosis was found to be 02.75% (14/509), 04.31% (21/509) and 03.73% (19/509) shows positive by RBPT, STAT and I-ELISA respectively. A total of 228 samples, 144 ELISA positive samples (61bovine milk, 64 bovine serum and 19 human serum samples) and 84 tissue samples were screened by PCR to detect the presence of *Brucella* genus specific gene (bcsp31, omp2 and 16S rRNA) and *Brucella abortus* species specific IS711genes. A total 49 samples were found positive for *Brucella* genus specific genes. Seroprevalence of brucellosis in serum, milk and aborted fetal tissue depicts a dangerous picture regarding human safety because milk is essential and complete food for human beings. So proper precautions to be taken while handling brucellosis infected animal and consume milk after proper boiling.

## **8. Prevalence and risk factor analysis associated with bovine brucellosis and its public health significance especially in peri-urban areas of Brij Region of Uttar Pradesh**

During present study an attempt was made to find seroprevalence of brucellosis in bovine milk, serum, aborted fetal tissue and human serum sample from different peri urban places of four districts of Brij region which include Mathura, Agra, Hathras and Kasganj. A total of 1860 samples comprising of 700 bovine milk samples, 567 bovine serum sample, 84 aborted fetal tissue sample and 509 human serum sample were processed. Out of 1860 samples, in 700 milk sample species wise prevalence of brucellosis in 450 cattle milk sample was found to be 05.78 % (26/450) and 08.45% (38/450) positive by MRT and I-ELISA respectively. On the other hand in buffaloes milk the prevalence of brucellosis in 250 milk sample was found to be 07.20% (18/250) and 09.02% (23/250) positive by MRT and I-ELISA respectively. In 567 animal serum sample the prevalence of brucellosis in 391 cattle was found to be 07.93% (31/391), 08.69% (34/391) and 10.74% (42/391) shows positive by RBPT, STAT and I-ELISA respectively and in 176 buffaloes tested serum sample the seroprevalence was found to be 09.66% (17/176), 10.79% (19/176) and 12.5% (22/176) positive by RBPT, STAT and I-ELISA respectively. Out of 509 tested human serum sample (male 394 and female 115), the seroprevalence of human brucellosis was found to be 02.75% (14/509), 04.31% (21/509) and 03.73% (19/509) shows positive by RBPT, STAT and I-ELISA respectively. A total of 228 samples, 144 ELISA positive samples (61bovine milk, 64 bovine serum and 19 human serum samples) and 84 tissue samples were screened by PCR to detect the presence of *Brucella* genus specific gene (bcsp31, omp2 and 16S rRNA) and *Brucella abortus* species specific IS711genes. A total 49 samples were found positive for *Brucella* genus specific genes. Seroprevalence of brucellosis in serum, milk and aborted fetal tissue depicts a dangerous picture regarding human safety because milk is essential and complete food for human beings. So proper precautions to be taken while handling brucellosis infected animal and consume milk after proper boiling.



## B. Ph.D

### College of Biotechnology

#### 1. Isolation, Characterization and Standardization of culture of goat spermatogonial stem cell

The current study was carried out to i) examine the morpho-biometric evaluations of testes and comparative analysis between pre and post pubertal spermatogonial stem cell (SSC) culture colonies ii) examine the effect of digestion method on isolation of SSC iii) study the effect of lectin coating on SSCs and feeder layer of sertoli cells iv) analyze the effect of supplementation of growth factor on proliferation of SSC colonies v) analysis the effect of fetal bovine serum (FBS) on SSC colonies in different concentration of FBS with respect to total number of colonies and number of passages in SSC culture vi) standardization of SSC culture in different types of culture media vii) analysis of SSC culture in breeding and nonbreeding season with respect to proliferation of SSC colonies due to seasonal effect. SSCs were isolated from pre and post pubertal slaughtered goat testes by double enzymatic treatment and through mechanical method. The isolated cells were enriched by filtration method (80  $\mu\text{m}$  and then 60  $\mu\text{m}$  net filters), differential adherence selection method and percoll density gradient centrifugation method. SSC cells were cultured on sertoli cell feeder layer culture conditions were optimized by observing the effect of age of buck, digestion methods, coating, growth factors, culture medium, FBS with respect to total number of colonies and number of passages in SSC culture. SSC colonies were further characterized by examining the expression of alkaline phosphate, immunofluorescence characterization by pluripotent markers NANOG and OCT4 and SSC specific marker PGP9.5 and PLZF. The results of the present study suggest that i) all the biometrical parameters except density were significantly higher ( $p < 0.05$ ) in the post pubertal testes as compared with pre pubertal testes but isolated cells and proliferation of SSC colonies was significantly higher in culture of pre pubertal SSC culture ii) enzymatic digestion method showed significantly higher number of cells from mechanical method iii) the rate of attachment

and proliferation is significantly higher in absence of coating material (lectin) iv) SSC cells, in presence of growth factor GDNF, FGF2, EGF are capable of undergoing proliferation during culture but the effect of combined growth factor was significantly ( $p < 0.05$ ) higher v) by the investigation of the effect of serum concentration significantly higher number of colonies with 20% FBS group in differential two (D2) as compared to other groups was observed vi) significantly higher number of SSC colonies were formed in Mesen Cult and DMEM-F12 media vi) in breeding season significantly higher number of colony were formed compared to the nonbreeding season. Cryopreserved colonies also showed proliferation after thawing.

#### 2. Molecular mapping of biofilm related genes and accessory gene regulator (agr) typing in *Staphylococcus aureus*

Internalization of *S. aureus* is strain-dependent and internalized bacteria have been reported to over express adherence and biofilm-forming genes in comparison to those that remain in the supernatant particularly by expressing various biofilm producing genes. Strains yielding highest invasion percentages are mostly carry *icaA*, *icaD*, *bap*, *can*, *fnbA* and *clfA* genes irrespectively of the presence of other resistance genes. Further, Biofilm-embedded bacteria that gain resistance to immune defense and antibiotics by antibiotic degrading enzymes, efflux pumps, and certain gene products of which expression are changed by the quorum sensing cause chronic and recurrent infections such as indwelling device-associated infections. Moreover, most of the *S. aureus* strains of animal origin, reported from all over the world are multidrug-resistant and carry multiple virulence genes, posing a potential public-health risk. Therefore, the present study was undertaken a) to determine ability of *S. aureus* to produce biofilm; b) to map the presence of biofilm related gene in biofilm forming *S. aureus* c) to determine accessory gene regulator (agr) typing in biofilm forming *S. aureus*. Out of 175 (100 human and 75 animals) samples, 86 (46 human and 40 animal) isolates were confirmed based on cultural, morphological, biochemical tests and by confirming the presence of species

specific nuc genes. The overall prevalence of *S. aureus* was 49.14% (61.3% and 40.0% in human and animal). The confirmation of methicillin resistance *mecA* gene revealed its presence in 32 isolates (12 human and 20 animals) with 18.28% (16.0% and 20% in human and animal) overall prevalence of MRSA was in all the isolates. Congo red agar (CRA) method revealed 47 (23 human and 24 animal) biofilm producer isolate in 86 isolates with 54.65% (48.9% and 51.06% in human and animal) overall prevalence of biofilm producing *S. aureus*. The amplification of *icaA*, *icaD*, *bap*, *can*, *fnbA* and *clfA* biofilm forming genes showed highest presence of *IcaD* gene (41) followed by *clfA* (26), *fnbA* (24), *can* (18) and *bap* (8). None of isolate revealed the presence of *icaA* gene. The overall prevalence of *icaD*, *fnbA*, *clfA*, *bap* and *can* were 47.67%, 27.91%, 30.23%, 9.30% and 20.93% respectively. The *agr* typing has been recommended as an important tool for deciphering of important epidemiological information about *S. aureus* in clinical isolates. The global presence of these genes makes them an effective tool for the epidemiological studies, and also for investigating the genetic relatedness and heterogeneity of *S. aureus*. A majority of isolates belonged to *agr* Group II (51.16%), followed by *agr* Group I (32.55%) and *agr* Group III (16.27%). The *agr* typing of 86 isolates revealed 28 isolates of *agr* type I (15 human and 13 animal), 44 isolates of *agr* type II (24 human and 20 animal) and 14 isolates of *agr* type III (7 human and 7 animal). None of the isolates was positive for *agr* type IV. 13 human isolates and 5 animal isolates revealed the amplification of more than one type of *agr* genes. However, 8 human and 12 animal isolates revealed no amplification of *agr* genes. The findings of study suggest that MRSA are adopting the environment and using multiple approaches to develop resistance. A single mechanism is not responsible for the methicillin resistance in *S. aureus*. *S. aureus* is very smartly using different mechanism to develop resistance. Thus, continuous monitoring is required to overcome the drug resistance in MRSA. The presence of multiple *agr* typed need further studies are required to establish these parentage and to link them with other MRSA.

### **3. Development of Multiplex PCR & Hydrolysis probe based molecular assays for diagnosis of viral enteritis in neonatal goat kids**

In the present investigation, a total of diarrhoeal (254) and non-diarrhoeal (50) faecal samples of goat kids (232), lambs (22) and necropsied tissue sample (17) were collected from different outbreaks and farms of five states of and screened for Group A rotavirus, group B rotavirus and Bovine corona virus by a RT-PCR, real time RT-PCR. The prevalence of rotavirus small ruminants was recorded as 14.57% for GARV, 7.48% for BCoV and 1.18% for GBRV by conventional RT-PCR. The results of conventional RT-PCR and real time RT-PCR showed some significant differences. Season, age and gender-wise analysis revealed highest occurrence of rotavirus in winter period (November to February). All the positive samples were from kids under one month of age, and maximum numbers of cases were detected during months of October to March. The prevalence of group A rotavirus in lambs was recorded as 22.7%. All the cases were detected in the month of January and February. None of the non-diarrhoeal samples from any species was found positive for rotavirus, indicating strong association of Group A rotavirus with diarrhoea in small ruminants. It was observed that for maximizing diagnostic potential of rotavirus infection, conventional RT-PCR is relevant. Sequencing and phylogenetic analysis revealed two major branches, where CIRG F2 strain was closely associated with bovine and human GARV strains, indicating the relevance of genetic re-assortment and its zoonotic potential. Two more strains viz., CIRG 1873 and CIRG1841 were placed in a clade genetically close to the porcine GARV isolates. This shows the dynamic nature of the circulating strains. qRT-PCR was standardized and developed for GARV targeting two genes viz., VP6 and NSP4, and for BCoV targeting NC gene. Out of 94 diarrheic neonate fecal samples tested 5 were positive for both GARV VP6-qRT-PCR, and out of 74 tested by NSP4 qRT-PCR, 4 were positive. These samples were detected with very high sensitivity and specificity for GARV. While NC-qRT-PCR for detection of BCoV revealed 3 positive out of 94



samples tested. To conclude, the current study could reveal some important features of the enteric viral affections in small ruminants with respect to various criteria like age, season, gender etc.. The GARV were the most common enteric pathogen followed by BCoV and lastly GBRV. The GARV emerged as most important pathogen, that was associated with clinical diarrhoeic cases as evidenced by the conventional RT-PCR assay and the VP6 & NSP4 gene based qRT-PCR. This indicates the fact that GARV needs attention in field conditions leading to diarrhea, slower growth rate and mortality in goat kids, which can only be addressed by vaccination and hygiene measures. Although the GBRV incidence was less than 2%, their importance with respect to clinical diarrhea and its combination with other bacterial pathogens like *Escherichia coli* or *Cryptosporidium* should be explored. The significance of enteric viruses in small ruminants was always not supported by ample data, which the current study could address in a way using the latest tools including qRT-PCR assays for their detection.

#### **4. Functional and molecular studies and associated signaling pathways of mercury-induced deleterious effects on spermatozoa of bucks**

The present study was undertaken to evaluate the effect of different concentrations of mercuric chloride on functional attributes, redox status (both oxidative and antioxidative), tyrosine phosphorylation, immunolocalization, intracellular  $\text{Ca}^{++}$  release, levels of cAMP, DNA damage, Bax and Bcl-2 expressions in spermatozoa and, involvement of  $\text{Ca}^{++}$  signaling, and MAPK pathways in mediating mercury-induced effects on buck spermatozoa. Six, healthy adult fertile Barbari bucks of almost similar age and body weight were selected for this study. Total 625 ejaculates were collected from these bucks using artificial vagina. Each ejaculate was diluted ( $50 \times 10^6/\text{ml}$ ) using PBS (pH 7.4) with 0.5% glucose. Diluted semen samples divided into five aliquots ( $12 \times 10^6/\text{ml}$ ) in-vitro treated with control (PBS pH 7.4) and different concentrations of mercuric chloride (0.031, 0.125, 0.25 and 1.25  $\mu\text{g}/\text{ml}$ ) and observed for different motility and functional attributes parameters up to 3h and results compared with

PBS control. Compared to control, percentage of progressively motile, HOST positive spermatozoa, and acrosomal integrity, and mitochondrial transmembrane potential were significantly ( $p < 0.05$ ) reduced following exposure to higher concentrations of mercury (0.25 and 1.25  $\mu\text{g}/\text{ml}$ ) at 15 min and 3 h. The results of our study also showed that mercuric chloride even at the lowest used concentration of 0.03  $\mu\text{g}/\text{ml}$  significantly ( $p < 0.05$ ) increased the lipid peroxidation (MDA), reactive oxygen species (ROS), intracellular  $\text{Ca}^{++}$  releases and cAMP levels in spermatozoa within 15 min of exposure. But there was no significant ( $p > 0.05$ ) change in DNA damage, or relative mRNA expression of Bax gene, but significant ( $p < 0.05$ ) increase in necrotic spermatozoa was observed and this effect was concentration- and time dependent. Compared to no effect on Bax gene relative mRNA expression of Bcl-2 gene was found to be significant increased at higher concentration (0.25 and 1.25  $\mu\text{g}/\text{ml}$ ) of Hg. After 3 h exposure of semen samples, high intensity bands of 58 kDa, 80 kDa, 100 kDa and 105 kDa in PBS control and less intensity bands of tyrosine phosphorylation of 80 kDa and 100 kDa proteins were observed in 0.031  $\mu\text{g}/\text{ml}$  mercuric chloride-treated group but as the concentration of mercuric chloride increased from 0.125 to 1.25  $\mu\text{g}/\text{ml}$ , no protein bands were observed. Compared to the PBS control ( $9.01 \pm 0.42\%$ ), only in lowest concentration (0.031  $\mu\text{g}/\text{ml}$ ) of mercury group immunoreactivity in the head of spermatozoa ( $4.11 \pm 0.02\%$ ) was while observed at other concentrations (0.125, 0.25, and 1.25  $\mu\text{g}/\text{ml}$ ), mercuric chloride failed to exhibit any immuno-reactivity of tyrosine phosphorylated protein. Following exposure of semen samples to different concentration of mercury alone, no significant effect on total motility and other kinematic patterns of spermatozoa was observed at lower concentrations (0.031, 0.125, and 0.25  $\mu\text{g}/\text{ml}$ ) in up to 3 h. But higher concentration (1.25  $\mu\text{g}/\text{ml}$ ) significantly ( $p < 0.05$ ) decreased the motility and other kinematic patterns of spermatozoa at 3 h compared to control. However, interestingly on concurrent treatment of semen samples even with the lowest used concentration of  $\text{HgCl}_2$  (0.031  $\mu\text{g}/\text{ml}$ ) and Bay-K, Nifedipine, NNC and MEK inhibitor significant ( $p < 0.05$ )

decrease in the total motility and other kinematic patterns of spermatozoa was observed and this effect was concentration and time-dependent. Thus, our findings suggest that mercury adversely affects the functional attributes of spermatozoa which in turn may be responsible for altering the functionality and fertilizing capacity of buck spermatozoa. On in-vitro exposure,  $\text{HgCl}_2$  even at  $0.031 \mu\text{g/ml}$  concentration is toxic enough to induce necrosis and apparently it does not induce early apoptosis in buck-spermatozoa. Therefore, mercuric chloride at the used concentrations has not induced any DNA damage in spermatozoa. Motility of spermatozoa is not dependent on extracellular  $\text{Ca}^{++}$ ; rather it is intracellular  $\text{Ca}^{++}$ -dependent. No direct effect of L-type and T-type channel blockers was observed and inhibitory effects of Hg in the presence of those blockers suggest that mercury seems to involve some other pathway(s) in mediating spermatozoa motility. MAPK/MEK pathway was found to be modulated in presence of Hg in reducing motility that indicating possible involvement of MEK pathway in presence of Hg. Mercury dose not seems to induce apoptosis in spermatozoa rather causes necrosis. Thus, sperm toxicity of mercury seems to be mediated through ROS-dependent intracellular  $\text{Ca}^{++}$  and/or cAMP mediated pathways that also modulating spermatozoa motility.

### **5. Development of omp31 protein-based ELISA for diagnosis of ovine and caprine brucellosis**

In India goat population contributes a lot to the agrarian economy, particularly in regions where crop and dairy farming are not economical, thus play an important role in the livelihood of landless, small and marginal farmers. Brucellosis caused by different species of *Brucella* is considered as a major public health problem due to its zoonotic nature, worldwide distribution and the economic losses. Among various *Brucella* species, *B. melitensis* is most pathogenic and highly zoonotic and included as category B biothreat. The diagnosis of brucellosis in goat is very important for control of this disease as there is no vaccine available for human use. The present study was designed to develop the recombinant omp31 (rOmp31) protein antigen based in

house ELISA for specific serodiagnosis of caprine brucellosis. Omp31 gene of *B. melitensis* strain was cloned and expressed in pET22b (+) expression system. The recombinant protein was purified under denaturing conditions using 8 M urea. The purified recombinant protein was confirmed by western blotting using known caprine *Brucella* positive and negative serum. The seroreactivity of the recombinant protein was also checked by reacting with antisera of known *B. melitensis*. Serodiagnostic potential of recombinant antigen was tested against 92 clinical serum samples collected from goats by iELISA. Out of 92 samples tested, 18 (19.56%) were positive and 74 (80.43%) were negative by rOmp31 antigen-based enzyme-linked immunosorbent assay (ELISA). In comparison to RBPT, the relative sensitivity and relative specificity of rOMP31-ELISA were found 92.85% and 93.59%, respectively. Positive predictive value of rOMP31-ELISA was found 72.22%, while negative predictive value was 98.64%. rOMP31-ELISA showed 93.40% in accuracy of prediction against RBPT. In comparison to commercial ELISA kit, the relative sensitivity and relative specificity of rOMP31-ELISA were found 94.11% and 97.33%, respectively. Thus, the test gave comparable results with the commercially available ELISA kit for diagnosis of brucellosis in goats. The rOMP31-ELISA showed 96.74% in accuracy of prediction against commercial ELISA kit in diagnosis of brucellosis in goats. Concordance was higher between rOMP31-ELISA and commercial ELISA, which was (96.74%) than RBPT and rOMP31-ELISA test with a concordance of (93.48%). Kappa statistics between rOMP31-ELISA and commercial ELISA showed almost perfect agreement as the value observed was 0.894, while RBPT and rOMP31-ELISA showed substantial agreement as their Kappa value was 0.774. From the results, it can be concluded that the developed in-house test may be used by the local veterinary diagnostic laboratories for diagnosis of caprine brucellosis and may have significant implications in control of brucellosis at least in Uttar Pradesh state. However, the efficacy of serodiagnosis also needs to be further evaluated using more number of sera samples from different

geographic regions. Beside this, the comparative evaluation for rOmp31 i-ELISA with other reported recombinant Omps and also their combinational use can also be explored.

#### **6. Development of sodium polyacrylate nanoparticles based combined mastitis vaccine and assessment of its efficacy in mice model**

The present study was conducted to develop a stable, safe and effective vaccine against mastitis. For the purpose, two most common mastitis causing bacterial pathogen *S. aureus* and *E. coli* were selected based on previous studies conducted locally and in different part of country. These were characterized by cultural, morphological, biochemical tests. Further, these were confirmed by the PCR based gene amplification. The amplified products were purified and sequenced. The sequences of PCR amplicons have been submitted to NCBI, GenBank to obtain Accession no. MH092071 and KY914488 for *S. aureus* and *E. coli*, respectively. Adjuvants always play critical role in the acceptance and success of any vaccine so well approved and recognized adjuvant Montanide™ GEL 1 was incorporated with virulent *S. aureus* (MH092071) and *E. coli* (KY914488) to develop formalized killed adjuvant combined mastitis vaccine PGV (Polymer gel based vaccine) to make it  $8.9 \times 10^8$  and  $1.85 \times 10^8$  CFU of formalin killed virulent *S. aureus* (MH092071) and *E. coli* (KY914488) in per shot (100µl) for mice. The PGV was tested for sterility and found sterile. Its safety was assessed in adult inbred albino female mice and it produced no untoward reaction. For stability testing PGV was stored at different temperature and PGV was found stable for 12 months at refrigeration temperature (4-8°C) and 9 months at room temperature. To assess efficacy of PGV, it was inoculated in 24 adult inbred albino female mice at the dose of 100µl  $\{8.9 \times 10^8$  and  $1.85 \times 10^8$  CFU of formalin killed virulent *S. aureus* (MH092071) and *E. coli* (KY914488)} through subcutaneous route. The control groups were inoculated equal volume of adjuvant and PBS (pH7.4) with similar route. All the mice were challenged on 28<sup>th</sup> day post vaccination with live virulent *S. aureus* (MH092071) and *E. coli* (KY914488) ( $10^2$  CFU) through intra mammary route and

sacrificed on 7<sup>th</sup> day post challenge. During experiment, blood was collected at 7<sup>th</sup>, 14<sup>th</sup>, 21<sup>st</sup>, 28<sup>th</sup> and 35<sup>th</sup> days for serum as well as whole blood. The blood erythrocytes were used for the estimation of oxidative stress biomarker parameters, plasma for plasma cytokine level. Serum samples were used to know the status of serum antibodies by plate agglutination test (PAT) and in-house indirect ELISA (iELISA). During the experiment all the mice were examined routinely for any gross pathological changes. On 35<sup>th</sup> day (7<sup>th</sup> day post challenge) all the mice were sacrificed to conduct postmortem examination. The vital organs were collected for live weight and estimation of oxidative stress biomarkers. Splenocytes were used for splenocytes proliferation assay. The spleen and mammary tissues were also used for live bacterial count and to study expression of oxidative stress biomarker, cytokines and TLR mRNA by Real time PCR. Histopathology was performed with the tissues of all the vital organs along with mammary tissues. Based on the findings of present study, it can be concluded that PGV is sterile, stable and safe for animal use. PGV is stable for the duration of 12 months under refrigeration temperature (4-8 °C). PGV is easy to administer. PGV confers good early serological as well as cell mediated immune response in mice mastitis model. PGV produced desirable oxidative stress for effective vaccination. Expression of mRNA for oxidative stress biomarkers, cytokines and TLR revealed the basis of effective protection. None of the organ revealed pathological changes in vaccinated and challenged mice. Thus, formalized killed combined mastitis vaccine can be used in animals safely and effectively for the prevention of mastitis. Further, PGV fulfill all sterility, safety, stability and efficacy parameters as desired in OIE guidelines and European pharmacopeia. Hence, it is recommended for field trial in homologous host.

#### **C. M.V.Sc.**

##### **College of Veterinary Science and Animal Husbandry**

#### **1. Effect of inorganic and nano zinc supplementation on performance and immune response in growing heifers**

Present study was conducted to see the effect of inorganic and nano zinc supplementation on



growth performance, nutrient utilization, blood biochemical and immune response in Hariana heifers. In present study, control group was not supplemented with any extra amount of zinc other than present in the basal diet, T1 group was supplemented with inorganic zinc @50 mg/kg of DM offered, while T2 and T3 group were supplemented with nano ZnO @25 and 50 mg/kg of DM offered, while T2 and T3 group were supplemented with nano ZnO @25 and 50 mg/kg of DM offered. Basal diet offered to experimental groups containing 50% concentrate, 25% green berseem and 25% wheat straw. DM was offered to all experimental group at about 4% of the body weight of animals. All groups of animals were fed with basal diet having same levels of nutrients. Body weight and dry matter intake were recorded fortnightly. DMI (kg/day), DMI (kg/100kgBW), TDN intake (g/kg  $W^{0.75}$ ) and DCP intake (g/kg  $W^{0.75}$ ) remained similar in all experimental groups. Nutrient digestibility and digestible nutrient intake were not impacted by supplementation of different levels of inorganic and nano zinc supplementation to all treatment groups. Average fortnight body weight gain, ADG, metabolic body weight gain were similar in all groups. FCR and FCE were not significantly different between treatment and control group. Zinc bioavailability was high in nano zinc supplemented T2 and T3 group in comparison to inorganic supplemented group and control group. Haematological parameters like blood haemoglobin concentration and pack cell volume values were not impacted in different treatment groups. Overall plasma glucose, triacylglycerol, cholesterol, plasma total protein, plasma albumin, BUN, ALP, ALT, AST, bilirubin and creatinine were found similar in all treatment and control group. Plasma globulin is significantly different between the group at 90 day of trial and globulin concentration was found higher in T1, T2 and T3 treatment group than the control group. Plasma Ca and P in present study were similar in all the experimental groups. Plasma zinc concentration was high in nano zinc supplemented T2 and T3 group in comparison to inorganic zinc supplemented T1 and control group. Plasma copper concentration was low in all treatment groups in comparison to control

group. Plasma SOD concentration was found higher in nano zinc supplemented T2 and T3 group than control group and inorganic zinc supplemented T1 group, at 30, 60, and 90 days. FRAP contestation increase within all groups over the time, and FRAP concentration were higher in all treatment groups than the control group. Plasma total immunoglobulin concentration was found higher in all treatment groups in comparison to control group. It may be concluded that nano Zn supplementation @25 and 50 ppm have better absorption, antioxidant and immunogenic effects thus may replace inorganic Zn source at lower level, @25 PPM.

## **2. Effect of different organic acids and their combination on silage quality, intake and growth performance of Indigenous heifers**

This study was conducted to determine the effect of different organic acids and their combinations on silage quality, feed intake, growth performance and blood metabolites of growing Sahiwal cattle. It was conducted into two phases, Phase I: Silage preparation and their quality evaluation and phase II: Feeding trial. In Phase I study, sorghum silage was either ensiled without organic acid or with 0.5% formic acid, 0.5% propionic acid or 0.25% combination of formic and propionic acid in 50 kg polythene bags. After ensiling for 60 days, silage was evaluated for nutrients content and physical and chemical characteristics. Low pH value, lactic acid content, buffering capacity (BC), total volatile fatty acids (TVFA) and low butyric acid and ammonia-nitrogen ( $NH_3-N$ ) content denoted that prepared sorghum silage in different groups were well preserved and was of very good quality. However, sorghum fodder ensiled with 0.5% propionic acid showed better aerobic stability compared to other groups. In Phase II study: 24 growing Sahiwal heifers were randomly allocated into four groups (n=6) on the basis of body weight and age. Experimental heifers either fed on basal TMR (compounded concentrate: silage devoid of preservative: wheat straw in the proportion of 40: 40: 20 on DM basis) ( $S_C$ ) or basal TMR which contained silage preserved with 0.5% formic acid ( $S_{0.5\%FA}$ ), basal TMR which contains silage preserved with 0.5%



propionic acid ( $S_{0.5\%PA}$ ) and basal TMR which contains silage preserved with combination of 0.25% formic acid and 0.25% propionic ( $S_{0.25\%FA+0.25\%PA}$ ). Experimental heifers were monitored daily for DMI and fortnightly for body weight change and feed efficiency. A digestion trial with a period of 6 days was conducted at the mid of the experiment to study the effect of treatments on the nutrients utilization. Blood samples were collected on the days 0, 30, 60 and 90 post treatments and analyzed for haematological attributes, biomarkers of protein, energy and lipid metabolism, liver and kidney function test and plasma mineral levels. Feeding of silage treated with formic and propionic acids did not exert any effect on feed intake and apparent nutrients digestibility. However, average daily gain (ADG) and feed efficiency was better ( $P<0.05$ ) in  $S_{0.5\%FA}$  group compared to other groups. Red blood cells (RBCs) count, granulocyte count, lymphocytes count, mean corpuscular haemoglobin concentration (*MCHC*), mean corpuscular volume (MCV) and mean cell haemoglobin (MCH) showed non significant effect while white blood cells (WBCs) and platelet (PLT) count were significantly lower ( $P<0.05$ ) in 0.5% formic acid group and haemoglobin (Hb) concentration and packed cell volume (PVC) or haematocrit (HIT) values were lower in 0.5% propionic acid group. Mean plasma total protein, albumin and globulin values showed non significant effect of silage preservatives in growing heifers. PUN showed significant effect ( $P<0.05$ ) of treatment and was lowest in heifers of  $S_{0.5\%FA}$  groups compared to  $S_C$ ,  $S_{0.5\%PA}$  and  $S_{0.25\%FA+0.25\%PA}$  groups. Plasma glucose and cholesterol concentration were significantly ( $P<0.05$ ) higher in 0.5% propionic acid added groups while plasma triglyceride level was significantly ( $P<0.05$ ) higher in combination group. No significant differences in the ALT and AST were observed among four different groups however; mean plasma ALP concentration was higher in 0.5% propionic acid group. No significant difference in the mean plasma Ca and P levels were observed among different groups. In conclusion, ensiling sorghum fodder with formic and

propionic acids improved silage quality while aerobic stability of silage was better in group ensiled with 0.5% propionic acid. Feeding 0.5% formic acid added silage improved growth performance of growing Sahiwal cattle.

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

This study was conducted to determine the effect of green fodder replacement with corn silage on feed intake, growth performance, feed utilization efficiency and blood metabolites in growing Haryana cattle. Present study was conducted into two phases, Phase 1: Silage preparation and evaluation and phase 2: Feeding trial. In Phase 1 study, corn silage was prepared in bunker silo and after ensiling for 60 days, silage was evaluated for nutrients content and physical and chemical characteristics. High pH value, lactic acid content, buffering capacity (BC), total volatile fatty acids (TVAs) and low ammonia-nitrogen ( $NH_3-N$ ) content denoted that prepared corn silage was well preserved and off very good quality. In phase 2 study, 18 growing Haryana heifers were randomly allocated into three groups ( $n=6$ ) on body weight and age basis. Experimental heifers either received a basal total mixed ration (TMR) devoid of corn silage ( $S_{0\%}$ ) or were fed on TMR of which 50 ( $S_{50\%}$ ) and 100% ( $S_{100\%}$ ) berseem fodder were replaced with corn silage. Experimental heifers were monitored daily for DMI and fortnightly for body weight change, feed efficiency measures and physiological variables. At the end of the study, a digestion trial for a period of 6 days was conducted to study the effect of replacement of green fodder with corn silage on nutrient utilization. Blood samples were collected on the days 0, 30, 60 and 90 post treatments and analyzed for haematological attributes, biomarkers of protein metabolism, biomarkers of energy and lipid metabolism, liver and kidney function test, biomarker of antioxidant status and immune response and plasma mineral levels. Replacement of green fodder with corn silage had significant ( $P<0.05$ ) effect on feed intake. As the level of

inclusion of silage increased, dry matter intake (DMI) also increased while average daily gain (ADG) was similar among all groups. RMFC measured as difference between metabolizable energy (ME) intake and ME required showed significant ( $P<0.05$ ) effect and showed linear increase with silage levels. Residual metabolizable feed consumption (RMFC) denoted that heifers in group  $S_{50\%}$  and  $S_{100\%}$  consumed 0.97 and 1.61 kg more DM/day than  $S_{0\%}$  group while gaining at the similar rate. Residual intake and body weight gain (RIG) showed significantly ( $P<0.05$ ) higher value in  $S_{0\%}$  group followed by  $S_{50\%}$  and  $S_{100\%}$  groups. Other feed efficiency measures did not show any effect of treatment. The apparent digestibility of crude protein (CP) was higher in  $S_{0\%}$  group while digestibility of the other nutrients was similar among three groups. Haematological attributes, biomarkers of energy and lipid metabolism, biomarkers of liver and kidney function, antioxidant and immune response and plasma mineral levels showed non significant effect of green fodder replacement with corn silage. However, plasma concentrations of total protein and albumin was higher in  $S_{0\%}$  group compared to  $S_{50\%}$  and  $S_{100\%}$  groups which could be due to higher protein content and digestibility. Cost of feeding increased with the increased level of corn silage inclusion. In conclusion, replacement of green fodder with corn silage increased feed intake, RMFC and cost of feeding without altering growth performance in growing Haryana cattle. However, corn silage can be used as alternate forage during scarcity period without adverse impact on performance of growing cattle.

#### **4. Effect of replacing protein source in concentrate mixture with dried Moringa oleifera meal on performance of Barbari buck**

The present study was designed to evaluate the effect of replacing protein source in concentrate mixture with dried Moringa oleifera leaf powder on growth performance, nutrient utilization, seminal attributes, haematological parameters, blood biochemicals, antioxidant and hormonal parameters of Barbari bucks. For this study,

18 Barbari bucks were selected from the herd maintained at Department of Physiology, DUVASU, Mathura (U.P.). The bucks were divided into 3 groups (Control, T10 and T20) having six animals each on body weight basis. Control group was fed basal diet consisting of concentrate mixture, green berseem and arhar straw where as T10 and T20 groups were fed basal diet (as that of control) along with replacement of soybean meal in concentrate mixture with dried Moringa oleifera leaf powder at level 10 and 20% respectively. Nutrient requirement of bucks were fulfilled as per NRC (2007) recommendation 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. Semen was collected twice a week using artificial vagina from each buck for three weeks, total of six ejaculate from each bucks were collected after 90 days of post feeding of experimental diets. Overall 108 ejaculates were collected. The result revealed no significant ( $P>0.05$ ) difference in the average body weight (kg) and metabolic body weight ( $\text{kg W}^{0.75}$ ) between groups. Fortnightly body weight gain (kg) and ADG (g) was found to be significantly higher and comparable in Control and T10 group. Similarly the overall DMI (kg/d, 100 kg BW) was also higher and comparable in Control and T10 group. No significant change in FCR was reported in experimental groups. 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 the entire experimental groups. CP intake (kg/day), DCP intake (kg/day) and TDN intake (kg/day) remained similar in all experimental groups. DMI (kg/100 kg BW), TDN intake ( $\text{g/kg W}^{0.75}$ ) CP and DCP intake ( $\text{g/kg W}^{0.75}$ ) remained similar in all experiment groups during digestion trial. Seminal attributes viz. volume of ejaculated semen (ml), semen colour, seminal pH, and spermatozoa concentration (millions/ml) were found

similar in all experimental groups. Whereas, mass motility, percent progressive motility, percent live spermatozoa count, HOST reactive spermatozoa percentage and intact acrosomal percentage was found significantly higher ( $P < 0.05$ ) in T10 group and significantly lower ( $P < 0.05$ ) in T20 group as compared to Control group. However, total morphological abnormality 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 T20 Moringa oleifera supplemented group. The concentrations of plasma glucose, cholesterol, triglycerides, total protein, albumin and globulin did not change significantly ( $P > 0.05$ ) in experimental bucks. Plasma level of enzymes like ALT, AST remain unchanged in Control and treatments group showing no deleterious effect of Moringa oleifera supplementation on hepatic metabolism in experimental animal. Overall super oxide dismutase activity (SOD) activity increases significantly ( $P < 0.05$ ) in T10 group whereas, plasma lipid peroxidation concentration significantly decreases in T10 groups but there were no significant change in catalase activity in the experimental bucks. Overall plasma cortisol concentration was found significantly lower ( $P < 0.05$ ) in T10 Moringa oleifera treated group. However, no significant difference in testosterone concentration was found between control and treatment groups. Hence the present results suggested that the soybean meal in concentrate mixture can be effectively replaced with dried Moringa oleifera leaf powder at 10 % level without any deleterious effect on blood parameters and hepatic metabolism, with stimulatory effects on their antioxidants status, anti stress and improved seminal attributes of Barbari bucks.

### **5. Seroepidemiology and Comparison of a PCR Assay in whole blood, Milk and serum specimens for Brucellosis diagnosis in bovines with reproductive disorder**

Brucellosis is one of the common zoonotic diseases that lead to the extensive economic losses throughout the World especially in

India where it is endemic. Control and eradication of this disease depends mainly on early detection. The present work was carried out between October 2017 and July 2018 as a cross-sectional study to determine the seroprevalence of brucellosis in bovines of Uttar Pradesh and the influence of various associated risk factors. Two hundred sixty two sera samples which including 359 females and 25 males were collected randomly from unvaccinated cattle and buffalo, in four districts of western Uttar Pradesh. All sera samples were screened for bovine brucellosis using RBPT and further confirmed by STAT and the positive samples reconfirmed using I-ELISA. A structured questionnaire was used to collect epidemiological data that was analyzed. Out of 262 serum samples, the overall seroprevalence of brucellosis by different serological test was 26 (9.92%), 42 (16.03%), 17 (6.48%) by RBPT, STAT and i-ELISA, respectively. On the basis of I-ELISA district wise seroprevalence was higher in Firozabad (10.41%), followed by Mathura (6.47%), Hathras (4.65%) and Aligarh (3.12%). There was higher prevalence in cattle than buffaloes, in adult animals and in animals reared under organized farming. Abortion cases (23.52%) had maximum prevalence followed by repeat breeding (21.42%) and pyometra (16.66%). Study findings showed a low prevalence of cattle brucellosis in areas of western Uttar Pradesh having good cattle population but various factors seem to influence the prevalence of the disease. Although, the current work form a baseline data for more study of cattle brucellosis, and start point for its control in this area.

### **6. Effect of floor type on performance of Sahiwal heifers**

The present study was carried out to observe the effect of different flooring types on the physiological, behavioural, haematological, and blood bio-chemical attributes; hygiene and hock health scoring and endocrinal profile of Sahiwal heifers. Twenty four healthy Sahiwal heifers maintained at DDD Farm of ILFC of DUVASU, Mathura were quasi randomly distributed into four groups on the basis of body weight and age. Heifers of



first group were reared on concrete flooring (T1) which served as control group, the heifers of second group were reared on Sand flooring (T2), the heifers of third group were reared on Cowdung bed flooring (T3) and the heifers of fourth group were reared on Rubber mat installed flooring (T4). The animals were exposed to their respective floorings round the clock, for which they were kept in tethered conditions (except for the period of measuring weight at every fortnight and blood collection (at monthly intervals)). Behavioural recording was done at 30<sup>th</sup>, 60<sup>th</sup> and 90<sup>th</sup> days stage using video recording devices, and scoring for health and hock health was done at fortnightly basis. The T4 group heifers showed significantly higher ( $P<0.05$ ) values of the pooled mean of DMI, ( $5.04 \pm 0.22$  Kg/d) than the T1 group, ( $3.61 \pm 0.22$  Kg/d). Further the T3 group heifers showed comparatively higher values of the pooled mean of DMI compared to T2 and T1 group ( $4.34 \pm 0.22$  Kg/d vs  $4.19 \pm 0.22$  Kg/d;  $3.61 \pm 0.22$  Kg/d). The T4 group heifers showed significantly higher ( $P<0.05$ ) values of the pooled mean value of ADG compared to T1 group flooring ( $596.29 \pm 28.57$  vs.  $420.37 \pm 28.57$  g/d). Further the T3 and T2 group heifers showed comparatively higher values of the pooled mean value of ADG than T1 group ( $512.96 \pm 28.57$  g/d;  $492.59 \pm 28.57$  g/d vs.  $420.37 \pm 28.57$  g/d). The T1 and T2 group heifers showed significantly higher ( $P<0.05$ ) values of the pooled mean value of ST<sup>1</sup> (Standing time from the period of 7:00 am – 7:00 pm) compared to T3 and T4 group heifers ( $353.56 \pm 9.93$  min and  $323.78 \pm 9.93$  min vs.  $252.11 \pm 9.93$  min and  $267.33 \pm 9.93$  min). The T3 and T4 group heifers showed significantly higher ( $P<0.05$ ) values of the pooled mean value of LT<sup>1</sup> (Lying time from the period of 7:00 am – 7:00 pm) compared to T1 and T2 group heifers ( $467.89 \pm 9.93$  min and  $452.67 \pm 9.93$  min vs.  $366.44 \pm 9.93$  min and  $396.22 \pm 9.93$  min). Similar pattern was observed on the values of the pooled mean value of ST<sup>2</sup> and LT<sup>2</sup> (Standing time and lying time in the period of 24 hrs) between the treatment groups. There was a significant effect ( $P<0.05$ ) observed on the values of frequency of head movements

while standing and lying down, and duration of postures and leg positions while lying down in different control and treatment groups. However there were no significant effect ( $P<0.05$ ) seen in the haematological and biochemical attributes (except albumin) between the treatment groups. The T1 (Control) group heifers showed significantly higher ( $P<0.05$ ) values of the pooled mean value of total plasma albumin concentration than T2 treatment group heifers. The T3 and T4 group heifers showed comparatively higher values of the pooled mean value of total plasma albumin concentration than T2 group heifers. There was a significant effect ( $P<0.05$ ) observed on the mean and pooled mean values of hygiene score of heifers in different groups, which indicated that hygiene level of T3 and T4 group was much better compared to T1 and T2 groups. Similarly there was a significant effect ( $P<0.05$ ) observed on the pooled mean value of hock score which indicated the hock health condition in the manner ( $T3>T4>T1>T2$ ). The T1 (Control) group heifers showed significantly higher ( $P<0.05$ ) values of the pooled mean value of Cortisol (ng/ml) than other treatment groups whereas there were no significant ( $P>0.05$ ) changes observed in the values of TSH ( $\mu$ lU/ml) between the treatment groups.

## **7. Development of shelf stable chicken pickle incorporated with humectants and acidulants as hurdles**

The present study was conducted to develop and assess the quality characteristics of hurdle technology based shelf stable chicken pickle incorporated with acidulants and humectants as hurdles. First experiment was carried out to optimize the formulation and processing technology of chicken pickle. Three different cooking methods viz. steam cooking without pressure (S1, S2, S3), frying (F1, F2, F3) and microwave cooking at 540 MHz (M1, M2, M3) were used for pre-cooking of marinated meat for 10, 15 and 20 minutes separately. For steam cooking without pressure, pH, moisture content and water activity ( $a_w$ ) values increased whereas titrable acidity, protein, L\* and shear force values decreased significantly



( $P < 0.05$ ) with increase in cooking time. Among the sensory attributes, flavor, texture, juiciness and overall acceptability scores were significantly ( $P < 0.05$ ) higher in S2, hence selected as the best treatment. For frying, pH, fat, ash content and  $a^*$  values increased significantly ( $P < 0.05$ ) whereas titrable acidity, moisture,  $L^*$  and shear force values decreased significantly ( $P < 0.05$ ) with increase in frying time. Among the sensory attributes, flavor, texture, juiciness, sourness and overall acceptability scores were significantly ( $P < 0.05$ ) higher in F2, hence selected as the best treatment. For microwave cooking, pH, ash content and  $a^*$  values increased significantly ( $P < 0.05$ ) whereas titrable acidity, moisture content,  $L^*$ ,  $b^*$  and shear force values decreased significantly ( $P < 0.05$ ) with increased cooking time. Among the sensory attributes, color and appearance, flavor, texture, juiciness and overall acceptability scores of M1 were significantly ( $P < 0.05$ ) higher, hence selected as the best treatment. On comparison of selected treatments, S2- steam cooking (without pressure) of marinated chicken meat for 15 minutes was selected and taken as control in next experiment. Second experiment was carried out to optimize the level of different acidulants i.e. acetic acid (AC1, AC2, AC3), citric acid (CA1, CA2, CA3) and lactic acid (LA1, LA2, LA3) at 0.5, 1.0 and 1.5% separately. For acetic acid, pH, ash content, water activity ( $a_w$ ),  $b^*$ , shear force values and sensory scores decreased whereas titrable acidity, moisture content and  $a^*$  values increased significantly ( $P < 0.05$ ) with incorporation of acetic acid. AC1 and AC2 had no significant difference for any sensory attribute; therefore AC2 was selected among the treatments. For citric acid, pH, water activity ( $a_w$ ),  $L^*$ , shear force values and sensory scores decreased whereas titrable acidity, moisture content and  $a^*$  values increased significantly ( $P < 0.05$ ) with incorporation of citric acid. CA1 had significantly ( $P < 0.05$ ) higher texture, sourness and overall acceptability scores than CA2 and CA3; therefore, CA1 was selected among the treatments. For lactic acid, pH, ash

content, water activity and shear force values decreased whereas titrable acidity and moisture content increased significantly ( $P < 0.05$ ) with incorporation of lactic acid. Among the sensory attributes, flavour, juiciness and overall acceptability of S2, LA1 and LA2 had no significant difference; however decreased significantly ( $P < 0.05$ ) in LA3. Therefore, LA2 was selected among the treatments. On comparison of selected treatments, LA2-chicken pickle incorporated with 1.0% lactic acid was selected and used as control in next experiment. Third experiment was carried out to optimize the level of humectants viz. glycerol (GL1, GL2, GL3), honey (HY1, HY2, HY3) and sorbitol (SB1, SB2, SB3) at 3, 6 and 9% level separately. For glycerol, pH, moisture, water activity and shear force values decreased whereas titrable acidity and  $a^*$  values increased significantly ( $P < 0.05$ ) with incorporation of glycerol. GL1 had significantly ( $P < 0.05$ ) higher sensory scores including overall acceptability than GL2 and GL3 and was selected among the treatments. For honey, pH, moisture content, water activity,  $L^*$  and shear force values decreased; however titrable acidity, ash content and  $a^*$  values increased significantly ( $P < 0.05$ ) with increased level of honey. Flavour, texture, juiciness, sourness and overall acceptability scores of LA2, HY1 and HY2 had no significant difference, but decreased significantly ( $P < 0.05$ ) in HY3. Therefore, HY2 was selected among the treatments. For sorbitol, pH, moisture content, water activity and shear force values decreased; however titrable acidity and ash content increased significantly ( $P < 0.05$ ) with increased level of sorbitol. There was no significant difference between SB1 and SB2 for any sensory attribute; however decreased significantly ( $P < 0.05$ ) in SB3. Therefore, SB2 was selected among the treatments. Fourth experiment was carried out to evaluate the storage stability of hurdle technology based shelf stable chicken pickle at ambient temperature. HY2, GL1 and SB2 along with control (S2) were stored at ambient temperature and evaluated for physico-chemical, microbiological and sensory

properties at every 10 days interval for 60 days. The pH, TBARS, FFA values and microbial count of HY2, GL1 and SB2 were significantly ( $P<0.05$ ) lower whereas titrable acidity was significantly ( $P<0.05$ ) higher than control during storage. The values of titrable 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. However all products were well accepted upto 60<sup>th</sup> day of storage. Among the treatments, HY2 had higher oxidation stability and lower microbiological count along with significantly ( $P<0.05$ ) higher overall acceptability scores of storage till the end of the storage. It can be concluded that well acceptable hurdle technology based chicken pickle may be prepared by precooking of marinated meat under steam without pressure for 15 minutes with incorporation of 1% lactic acid as acidulant and 6% honey as humectants. This product may be at least well acceptable at room temperature for 60 days on the basis of physicochemical properties, microbiological studies and sensory evaluation.

#### **8. Studies on coagulation profile, clinical relevance of canine C-reactive protein and oculopathies related to Ehrlichiosis in dogs**

Present investigation entitled "Studies on coagulation profile, clinical relevance of canine C-reactive protein and oculopathies related to Ehrlichiosis in dog" has recorded ehrlichiosis associated clinical, hemato-logical, biochemical alterations, coagulation profile, fibrinogen status, oculopathies along with C-reactive protein status associated with disease. In addition to this, D- dimer status was also evaluated. In present investigation total 79 dogs were screened for ehrlichiosis based on the clinical diagnosis criteria as stated earlier. All the screened dogs underwent for blood smear examination to confirm the dogs suffering with ehrlichiosis. Blood smear examination results showed 7 dogs positive for ehrlichiosis; primary PCR revealed 21 positive dogs, however nested

PCR confirmed 64 dogs positive for ehrlichiosis of all screened dogs. Important clinical symptoms exhibited by the ehrlichia positive dogs in decreasing frequency were fever (93.75%) and mucosal pallor (94.36%) followed by depression (88.73%), lymphadenomegaly (87.5%), melena (87.5%) and splenomegaly (48.43%) tick infestation (46.87%), weight loss (42.18%). Clinical symptoms with moderate frequency were ecchymotic and petechial hemorrhages (28.12%), ocular abnormalities (28.12%), vomiting (15.62%), epistaxis (10.93%), ascites (10.93%), hind limb/scrotal edema/facial edema (7.81%). Symptoms with least frequency were icterus (3.13%), hematuria (3.13%), hematemesis (3.13%) and CNS signs (1.56%). In present study, Nested PCR was considered as standard test to compare other diagnostics. Diagnostic relevance of various diagnostics was compared on 79 samples suspected for ehrlichiosis based on clinical examination. Leishmann stained thin blood smear examination of all 79 samples revealed the presence of *E.canis* in 7 samples, showing a percentage positivity of 8.86. Simple PCR of same 79 blood samples, showed positivity in 21 samples, for which the 26.58 percentage positivity was calculated. All the 79 samples were finally underwent for confirmation of disease by nested PCR, which yield 64 sample positive for the ehrlichiosis with a percentage positivity of 81.01%. In the present study Percentage positivity of Ehrlichiosis was recorded on the basis of breed, age, sex and season, respectively. On the basis of season, dogs were categorized in 2 categories summer and winter, for which the positivity was recorded 78.12% and 21.87 % respectively. Age group with highest positivity was category 3 with a positivity of 65.62 % followed by category 2, with a positivity of 21.87 % and lowest positivity was recorded in category 1 with a positivity of 12.5%. On the basis of sex, dogs were categorized in 2 categories male and female and positivity of male and female was 68.75 and 31.25 % respectively. On the basis of Breed, dogs were categorized in to 9 breeds, breed with highest

positivity was German shepherd with a positivity of 43.75 % followed by Rottweiler (14.06 %), Labrador (9.3 %), Non descript (7.8 %), Pomeranian (7.8 %), Saint Bernard (4.6 %) and Pug (4.6 %), Pitbull (4.6 %), spitz (3.1%). The breed wise positivity mostly depend on popularity of breed in the region, therefore could not be considered as prevalence of disease and breed predisposition for the diseases. Present study showed significant decrease in platelets count (PLT) and Plateletrit (PCT) in the dogs of treatment group at day 0 in comparison to dogs of control group. Analysis of treatment group revealed significant increase in the PLT and PCT at the day 14th after the treatment in the treatment group, but present study revealed insignificant change in MPV, PDW in the dogs of treatment group in comparison to control. There was no significant change in the MPV, and PDW at the day 14th after the treatment in the treatment group. Present study showed significant increase in APTT, FIB and D-Dimer concentration in the dogs of treatment group in comparison to control at day 0, however significant decrease was recorded in the APTT, FIB and D-Dimer concentration at the day 14th in the dogs of treatment group. Analysis of PT showed non-significant changes in between treatment and control group.

### **9. Studies on Ameliorative Potential of Polyherbal Formulation on Expression of Skin Barrier Proteins and Cytokines in Dogs with Atopic Dermatitis**

Canine atopic dermatitis (AD) is one of the most frequent skin diseases of dogs and skin barrier functions and misbalance of inflammatory cytokines are considered to have a paramount role in the pathogenesis AD. The protein expression of FLG and INV in canine AD is still unclear. A major determinant of which antibody class predominates is which one of two subsets of T-helper lymphocytes (designated Th1 and Th2) is dominant. The factors that determine whether a Th1 or a Th2 response will predominate are complex but include both genetic and environmental influences. The management of canine AD is multifaceted,

and usually combines interventions such as allergen avoidance, allergen-specific immunotherapy, antimicrobial and anti inflammatory pharmacotherapy. Glucocorticoids (GCs) (prednisone, prednisolone, methylprednisolone) are considered to be the first line of sole therapy to manage canine AD. Owing to the wide prevalence of skin diseases, increasing incidence detrimental side effects with the most of allopathic drugs, there is a quest for the safe alternative medicines. Traditional medicines hold a great promise as a source of easily available effective therapy for skin diseases to the people, particularly in tropical developing counties, including India. In cerebration of these facts, the present study was aimed to evaluate the therapeutic potential of Polyherbal formulation in dogs with atopic dermatitis, and to evaluate the ameliorative potential of polyherbal formulation on the expression of skin barrier proteins and Th1/Th2 cytokines in dogs with atopic dermatitis. The dogs which fulfilled any five of the Favrot's AD inclusion criteria were included in the present study. The dogs with atopic dermatitis were allocated into two groups. Dogs with AD were treated with Prednisolone) and kept as standard positive controls. In another group, dogs with AD were treated with the Polyherbal capsule. Before the start of therapy, the dogs with AD revealed significantly higher expression of filaggrin and lower expression of involucrin genes. On day 60 post-therapy, atopic dogs treated with Polyherbal capsule revealed a significant reduction in filaggrin and significant increase involucrin genes expressions as compared to their day 0 expressions. However, on day 60 post-therapy, atopic dogs treated with prednisolone revealed significant reductions in both filaggrin and involucrin genes expressions. Before the start of therapy, dogs with AD revealed significantly higher expression of TNF- $\alpha$ , IL-31, and IL-13. On day 60 post-therapy, the atopic dogs treated with Polyherbal capsule revealed significant downregulation of TNF- $\alpha$  and IL-31 genes. On day 60 post-therapy, the atopic dogs treated with prednisolone have not revealed



significant reduction in TNF- $\alpha$ . On the contrary, the atopic dogs treated with prednisolone revealed a significantly higher expression of IL-31 genes on day 60 post-therapy as compared to their day 0 values. Remarkable alterations were observed in the leukograms and haemograms of dogs with AD as compared to healthy dogs. Remarkable alteration in some biochemical panels was observed in dogs with AD as compared with healthy dogs. The atopic dogs treated with Polyherbal capsule revealed  $55.55 \pm 5.84\%$  and  $75.46 \pm 7.61\%$  improvements in CADLI on day 30 and day 60 post-therapy, respectively. Whereas, the atopic dogs treated with prednisolone revealed  $29.67 \pm 3.34\%$  and  $46.50 \pm 5.52\%$  improvements in CADLI on day 30 and day 60 post-therapy, respectively. An appreciable improvement in body coat lustre, hair re-growth, healing of skin lesions and food intake was revealed by the atopic dogs treated with Polyherbal capsule. The result of the present study indicates that the Polyherbal capsule might have the therapeutic effects against atopic dermatitis via regulation of the barrier proteins expression in the skin as well as via mitigating the immunological deregulation in dogs with AD. Therefore, it can be concluded that the Polyherbal capsule could be a better therapeutic agent against canine AD and can cure atopic dermatitis in dogs not only at the symptomatic echelon but also at the immuno-pathological points.

#### **10. Evaluation of Ameliorative Potential of a Polyherbal formulation on Toll-like Receptors and Cytokines expression in Peripheral Blood Mononuclear Cells and Lesional Skin of Dogs with Generalised Demodicosis**

The generalized demodicosis can be a serious dermatological condition in dogs if not managed well and the exact pathogenesis of generalized canine demodicosis is yet to be unravelled; however, an aberration in host immunity is considered one of the most significant factors apart from the perpetuating parasite. The therapeutic management of canine demodicosis remains one of the main challenges in veterinary dermatology. Traditional medicines hold a great promise as

a source of easily available effective therapy for skin diseases to the people particularly in tropical developing countries including India. Therefore, the present study aimed to evaluate the effects of a polyherbal formulation on clinical recovery and immuno-competence of dogs with generalized demodicosis. The dogs diagnosed with generalized demodicosis were categorized into two groups; nine demodicated dogs were treated with 0.0375% solution v/v of amitraz rinse along with Polyherbal formulation and another six were treated with amitraz alone. Marked alterations in the haemograms and leukograms were observed in dogs with GD as compared to healthy dogs. The dogs supplemented with Pyodermacare-G were found to have marked amelioration in the altered leukograms on day 60 post-therapy. Marked upregulation of TLR-2 in systemic as well as local lesion skin of the dogs with GD. Whereas, marked downregulation of TLR-6 in systemic as well as local lesion skin was observed in dogs with GD. Marked systemic up-regulation of immunosuppressive cytokines, IL-10 and TGF- $\beta$ , in dogs with GD. While changes in the expression of these immunosuppressive cytokines genes could not be detected in the skin lesions of dogs with GD. A marked amelioration of immunosuppressive cytokines in PBMCs of demodicated dogs adjunctly supplemented with Pyodermacare-G capsules on day 60 post-therapy was detected. On day 30 and 60 post-therapy, the per cent reduction in total mites counts in Pyodermacare-G supplemented dogs were remarkably higher as compared with the same day values of the non-supplemented group. The clinical recovery e.g. improvement in Demodex-induced skin lesions score (DSLSS) of both the studied group of demodicated dogs revealed that on day 30 and 60 post-therapy, the per cent improvement in DSLSS in Pyodermacare-G supplemented dogs were remarkably higher as compared with the same day values of non-supplemented dogs. Therefore, it can be concluded that marked alterations in haemato-biochemical panels and immunological dysregulation in including both the innate and adaptive immune systems are attributed to generalised

demodicosis in dogs. Pyoderma care-G capsule have potential to improve the immunological defects of canine demodicosis, and can hasten the clinical and parasitological cure when adjunct supplemented with amitraz.

### **11. Studies on purinergic signalling in vascular hyporeactivity in septic mice**

Present study was undertaken to assess the effect of sepsis on purinergic signaling with special reference to P2Y6 and P2X7 receptors in mouse aorta; and to unravel the interplay between purinergic receptor (P2Y6) and angiotensin II type I receptor (AT1R) in mediating vascular hyporeactivity during sepsis. Sepsis significantly decreased total erythrocytes count, haemoglobin level, total leukocytes count and differential leukocytes count compared to sham-operated mice (SO). Sepsis significantly increased plasma levels of ALT, AST, BUN, creatinine values. Similarly sepsis significantly increased total bacterial count in peritoneal lavage, blood and spleen compared to healthy control. Functional studies revealed that in mice of SO groups, high  $K^+$ -depolarising solution produced almost equal contraction in the aortic rings having the intact-endothelium or denuded. But compared to the SO group, mice of the sepsis group, irrespective of the presence or absence of endothelium in aortic rings, exhibited significantly reduced contractile response following exposure to high  $K^+$ -depolarising solution. UDP-induced vasoconstriction was significantly higher in endothelium-denuded mouse aorta compared to the endothelium-intact aorta and this response is mediated through P2Y6 receptors. Bz-ATP-induced vasoconstriction was also higher in endothelium-denuded mouse aorta compared to the endothelium-intact aorta and this response is mediated through P2X7 receptors. Ang-II also produced higher contraction in endothelium-denuded mouse aorta compared the endothelium-intact aorta and response is mediated through AT1 receptors rather than AT2. UDP and Ang-II, but not of Bz-ATP, produced higher contractile effect in presence of LNAME, the non-specific inhibitor of nitric oxide synthase, in endothelium-intact mouse aortic

rings. Sepsis—resulted in contractile response following exposure to UDP, Bz-ATP, Ang-II in mouse aorta. Sepsis caused upregulation of P2Y6 receptor mRNA expression in endothelium-intact septic mouse aorta. But sepsis caused down regulation of AT1a receptor. Ang-II produced higher contractile effect in the presence of 1400W, the specific inhibitor of iNOS in septic mouse aorta. Ang-II produced lower contractile effect in the presence of MRS-2578, the selective antagonists of P2Y6 receptor, in SO mouse aorta but the contractile effect of UDP was not altered in the presence of losartan, the selective antagonists of AT1 receptor and also contractile effect of noradrenaline was not altered in the presence of MRS-2578.

### **12. Studies on testicular activity of type 2 diabetic rats following concurrent pre-exposure to arsenic and chromium**

The objective of present study was to evaluate the influence of pre-exposure of chromium @ 1 mg/kg body weight and arsenic @ 38 ppb in drinking water continuously for 30 days in experimentally streptozotocin-induced type 2 diabetes in male Wistar rats and after 30 days of continuous exposure ameliorative potential of an ITK formulation @ 435 mg/kg body weight and its comparative efficacy with metformin @ 50 mg/kg body weight on diabetes-induced testicular dysfunction. Eighty four obese male Wistar rats were divided into fourteen groups viz. Normal Control, Obese, Non-diabetic + Chromium, Non-diabetic + Arsenic, Non-diabetic + Chromium-Arsenic combination, Obese Diabetic + chromium, Obese Diabetic + Arsenic, Obese Diabetic + Chromium Arsenic combination, Obese Diabetic + Chromium + Metformin, Obese Diabetic + Arsenic + Metformin, Obese Diabetic + Chromium Arsenic combination + Metformin, Obese Diabetic + Chromium + ITK, Obese Diabetic + Arsenic + ITK, Obese Diabetic + Chromium-Arsenic combination + ITK, consisting six animals in each group, were induced diabetes with streptozotocin @ 30 mg/kg body weight, intraperitoneally single dose after 30 days of pre-exposure to chromium and arsenic. After induction of

diabetes ITK formulation and metformin were given by oral gavage continuously for 30 days. Obese diabetic rats pre-exposed to chromium and arsenic increased feed and water intake and decrease in body weight, percent weight gain and anthropometric parameters, hemoglobin, TEC and platelets count whereas significant increase in TLC, fasting blood glucose and percent HbA1c. Also increased triglyceride, total cholesterol, LDL and decrease in HDL, increased activity of liver injury markers (ALP, GGT, ALT, AST) and rise in kidney injury markers (BUN, creatinine, total proteins, albumin, globulin and ratio between albumin and globulin) was observed. Testicular injury biomarkers (ACP, SDH, LDH, GGT, 17- $\beta$  HSD) were also increased along with decrease serum testosterone level. Also increase in lipid peroxidation (MDA level) and decrease in GSH content with antioxidant enzymes (CAT, SOD, GST and GP<sub>x</sub>) in testes were evident. Live and dead sperm count and HOST (+ve) sperm cells were adversely affected in pre-exposed obese diabetic rats. Treatment with ITK formulation and metformin moderately to significantly improved general parameters, hematological indices, oxidative stress markers (by increasing GSH content and activity of CAT, SOD, GST and GP<sub>x</sub> in testes and decrease in lipid peroxidation) improving antioxidant defense system. However, experimental type 2 diabetes and pre-exposure of chromium and arsenic could not have been able to induce micronuclei formation, comet formation and DNA fragmentation in sperm cell. Histopathological findings revealed relatively normal testes in chromium exposed group whereas, degeneration (vacuolation) with presence of edema in interstitial tissue and loss of some spermatogenic cells in arsenic treated groups, combination of chromium and arsenic showed normal histoarchitecture while edema of interstitial space and hyperaemia of the parenchyma present. Histoarchitecture of testes was severely affected in diabetic pre-exposed rats, while ITK and metformin restored the normal histology of testes.

### 13. Effect of organic, inorganic and nano selenium particles on the performance of turkey poult

The present study was designed to assess the effect of dietary supplementation of organic, inorganic and nano-selenium particles (SeNPs) on the performance of turkey poult. A total no. of (n=84), day old turkey poult were randomly distributed into four dietary treatments having three replicates each with seven turkey poult. The study was conducted in turkey poult during 0-8 weeks of age. During this phase, poult were fed with a basal diet, control group (T<sub>1</sub>), while T<sub>2</sub> group was supplemented with inorganic selenium @ 0.3 mg/kg basal diet, T<sub>3</sub> group was supplemented with organic selenium @ 0.3 mg/kg basal diet and T<sub>4</sub> group was supplemented with nano-selenium @ 0.3 mg/kg basal diet. T<sub>4</sub> poult had significantly higher (P<0.05) body weight compared to T<sub>1</sub> and comparatively higher than T<sub>2</sub> and T<sub>3</sub> treatment groups at 1<sup>st</sup> week of age respectively. T<sub>4</sub> poult had a significantly higher (P<0.05) body weight gain than T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> treatment groups at 1<sup>st</sup> week of age. Further, the nano selenium supplemented group poult had a comparatively higher average weekly body weight than the other treatment groups till 6<sup>th</sup> week of age. Further, the nano selenium supplemented group poult had a comparatively higher average weekly body weight than the other treatment groups till 6<sup>th</sup> week of age. However, weekly body weight gain in the control group (T<sub>1</sub>) was significantly higher (P<0.05) compared to other treatment groups at 7<sup>th</sup> week of age. T<sub>2</sub> poult had a significantly higher (P<0.05) feed consumption than T<sub>3</sub> and T<sub>1</sub> and comparatively higher than T<sub>4</sub> at 3<sup>rd</sup> week of age. FCR was significantly better (P<0.05) in T<sub>1</sub>, T<sub>3</sub> and T<sub>4</sub> than T<sub>2</sub> during 0-4<sup>th</sup> week of growth phase. The humoral immune response (HA) titre was comparatively higher in T<sub>4</sub> than other treatment groups. IgG response was significantly higher (P<0.05) in T<sub>3</sub> than T<sub>1</sub> and T<sub>2</sub> and comparatively higher than T<sub>4</sub> after 8 weeks of age. HDL and SOD levels were significantly higher (P<0.01) in T<sub>4</sub>



than T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> groups. The Nano-selenium supplemented group T<sub>4</sub> had significantly higher ( $P<0.05$ ) percent lymphocytes than other treatment groups. Further, T<sub>1</sub> and T<sub>2</sub> had significantly higher ( $P<0.01$ ) percent heterophils than T<sub>3</sub> and T<sub>4</sub> groups respectively. In addition, the heterophil lymphocyte ratio was significantly lower ( $P<0.05$ ) in T<sub>4</sub> compared to other treatment groups. In histological study T<sub>4</sub> showed highest amount of lymphoid cell proliferation in bursa and caeca, as compared to other treatment groups. Percent protein of breast muscle (pectoralis major) was significantly higher ( $P<0.01$ ) in T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> than T<sub>1</sub> and Se level was significantly higher ( $P<0.01$ ) in T<sub>4</sub> as compared to T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub>. Further, percent protein of thigh muscle (ilio tibialis) was significantly higher ( $P<0.01$ ) in T<sub>3</sub> and T<sub>4</sub> as compared to T<sub>1</sub> and T<sub>2</sub> and Se level was significantly higher ( $P<0.05$ ) in T<sub>3</sub> compared to T<sub>1</sub> and T<sub>2</sub> and comparatively higher than T<sub>4</sub>. Further, Se level was significantly higher ( $P<0.05$ ) in T<sub>4</sub> as compared to T<sub>1</sub> and comparatively higher than T<sub>2</sub>. Thus, it may be concluded that supplementation of nano selenium particles @ 0.3 mg/ kg diet may reduce the adverse effects of stress as depicted by decreased heterophil lymphocyte ratio, increased lymphocytic proliferation in lymphoid organs and enhanced immunity of turkey poults. Further, dietary supplementation of nano selenium particles @ 0.3 mg/ kg diet lead to increase in percent protein in breast and thigh meat cuts and increase in selenium concentration in breast and thigh meat cuts.

#### **14. Influence of graded levels of Moringa leaf meal on the performance of coloured chicken**

An experiment was conducted to study the effect of dietary supplementation of Moringa oleifera dry leaf powder meal at graded levels on the performance of coloured chicken with the objectives: To study the effect of feeding moringa 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+1% Moringa leaf meal (MLM), T3- T1+2% MLM, T4- T1+3% MLM, T5- T1+4% MLM, T6-T1+5% MLM, having three replicates each. There was no clear trend in the weekly body gain of the treatment groups. During 4-8 weeks of age, T4 birds had significantly higher ( $P<0.05$ ) phase wise body weight gain than control and T6 and comparatively higher body weight gain than other treatment groups. During 0-8 weeks of age, phase wise body weight gain of T4 and T5 birds were significantly higher ( $P<0.05$ ) than control and T6 and apparently higher than T2 and T3. Similarly, there was no clear trend in the weekly FCR of the treatment groups. However, during 4-8 weeks of age, T2, T4 and T5 had significantly better ( $P<0.05$ ) FCR than T1 group. Total immunoglobulin response of T2 were significantly higher ( $P<0.01$ ) than T1, T3 and T4 and apparently higher than T5 and T6. Further, T2 had numerically better IgM response than other treatment groups. There was no significant difference in percent yield of cut-up-parts viz. thighs, breast, back, neck, drumstick and wings, among the various treatment groups. There was no significant difference in any of the digestive organs among the treatment groups at 8<sup>th</sup> week of age. Percent protein of breast meat was significantly higher ( $P<0.05$ ) in T3, T4, T5 and T6 than other treatment groups T1 and T2, respectively. Percent protein in thigh (iliotibialis) muscle of coloured chicken after 8 weeks of age was significantly higher ( $P<0.05$ ) in T3 than T1, T2 and T5 and numerically higher than T4 and T6. Thus, it may be concluded that dietary supplementation of 3% moringa leaf meal in coloured chicken resulted in significantly better FCR during 4-8 weeks of growth phase. Dietary supplementation of 1% moringa leaf meal resulted in significantly higher humoral immune response in coloured chicken. Dietary supplementation of 2% moringa leaf meal lead to increase in percent crude protein of breast and thigh meat cuts in coloured chicken.

### **15. Effect of various levels of mint leaf on the performance of coloured chicken**

An experiment designed to study the effect of mint leaf meal on the performance of coloured chicken with the objectives. To study the effect of feeding mint leaf meal on growth performance, immune competence, blood biochemical attributes and carcass quality of coloured chicken. A total of (n=210), day old straight run coloured chicken were distributed into seven dietary treatments: T1-basal diet, T2-T1+0.25% Mint leaf meal (MLM), T3-T1+0.5% MLM, T4- T1+0.75% MLM, T5-T1+1% MLM, T6-T1+1.25% MLM, T7-T1+1.5% MLM having three replicates each. There was no clear trend in the weekly body weight gain till 8 weeks of age. However, during 4-8 weeks, T4 birds had significantly higher ( $P<0.01$ ) body weight gain than T1 and T2 birds and apparently higher body weight gain than T3, T5, T6 and T7. During 0-8 weeks, T4 birds had significantly higher ( $P<0.01$ ) body weight gain than T3 and T5 and apparently higher body weight gain than T1, T2, T6 and T7. There was no clear trend in the weekly FCR. However, during 0-4 weeks of age, FCR was significantly better ( $P<0.01$ ) in control group compared to other treatment groups. During 4-8 weeks of age, FCR was significantly better ( $P<0.01$ ) in T4 compared to T3, T5, T6 and comparatively better than T1, T2 and T7. There was no significant difference among the treatment groups in any of the blood biochemical parameters, carcass quality characteristics and cut up parts among the treatment groups at 8 weeks of age. HA response to 1% SRBC (log<sub>2</sub> titre) was higher significantly ( $P<0.01$ ) in T4 as compared to other treatment groups. Further, the IgM response was significantly higher ( $P<0.01$ ) T2 as compared to other treatment groups. Similarly, IgG response was better in T4 group as compared to the other treatment groups 8 weeks of age. Results indicated that 0.75% coloured bird had a significantly better ( $P<0.01$ ) cell mediated response to PHA-P compared to T1, T2, T3, T5, T6 and T7. Percent ether extract of both breast and thigh muscle was lower in all mint leaf meal supplemented groups compared to control

group. Thus, it may be concluded that dietary supplementation of 0.75% mint leaf meal in coloured chicken resulted in better growth performance after 4 weeks of age and significantly higher humoral and cell mediated immune response in coloured chicken. Dietary supplementation of mint leaf meal lead to decrease in percent crude fat of breast and thigh meat cuts in coloured chicken.

### **16. Effect of dietary supplementation of glutamine on the performance of turkey poult**

The present study was conducted to assess the effect of supplementation of glutamine in turkey poults. Day old turkey poults (n= 84) were distributed into four dietary treatment groups, having three replicates of 7 birds each. The study was conducted in turkey poults during 0 - 8 weeks of age. The birds of the control group (T1) were fed a basal diet, while T2 group was supplemented with 0.5% glutamine along with the basal diet, T3 group was supplemented with 1% glutamine with the basal diet and T4 group was supplemented with 1.5% glutamine along with basal diet. Data on body weight changes indicated that T2 and T3 poults had higher body weight compared other treatment groups in the entire experimental period. The T3 poults had a significantly higher ( $P<0.05$ ) body weight gain and better FCR than other treatment groups. HA titre and IgM response was significantly higher ( $P<0.05$ ) in T3 as compared to other treatment groups. Similarly, IgG response was comparatively better in T3 group as compared to the other treatment groups after 8 weeks of age. However, foot web index value was comparatively better in the 0.5% Gln supplemented group compared to the control group after 8 weeks of age. Serum IgG, IgM and cortisol level was significantly higher ( $P<0.05$ ) in T3 as compared to T1 and comparatively higher than other treatment groups. Total plasma protein and total plasma ALP values was significantly higher ( $P<0.05$ ) in T2 as compared to T1 and comparatively higher than T3 and T4. The SOD value was significantly higher ( $P<0.05$ ) in T2 than other

treatment groups. LPO value was significantly higher ( $P<0.05$ ) in the control group as compared to the glutamine supplemented groups. Supplementation of glutamine at different levels showed normal histoarchitecture of both liver and spleen in all the groups. The changes in group T2 and T4 showed more prominent structures in tissue sections in both liver and spleen such as hepatocytes in liver and germinal centers with red pulp in spleen as compared to control group. Percent shrinkage was significantly higher ( $P<0.05$ ) in the T3 group as compared to T4. Bursa weight was significantly higher ( $P<0.05$ ) in T3 group. Breast percent was significantly higher ( $P<0.05$ ) in T2 group as compared to T4 groups. The percent crude protein level in breast muscle of turkey poult was significantly higher ( $P<0.05$ ) in T3 as compared other treatment groups. It was concluded that Gln supplementation @ 1% elicited the growth performance and immunocompetence traits of turkey poult. Further, supplementation Gln @ 1% resulted in significantly higher SOD and lower LPO values in the serum which reflected better antioxidative status of the turkey poult.

#### **17. Effect of organic, inorganic and nano chromium particles on the performance of turkey poult**

The present study was conducted to assess the effect of supplementation of organic, inorganic and nano particles of chromium on performance of turkey poult. Day old turkey poult ( $n=120$ ) were distributed into four dietary treatment groups, having three replicates of 10 birds each. The study was conducted in turkey poult during 0-8 weeks of age. Poult were fed T1 (control) basal ration, T2- basal ration supplemented with 0.5 mg/kg diet chromium chloride (inorganic chromium), T3- basal ration supplemented with 0.5 mg/kg diet chromium picolinate (organic chromium), T4- basal ration supplemented with 0.5mg/kg diet nano particles of chromium picolinate. No significance difference was observed in average weekly body weight of birds during entire experimental period. No significance difference was observed in average weekly

body weight gain in birds during entire experimental period except at 6<sup>th</sup> week where birds in T3 group had significantly higher ( $P<0.01$ ) body weight gain than T1, T2 and T4. The results indicated that there was no significant difference in the average weekly feed intake of birds among various treatment groups throughout the experimental period. However, T2 birds had significantly higher ( $P<0.05$ ) feed intake than T4 birds during 0-4 weeks. No significance difference was observed in feed intake during 4-8 weeks and 0-8 weeks. There was no significant difference recorded in FCR of birds during the entire experimental period except at 6<sup>th</sup> week where FCR was significantly better ( $P<0.05$ ) in T3 as compared to T4 and comparatively better than other treatment groups. However, when FCR during different phases of growth during 0-8 weeks of age was calculated, significantly better ( $P<0.05$ ) FCR was observed in T3 than T2 and comparatively better than T1 and T4 during 0-4 week. There was no significant difference in FCR of birds during 4-8 weeks and during 0-8 weeks of growth phase. There was no significant difference in total immunoglobulins, IgG and IgM values among treatment groups. Although numerically higher values of total immunoglobulins, IgG, IgM were observed in T4 as compared to the other treatment groups. There was no significant difference observed in the foot web index of birds though the cell mediated immune response measured as foot web index was comparatively better in the nano chromium supplemented group compared to other treatment groups after 8 weeks of age. There was no significant difference observed in serum cortisol, IgG and IgM concentration among treatment groups although apparently higher values were recorded in T4 as compared to other treatment groups. There was no significant difference in plasma total proteins, plasma uric acid, ALT, AST, ALP, plasma total cholesterol and HDL cholesterol values among different treatment groups. SOD values were significantly higher ( $P<0.05$ ) in T4 than T1 and comparatively higher than T2 and T3. LPO values were significantly higher



( $P < 0.05$ ) in T1 as compared to T2, T3, T4. Histological segments of bursa, thymus, spleen and liver showed mild changes in histoarchitecture in organic chromium supplemented group as compared to control group. Significantly higher ( $P < 0.05$ ) dressing percentage was observed in T3 than T1, T2 and T4. There was no significant difference in percent shrinkage and percent ready to cook yield. There was no significant difference in yield of cut up parts among different treatment groups except percent neck yield. Percent neck yield was significantly higher ( $P < 0.05$ ) in T3 than T1 and comparatively higher than T2 and T4. There was no significant difference recorded in development of the digestive organs among the treatment groups except small intestine weight and cecal length. Small intestine weight was significantly higher ( $P < 0.05$ ) in T1 than T2. Cecal length was observed significantly higher ( $P < 0.05$ ) in T4 than T2. Significantly higher weight ( $P < 0.05$ ) of thymus was observed in T4 than T1 and comparatively higher than T2 and T3. Similarly significantly higher ( $P < 0.05$ ) weight of bursa was observed in T4 than T1, T2 and T3. The data obtained on proximate analysis of breast (*pectoralis major*) and thigh (*iliotibialis*) muscle showed that there was no significance difference observed in moisture, dry matter, crude protein, ether extract, total ash and calcium content of the muscle. Chromium content was significantly higher ( $P < 0.05$ ) in T4 than T1 and comparatively higher than T2 and T3 in both breast (*pectoralis major*) muscle and thigh (*iliotibialis*) muscle. Hence dietary supplementation of nano chromium @0.5mg/kg diet may reduce adverse effect of heat stress as depicted by decreased LPO and increased SOD values. Further, supplementation of nano chromium @0.5mg/kg diet resulted in increased deposition of chromium in breast and thigh meat cuts.

#### **18. Effect of Quercetin on sperm characters, capacitation like changes and seminal antioxidant status in cryopreserved Barbari buck semen**

A study was designed to evaluate the cryoprotective effect of quercetin during

freezing and thawing process in Barbari buck semen. Six healthy Barbari bucks of similar age (1.5-2 years) and weight (30-35 kg) were selected as semen donor during the experiment. The semen was collected twice a week from each buck using artificial vagina. A total of 48 ejaculates were collected (eight from each buck) during each experiment. The collected semen was pooled. Pooled semen was divided into five aliquots. Each aliquot was diluted with extender containing different concentration of quercetin viz. 50  $\mu\text{M}$  (T-1), 75  $\mu\text{M}$  (T-2), 100  $\mu\text{M}$  (T-3) and 125  $\mu\text{M}$  (T-4) while no quercetin was added in control (C). The seminal attributes and sperm characters viz. volume (ml), mass activity (0-5 scale), sperm concentration (million/ml), progressive motility (%), sperm livability (%), HOST (%), total sperm abnormal morphology (%) acrosomal integrity (%) and kinematic parameters, membrane fluidity, DNA fragmentation, intracellular Ca level and antioxidative enzyme level were evaluated in the frozen thaw semen. The result of the study showed that quercetin supplementation @75  $\mu\text{M}$  improved the percent viable spermatozoa, membrane integrity as evaluated through HOST. Quercetin improve the path velocity (VCL,  $\mu\text{m}/\text{sec}$ ; VAP,  $\mu\text{m}/\text{sec}$  and VSL,  $\mu\text{m}/\text{sec}$ ) of sperm but do not affect the motion characters of sperm except BCF and ALH. 75  $\mu\text{M}$  of quercetin as supplement reduces the ROS evident through higher values recorded for antioxidative enzyme status (SOD, GST, CAT, GPX). Quercetin maintains the acrosomal integrity, DNA compaction and prevents cells from cryocapacitation and apoptotic changes. Quercetin did not show any significant difference in intracellular Ca ion concentration in post thaw semen.

#### **19. Studies on seroprevalence of brucellosis and molecular detection of organisms causing reproductive disorders in ruminants**

A study was conducted to know the prevalence of brucellosis in ruminants and human of Brij region, Mathura, India, using different serological tests viz. RBPT, STAT and i-ELISA. A total of 493 serum samples

were collected comprising Cattle (90), Buffalo (125), Sheep (135), Goat (113) and Human (50). On analysis total 463 animal samples, RBPT recorded 3.46% (16/463) in animals [6.05% (13/215) in Large Ruminants; 1.21% (3/248) in Small Ruminants] whereas 0% (0/50) in human. STAT showed 10.37% (48/463) [10.23% (22/215) Large Ruminants; 10.48% (26/248) Small Ruminants] and 2% (1/50) in human. Similarly, i-ELISA revealed 6.05% (28/463) [6.51% (14/215) Large Ruminants; 5.65% (14/248) Small Ruminants] and 4% (2/50) in human. Distribution of the antibodies against *Brucella* antigens did not vary significantly ( $P < 0.05$ ) in large ruminants but it varies in small ruminants. On the basis of i-ELISA, percent positivity of brucellosis in goat (10.62%) was found the highest among all the species of animals (10%, 4%, 1.48% in cattle, buffalo, sheep respectively) and human (4%). Females were found more prone to brucellosis. Animals mostly more than 4 years of age in large ruminants and animals up to 4 years and 2 years in sheep and goat respectively found more sensitive towards *Brucella* organisms. In comparison to i-ELISA among total animals, sensitivity of RBPT and STAT were 53.57% and 42.86% respectively with substantial agreement whereas specificity of RBPT and STAT were 99.77% and 91.72% respectively with fair agreement. PCR detected amplicons of 223bp in 28 sera samples employed whereas only 1 sample was detected with *B. abortus* by AMOS PCR at 498bp. Multiplex PCR was standardized for simultaneous detection of *Brucella spp.*, *Mycoplasma spp.*, *Listeria spp.* and *Leptospira spp.* at amplification bands at 223bp, 270bp, 456bp and 331bp respectively. A combination of tests should be carried out to have a concrete evaluation of result. Factors like restricted mixing of new and diseased animals with other herd members, proper hygienic measures, vaccination of animals, testing of animals before merchandise and awareness and knowledge regarding the disease can help reduce the occurrence of this disease which is alarmingly increasing in India.

## 20. Echocardiography and Cardiac biometry in Muzaffarnagari sheep

The present study was carried out on 12 apparently healthy Muzaffarnagari sheep maintained at ILFC, DUVASU, Mathura. The animals were divided into two groups each containing 6 animals to evaluate various Vertebral Heart Score (VHS) and Echocardiographic parameters. Mean  $\pm$  S.E values of body weight and age were measured ( $17.83 \pm 0.70$ , range 10 - 20) kg, ( $4.67 \pm 0.33$ , range 3 - 6) months and ( $37.58 \pm 0.66$ , range 25 - 40) kg, ( $13.83 \pm 0.40$ , range 12 - 15) months in animals of the group-I and II, respectively. The purpose of this study was to establish the standard values for parameters studied. Most of the parameters were found to be non-significantly different between group I and group II animals, except VHS. The mean LA, SA and VHS in group I was  $10.83 \pm 0.23$ cm,  $6.53 \pm 0.14$ cm and  $8.40 \pm 0.14$ v respectively, whereas in group II these mean values were  $12.47 \pm 0.23$ cm,  $7.55 \pm 0.30$ cm and  $8.23 \pm 0.21$ v respectively. The mean LA and SA values showed positive correlation with age and body weight in both the groups, however, mean VHS value showed negative correlation.

In echocardiographic studies, B-mode, M-mode and Doppler mode examinations were performed to generate the reference values of the parameters in Muzaffarnagari sheep. B-mode echocardiographic examinations of animals showed normal structural conformations of various cardiac structures. On M-mode echocardiography, The mean EPSS (mm), RVDd (mm), IVSd (mm), LVDd (mm), PWd (mm), IVSs (mm), LVDs (mm), LVDs (mm), PWs (mm), EF%, FS%, S%, LVM (gms), PW% of group I was  $2.92 \pm 0.52$ ,  $10.98 \pm 0.87$ ,  $8.27 \pm 0.31$ ,  $24.00 \pm 1.50$ ,  $8.05 \pm 0.52$ ,  $11.00 \pm 0.41$ ,  $12.50 \pm 1.02$ ,  $10.98 \pm 1.06$ ,  $81.17 \pm 1.99$ ,  $48.17 \pm 1.99$ ,  $33.00 \pm 6.08$ ,  $40.33 \pm 4.01$ ,  $38.00 \pm 10.97$  respectively, whereas in group II these mean values were  $2.03 \pm 0.31$ ,  $11.15 \pm 0.91$ ,  $7.87 \pm 0.75$ ,  $26.47 \pm 0.91$ ,  $7.90 \pm 0.58$ ,  $10.00 \pm 1.06$ ,  $13.28 \pm 0.96$ ,  $11.08 \pm 0.47$ ,  $82.67 \pm 2.30$ ,  $49.83 \pm 2.41$ ,  $46.17 \pm 10.63$ ,  $46.33 \pm 6.21$ ,  $45.00 \pm 4.58$  respectively. Most of the parameters were

found to be non-significantly different between group I and II of the animals, except RVDd. Positive correlation with age and body weight were observed in M-mode echocardiographic measurements of RVDd, LVDd, IVSs, LVDs, PWs, EF%, FS%, S%, LVM, PW%, while other parameter was negative correlation with age and body weight of the animals. The mean left atrium diameter (LA), aorta diameter (AO) and LA/Ao in group I was  $1.495 \pm 0.49$ ,  $1.462 \pm 0.21$ ,  $0.77 \pm 0.03$  respectively, whereas in group II these mean values were  $1.462 \pm 0.21$ ,  $1.778 \pm 0.81$  and  $0.83 \pm 0.03$  respectively. The left atrium diameter (LA), aorta diameter (AO) showed negative correlation with age and body weight in both the groups, however, LA/AO value showed positive correlation.

The mean E peak, A peak, and E/A value for peak mitral velocity and peak tricuspid velocity of group I was  $0.51 \pm 0.02$ ,  $0.32 \pm 0.01$ ,  $1.59 \pm 0.04$ ,  $0.58 \pm 0.03$ ,  $0.35 \pm 0.02$ ,  $1.66 \pm 0.08$  respectively whereas in group II it was  $0.51 \pm 0.03$ ,  $0.31 \pm 0.03$ ,  $1.66 \pm 0.07$ ,  $0.51 \pm 0.02$ ,  $0.32 \pm 0.02$ ,  $1.62 \pm 0.06$  respectively. The E peak and A peak for both peak mitral velocity and peak tricuspid velocity showed negative correlation with age and body weight, while the E/A for peak mitral velocity showed positive correlation with age and body weight whereas E/A for peak tricuspid velocity showed negative correlation with age and body weight. The mean pulmonary velocity and aortic velocity of group I was  $0.69 \pm 0.03$ ,  $0.70 \pm 0.02$  where as in group II it was  $0.64 \pm 0.03$ ,  $0.68 \pm 0.01$  respectively, however both pulmonary velocity and aorta velocity showed negative correlation with age and body weight. Color doppler study of the flow pattern through mitral, aortic, pulmonary and tricuspid valves revealed unidirectional flow through the valves was seen with absence of mosaic pattern signifying absence of regurgitation.

## **21. Studies on ultrasonography of the pancreas in dogs**

The present study was undertaken to standardize the ultrasonographic examination protocol in dogs and generation of reference images. This study was conducted in two

parts. Part I of the study was conducted on 18 apparently healthy dogs divided into three groups of six animals each namely, group I comprising of animals of 01 to 09 months of age, group II comprising of animals more than 09 months to 06 years of age and group III comprising of animals above 06 years of age. Part II comprised of patients reporting to the VCC with symptoms like lack of appetite, weight loss, acute vomiting, diarrhoea, dehydration, abdominal pain, tucked up belly were enrolled to assess the echotexture and size. Ultrasonographic examination was done in lateral recumbency in all dogs but in some cases, ultrasonography was also done in dorsal recumbency without using any anaesthesia or sedatives. In all the dogs (except one) not all regions of the pancreas were visualized by ultrasound, only thickest portion of the pancreas was identified by ultrasound and was measured by in-built calipers of the ultrasound machine. Ultrasonographic images of the pancreas were recorded in sagittal plane and transverse plane. The right limb of pancreas was visualized in transverse view in right cranial abdomen by placing the transducer just behind the last rib. Direct visualization of the pancreas was not possible. The right limb of the pancreas could be seen dorsomedial to the duodenum, ventral to the right kidney and lateral to the portal vein. The left limb of the pancreas could be identified in a sagittal plane in the left cranial abdomen by keeping the transducer midway between the xiphisternum and the last rib beneath the subcostal arch. The left pancreatic lobe was visualized in a triangular region cranial to the left kidney, caudal to stomach and medial to spleen in the left cranial abdomen. The pancreas appeared to be hypoechoic to isoechoic as compared to surrounding structures in all the groups. The echoarchitecture of both the limbs of pancreas were homogeneous in the animals of all the groups and lacked capsular marginations. The mean width of the right limb of pancreas was  $1.2 \pm 0.03$  cm in group I,  $1.31 \pm 0.06$  cm in group II and  $1.50 \pm 0.06$  cm in group III, being highest in group III and lowest in group I. The mean width of the left



limb of pancreas was  $1.47 \pm 0.16$  cm in group I,  $1.77 \pm 0.10$  cm in group II and  $1.92 \pm 0.15$  cm in group III, mean thickness of the left limb of pancreas was  $1.17 \pm 0.06$  cm in group I,  $1.35 \pm 0.09$  cm in group II and  $1.50 \pm 0.10$  cm in group III. The mean width of limb of pancreas was maximum in group III and minimum in group I.

In the second part of the study the echoarchitecture of both limbs of pancreas were different from those of part I of the study. In part II the pancreas were larger, with irregular demarcation and appeared hypoechoic whereas; the mesentery adjacent to it was hyperechoic. In one animal the width and thickness were 3.22 cm and 2.31 cm, respectively, which were considerably higher than group II (mean width  $1.77 \pm 0.10$  cm, mean thickness  $1.35 \pm 0.09$  cm) and in another case the width and thickness were 3.57 cm and 2.62 cm, respectively, which were considerably higher than the values of animals in group III (mean width  $1.92 \pm 0.15$  cm, mean thickness  $1.50 \pm 0.10$  cm). these ultrasonographic changes corroborated the clinical findings and suggested pancreatic inflammation. On the basis of this study it can be concluded that pancreas in dogs can be scanned without sedation and anaesthesia. Subcostal approach is the best approach to scan the right and left limbs of pancreas using 7.5 MHz curvilinear transducer in lateral recumbency by placing the probe caudal to the last rib and ventral to the lumbar process. The dimensions and the echoarchitecture of the pancreas may assist in the diagnosis of pathologies of the pancreas or other organs.

## **22. Echocardiography of anaesthetised dogs undergoing surgical procedure**

This study was conducted on twelve dogs of different breeds and age (8 males and 4 females) reporting for various surgical procedures. A baseline (T0) echocardiography was performed before administration of any preanaesthetic or anaesthetic agent. The animals were then administered. Atropine and Xylazine and induced with ketamine and maintained with isoflurane. They were then subjected to echocardiography immediately after induction, 10

minutes into anaesthesia/surgery (T10) and at recovery. M-mode parameters were recorded. The baseline RVDd mean value was  $0.82 \pm 0.04$  cm, whereas, it was  $0.90 \pm 0.04$  cm immediately after induction (at 0 minute),  $0.82 \pm 0.03$  cm at 10 minute and  $0.78 \pm 0.02$  cm at recovery. The mean values of LVDd were  $2.84 \pm 0.16$  cm at baseline,  $2.57 \pm 0.15$  cm at 0 minutes,  $2.43 \pm 0.25$  cm at 10 minutes and  $2.24 \pm 0.26$  cm at recovery. The mean values of LVDs were  $1.39 \pm 0.11$  cm at baseline,  $1.57 \pm 0.11$  cm at 0 min,  $1.75 \pm 0.11$  cm at 10 minute,  $1.61 \pm 0.11$  cm at recovery phase. The mean values of IVSd were  $0.77 \pm 0.03$  cm at baseline,  $0.85 \pm 0.03$  cm at 0 minute,  $0.80 \pm 0.03$  cm at 10 minute, and  $0.77 \pm 0.03$  cm during recovery. None of these values varied significantly over different points of time. The mean values of IVSs were  $0.99 \pm 0.03$  cm at baseline,  $0.90 \pm 0.03$  cm at 0 minute,  $0.82 \pm 0.03$  cm at 10 minutes and  $0.78 \pm 0.03$  cm at recovery phase. The decrease in thickness of IVSs was significant ( $P < 0.05$ ) at 0 minute, 10 minute and recovery as compared to the baseline values. However, variation was not significant between 10 and recovery phase, but there was significant decrease in thickness from 0 min. to 10 min. and recovery phase. The mean values of PWd were  $0.93 \pm 0.04$  cm at baseline,  $1.07 \pm 0.04$  cm at 0 minute,  $0.93 \pm 0.04$  cm at 10 minute and  $1.00 \pm 0.05$  cm at recovery phase with no significant variation in thickness at different time interval. The mean values of PWs were  $1.35 \pm 0.05$  cm at baseline,  $1.22 \pm 0.06$  cm at 0 minute,  $1.10 \pm 0.05$  cm at 10 minute and  $1.07 \pm 0.05$  cm at recovery. There was significant ( $P < 0.05$ ) decrease in thickness of PW in systole observed at 0 min, 10 min and recovery phase as compared to baseline values. The decrease in the thickness of PWs from 0 min. to 10 min. and recovery phase was significant ( $P < 0.05$ ). The mean values of FS were  $44.83 \pm 0.76$  % at baseline,  $35.17 \pm 0.94$  % at 0 min,  $33.13 \pm 1.08$  % at 10 min. and  $28.83 \pm 0.98$  % at recovery phase. The decrease in the fractional parameters FS was observed at 0 min, 10 min and recovery phase; that at 0 min in comparison to baseline value and that at 10 min. and recovery phase

in comparison to 0 min were significant ( $P < 0.05$ ). The mean values of EF were  $77.75 \pm 0.72\%$  at baseline,  $65.50 \pm 0.81\%$  at 0 min,  $59.00 \pm 1.13\%$  at 10 min and  $56.75 \pm 0.79\%$  at recovery phase. The decrease in EF values observed at T0, T10 and recovery phase as compared to baseline value and that from 0 min. to 10 min. and recovery phase, were significant ( $P < 0.05$ ). The mean values of LVM were  $63.25 \pm 7.25$  gm at baseline,  $62.20 \pm 7.71$  gm at 0 min,  $60.58 \pm 7.78$  gm. at 10 minute and  $60.67 \pm 7.65$  gm. These variations were non significant ( $p > 0.05$ ). Perioperative echocardiography can be done in dogs when the site of the proposed surgical procedure is away from the site for echocardiography avoiding any risk of breach of asepsis and can also be used for monitoring the heart function during the surgical procedure.

### **23. Studies on Thoracic Radiography, Electrocardiography and Echocardiography in canine**

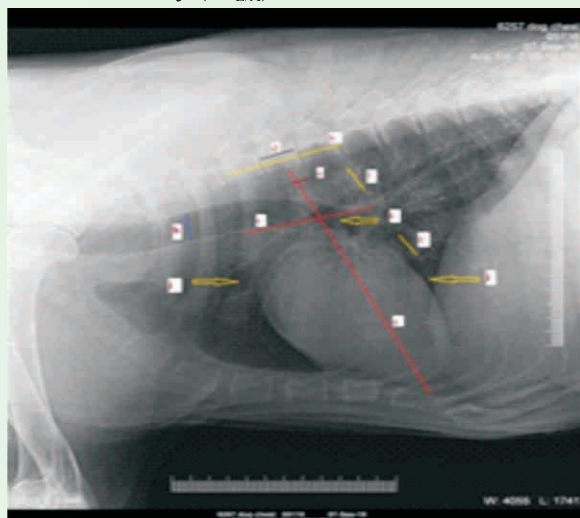
The present study was conducted in two groups to establish the reference values of various cardio-thoracic parameters. In group-I, total eight apparently healthy German shepherd dogs aged 36 - 72 months and body weight 22 – 33.2 kg free from cardio-thoracic diseases were selected, group-II contained three German shepherd dogs suffering with cardiothoracic diseases. Highly significant ( $p \leq 0.05$ ) negative correlation of tracheal diameter/  $T_4$  with age was observed. Significant positive ( $p \leq 0.01$ ) correlation of cardiac inclination angle with body weight, significant negative ( $p \leq 0.01$ ) correlation was seen in cardiac height and tracheal diameter with age and body weight while tracheal diameter/  $T_4$  was found significantly negatively correlated with body weight. Positive correlation with age and body weight were observed in cardiosternal contact, cardiophrenic contact, tracheal angle, cardiac width/  $T_3$ - $T_5$ , cardiophrenic contact /cardiac height, CVC/  $T_4$ , CVC/  $R_4$ , AO/  $T_4$ , AO/  $R_4$ , 2TD/3, cardiac distance and right costophrenic angle. Cardiac width/  $R_3$ - $R_5$ , cardiac height + cardiac width /  $T_3$ - $T_5$  were positively correlated with body weight.

Negative correlation with age and body weight were observed in VHS, cardiac height/thoracic height, cardiac width/thoracic height, cardiac height/  $T_3$ - $T_5$ , cardiac height/  $R_3$ - $R_5$ , cardiac height + cardiac width /  $R_3$ - $R_5$ , cardiac height + cardiac width / thoracic height, CVC/AO, cardiac index, cardiothoracic ratio, leftside costophrenic angle and CdLA/ $R_9$ . Cardiac width/  $R_3$ - $R_5$ , cardiac height + cardiac width /  $T_3$ - $T_5$  were negatively correlated with age.

Heart rate showed negative correlation with age and body weight. Positive correlation of amplitude of S and T wave, QRS complex, duration of T wave, P-R interval and R-R interval with age and body weight; amplitude of Q wave, duration of P wave and Q-T interval with body weight was observed. Positive correlation of amplitude of S and T wave, QRS complex, duration of T wave, P-R interval and R-R interval with age and body weight; amplitude of Q wave, duration of P wave and Q-T interval with body weight was observed. Negative correlation of amplitude of P and R wave, S-T interval with age and body weight; amplitude of Q wave, duration of P wave and Q-T interval with age was observed.

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 was observed in M-mode echocardiographic measurements of EPSS, RDVd, PWd, PWs and LVM. IVSd was found positively correlated with age and stroke volume index (SVI), LA/Ao with body weight. Negative correlation with age and body weight was observed in M-mode echocardiographic measurements of LVDd, IVSs, LVDs, EF %, FS %, S %, PW %, EDV, ESV, stroke volume, cardiac output and cardiac index. IVSd was found negatively correlated with body weight and stroke volume index (SVI), LA/Ao with age. Positive correlation with age and body weight was observed in Doppler echocardiographic measurements of Peak tricuspid velocity (A peak) while age was positively correlated with Peak mitral velocity (ME/A).

Negative correlation with age and body weight was observed in Doppler echocardiographic measurements of Peak mitral velocity (A peak, P peak), Peak tricuspid velocity (E peak,  $T_{E/A}$ ), pulmonary velocity and aortic velocity while body weight was negatively correlated with Peak mitral velocity ( $M_{E/A}$ ).



**Fig. Thoracic radiograph of dog showing measurement of various parameters**

#### **24. Studies on effect of quercetin on freezability of Haryana bull spermatozoa**

The present investigation was planned to evaluate the beneficial effect of Quercetin on different seminal attributes (progressive motility, liveability, HOST reactivity, acrosomal integrity, capacitation status) and antioxidant enzymes (SOD, LPO [MDA]) during freeze-thaw process of Haryana bull spermatozoa. Eight ejaculates from four Haryana bulls ( $8 \times 4 = 32$ ) were evaluated for volume (ml), mass motility, seminal pH, concentration (millions/ml) and progressive motility of spermatozoa and upon evaluation of their parameters in the prescribed range were used for further processing. Semen samples were extended with EYTG and EYTG + Quercetin @ (20 $\mu$ M, 40 $\mu$ M and 60 $\mu$ M). The control (EYTG) and treatment (EYTG + Quercetin @ 20, 40, 60,) groups were subjected to the process of cryopreservation and evaluated for various parameters of freeze-thaw process. In the neat semen of Haryana bulls, no significant ( $P > 0.05$ ) difference was observed among volume (ml), mass motility, seminal pH, concentration

(millions/ml) and progressive motility. After dilution, pre-freeze and post-thaw stage, all parameters i.e. progressively motile spermatozoa, live spermatozoa, membrane integrity (HOST), spermatozoa with intact acrosome (Giemsa), capacitation status of spermatozoa along with antioxidative enzymes (SOD, LPO [MDA]) were found to differ significantly ( $P < 0.05$ ). The per cent progressive motility, live sperm percentage, per cent HOS positive spermatozoa, per cent spermatozoa with intact acrosome, uncapacitated spermatozoa were significantly ( $P < 0.05$ ) higher in  $T_2$  group as compared to control and other treatment groups ( $T_1$  and  $T_3$ ). For antioxidant enzymes, the significantly higher values were found with  $T_3$  group (60 $\mu$ M quercetin).

Thus, Quercetin supplementation at concentration of 40  $\mu$ M produce better results in the terms of sperm per cent progressive motility, live sperm percentage, per cent HOS reactive spermatozoa, per cent spermatozoa with intact acrosome, Quercetin at the concentration of 40  $\mu$ M can be added to the Tris extender for its positive effect on sperm progressive motility, live %, membrane integrity, acrosomal integrity

#### **25. Studies on effect of Taurine on cryopreservation of Haryana bull spermatozoa**

The present investigation was planned to evaluate the beneficial effect of Taurine on different seminal attributes (liveability, progressive motility, HOST reactivity, acrosomal integrity, capacitation status) and antioxidant enzymes (SOD, LPO [MDA], GST) during freeze-thaw process of Haryana bull spermatozoa. Seven ejaculates from four Haryana bulls ( $7 \times 4 = 28$ ) were evaluated for volume (ml), pH, mass motility, concentration (millions/ml), progressive motility and live percentage of spermatozoa and upon evaluation of their parameters in the prescribed range, were used for further processing. Semen samples were extended with EYTG and EYTG + taurine @ (25mM, 50mM, 100mM and 200mM). The control (EYTG) and treatment (EYTG + taurine @ 25, 50, 100, 200) groups were subjected to the process of cryopreservation and evaluated for



various parameters during different stages (post dilution and pre-freeze) of freeze-thaw process. In the neat semen of Hariana bulls, no significant ( $P < 0.05$ ) difference was observed among seminal pH, concentration (millions/ml), progressive motility and live sperm percentage, however, significant difference was observed for semen volume (ml) and mass motility (0-5 scale). After dilution, pre-freeze and post thaw stage, all parameters i.e. live sperm percentage, HOS positive spermatozoa, sperm with intact acrosome, 'F', 'B', 'AR' pattern spermatozoa (CTC assay) and antioxidant enzymes (SOD, LPO[MDA] and GST) did not found to differ significantly ( $P > 0.05$ ). However, the percentage of progressively motile spermatozoa differ significantly ( $P < 0.05$ ) between control and treatment groups. Taurine between 25 to 50 mM behave similar to control, however, at 100 and 200 mM suppresses the progressive motility. In conclusion, Taurine (25 to 200 mM) did not improve the freezability of Hariana bull spermatozoa based on the parameters covered under this study. However, its higher concentration (100 mM and 200 mM) inhibited the progressive motility of spermatozoa.

## **26. Studies on effect of egg yolk powder on freezability of Hariana bull spermatozoa**

The present study was to evaluate the effect of Egg yolk powder as a substitute in Tris egg yolk base extender in Hariana bull semen opted for cryopreservation. The study evaluated physico-morphological seminal attributes (motility, livability, HOS response and acrosomal integrity). Post-thaw seminal plasma enzymes activities (SOD, LPO and GST) was also evaluated cryocapacitation like changes and tyrosine phosphorylation. Eight ejaculates collected from four Hariana bulls were divided into seven aliquots. One aliquot diluted with egg yolk tris glycerol (EYTG) extender Group I (Control without egg yolk powder), Group II was diluted with Iris glycerol and supplemented with 5% egg yolk powder/  $100 \times 10^6$  spermatozoa, Group III was diluted with tris glycerol and supplemented with 10% egg yolk powder/  $100 \times 10^6$  spermatozoa. Group IV was diluted with tris glycerol and supplemented

with 15% egg yolk powder/  $100 \times 10^6$  spermatozoa, Group V was diluted with tris glycerol and supplemented with 20% egg yolk powder/  $100 \times 10^6$  spermatozoa were cryopreserved. Semen evaluation after equilibration and post-thaw stages showed supplementation of with 5% egg yolk powder/  $100 \times 10^6$  spermatozoa in semen significantly ( $p < 0.05$ ) increased motility (%), sperm livability (%), HOST (%), and % acrosomal integrity of spermatozoa. In the present study, seminal plasma enzymatic profile of semen viz. SOD, GST and MDA were evaluated at post-thaw stage of semen cryopreservation and significant ( $p < 0.05$ ) difference was observed between estimated seminal plasma enzymatic profile. The degree of cryocapacitation was ( $p < 0.05$ ) decreased in the group supplemented with 5% egg yolk powder/  $100 \times 10^6$  spermatozoa at post-thaw stage of cryopreservation. Immunoblots revealed five proteins which were tyrosine phosphorylated proteins at middle piece, principal piece, acrosome and post acrosome regions at post-thaw stages of cryopreservation. The result of the present study clearly demonstrated beneficial effect of egg yolk powder, 5% on cryopreservation of Hariana bull spermatozoa.

## **27. Studies on effect of IGF – 1 on cryopreservation of Hariana bull spermatozoa**

This experiment was designed to study the effect of insulin like growth factor (IGF-1) on cryopreservation of Hariana bull spermatozoa. For this purpose, semen ejaculates were collected from four Hariana bulls using artificial vagina at biweekly interval. The semen sample which possess more than 70% initial progressive motility and above 500 million/ml spermatozoa concentration was subsequently subjected to processing for experiment. Semen samples were extended in egg yolk tris glycerol (EYTG) extender and split into four parts. For these parts IGF-1 added @ 50 ng/  $80 \times 10^6$  spermatozoa, 100 ng/  $80 \times 10^6$  spermatozoa and 150 ng/  $80 \times 10^6$  spermatozoa in group II, III, IV respectively and group I taken as control (without IGF-1). Semen samples were evaluated at pre-freeze and post-thaw stage for per cent live spermatozoa, percent individual progressive

motility, percent HOS positive spermatozoa, percent spermatozoa with intact acrosome and seminal plasma enzyme (SOD,MDA) activity. A significant ( $P<0.05$ ) higher individual progressive motility, viability, HOS response and acrosomal integrity observed at pre-freeze and post-thaw stage by using 150 ng/ml IGF-1. No significant ( $P<0.05$ ) difference was observed in seminal plasma enzymatic (SOD, MDA) activity both at pre-freeze and post-thaw stages. However, the SOD and MDA activity in seminal plasma was non significantly lower in group IV (supplimented with IGF-1 @ 150 ag/80 x 10<sup>6</sup> spermatozoa). Concentration of 150 ng/ml IGF-1 was found to be more beneficial in cryopreservation of Haryana bull spermatozoa as evidenced by post-thaw seminal parameter. Study suggests that IGF-1 can be added to extender for improving cryosurvial of Haryana bull spermatozoa.

#### D. M.Sc.

##### College of Biotechnology

#### 1. Isolation, identification and virulence typing of *Escherichia coli* from clinical cases (animals and humans) and their surroundings

The purpose of study was to determine molecular characteristics, biofilm production and antimicrobial pattern of *E. coli* in animals, humans and their environment. Out of total 200 samples [animals (n=70), humans (n=65) & environment samples (n=65), 35 *E. coli* isolates were obtained. Out of 35 *E. coli* isolates from various sources, 2 pathogenic *E. coli* (only VTEC, no EPEC) were obtained, which was 5.71% of the total *E. coli* and 1% of the total samples collected. Percentage of pathogenic *E. coli* (VTEC) from animal, human & environmental samples were 6.89%, 0% & 0%, respectively. From animal samples, % pathogenic *E. coli* (VTEC) in cattle faeces and urine were 10% & 9.09%, respectively. No pathogenic *E. coli* was found in human and environment samples. A total of 35 isolates of *E. coli* were screened by multiplex PCR for virulence to detect the presence of stx1, stx2 (variants of stx2), eaeA, hlyA and rfb O157 gene. Only one (4.45%) isolate was found carrying the stx2 gene alone while the other isolate was found carrying two or more pathogenic genes (stx1, stx2 and

hlyA) in combinations. All samples were found negative for eaeA and rfb O157 gene. The overall percent positivity by phenotypic detection of biofilm producing *E. coli* by CRA, TM & TCP method showed biofilm formation 62.85%, 62.85% and 74.28% respectively. Biofilm producing *E. coli* isolates showing the very high prevalence i.e. 45.71% (16/35) for the luxS gene which is confirmation of biofilm production Also, the AntibioGram testing has been done on all positive *E. coli* (VTEC) isolates using 18 antibiotics. After testing, result revealed that imipenem (100%) showed highest sensitivity. The sensitivity of all others was below 50%. While antibiotics like vancomycin (100%), linezolid (100%) ampicillin (97.14%) erythromycin (88.57%), and oxacillin (85.71%) showed highest resistance towards the *E. coli* isolates. The multi drug resistance of biofilm producing *E. coli* strains showing maximum to ampicillin (97.14%) followed by erythromycin (88.57%), gentamicin (88.57%) and co-trimoxazole (57.14%).

#### Photographs

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

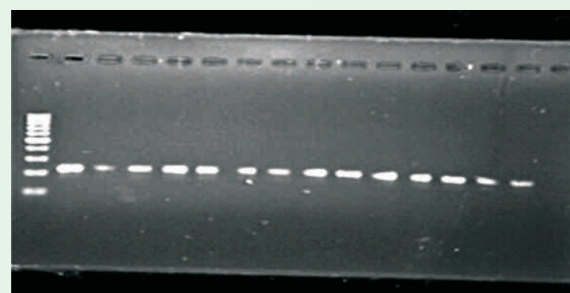


Figure : Gel electrophoresis of PCR amplified fragments by using B4/B5 primer pair

Lane 1 – 100 bp DNA Ladder

Lane 2 – Positive Control

Lane 3 to 15 – Positive Samples showing *Brucella* genus at 223 bp

Lane 16 – Negative Control

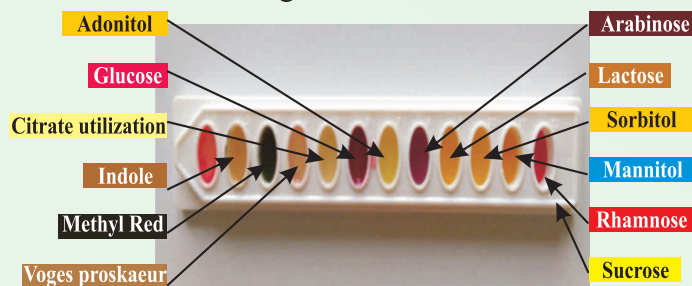
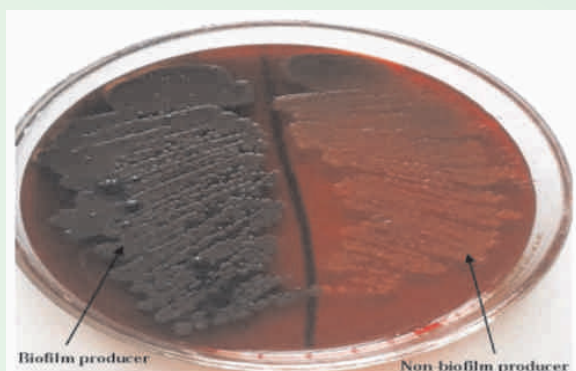


Figure: Biochemical test kit showing Biochemical reaction of *E. coli*



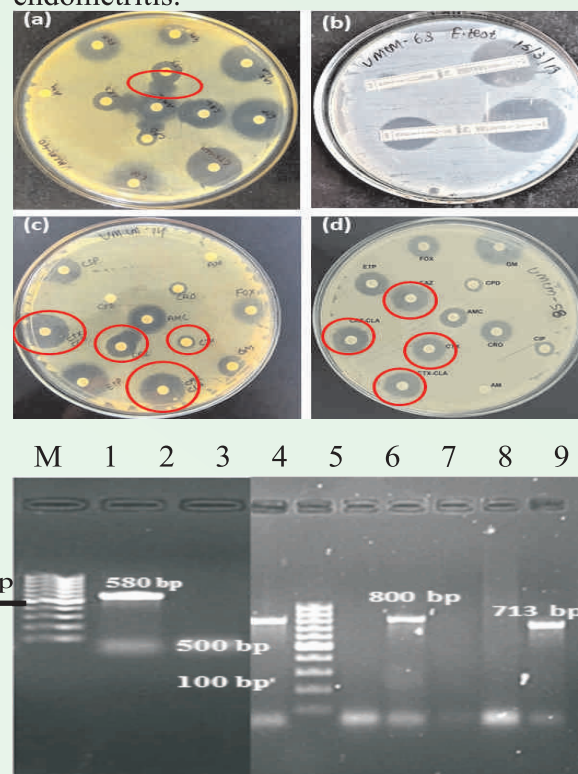


**Figure : CRA methor applied on CRA medium. Black Crystalline colonies showing the biofilm producer and pinkish-red colonies of non-biofilm producing *E. coli***

## 2. Isolation and characterization of Extended - Spectrum - $\beta$ - Lactamase producing organism from bovine female reproductive tract with special reference to *Escherichia coli*

Extended-spectrum  $\beta$ -lactamase (ESBL) producing Enterobacteriaceae, resistance against third- generation cephalosporin is a serious public health concern. The present study was conducted to obtain the prevalence of ESBL positive organism in bovine uterine infection. The study population included non-repetitive 70 cow and buffaloes from Mathura and adjoining region. Uterine samples were collected from animals with the history of clinical endometritis and processed in the laboratory for bacterial isolation. Bacterial isolates were characterized by biochemical test for genus and species determination. Antimicrobial susceptibility tests were performed for initial screening of ESBL organism. 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 62 isolates were identified as ESBL-producing Enterobacteriaceae, which includes *E. coli* (64.5%), *Klebsiella* Sp (11.2%), *Citrobacter* (8.06%), *Serratia* (6.45%), *Entrobacter* (3.22%), and *Pseudomonas* (3.22%). Most of the isolate showed high rate (69%) of resistance for three cephalosporin antibiotic (cefotaxime,

ceftriaxone, and cefpodoxime) combined. A high proportion of isolates were found to have MIC value  $\geq 32 \mu\text{g}$  for cefotaxime, amoxicillin, ampicillin, ceftazidime, and enrofloxacin. In the present study, bla CTX-M was observed as a predominant beta-lactamase type with the preponderance of CTX-M group 1, whereas, 37.5% organisms were also found positive for bla TEM type ESBL. The study found carbapenemase prevalence of 6.45 % in the isolates using phenotypic tests. These CPE isolates were found to have co-localized bla VIM and bla IMP beta-lactamase. The phylogenetic grouping of the 40 *E. coli* strains was done using the Clermont multiplex PCR methods. Highest prevalence was observed for B1 (22.0 %) followed by A (20%), C (12.0%), D (12.0%), F (8.0%), E (3.0 %), Clad I (3.0 %). In vitro antimicrobial test using *Polyalthia longifolia* and *Eucalyptus robusta* extract showed minimum or no antimicrobial property against gram negative bacilli. In conclusion we have observed a very high prevalence of ESBL *E. coli* in bovine clinical endometritis.



**Figure : PCR amplification of bla CTX-M gene (580 bp) DNA ladder Lane 1: bla CTX-M Lane3, 6: bla TEM Isolate, Lane 9 bla SHV and Lane 2 and 8: *E.coli* ATCC25922**



## EXTENSION

## 1. Directorate of Extension

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

S. No.	Theme of Training	Duration	No. of Trainees	Beneficiaries	Funding Agency
1.	Master Training Programme on "Improving Reproductive efficiency of dairy animal using Artificial Insemination technique"	17 <sup>th</sup> - 21 <sup>th</sup> June, 2019	13	Veterinary Officers	Uttar Pradesh Livestock Development Board (UPLDB)
2.		22 <sup>nd</sup> - 26 <sup>th</sup> July, 2019	14		
3.		05 <sup>th</sup> - 09 <sup>th</sup> August, 2019	14		
4.		02 <sup>nd</sup> - 06 <sup>th</sup> Sept., 2019	14		
5.		10 <sup>th</sup> - 14 <sup>th</sup> Feb, 2020	05		
6.	Refresher training programme on Capacity building for effective delivery of critical services	27 <sup>th</sup> - 29 <sup>th</sup> Feb, 2020	15	Uttar Pradesh Veterinary Officer	Uttar Pradesh Veterinary council
7.	ATMA training programme on Scientific management of dairy animals	02 <sup>nd</sup> - 06 <sup>th</sup> Mar, 2020	30	Farmers	ATMA, Bharatpur (Rajasthan)



## B. Visit of Farmers/Students/Officials

S. No.	Date	Details of Visit	Sponsoring Agency	Remarks
1.	03 <sup>rd</sup> Jun., 2019	08 Farmers under the leadership of Shri R.S. Rajput. from Agriculture Department, Hoshangabad district of Madhya Pradesh state	State Government under Mukhyamantri Khet Thirtha Yojanantaragt	Provided hands on training on basic concept of dairy management and visit to dairy farm and Pashu Gyan Chaupal
2.	28 <sup>th</sup> Jun., 2019	15 Farmers with 02 departmental personnel under the leadership of Dr. A. R. Jangle (VAS) and Shri Yogesh Chahar (AVFO) from Malkharoda block of Janjgir District of Chhatisgarh state	State Government under Krishak Kaushal Vikas Yojana	Provided information & literature regarding dairy farming & visit of PGC and dairy
3.	22 <sup>nd</sup> Jul., 2019	15 Farmers under the leadership of Dr. H. S. Chandrakar (VAS, Utai) from Utai Block of Durg District of Chhatisgarh State	Animal Husbandry Department of Chhatisgarh state	Provided information & literature regarding scientific dairy and goat farming at college farm and delivered the lecture on Management dairy animals
4.	08 <sup>th</sup> Aug., 2019	35 Farmers under the leadership of Dr. C.P. Mishra (VAS) and Dr. Tikesh Thakur (VAS) from Bhanupratapur and Durgukondal Block of Kanker district of Chhattisgarh state	Animal Husbandry Department of Chhatisgarh state	Provided lecture on Importance of conservation of Indigenous germplasm and scientific milking methods at seminar hall of PGC, Visit of Dairy Farm and literature about the animal husbandry practice
5.	14 <sup>th</sup> Sept., 2019	15 Farmers under the leadership of Santosh Kumar Mandawa from Bemetara district of Chhattisgarh State	Animal Husbandry Department of Chhatisgarh state	Provided information & literature regarding dairy farming & Visit of PGC and dairy farm
6.	14 <sup>th</sup> Sept., 2019	36 Input Dealers of Mathura Uttar Pradesh	ATMA, Mathura	Provided information & literature regarding dairy farming and University dairy farm
7.	23 <sup>rd</sup> Sept., 2019	11 Farmers under the leadership of Dr. Anil Karsh from Janjgir, Champa Chhatisgarh state	Department of Animal Husbandry, Chhattisgarh State	Provided information & literatures regarding scientific dairy farming
8.	21 <sup>st</sup> Oct., 2019	Akshay Ashok Raut, Mathura Army Camp belong to Beed district of Maharashtra state	Self Visit	Provided information & literature about Dairy Farming and suitable breeds for dairy

9.	10 <sup>th</sup> Nov., 2019	30 Farmers under the leadership of Dr. S.P.Shukla from Ganna Kisan Sansthan Prashichhan Kendra, Gonda (Uttar Pradesh)	Ganna Sansthan	Provided information & literature regarding Animal husbandry at Semianr hall of PGC & Visit of Dairy
10.	15 <sup>th</sup> Jan., 2020	48 Internship students of College of Veterinary Science & Animal Husbandry, Junagarh under the leadership of Dr. Santosh Morandi, Assistant Professor (Gujarat)	Junagarh Agriculture University (Gujarat)	Provided brief information about the Dairy farm, PGC and conservation projects of Indigenous breed and Farm Visit of Students
11.	25 <sup>th</sup> Feb., 2020	50 Farmers under the leadership of Mohammad Umar from Ganna Kisan Sansthan Prashichhan Kendra, Pipraich, Gorakhpur (Uttar Pradesh)	Ganna Sansthan	Provided literature and information about the dairy farming, health management and composting visit of PGC and Dairy
12.	27 <sup>th</sup> Feb., 2020	24 Farmers under the leadership of Dr. Nilkhanth (VAS Charama) and Dr. Virender Singh Nag (VAS Narharpur) from Kanker district of Chhatisgarh	Krishak Kaushal Vikas Yojana	Provided hands on training, information and literature about dairy and goat farming. Visit of PGC, Goat unit and Dairy
13.	28 <sup>th</sup> Feb., 2020	40 Farmers under the leadership of Dr. Navin Kumar Sharma from KVK, Kaushambi of Uttar Pradesh	ICAR, New Delhi	Visit of Dairy farm and PGC, Distribution of literature to the farmers about the animal husbandry practices
14.	29 <sup>th</sup> Feb., 2020	48 Farmers under the leadership of Dr. Radhey Shyam Singh (SMS) from Dy. Director Agriculture Agra (Uttar Pradesh)	Department of Agriculture	Provides hands on training, information and literature about dairy and goat farming. Visit of PGC and Dairy





### C. Training Manual Published: 02

1. Sarvajeet Yadav, Amit Singh, Anuj Kumar, Deep Narayan Singh and Vikas Sachan (Eds.) 2019. Master Training Programme on “Improving Reproductive efficiency of dairy animal using Artificial Insemination technique” Under National Livestock Mission (Sponsored by U.P.L.D.B, Lucknow) – 2019. Pp 1-120: DUVASU publication no. 186.
2. सर्वजीत यादव, दीप नारायण सिंह एवं अमित सिंह (2020). डेयरी व्यवसाय की वैज्ञानिक पद्धति. दुवासु प्रकाशन।

### 2. Department of Veterinary And Animal Husbandry Extension

The mandate of this department is to provide livestock owners with information and innovative knowledge by adopting improved technologies that may enhance their skills, increase their productivity, provides more employment opportunities and thereby making them economically sound. The department is also involved in under-graduate and post-graduate teaching to the students to equip them with methodologies to diffuse innovative researches among livestock owners in order to make them economically viable.

#### Exposure visit of the farmers conducted

S. No.	Department / Agency	Date	Number of beneficiaries	
			Male	Female
1.	Farmer visit (Chhattisgarh)	14 <sup>th</sup> Nov., 2019	15	-
2.	State uma secondary school bechgaon, mathura	25 <sup>th</sup> Nov., 2019	19	-
3.	Farmer visit (Chhattisgarh)	26 <sup>th</sup> Nov., 2019	17	-
4.	Farmer visit (Chhattisgarh)	26 <sup>th</sup> Nov., 2019	19	-
5.	P.D. ATAMA, School (M.P.)	07 <sup>th</sup> Dec., 2019	23	-
6.	Farmer visit (Chhattisgarh)	30 <sup>th</sup> Dec., 2019	16	-
7.	Farmer visit (Chhattisgarh)	28 <sup>th</sup> Feb., 2020	15	-

### 3. Other Extension Activities By The College of Veterinary Science And Animal Husbandry

#### ● Extension trainings organized by different departments

S. No.	Theme of Training	Duration	No. of Trainees	Beneficiaries	Department
1.	Training on "मृत पशुओं के अंगों के व्यवसायिक उपयोग पर ग्रामीण युवाओं के लिये कौशल विकास प्रशिक्षण" under R.K.V.Y. Project entitled "Entrepreneurial promotion by preparation of specimens from fallen animals"	21 <sup>st</sup> - 23 <sup>rd</sup> Nov., 2019	20	Rural unemployed youth	Department of Veterinary Anatomy
2.		16 <sup>th</sup> - 18 <sup>th</sup> Dec., 2019	18		
3.		07 <sup>th</sup> - 09 <sup>th</sup> Jan., 2020	20		
4.		23 <sup>rd</sup> - 25 <sup>th</sup> Jan., 2020	20		
5.		10 <sup>th</sup> - 12 <sup>th</sup> Feb., 2020	20		
6.		05 <sup>th</sup> - 07 <sup>th</sup> Mar., 2020	19		

7.	Three days training programme on “Control of subclinical parasitism in dairy animals” under RKVY project entitled “Strategic control of subclinical parasitism for better animal health and enhanced productivity in Uttar Pradesh”	24 <sup>th</sup> - 26 <sup>th</sup> Feb., 2020	20	Veterinary Officers	Department of Veterinary Parasitology
8.	Six days training on “Application of diagnostic imaging technology and management of surgical conditions in animals” organised under All India Network Programme on Diagnostic Imaging and Management of Surgical Conditions in Animals (AIND-DIMSCA)	27 <sup>th</sup> Jan. 02 <sup>nd</sup> Feb., 2020	10	Veterinary Officers	Department of Veterinary Surgery and Radiology
9.	Two days workshop on 'Productivity enhancement in goats through artificial insemination: scopes, challenges and strategies' under RKVY funded project	13 <sup>th</sup> - 14 <sup>th</sup> Jan., 2020	10	Veterinary Officers	Department of Veterinary Physiology
	Two Training programmes on 'Artificial Insemination in goats' under RKVY funded project	24 <sup>th</sup> - 27 <sup>th</sup> Feb., 2020	28		
11.		04 <sup>th</sup> - 07 <sup>th</sup> Mar., 2020	20		
12.	Awareness programme on Swachhta and Pashujanya rog and distributed folders under ICAR funded OPZD project	05 <sup>th</sup> Apr., 2019	--	Murga Phatak slaughter workers and Khatik Muhalla, Sadar, Mathura	Department of Veterinary Public Health
13.	Awareness programme on Brucellosis and Swachhta and distributed folders under ICAR funded OPZD Project	5 <sup>th</sup> Mar., 2020	--	Gaushalas and Government Veterinary Hospital, Vrindavan	



**Training by Department of Veterinary Anatomy under RKVY project**



**Training by Department of Veterinary Parasitology under RKVY Project**



**Training by Department of Veterinary Surgery and Radiology under AINP-DIMSCA**



**Workshop by Department of Veterinary Physiology under RKVY Project**



**Two days workshop on 'Productivity enhancement in goats through artificial insemination: scopes, challenges and strategies' under RKVY funded project**



**Awareness Programme and kit distribution at Hasanand Gaushala, Vrindavan on 1<sup>st</sup> March 2020**





**Awareness Programme and kit distribution at Government Veterinary Hospital, Vrindavan on 1<sup>st</sup> March 2020**

● **Extension training lectures / publication by different departments**

S. No.	Title of the lecture	Published in	Authors
1.	मृत पशुओं का टैक्सीडर्मी (चर्मपूर्ण) प्रक्रिया द्वारा संरक्षण	Training on "मृत पशुओं के अंगों के व्यवसायिक उपयोग पर ग्रामीण युवाओं के लिये कौशल विकास प्रशिक्षण" under R.K.V.Y. Project entitled "Entrepreneurial promotion by preparation of specimens from fallen animals"	वर्षा गुप्ता, एम. एम. फारुकी, अजय प्रकाश, अर्चना पाठक, अभिनव वर्मा एवं श्री प्रकाश सिंह
2.	मृत पशुओं के फेफड़े को हवा में सुखा कर पढ़ने योग्य नमूना बनाना।		श्री प्रकाश, एम. एम. फारुकी, अजय प्रकाश, अर्चना पाठक, अभिनव वर्मा व वर्षा गुप्ता
3.	मृत पशुओं के पेट में गुब्बारे की मदद से पढ़ने योग्य नमूना बनाना		श्री प्रकाश, एम. एम. फारुकी, अजय प्रकाश, अर्चना पाठक, अभिनव वर्मा व वर्षा गुप्ता
4.	मृत पशुओं से अस्थियों को निकालने एवं अस्थि पिंजर बनाने की विधियाँ		अभिनव वर्मा, अजय प्रकाश, एम. एम. फारुकी, अर्चना पाठक, श्री प्रकाश सिंह एवं वर्षा गुप्ता
5.	कंकाल बनाने हेतु अस्थियों को साफ करने की प्रक्रिया का प्रशिक्षण		अर्चना पाठक, अजय प्रकाश, एम. एम. फारुकी एवं अभिनव वर्मा
6.	सिलिकॉन द्वारा पशुओं के फेफड़े का कास्ट बनाने की विधि का प्रशिक्षण		अर्चना पाठक, अजय प्रकाश, एम. एम. फारुकी एवं वर्षा गुप्ता
7.	पेट एवं आँतों को साफ करने की प्रक्रिया का प्रशिक्षण		अर्चना पाठक, अजय प्रकाश, एम. एम. फारुकी एवं श्री प्रकाश
8.	खाल या त्वचा का चमड़े में रूपांतरण: संरक्षण और प्रसंस्करण		विकास पाठक, मीना गोस्वामी अवस्थी एवं संजय कुमार भारती
9.	खाल का चमड़े में परिवर्तन		मीना गोस्वामी अवस्थी, विकास पाठक एवं संजय कुमार भारती
10.	Cytological examination of milk	Training manual on Laboratory & X-ray Techniques in Animals for Paraveterinary Professionals of Sashastra Seema Bal, DUVASU Publication-192	Meena Goswami and Vikas Pathak
11.	Feed Supplements to Improve Livestock Production		Raju Kushwaha, Vinod Kumar, Muneendra Kumar, Shalini Vaswani, Avinash Kumar
12.	Vaccination of Livestock		Udit Jain

13.	Common Zoonotic Diseases of Animals and their control measures	Training manual on Laboratory & X-ray Techniques in Animals for Para veterinary Professionals of Sashastra Seema Bal, DUVASU Publication-193	Udit Jain
14.	Effect of balanced ration on dairy animal productivity and health	Training manual masters training programme by UPLDB published by Directorate of Extension, DUVASU, Mathura, 2019	Vinod Kumar, Muneendra Kumar, Raju Kushwaha, Shalini Vaswani, Avinash Kumar
15.	Strategies for Revitalizing fodder Production availability throughout the year		Shalini Vaswani, Vinod Kumar, Muneendra Kumar, Raju Kushwaha, Avinash Kumar
16.	Recent innovation in ensuring fodder availability throughout the year		Muneendra Kumar, Vinod Kumar, Raju Kushwaha, Shalini Vaswani, Avinash Kumar
17.	Dudharu avam garnhit pashuon ka poshan prabandhan	Training manual ATMA from Directorate of Extension, 2020	Muneendra Kumar Vinod Kumar
18.	Effect of Balanced ration on dairy animal productivity and health	Masters training programme of 05 days entitled organized by Directorate of Extension, DUVASU, Mathura, 2020	Muneendra Kumar Vinod Kumar
19.	बकरियों का खाद्य प्रबंधन: उन्नत बकरी पालन	Training manual published under RKVY project by Department of Veterinary Physiology, 2020	Shalini Vaswani, Vinod Kumar
20.	Endoscopy in veterinary practice-principles, instrumentation and clinical application	Refresher training programme manual on capacity building of veterinary officers for effective delivery of critical services held in Extension Department 2020	Rudra Pratap Pandey, Sanjay Purohit, Gulshan Kumar
21.	Radiography in veterinary practice-principles, instrumentation and clinical application		Gulshan Kumar
22.	Ultrasonography in veterinary practice-principles, instrumentation and clinical application		Sanjay Purohit
23.	Common and special surgical interventions in goats	Refresher training programme manual on capacity building of veterinary officers for effective delivery of critical services held in extension department, 2020	R.P. Panday
24.	Guidelines for certain procedures in bovine		Rudra Pratap Pandey, Sanjay Purohit, Gulshan Kumar
25.	Bovine foot lameness and its impact on fertility		Rudra Pratap Pandey, Gulshan Kumar
26.	Brucellosis and its vaccination		Udit Jain and Parul
27.	Zoonotic diseases of importance		Parul and Udit Jain
28.	नवीन तकनीकों द्वारा पशु रोगों के लिए परीक्षण एवं टीकाकरण	DUVASU, Pashudhan Patrika, July 2019	Parul, Udit Jain & Barkha Sharma
29.	गोवंशी पशुओं में सिंग का कैंसर		Gulshan Kumar
30.	गर्भित गाय और भैंसों में गर्भाशय की ऐठन		Vikas Sachan, Jitendra Agrawal, Avneesh Kumar Singh

31.	भारतीय परिपेक्ष्य में पशुपालन एवं प्रबन्धन	DUVASU, Pashudhan Patrika, July 2019	Jitendra Agrawal Vikas Sachan, Atul Saxena
32.	पशुओं में बांझपन कारण एवं निवारण		Jitendra Agrawal, Vikas Sachan, Atul Saxena
33.	आदर्श साइलेज उत्पादन ।	साइलेज: संरक्षित हरा चारा ।	D.N. Singh, Rajneesh Sirohi and Yajuvendra Singh
34.	हरे चारे का संरक्षण ।		D.N. Singh, Rajneesh Sirohi and Yajuvendra Singh
35.	Care of new born calf	Pashu Sandesh, January, 2020	Vikas Sachan, Shashikant Gupta
36.	Embryo transfer technique in animals an introduction	Pashu Sandesh, March, 2020	Vikas Sachan, Akshay Kumar
37.	Pregnancy and parturition manage- ment in goat		Vikas Sachan, Jitendra K Agrawal

### Publish Folders and leaflets for awareness of farmers by different departments

S. No.	Name of folder/leaflet	Department
1.	Pashujanya rog, (Hindi & English, multicolor) 2019	Department of Veterinary Public Health
2.	Brucellosis rog (Hindi & English, multicolor) 2019	
3.	Apney haton ko kab aur kese dhoye (Hindi & English Multicolor)2019	
4.	Paltupashu palkon me swachta ke prati jagrookta (Hindi & English Multicolour) 2019	
5.	Gaushala me uchiit prabandhan v swachhta ke dwara hi brucellosis v anya pashujanya rogo se bachav. (Hindi & English Multicolour) 2020	
6.	Rabies (hindi-single colour)-2019	

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

S. No.	Date	Exposure visit of farmers, students, Veterinary Officers, Dignitaries
1.	15-06-2019	Dr. A. B. Mandal, Central Avian Research Institute (CARI), Izzatnagar, Bareilly, U.P. (India) visited Department of Poultry Science
2.	19-06-2019	Twenty (20) nos. of participants of Agriculture Skill Development Programme organized by Animal Husbandry Department Surajpur district (Chhattisgarh) along with Dr. K. M. Yadav (Asst. Veterinary Surgeons), visited Department of Poultry Science
3.	28-06-2019	Twenty (20) nos. of participants of Agriculture Skill Development Programme organized by Animal Husbandry Department Janjgir-Champa district (Chhattisgarh) along with Dr. A. R. Jangare (Asst. Veterinary Surgeons), visited Department of Poultry Science
4.	29-06-2019	Dr. D. S. Nauriyal, President, Indian Society of Veterinary Medicine (ISVM) visited Department of Poultry Science
5.	05-07-2019	Fifteen (15) nos. of farmers of Agriculture Skill Development Programme organized by Animal Husbandry Department Mungeli district (CG) of block Lormi along with Dr. Tanmay Ottalwar (Asst. Veterinary Surgeon), visited Department of Poultry Science
6.	05-07-2019	Fifteen (15) nos. of farmers of Agriculture Skill Development Programme organized by Animal Husbandry Department Mungeli district (CG) of block Patharra along with Dr. Prasant (Asst. Veterinary Surgeon), visited Department of Poultry Science



7.	09-07-2019	Fifteen (15) nos. of farmers of Agriculture Skill Development Programme organized by Animal Husbandry Department Janjgir-Champa district (CG) along with Dr. Jagat (Asst. Veterinary Surgeon), visited Department of Poultry Science
8.	22-07-2019	Sixty five (65) nos. of farmers of Agriculture Skill Development Programme organized by Animal Husbandry Department Durg district (CG) along with Dr. H. R. Chandomal (Asst. Veterinary Surgeon), visited Department of Poultry Science
9.	28-01-2019	Thirty two (32) nos. of boys and girls of Govt. School Bachgaon of Mathura district (U.P.) along with class teachers (3 in nos.), visited Department of Poultry Science
10.	05-08-2019	Fourteen (14) nos. of participants of Agriculture Skill Development Programme organized by Animal Husbandry Department Janjgir-Champa district (Chhattisgarh) along with Dr. Jainend Surywanshi (Assistant Veterinary Surgeon), visited Department of Poultry Science
11.	08-08-2019	Fourteen (14) nos. of participants of Agriculture Skill Development Programme organized by Animal Husbandry Department Kanker district (Chhattisgarh) along with Dr. T. S. Thakur (Asst. Veterinary Surgeons), visited Department of Poultry Science
12.	08-08-2019	Fourteen (14) nos. of participants of Agriculture Skill Development Programme organized by Animal Husbandry Department Kanker district (Chhattisgarh) along with Dr. C. P. Mishra (Asst. Veterinary Surgeons), visited Department of Poultry Science
13.	09-08-2019	Colonel Aman Katoch, Mathura, U.P. (India) along with five other members visited Department of Poultry Science
14.	12-08-2019	Fourteen (14) nos. of participants of Agriculture Skill Development Programme organized by Animal Husbandry Department Janjgir-Champa district (Chhattisgarh) along with Dr. K. K. Rathore (Asst. Veterinary Surgeons), visited Department of Poultry Science
15.	02-09-2019	Educational tour (32) nos. of students of B.Sc. (Ag) organized by CAU Jhansi district (UP) along with Dr. A. B. Majumdar (Ex. Principal Scientist, IGFR cum Guest Faculty), visited Department of Poultry Science
16.	05-09-2019	Dr. Anil Kumar (Deputy CVO-Fatehpur, UP) along with three doctors team visited Department of Poultry Science
17.	12-09-2019	Dr. P.K. Pradhan (Joint Director-Poultry-Lucknow) along with other organizational members visited Department of Poultry Science
18.	23-09-2019	Eleven (11) nos. of farmers of Agriculture Skill Development Programme organized by Animal Husbandry Department Janjgir-Champa district (CG) along with Dr. Anil (Asst. Veterinary Surgeon), visited Department of Poultry Science
19.	25-09-2019	Fifty (50) nos. of farmers of Agriculture Skill Development Programme organized by Saraswati Educational Welfare Trust Shahjahanpur district (UP) along with (team leader) Mr. Rakesh Pandey, visited Department of Poultry Science
20.	24-10-2019	Dr. Subrat Kumar Bhanja (Principal Scientist), Central Avian Research Institute, Izatnagar UP visited Department of Poultry Science
21.	14-11-2019	Fifteen (15) nos. of farmers of Agriculture Skill Development Programme organized by Animal Husbandry Department Ramgarh district (CG) along with Dr. L. K. Biswal (Asst. Veterinary Surgeon), visited Department of Poultry Science
22.	23-11-2019	Dr. H. P. Srivastava (Retired Scientist), Central Avian Research Institute, Izatnagar UP visited Department of Poultry Science.
23.	24-11-2019	Twenty (20) nos. of students of Rajkiya High School, Fainchari, Mathura (UP) along with three teachers visited Department of Poultry Science.
24.	26-11-2019	Fifty one (51) nos. of farmers of Agriculture Skill Development Programme organized by Animal Husbandry Department Raj Nandgaon district (CG) with Drs. Abhinav Verma, P. L. Patel and B. Tapar (Asst. Veterinary Surgeon), visited Department of Poultry Science.
25.	13-12-2019	Dr. M. L. Mehra (Professor and Head-LPM & LFC), College of Veterinary and Animal Science, Khalsa, Amritsar (Punjab) visited Department of Poultry Science.
26.	25-12-2019	Dr. G. D. Singh (Assistant Professor-TVCC), Bihar Veterinary College, BASU, Patna (Bihar) visited Department of Poultry Science.
27.	15-01-2020	A total of 30 nos. of cadets of SSB from different parts of the country visited the Department of Poultry Science and took training on Management of Brooding, Broiler, and Layers.
28.	06-02-2020	Fifteen (15) nos. of farmers of Agriculture Skill Development Programme organized by Animal Husbandry Department Koriya district (CG) along with Dr. R. S. Singh (Asst. Veterinary Surgeon) and her assistant, visited the Department of Poultry Science.

29.	14-02-2020	A total of 30 nos. of cadets of SSB from different parts of the country visited the Department of Poultry Science and took training on Poultry farming.
30.	20-02-2020	Dr. R. P. Nema (Professor and Head-Poultry Science), College of Veterinary Science and Animal Husbandry, Jabalpur NDVSU, (MP) visited the Department of Poultry Science.
31.	26-02-2020	Twenty four (24) nos. of farmers of Agriculture Skill Development Programme organized by Animal Husbandry Department Kanker district (CG) along with Drs. Virendra, Neelkanth (Asst. Veterinary Surgeon) and his two assistants visited the Department of Poultry Science.

#### 4. Krishi Vigyan Kendra, DUVASU, Mathura

The krishi vigyan kendra (KVK) of the university conducted several on and off - campus trainings, frontline demonstrations, on-farm testings. A number of meets and events were also organized by KVK for the benefit of farmers.



## 1. Trainings

Clientele	No. of Courses	Male	Female	Total Participants
Farmers & farm women	82	1713	502	2215
Rural Youths	14	183	83	272
Extension Functionaries	06	295	34	329
<b>Total</b>	<b>102</b>	<b>2197</b>	<b>619</b>	<b>2816</b>

## 2. Frontline Demonstrations

Area in ha			Number of Farmers	
Crop	Targets	Achievement	Targets	Achievement
<b>Oilseed</b>				
Mustard	50	86.8	197	192
<b>Pulses</b>				
Green gram	50	50	125	125
<b>Cereals</b>				
Paddy	9	10.4	20	26
Bajra	5	5	10	13
Wheat	15	18.2	30	41
Wheat under CRM	50	46	100	92
<b>Vegetables</b>				
Brinjal	4	4	10	10
Cauliflower	8	4	20	20
<b>Fodder</b>				
Berseem	5	5.6	100	118
<b>Livestock Production</b>				
Disease Management (Mineral Mixture)	-	-	17	17
<b>Home Science</b>				
Nutrition Management	-	-	20	20
Food grain storage	-	-	15	15
<b>Grand Total</b>	<b>196</b>	<b>234</b>	<b>664</b>	<b>689</b>

## 3. On Farm Testing

Discipline	Number of On Farm Testing		Total no. of Trials	
	Targets	Achievement	Targets	Achievement
Crop Production	3	3	11	11
Horticulture	5	5	25	25
Live Stock Production	1	1	10	10
Home Science	3	3	35	35
Soil Science	3	3	15	15
<b>Total</b>	<b>15</b>	<b>15</b>	<b>96</b>	<b>96</b>



#### 4. Production of seeds by the KVK

Crop	Name of the Crop	Name of the Variety	Quantity of seed (q)	Value (Rs)	Agency/Distributed to
Cereals	Wheat	HD-3086	856.34	30,00,000	Supplied to IARI
	Paddy	PB-1509	3.98	8756.00	-
oilseeds	Til	Shekhar	0.56	3920.00	-
Fodder	Jawar (15 acres)	Deshi	-	191250.00	Supplied to University dairy farm for animals
<b>Total</b>	-	-	<b>860.88</b>	<b>3203926.00</b>	-

#### 5. Production of planting materials by the KVK

Crop	Name of the Crop	Name of the Variety	Number	Value (Rs)	Number of Farmers/Beneficiaries
Flower	Marigold	Pusa Narangi	1200	175.00	8
Flower	Calendula	-	2800	350.00	10
Flower	Chrysanthamum	-	2725	500.00	15
Flower	Ice Plant	-	400	675.00	10
Fruit	Papaya	Pusa Dwarf	254	6000.00	10
Vegetable	Onion	Nasik Red	12450	2500.00	35
Vegetable	Brinjal	Kashi Sandesh	2490	1000.00	15
Vegetable	Tomato	Kashi Abhiman	3490	2500.00	21
Vegetable	Cabbage	KGMR-1	3740	2000.00	23
Vegetable	Cauliflower	PSBKT-25	3691	2500.00	23
Vegetable	Chilli	Pus Jwala	2115	2000.00	12
<b>Total</b>	-	-	<b>35355</b>	<b>20200.00</b>	<b>182</b>

#### 6. Production of bio-products by the KVK

Bio-Products	Name of the bio-product	Quantity Kg.	Value (Rs.)	No. of Farmers/Beneficiaries
Bio-Fertilizers	Vermi-compost	634	3170.00	65
	NADEP Compost	1450	-	Use in university farm
<b>Total</b>	-	<b>2084</b>	<b>3170.00</b>	-

#### 7. Details of Soil, Water and Plant Analysis

Samples	No. of Samples	No. of Farmers	No. of Villages	Amount realized (Rs.)
Soil	735	604	42	5145.00
Water	22	20	3	0.00
<b>Total</b>	<b>757</b>	<b>624</b>	<b>45</b>	<b>5145.00</b>

## 8. Extension Activities

Activities	No. of Programmes	No. of Farmers	No. of Extension Peronnel	Total
Advisory Services	198	179	16	195
Diagnostic visits	42	185	33	218
Field Day	2	165	2	167
Group Discussions	42	167	17	184
Kisan Ghosthi	17	862	47	909
Film Show	2	205	-	205
Self-help groups	4	40	-	40
Kisan Mela	10	3919	81	4000
Exhibition	6	3500	17	3517
Scientists' visit to farmers field	70	295	14	309
Plant/animal health camps	1	87	7	94
Method Demonstrations	12	168	-	168
Celebration of important days	5	1230	30	1260
Special day celebration	1	1176	14	1190
Exposure visits	12	412	21	433
<b>Total</b>	<b>424</b>	<b>12590</b>	<b>299</b>	<b>12889</b>

### Crop Residue Management

#### Awareness Campaigning

Sr. No.	Name of the activity	Target Nos.	Achievement	No. of Participants	Remarks
1.	Village level programme	5	5	596	To aware farmers about parali management, one day training was given to the farmers in each village
2.	Demonstrations	100 ha.	64 ha.	97	Demonstration on wheat by menaging parali with machines like ratavator, Mulcher, Happy seeder and zero seed drill were conducted

Sr. No.	Name of the activity	Nos.	No. of Participants	Remarks
3.	Slogan Writing on wall	110	148	Various points at strategic
4.	Poster banner placed at different places	30	-	Pasted at different places to aware farming community about management of crop residue
5.	Radio Jingle	2	-	Aired from AIR, Mathura Vrindavan for the awareness of farmers
6.	Field day	7	90	Field day on use of Machines like Rotavator, RMB, Mulcher, Happy Seeder etc. to manage crop residue
7.	Advertisement in print media	7	-	To aware farmers, advertisement of various techniques to manage crop residue were shown through advertisement.

## Other Extension activities

### ● World soil health day (05.12.2019)

On 5<sup>th</sup> December, 2019, World Soil Health Day was organized at KVK, Mathura. The Programme was inaugurated by Hon'ble Vice Chancellor, DUVASU, Mathura Prof. G.K. Singh. During the function more than 50 farmers were provided training on importance of soil testing. The soil health cards were also given to the farmers. Besides farmers, officers of the line department along with scientists and staff of KVK also participated in the programme.

### ● Jal Shakti Mission

Sr. No.	Particulars	No. of Programme	No. of Participants
1.	Awareness Programme/Gosthi	05	830
2.	Kisan Mela, Exhibition & Gosthi (Block Raya & Baldeo)	02	1800
3.	Publication of literature	03	6000
4.	Preparation of exhibits/model	1	-

### ● 150<sup>th</sup> birth anniversary of Mahatma Gandhi under Jal Shakti Mission

A grand kisan mela, exhibition and gosthi was organised on the occasion of 150<sup>th</sup> Birth Anniversary of Mahatma Gandhi at R.S.S. (PG) College, Baldeo, Mathura on 02<sup>nd</sup> Oct., 2019. The chief guest of the occasion was Shri Shelja Kant Mishra, Vice Chairman, U.P. Braj Teerth Vikash Parishad, Mathura and the guest of honour Prof. G.K. Singh, Hon'ble VC, DUVASU, & Shri Sarvagya Ram Mishra, DM, Mathura. More than 900 farmers participated in this programme.

### ● Swacchata Hi Sewa Campaign (17.01.19 to 31.01.2019 & 11.09.19 to 02.10.19)

No. of Awareness Program	No. of Activities	No. of Participants
25	25	96

### ● Environment Awareness & Plant Distribution Programme

To commemorate the birthday of Hon'ble Prime Minister Shri Narendra Modi Ji, KVK Mathura in collaboration with IFFCO organized environment awareness & massive plantation programme on 17.09.2019 under the chairmanship of Prof. G.K. Singh, Hon'ble Vice Chancellor, DUVASU, Mathura. On this occasion the chief guest Shri Shailjakant Mishra, Chairman, U.P. Brajteerth Vikas Parishad and other guest of honour Shri Prabodh Seth, IAS, Joint Secretary, Govt. of India, Shri Ram Newas, IAS, CDO, Mathura, Shri Jagpravesh, IAS, Joint Magistrate, Mathura, Shri Janardan Sharma, Representative of Hon'ble MP, Mathura, Shri Ravi Kishore Trivedi, DDO and Shri Pradeep Kumar, DGM, IFFCO planted species of Bel, Ber, Jamun, Moringa, Mango, Pomegranate & Guava. Around 100 farmers were given away 10 plants each of Neem, Bargad, Gular, Seesam, Kanji, Peepal etc. besides, they were also educated about the importance of plants in conservation of soil & water to improve the environment.





## UNIVERSITY FARMS

### A. Livestock Farm Complex (LFC)

At LFC Mathura, the total number of animals on 31.03.2020 were 720. It included Haryana cattle (264), crossbred cattle (75), Sahiwal cattle (299), buffalo (79) and teaser bulls (03). During 2019-20, total milk production at the farm was 215281 liters, out of which, the production of cow milk was 189745.50 liters, buffalo milk was 25835.50 liters. The animals are being used for research work of M.V.Sc. & Ph.D students of the University, Hands on practical training of the students of B.V.Sc. & A.H. as well as the diploma courses being run by the University. One Gokul mission project is also being run at the LFC. During this year 12 Sahiwal heifer were sent to Veterinary College Nagpur and 16 Sahiwal heifers, 04 Sahiwal cow, 02 Sahiwal male and 02 Haryana male

were sent to Dr. Rajendra Prasad Central Agricultural University, PUSA, Samastipur, Bihar. During the financial year 2019-20 the revenue generated at LFC was Rs. 14, 07, 210.00 (fourteen lac seven thousand two hundred ten only). Out of which Rs. 12, 15, 170.00 (twelve lac fifteen thousand one hundred seventy) was generated through the sale of milk coupons, Rs. 1,350.00 (one thousand three hundred fifty) through the sale of dung/fertilizer and Rs. 1, 90, 690 (one lac ninety thousand six hundred ninety) 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 2019-20.

Sr. No.	Species, Breeds and Varieties	Flock Population
1.	Layers	144
2.	Chabro Breeders	234
3.	Chabro chicks	769
4.	Other breeds chicks	840
5.	Turkey poult	205
6.	Layer chicks	559
7.	Aseel birds	26
8.	Kadaknath Birds	19
9.	Naked Neck	15
10.	Japanese quail	60
11.	Turkey	70
12.	Guinea fowl	60
13.	Emu	3
14.	Other breeds (black Rock, White Rock, Red Cornish, Delham Red, Barred Rock, Punjab Brown, CHD Broiler, PB Broiler, PB Layer, CHD Black)	152
<b>Grand Total</b>		<b>3904</b>

During FY 2019-20, the farm generated a revenue of Rs. 5,63,782/- (five lac sixty three thousand seven hundred and eighty two) from sale of different birds and eggs. Additionally, a sum of Rs. 6,59,726/- (six lac fifty nine thousand seven hundred and twenty six) and 1,30,250 /- (one lac thirty thousand two hundred and fifty) was generated from sales of poultry products under Experiential Learning Unit (ELU) and revolving funds in Poultry Science Department respectively.

## C. Directorate of Farms

### 1. Madhuri Kund Agriculture Farm

- The zonewise production of Rabi crop during FY 19-20, in 295 acre of land in Madhuri Kund Farm is as follows:

#### Seed Production

Sr. No.	Zone	Name of Crop	Variety	Area (in acre)	Production (in quintal)	Utilization
1.	A	Wheat	HD3086	75	767-11	Seed supplied to NSC Agra
	B	Wheat	HD2967	75	796-65	
<b>Total</b>				<b>150</b>	<b>1563-76</b>	
2.	A	Oat	kent	25	139-68	Seed supplied to NSC Agra
<b>Total</b>				<b>25</b>	<b>139-68</b>	

#### Commercial Production

Sr. No.	Zone	Name of Crop	Variety	Area (in acre)	Production (in quintal)	Utilization
3.	A	Barley	-	70	700.00	Supplied to Physiology Deptt. & ILFC Dairy farm, DUVASU Mathura
	B	Barley	-	50	500.00	
<b>Total</b>				<b>120</b>	<b>1200.00</b>	
4.	B	Barseem	Vardan	10	1.00	Seed produced is at MKD Farm Store for fodder production

- The revenue generated from wheat and oat was Rs. 36,25,525.00 (thirty six lac twenty five thousand five hundred twenty five) and from barseem was Rs. 1,40,000.00 (one lac forty thousand only). Thus total revenue generated during the financial year (2019-20) at Madhuri Kund farm was Rs. 37,65,525.00 (thirty seven lac sixty five thousand five hundred twenty five only).
- Approximately 550 quintals of wheat straw was prepared at the farm and provided to the dairy animals of LFC. In addition to this, approximately 1000 quintals of barley was supplied to LFC, DUVASU, Mathura for the dairy animals.

### 2. Pasture Unit

- Fodder research section: During FY 19-20, the sowing of rabi and kharif crops and their total production is depicted as follows:

#### Sowing crops in different season

##### Pasture & Forage Research Division-sowing

Seasons	Crop	Sowing Area (in Acre)
Rabi, 2019	Wheat HD 2086	31.0
Kharif, 2019	Jwar Purvi	20.0

## Production

Crop	Seed (In Qt.)	Green Fodder (In Qt.)	Bhusa (In Qt.)	Income	Expected Income	Others
Wheat	305.90	--	--	11,96,680.00	--	Deposited in Uni. A/c
Wheat (under size)	33.50	--	207.05		2,27,280.00	Transferred to L.F.C.
Jwar Purvi	--	1360.45			2,72,090.00	
<b>Total</b>				<b>11,96,680.00</b>	<b>4,99,680.00</b>	



Opening of fodder demonstration field by Dr. K.M.L. Pathak, Former Vice Chancellor of DUVASU, Mathura on 21.11.2020



Plantation at Pt. Deen Dayal Upadhyaya Aushidhi Vatika by Prof. A.D. Pandey, Akhil Bhartiya Sampark Vibhag, RSS on 09-02-2020

### II. LFC - Pasture Unit

The unit has procured 03 harrows and 01 leveller in FY 19-20 for efficient functioning. The production of fodder crops under Rabi and Kharif seasons in FY 19-20 is depicted as follows

Seasons	Crop	Sowing Area (in Acre)
Rabi, 2019	Barseem & laha, Oat, Barley Nepiyar Grass	16.0, 50.0, 45.0, 2.5
Zayad and Kharif, 2019	Sugar graze jwar, Multicut jwar Maize, Jwar Purvi, Nepiyar Grass	20.0, 10.0, 20.0, 30.0, 2.5

## Production

Crop	Green Seed (In Qt.)	Green Fodder (In Qt.)	Bhusa (In Qt.)	Expected Income	Others
Barley	302.20	11799.81	211.70	23,59,962.00	Transferred to L.F.C.
Oat	45.75		-		
Mustard & Laha	-		-		
Barseem	-		-		
Maize & Lobia	-		-		
Sugar graze jwar	-		-		
Jwar Purvi	-		-		
Nepiyar grass	-		-		
	-		-		
<b>Total</b>				<b>31,78,507.00</b>	





## **2. Three Days Training Program on “Control of Subclinical Parasitism in Dairy Animals”, 24-26 Feb, 2020**

Department of Veterinary Parasitology conducted Three days training program on “Control of subclinical parasitism in dairy animals” for Veterinary Officers of Uttar Pradesh under RKVY project entitled “Strategic control of subclinical parasitism for better animal health and enhanced productivity in Uttar Pradesh.

## **3. "Ten Days ICAR Sponsored Training Under SCSP Budget Head of ICAR-EVM Project on “Application of Analytical And Molecular Tools for Characterization And Identification of Plants Based Drugs And Their Targets” (15-24 Feb, 2020)**

Department of Veterinary Pharmacology and Toxicology organized ICAR sponsored training under SCSP budget head of ICAR-EVM project on “Application of analytical and molecular tools for characterization and identification of plants based drugs and their targets” (15-24 Feb, 2020).

## **4. One Day Workshop Cum Ghosthi 'to Promote Use of Indigenous Drugs In The Treatment of Animals And To Augment Animals Health And Productivity' Under SCSP of ICAR-EVM Project on 08 Jan, 2020**

In order to promote the usage of indigenous drugs in the treatment of animals, Department of Veterinary Pharmacology and Toxicology organized One day Workshop cum Ghosthi 'To promote use of Indigenous drugs in the treatment of animals and to augment animals health and productivity' under SCSP of ICAR-EVM project on 08 Jan, 2020.

## **5. Six Days Training on “Application of Diagnostic Imaging Technology And Management of Surgical Conditions In Animals”**

Department of Veterinary surgery and Radiology organized a six days training on “Application of diagnostic imaging technology and management of surgical conditions in animals” under All India Network Programme on Diagnostic Imaging and Management of Surgical Conditions in Animals (AINP-

DIMSCA) for 10 veterinary officers of Animal Husbandry Department of U.P. from 27 Jan-12-Feb, 2020. Total 8 theory lectures and 12 Hands on training were conducted. Endoscopy in Veterinary Practice – Principles, Instrumentation and Clinical Applications (Prof. R. P. Pandey, Dr. S. Purohit and Dr. G. Kumar), Radiography in Veterinary Practice: Principles, Instrumentation and Clinical Application (Dr. Gulshan Kumar), Ultrasonography in Veterinary Practice – Principles, Instrumentation and Clinical Application (Dr. Sanjay Purohit), Application of Ultrasonography in Animal Reproduction (Prof. Atul Saxena), Application of Electrocardiography in Canine Diagnostics (Dr. M. K. Srivastava), Common and Special Surgical Interventions in Goats (Prof. R. P. Pandey), Guidelines for Certain Procedures in Bovine (Prof. R. P. Pandey, Dr. S. Purohit and Dr. G. Kumar) and Bovine Foot Lameness and its Impact on Fertility (Prof. R. P. Pandey and Dr. G. Kumar) were main focus of the training. The training was highly fruitful to veterinary officers and they further recommended specialized training on orthopedic and ophthalmic affections.

## **6. One Day Brainstorming Session Organized on 'Climate Change, Animal Health and Production: Way Forward'**

Department of Veterinary Physiology organized One day Brainstorming session on 'Climate Change, Animal Health and Production: Way Forward' on 11<sup>th</sup> December 2019 wherein scientists from Indian Meteorological department, New Delhi; CSWRI, Avikanagar; IGFRI, Jhansi; IVRI, Izatnagar; Bihar Animal Science University, Patna; NDRI, Karnal; CIRG, Makhdoom, Mathura; DARL, DRDO, Leh, Ladakh; NIANP, Bangalore and DUVASU, Mathura expressed their ideas.

The recommendations of Brainstorming session were:

- A. Formulation of geographical area based Temperature Humidity Indices (THI) was recommended.



- B. Adaptability marker should be standardized for assessing the differential adaptability of breeds of a particular livestock species for which collaborative research was recommended.
- C. The basic data related to methane emission per unit production in different breeds of livestock species needs to be generated.
- D. Rumen microbiota metagenomics should be studied to understand the nutrient utilization pattern during heat stress.
- E. Under National Initiative on Climate Resilient Agriculture (NICRA) program of Government of India, Veterinary University Mathura should be included as one of the centers which is having state of art facility for conducting adaptability and methane emission studies besides having variety of farm animals.



### **7. Two Days Workshop Under RKVY Funded Project on 'Productivity Enhancement In Goats Through Artificial Insemination: Scopes, Challenges And Strategies'**

Department of Veterinary Physiology organized a two day workshop under RKVY funded project on 'Productivity enhancement in goats through artificial insemination: scopes, challenges and strategies' on 13<sup>th</sup> and 14<sup>th</sup> Jan, 2020. The workshop was inaugurated by Hon'ble Cabinet Minister Govt. of India, Sh. Giriraj Singh Ji in the presence of Prof. Gurdial Singh, Vice Chancellor, LUVAS; Prof. R. K. Singh, Director cum Vice Chancellor, IVRI; Prof. Rameshwar Singh, Vice Chancellor, BASU; Prof. Vishnu Sharma, Vice Chancellor, RAJUVAS; Prof.

N.H. Kelawala, Vice Chancellor, Kamdhenu University, Dr. Praveen Malik, Commissioner Animal Husbandry, Govt. of India, Dr. M.S. Chauhan, Director, CIRG, Mathura, and Prof. G.K. Singh Vice Chancellor, DUVASU Mathura as host of the function. Officers engaged in animal husbandry activities from all over the country participated in the workshop with launching the distribution of FSD of goat semen for utilization by various agencies. Veterinary Officers from line departments of state govt. attended the workshop with lectures on 'Artificial Insemination in Goats/Sheep: Present Status and Future Prospects', 'Experiences of BAIF In Goat Development', 'Goat Health Care in India', 'Strengthening Goat Based Livelihoods', 'Network for promotion of AI in Goats in the state of Kerala', 'Status of Goat Genetic Resources of India, Conservation & their Contribution in Farm Economy and Rural Livelihood', 'Nurturing Lives & Livelihoods: Field Experiences with 85 Partners in 18 Indian states' and 'Commercial Goat feeding and Nutrition: Ensuring profitability' by scientists and workers in the field of Goat research and goat husbandry.

### **8. Training Program on 'Artificial Insemination In Goats' For Veterinary Officers of Uttar Pradesh**

Two Training programs on 'Artificial Insemination in goats' for 28 Veterinary Officers of Uttar Pradesh were organized from 24<sup>th</sup> to 27<sup>th</sup> February, 2020 and for 20 Veterinary Officers from 4<sup>th</sup> to 7<sup>th</sup> March, 2020. A dedicated Clinical complex for Goats was established and inaugurated by Dr R.C. Agrawal, DDG, Education, ICAR on 06.03.2020, to provide information regarding scientific goat rearing practices to farmers and new advancement to veterinary officers.

### **9. National Symposium on "Public Health Challenge Mitigation Strategies At The Confluence of One Health Appro-aches" And XIV National Biennial Conference of**



### **Association of Public Health Veterinarians (APHV)**

National Symposium on, “Public Health challenge mitigation strategies at the confluence of one health approaches” and XIV National Biennial Conference of Association of Public Health Veterinarians (APHV) on 24<sup>th</sup> and 25<sup>th</sup> January, 2020 at COVS & AH, DUVASU, Mathura.

### **10. National Symposium on “Sustainable Improvement In Animal Health And Production- Bridging Science And Policy For Economic Upliftment of Farmers” And “1<sup>st</sup> Annual Convention of Veterinary Internal And Preventive Medicine Society”**

First Annual convention of Veterinary Internal and Preventive Medicine Society (VIPM) & National Symposium on “Sustainable Improvement in Animal Health and Production Bridging Science and Policy for Economic Upliftment of Farmers” jointly organized by Department of Veterinary Medicine, DUVASU, Mathura, U.P. and ICAR-CIRG, Farah, Makhdoom, Mathura, U.P. on 8-9<sup>th</sup> November 2019. Organizing Secretary, Co- Organizing Secretary and treasurer were Dr. Ashok Kumar, Principal Scientist, CIRG, Dr. Mukesh Srivastava, Incharge, Department of Vety. Medicine and Dr. Ashish Srivastava, Asst. Prof., Department of Vety. Medicine. Conference was attended by the total 198 participants from different states of India including volunteer post graduate students.

During Inaugural function Prof. A.K. Gahlot, Former Vice Chancellor, RAJUVAS, Bikaner, was present as Chief Guest along with Prof. G.K. Singh, Hon'ble Vice Chancellor, DUVASU, Mathura, Chief Patron and Prof. S.K. Garg, Dean, Veterinary Faculty, DUVASU as Chairman, and Organizing Committee, Dr. A.U. Bhikane, President, VIPM, Dr. D.S. Meena, Vice-President, Dr. S.K. Raval, Vice-President, Dr. Neelesh

Sharma, Executive General Secretary, Dr. Siddiqui. MFMF, Joint General Secretary, and Dr. G. Ambica and Dr. Rathish RL (Zonal Secretaries).

Key notes were presented by Prof. A.K. Gahlot, Prof. Abdul Samad and Mr. Akhil Garg in the thematic session. Eminent lead speakers of different sessions were Dr. J.P. Varshney Retd. Principal Scientist, IVRI, Dr. V.K. Gupta, JD, CADRED, IVRI, Dr. N.K. Sood, Ex. Prof. & Head, Pathology, GADVASU, Dr. P.K. Rout, Principal Scientist, CIRG,, Dr. NA Sudhan, Ex. Director TVCC, SKAST, Jammu, Dr. Kaffil Hussain, wildlife institute, Dehradun Dr. Ilayaraja. S., Wildlife SOS, Keetham, KGururaj, CIRG, Sanjay purohit, DUVASU, Mathura Jasjeet Joshan, Renowned Private Practitioner, Delhi.

A total 190 papers were presented in in oral/poster forms under five different sessions including farm animals medicine, companion animals medicine, avian / exotic / wildlife medicine, alternative & animal biotechnology. A separate session was conducted for the practicing veterinarians.

Prof. Abdul Samad, former Dean Faculty, MAFSU, Nagpur was present as Chief Guest of Valedictory function along with Prof. A.K. Gahlot, Former Vice Chancellor, RAJUVAS and Dr. R.K. Dhuria, HOD, Animal Nutrition, Bikaner & Ex. Dean, College Of Veterinary & Animal Science, Navania, Vallabhnagar, Udaipur (Rajasthan) as guest of honor. Young scientist awardees were Dr. B. S. Reddy, Dr. T. A. Safi for Ruminant Medicine, Dr. Moneesh Thakur and Dr. Prakash Khangal for Companion Animal Medicine, Dr. Nitika Sharma and Dr. P. N. Panigrahi for Alternative Medicine, Dr. Kapil Kumar Gupta, Dr. Aboli Lakhpati and Bharai Munja Jadav Bhai for Dr H.P. Lal Young Scientist award for Students.



**National Symposium on “Sustainable Improvement In Animal Health And Production- Bridging Science And Policy For Economic Upliftment of Farmers” And “1<sup>st</sup> Annual Convention of Veterinary Internal And Preventive Medicine Society”**

## B. Participation of Faculty Members In International And National Conferences Symposia

S. No.	Name of the faculty member	Title of the event	Date
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### A. International

1.	Prof. Sharad Kumar Yadav	Global Conference on Infectious Diseases” at Flora Grand Hotel, UAE, Dubai.	22 <sup>nd</sup> - 24 <sup>th</sup> Apr. 2019
2.	Prof. Vikas Pathak Dr. Sanjay Kumar Bharti	International symposium & conference “IMSACON-IX” on “Advances in Production Processing and Quality Assurance of Muscle Foods for Improved Health and Nutritional Security” at Palampur, Kangra, Himachal Pradesh.	06 <sup>th</sup> - 08 <sup>th</sup> Nov. 2019
3.	Dr. Ambika Sharma	11 <sup>th</sup> Annual Meeting of Proteomics Society, India, 2019 and International Conference on Proteomics for System integrated Bio-omics, one Health and food Safety at ICAR-National Dairy Research Institute, Karnal.	02 <sup>nd</sup> - 04 <sup>th</sup> Dec. 2019
4.	Dr. Vinod Kumar Dr. Shalini Vaswani	International Conference on Animal Nutrition 2019 on Nutritional Strategies for improving Farm Profitability and Clean Animal Production, WBUAFS, Kolkata.	17 <sup>th</sup> - 19 <sup>th</sup> Dec. 2019
5.	Dr. Vinod Kumar Singh	7 <sup>th</sup> International Conference on Sustainable Animal Agriculture for Developing Countries (SAADC-2019) organized by Nepal Veterinary Association at Hotel Pokhara Grande, Pokhara, Nepal.	08 <sup>th</sup> - 11 <sup>th</sup> Nov. 2019

### B. National

1.	Prof. Vikas Pathak Dr. Amit Singh Dr. Sanjay Kumar Bharti Dr. Rashmi	3 <sup>rd</sup> National Conference on Livestock development for societal needs: Extension and allied sectors initiatives at College of Veterinary and Animal Science, GBPUA&T, Pantnagar, U. S. Nagar Uttarakhand.	03 <sup>rd</sup> - 06 <sup>th</sup> Apr. 2019
2.	Prof. Rashmi Singh	World Zoonosis Day organized by Association of Public Health Veterinarians at WBUAFS, Kolkata.	06 <sup>th</sup> Jul. 2019
3.	Prof. Vikas Pathak	12 <sup>th</sup> meeting of the Scientific Panel on Meat & Meat Products (including Poultry) organized by Food Safety & Standard Authority of India (FSSAI), GOI.	27 <sup>th</sup> Sep. 2019
4.	Dr. Vinod Kumar Singh	NextGen Genomics, Biology, Bioinformatics and Technologies (NGBT-2019) Conference in Mumbai.	30 <sup>th</sup> Sep., -2 <sup>nd</sup> Oct., 2019
5.	Dr. Brijesh Yadav	2 <sup>nd</sup> Annual Conference of Animal Physiologist Association at SVVU, Tirupati, Andhra Pradesh.	14 <sup>th</sup> -15 <sup>th</sup> Oct., 2019
6.	Prof. Atul Saxena	Participated as expert in the seminar on 'Menace of Monkey in Mathura 'Wild life Institute of India in collaboration with Forest Department, Mathura.	11 <sup>th</sup> Nov.,2019
7.	Dr. Sanjay Purohit	43 <sup>rd</sup> Annual Congress of ISVS and National Symposium on “Recent Advances on Amelioration of Anaesthetic and Surgical Stress in Farm and Companion Animals” at LUVAS, Hisar	14 <sup>th</sup> -16 <sup>th</sup> Nov., 2019
8.	Dr. Mukesh Kumar Srivastava	11 <sup>th</sup> FSAPAI CE on companion animal practice and 18 <sup>th</sup> world small animal veterinary association (WSAVA) continuing education program. Federation of small animal practitioners associations of India and pet practitioners association of Mumbai.	22 <sup>nd</sup> -24 <sup>th</sup> Nov., 2019
9.	Prof. M.M. Farooqui Prof. Archana Pathak Dr. Varsha Gupta Dr. Shriprakash Singh	XXXIV Annual Convention of IAVA & National Symposium on “Recent Advances in Veterinary Anatomy and its Application in Clinical Sciences, Department of Veterinary Anatomy, Veterinary College, Karnataka Veterinary, Animal & Fisheries Sciences University, Bengaluru.	28 <sup>th</sup> -30 <sup>th</sup> Nov., 2019
10.	Prof. Atul Saxena	“Livestock improvement through AI” NAAS, NAAS complex , New Delhi.	06 <sup>th</sup> Dec., 2019



11.	Dr. Soumen Choudhury	5 <sup>th</sup> IUPHAR World Conference on the Pharmacology of Natural Products & 51 <sup>st</sup> Annual Conference of Indian Pharmacological Society (IPS).	04 <sup>th</sup> -07 <sup>th</sup> Dec., 2019
12.	Prof. P.K. Shukla Dr. Amitav Bhattacharyya Dr. Rajneesh Sirohi Dr. D.N. Singh Dr. Meena Goswami	XXXVI Annual Conference and National Symposium of Indian Poultry Science Association (IPSA) on “Conceptual understanding and future strategies for welfare friendly poultry production in India” at College of Veterinary Science and Animal Husbandry, Chhattisgarh Kamdhenu Vishwavidyalaya, Durg, Chhattisgarh.	11 <sup>th</sup> -13 <sup>th</sup> Dec., 2019
13.	Dr. Atul Prakash	XVIX Annual Conference Indian Society of Veterinary Pharmacology and Toxicology held at Department of Veterinary Pharmacology and Toxicology, College of Veterinary and Animal Sciences, Mannuthy, Kerala Veterinary and Animal Sciences University, Thrissur-680651 (Kerala)	18 <sup>th</sup> -20 <sup>th</sup> Dec., 2019
14.	Dr. Vijay Pandey	Annual Convention of Society of Veterinary Biochemists & Biotechnologists of India (SVBBI) and National Symposium organized at Department of Veterinary Biochemistry, College of Veterinary Science, Sri Venkateswara Veterinary University, Tirupati (AP).	04 <sup>th</sup> -05 <sup>th</sup> Feb., 2020
15.	Dr. Muneendra Kumar Dr. Sanjay Purohit Dr. Yajuvendra Singh	National Conference on Paradigm Shift in Livestock Management to Obtain High Quality Animal Products for Enhancing Farm Economy and Entrepreneurship and 27 <sup>th</sup> Annual convention of Indian Society of Animal Production and Management (ISAPM 2020) held at Post Graduate Institute of Veterinary Education and Research (PGIVER), Jaipur (Rajasthan)	04 <sup>th</sup> -06 <sup>th</sup> Feb., 2020
16.	Prof. Daya Shanker Dr. Jitendra Tiwari Dr. Amit Kumar Jaiswal Dr. Vikrant Sudan	29 <sup>th</sup> National Conference of Veterinary Parasitology And National Symposium on “Challenges And Innovations In Controlling Parasitic Diseases of Livestock And Poultry With Changing Climate, Jabalpur (M.P)	05 <sup>th</sup> -07 <sup>th</sup> Feb., 2020
17.	Dr. S.K. Singh	37 <sup>th</sup> National conference of Indian Society for Veterinary Medicine (ISVM), organized by KAFSU, Bangalore	05 <sup>th</sup> -07 <sup>th</sup> Feb., 2020
18.	Dr. Sanjay kumar Bharti	2 <sup>nd</sup> National Conference on “Technological and Emerging Aspects in Agriculture and Community Science” at International Buddhist Research Institute, VipinKhand, Gomtinagar, Lucknow, Uttar Pradesh	07 <sup>th</sup> -08 <sup>th</sup> Feb., 2020
19.	Dr. Mukesh Kumar Srivastava	Indian VETopia and FASAVA CPD-2020 RACE approve CE programme, Jaipur, Rajasthan.	13 <sup>th</sup> -15 <sup>th</sup> Feb., 2020
20.	Prof. Arun Kr. Madan Dr. Brijesh Yadav Dr. Dilip Kr Swain Dr. Rajneesh Sirohi	SAPICON-2020: XXVIII Annual Conference & National Symposium on “Physiological approaches to address environmental challenges for increasing animal Productivity and farmer's income” Held at ICAR- Central sheep and wool research institute, Avikanagar- 304501 (Rajasthan)	18 <sup>th</sup> -19 <sup>th</sup> Feb., 2020
21.	Prof. Vikas Pathak	13 <sup>th</sup> meeting of the Scientific Panel on Meat & Meat Products (including Poultry) organized by Food Safety & Standard Authority of India (FSSAI), GOI	3 <sup>rd</sup> Mar., 2020

- Prof. Atul Saxena, Dr. Sanjay Purohit, Dr. Amitav Bhattacharyya, Dr. Barkha Sharma, Dr. Mukesh Kr Srivastava, Dr. Anuj Kumar, Dr. Jitendra Tiwari, Dr. Udit Jain, Dr. Soumen, Choudhury, Dr. Arvind Tripathi, Dr. Ashish Srivastava, Dr. Ajay Pratap Singh, Dr. Ruchi Tiwari, Dr. Vikrant Sudan, Dr. Pradeep Kumar, Dr. P N Panigrahi, Dr. Jitendra Kumar

Agrawal, Dr. Parul, Dr. Amit Shukla, Dr. Shyama N. Prabhu and Dr. Renu Singh participated in National symposium on “Sustainable Improvement in Animal Health and Production- Bridging Science and Policy for Economic Upliftment of Farmers” and “1<sup>st</sup> Annual Convention of Veterinary Internal and Preventive

Medicine Society” held at College of Veterinary Science and Animal Husbandry, DUVASU, Mathura, Uttar Pradesh.

- Prof. Vikas Pathak, Prof. Rasmi Singh, Dr. Sanjay Purohit, Dr. Deepak Sharma, Dr. Barkha Sharma, Dr. Madhu Tiwari, Dr. Amitav Bhattacharya, Dr. Mukesh Kr Srivastava, Dr. Udit Jain, Dr. Gulshan Kumar, Dr. Neeraj Kumar Gnagwar,

Dr. Meena Goswami, Dr. Ashish Srivastava, Dr. Ajay Pratap, Singh, Dr. Ruchi Tiwari, Dr. P. N. Panigrahi, Dr. Parul, Dr. Shyama N. Prabhu, Dr. Renu Singh participated in National Symposium and XIV Biennial National Conference on Public Health challenge Mitigation strategies at the confluence of one health approaches” held at DUVASU, Mathura.

### C. Participation of Faculty Members In Trainings/workshops

S. No.	Name of the faculty member	Title of the event	Date
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#### A. International

1.	Dr. Ambika Sharma	11th Annual Meeting of Proteomics Society, India, 2019 and International Workshop at ICAR-National Dairy Research Institute, Karnal	28 <sup>th</sup> Nov., - 1 <sup>st</sup> Dec., 2019
2.	Dr. Brijesh Yadav	Indo-Australian International Workshop on transfer of mitigation technologies for heat stress in Farm Animals organized by ICAR-NIANP Bengaluru in collaboration with university of Melbourne, Australia	05 <sup>th</sup> -06 <sup>th</sup> Feb., 2020

#### B. National

1.	Dr. Shriprakash Singh	Plastination : Hands on workshop- 3 at Sathagiri institute of Medical Sciences and Research centre Chikkasandra ,Hesaraghatta Main Road Bangalore 560090	1 <sup>st</sup> -2 <sup>nd</sup> Aug., 2019
2.	Dr. Varsha Gupta Dr. Abhinov Verma	National workshop on “ Willd Body Programme and Humane Alternatives for Laboratories in Veterinary Education” held at Department of Veterinary Anatomy, NTR College of Veterinary Sciences, SVVU, Gannavaram, A. P.	30 <sup>th</sup> Aug., 2019
3.	Dr. Vijay Pandey	4 weeks online NPTEL Certification course on “Functional Genomics” 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	27 <sup>th</sup> Aug., -15 <sup>th</sup> Sep., 2019
4.	Dr. Avneesh Kumar	4 days workshop on “Public procurement with e-procurement” at Tirupati, Andhra Pradesh organized by NAHRD, New Delhi	2 <sup>nd</sup> - 5 <sup>th</sup> Sep., 2019
		2 days Brainstorming meet and training on “Livestock genomics for conservation of indigenous cattle” organised by NIAB, Hyderabad	10 <sup>th</sup> -11 <sup>th</sup> Sep., 2019
5.	Dr. Avinash Kumar	Twenty one days ICAR sponsored Winter School on “Recent Biotechnological Advances for Precision Feeding” organized by Department of Animal Nutrition, WBUAFS at Belgachia, Kolkata	4 <sup>th</sup> - 24 <sup>th</sup> Sep., 2019
6.	Dr. Vikas Sachan	CAFT Training programme on “ Current Knowledge and Future Challenges in Domestic Animal Theriogenology at Dept of Gynecology and Obstetrics, GADVASU, Ludhiana	3 <sup>rd</sup> - 23 <sup>rd</sup> Oct., 2019
7.	Dr. Neeraj Kumar Gnagwar	21 day training on “Advances in Livestock Disease Diagnosis using Clinico-Pathological and Molecular Techniques” held at IVRI	3 <sup>rd</sup> - 23 <sup>rd</sup> Oct., 2019
8.	Dr. Mukesh Kumar Srivastava	Workshop on Small Animal's Neurology and Weight management, organized by Small animal Veterinary Association of North (SAVAN) and MARS Petcare, Agra	13 <sup>th</sup> Oct., 2019

9.	Dr. Varsha Gupta	Winter School Training programme on “Stem cell technology for Augmentation, restoration and enhancement of male and female fertility and its clinical application” at Dept. of Physiology and Reproduction, CIRG, Makhdoom, Farah, Mathura	1 <sup>st</sup> - 21 <sup>st</sup> Nov., 2019
10.	Dr. D.N. Singh Dr. Yajuvendra Singh Dr. Raj Kumar Yadav Dr. Abhinvo Verma Dr. Raju Kushwaha Dr. Jitendra Kumar Agrawal	Online training on “Massive Open Online Course on Teaching Excellence” by ICAR, NAARM	1 <sup>st</sup> - 30 <sup>th</sup> Nov., 2019
11.	Dr. D.N. Singh	Winter School on “Current status, emerging issue and future scenario regarding conservation of indigenous breeds of livestock” held at College of Veterinary and Animal Science, Rajasthan University of Veterinary and Animal Sciences, Bikaner	05 <sup>th</sup> - 25 <sup>th</sup> Nov., 2019
12.	Dr. Avneesh Kumar	21 days winter school training programme on 'Conservation and improvement of indigenous bovine genetic resources through integrated omic approaches and optimal resource utilization' at NDRI (Adugodi) - NDRI-RS, Bengaluru organized by ICAR	06 <sup>th</sup> -26 <sup>th</sup> Nov., 2019
13.	Dr. Udit Jain	One day strategy workshop on Food borne Zoonotic diseases organized by National Academy of Agricultural Sciences at NASC Complex, New Delhi	21 <sup>st</sup> Nov., 2019
14.	Dr. Atul Saxena	Workshop on 'Academia - industry - government linkage for quality agriculture education	27 <sup>th</sup> -28 <sup>th</sup> Nov., 2019
15.	Dr. Muneendra Kumar	21 days short course at CAFT in Animal Nutrition Indian Veterinary Research Institute on Dietary manipulations for improving energetic efficiency and reducing methane emission in ruminants	3 <sup>rd</sup> -23 <sup>rd</sup> Dec., 2019
16.	Prof. Atul Saxena Dr. Vijay Pandey Dr. Barkha Sharma Dr. Aveensh Kumar	One day Brainstorming on 'Climate change: Animal Production and Health, Challenge and Way Forward” at Dept of Veterinary Physiology, DUVASU, Mathura	11 <sup>th</sup> Dec., 2019
17.	Dr. Raj Kumar Yadav	Short term training course on “Animal cell culture” organized by CCMB, Hyderabad, Telangana, India	27 <sup>th</sup> -31 <sup>st</sup> Jan., 2020
18.	Prof. Atul Saxena	'Workshop on Career Development Centre Organized by Keral Agriculture University, Trichure (Kerala)	05 <sup>th</sup> Feb., 2020
19.	Dr. Barkha Sharma	An online course on 'COVID-19: Operational Planning Guidelines and COVID-19 Partners Platform to support country preparedness and response', organized by WHO in March, 2020	24 <sup>th</sup> Mar.,2020
		An Online Course on 'Coronavirus Disease 2019' by AACC Learning Lab for Laboratory Medicine on NEJM Knowledge	29 <sup>th</sup> Mar.,2020



## STUDENTS WELFARE

### A. National Cadet Corps

During 2019-2020, 48 cadets appeared in 'B' certificate examination. On the occasion of 20<sup>th</sup> Kargil Vijay Diwas 19 cadets voluntarily donated blood on 26<sup>th</sup> July 2019 in a Blood donation camp at Army Hospital, Mathura. NCC students gave Guard of Honour to the Hon'ble Governor of Uttar Pradesh, Smt. Anandiben Patel Ji on 28<sup>th</sup> August 2019 on the occasion of 9<sup>th</sup> Convocation ceremony held at the University auditorium. NCC cadets also escorted and gave 'Guard of Honour' to the Hon'ble Vice-Chancellor of the University on Republic Day and Independence Day. All the enrolled cadets of NCC participated in "Mega Swachhta Pakhwada: National Level" from 17<sup>th</sup> September 2019 to 2<sup>nd</sup> October 2019 and created awareness and motivated people towards cleanliness and hygiene. NCC cadets participated in "SWACHHTA PAKHWADA" in the University premises from 1<sup>st</sup> December 2019 to 15<sup>th</sup> December 2019. During the period under report, nine cadets participated in CATC-39 camp held at Atrauli, Aligarh from 17<sup>th</sup> September 2019 to 26<sup>th</sup> September 2019. 13 cadets participated in CATC-43 camp held at Fatehgarh from 17<sup>th</sup> January 2020 to 26<sup>th</sup> January 2020 and 25 girl cadets participated in CATC-42 camp at Hathras from 23<sup>rd</sup> January 2020 to 31<sup>st</sup> January 2020. Cadets Ishika Rajput, 2<sup>nd</sup> year B.V.Sc & A.H student and Arpan Chauhan, 3<sup>rd</sup> year B.V.Sc & A.H student participated in the Republic Day camp and represented Directorate of Uttar Pradesh. Twenty-one cadets participated in Horse Show held on 26<sup>th</sup> September 2019 on the occasion of Pandit Deen Dayal Upadhyaya birth anniversary. Cadet Ishika Rajput, 2<sup>nd</sup> year B.V.Sc & A.H student got selected in the prestigious exchange programme. Mounted NCC cadets piloted the convoy of Hon'ble Governor of Uttar Pradesh and Chancellor of the University Mrs. Anandiben Patel Ji to the Pandit Deen Dayal Upadhyaya Auditorium during the 9<sup>th</sup>

Convocation of the University. Further on Independence Day and Republic Day mounted NCC cadets piloted the Hon'ble Vice Chancellor of the University to the University Ground for hoisting and unfurling the National Flag respectively.

### B. LITCUL Fest 2019

Literary and cultural events were organized by DUVASU in which students from COVSc 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. Overall Champion of the LITCUL FEST 2019 was Ms. Vaishali Gupta form 5<sup>th</sup> year BVSc & AH.

### C. South India Educational Tour

An Educational Tour of 4<sup>th</sup> Year B.V.Sc & A.H students was organized from 23<sup>rd</sup> June 2019 to 10<sup>th</sup> July 2019 to visit different places of educational importance in India pertaining to the Veterinary and Animal Husbandry activities. A total of 60 Students (32 boys and 28 girls) visited veterinary colleges and other related institutes at Hyderabad, Chennai, Thrissur, Coimbatore, Bengaluru, Goa, Pune and Mumbai. Dr. Vijay Pandey, Associate Professor, Department of Veterinary Biochemistry and Dr. Atul Prakash, Assistant Professor, Department of Veterinary Pharmacology & Toxicology accompanied the students as tour leaders.





#### **D. 18<sup>th</sup> Annual sports meet**

The 18<sup>th</sup> Annual sports meet 2019 of the university was held on 19-20 February 2020. The event was inaugurated by Prof. (Dr.) G.K.Singh, Vice-Chancellor by unfurling of University Flag. The meet was declared open by Hon'ble Vice-Chancellor after the march-past, salutation and sports oath. Doves were released as a token of peace and freedom. A number of sports events were organized in which students from different programmes participated. Mr. Baldev Singh, 2<sup>nd</sup> Year Diploma and Miss Vishakha Singh Gaur, 3<sup>rd</sup> Year B.V.Sc. & A.H. respectively, were adjudged as the best male and female athletes of the year. The closing ceremony was held on 20<sup>th</sup> February 2020, where Professor (Dr.) Rana Singh, Vice-Chancellor of the Sanskriti University was the Chief Guest.

#### **E. National Youth Conclave and National Debate (Youth Awakening Festival, YUVA)**

The University sent a team of students for participation in the National Youth Conclave and National Debate organized by G.B. Pant University of Agriculture & Technology, Pantnagar on 20-23 February 2020. 06 Students (03 girls and 03 boys) took part in National Youth Conclave whereas 04 students (03 girls and 01 boy) competed for National Debate Competition. Dr. Ajay Pratap, Assistant Professor, Department of Veterinary Microbiology and Dr. Shyama N Prabhu, Assistant Professor, Veterinary Pathology acted as team leaders.

#### **F. Workshop cum presentation on Motivational Program**

The University organized a Workshop cum presentation on Motivational Program by Col. Virendra Kumar for the students on 15<sup>th</sup> February 2020. A series of presentations and demonstrations on the road to excellence, anger management, goal setting, team building, personal effectiveness were made to motivate the students.



#### **G. AGRIUNIFEST**

A team of 21 Students (15 girls and 6 boys) was sent for participation in the 20<sup>th</sup> All India Inter-Agricultural University Youth Festival, AGRIUNIFEST 2019-20 organized by Indira Gandhi Krishi Vishwavidyalaya, Raipur (Chhattisgarh) on 8-12 February, 2020. Dr. Varsha Gupta, Assistant Professor, Department of Veterinary Anatomy and Dr. Avneesh Kumar, Assistant Professor, Department of Animal Genetics and Breeding acted as tour leaders.

#### **H. National Service Scheme Cell (NSS)**

The National Service Scheme (NSS) Unit was established in the U.P. Pt. Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go-Anusandhan Sansthan, Mathura – 281001 (U.P.) on December, 2018. The unit will help to awaken the social consciousness of the students and provide them with an opportunity to engage with people around the campus constructively and to impart public social responsibility. The motto of NSS is “NOT ME BUT YOU”, which expresses the essence of democratic living, upholds the



need for selfless service and volunteerism and underlines that individual welfare is dependent on the welfare of the society as whole.

As directed by the administration out efforts were directed towards “developing of the personality of students through community service”. This objective is sought to be achieved by enabling the students to work in community. The programme and activities organized under NSS aims to inculcate social welfare in students, and to provide service to society without bias. NSS volunteers work to ensure that everyone who is needy gets help to

enhance their standard of living and lead a life of dignity. In doing so, volunteers learn from people in urban and rural areas how to lead a good life despite a scarcity of resources. Within a short span of time, the NSS Unit has scaled heights including volunteer's participation in the different activities in the university. At present more than 50 volunteers registered with the unit and all of them are well connected with email and social media platforms.

The lists of activities carried out by the NSS unit during 2019-20:

Sr. No.	Name of the Activity and its details	Volunteer Participated
1.	Awareness Campaign by Poster Presentation in 22 <sup>nd</sup> July, 2019	45
2.	Tree Plantation Drive held on 15 <sup>th</sup> August, 2019	48
3.	Swachhata Abhiyan, 22 <sup>nd</sup> August, 2019	48
4.	Awareness Campaign on Rashtriya Poshan Maah, 20 <sup>th</sup> September, 2019	45
5.	Plastic Mukt Abhiyan, 02 <sup>nd</sup> October, 2019	46
6.	Signature Campaign, 02 <sup>nd</sup> October, 2019	48
7.	Constitution Day held at DUVASU, Mathura on 26 <sup>th</sup> November	48
8.	Drawing competition and awareness about Constitution Day held at DUVASU, Mathura on 26 <sup>th</sup> November	50
9.	Awareness programme in Primary school about Milk held at DUVASU, Mathura on 26 <sup>th</sup> November	50
10.	National Milk Day Celebration held at DUVASU, Mathura on 26 <sup>th</sup> November	50
11.	Collection and distribution of old warm cloths held at DUVASU, Mathura on 6 <sup>th</sup> December	50
12.	Awareness programme on Zoonotic Disease and Personal Hygiene at Gaushal of Vrindavan on 2 <sup>nd</sup> March, 2020	45







## I. Educational Visits

The students of II<sup>nd</sup> & III<sup>rd</sup> Year B.Sc. Biotechnology and Industrial Microbiology visited National Agri-Food Biotechnology Institute, Mohali, Punjab and Institute of

Nano Science and Technology, Punjab. The tour leaders were Dr. Vijay Laxmi, Dr. Priyambada Kumari, Mr. Himanshu Awasthi and Mr. Krishna K.Jhakad.



## OTHER HIGHLIGHTS AND ACTIVITIES

### 1. Entrance Examination

University conducted Pre-Veterinary Test-2019 on 31<sup>st</sup> May 2019 in five cities-Allahabad, Kanpur, Bareilly, Lucknow and Mathura in which total 6543 candidates appeared. Out of these, 1235 candidates qualified the prelim examination. PVT Mains was conducted on 23<sup>rd</sup> June 2019 at two centers in Mathura wherein 638 candidates qualified. University also conducted Pre-Diploma Entrance Examination-2019 on 28<sup>th</sup> July 2019 and Postgraduate (M.V.Sc. and PhD) Entrance Examination-2019 on 17<sup>th</sup> July 2019 wherein 279, 89 and 02 candidates qualified the respective examinations. Selected candidates were admitted to different academics degree and diploma programmes on the basis of their merit in the competitive examination under various categories as per availability of seats in the College of Veterinary Science & Animal Husbandry and Institute of Para Veterinary Sciences for the session 2019-2020.

### 2. Oath Taking Ceremony

Oath taking ceremony of 2014 batch of BVSc & AH student was organized on 9<sup>th</sup> January, 2019 at Pant Hall. On this occasion, the outgoing students were sworn oath to utilize their professional knowledge with dignity and follow the principles of veterinary medical ethics. Hon'ble Vice-Chancellor administered oath to the outgoing students. Prof. A.C. Varshney, Chief Guest of the ceremony, graced the programme with his encouraging words to the students. Amishi Singh and Arzoo Nisha secured the first and second rank, respectively in their batch.

### 3. Independence Day Celebrations

The Independence Day was celebrated with great enthusiasm and respect by the senior officers, faculty members, staff and students of the University. The celebration started with inspection of 1 UP R&V SQN NCC, Mathura 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.



### 4. Fresher Party

RooBaRoo-2019 was organised by second year diploma students to welcome the freshly admitted students of Diploma program on 25<sup>th</sup> September 2019 at Kisan Bhavan auditorium. Dr. G.K. Singh, Hon'ble Vice-Chancellor was the chief guest of the occasion. Mr. Badal Rathi (DVP) & Ms Aausi were chosen as Mr. FRESHER & Ms. FRESHER 2019 respectively.







### **5. Gandhi Jayanti and Shastri Jayanti**

The University Celebrated Mahatma Gandhi's 150<sup>th</sup> Birth Anniversary on 2<sup>nd</sup> Oct, 2019. All the officers, teachers, students & staff attended the event. The unveiling of the portrait of Gandhiji was done followed by offering of floral tribute. A Cleanliness Drive under 'Swachh Bharat Swasth Bharat' Abhiyaan Programme was organized on the occasion.

### **6. Pt. Deen Dayal Upadhyaya Jayanti**

103<sup>rd</sup> birth anniversary of well-known thinker and philosopher Pt. Deen Dayal Upadhyaya was celebrated at the University on 25<sup>th</sup> September. On this occasion floral tributes were offered to his portrait and Hon'ble Vice chancellor of the University called upon the gathering to follow the path shown by Deen Dayal ji.

### **7. Foundation Day**

DUVASU celebrated its foundation day on 25<sup>th</sup> October, 2019 at Kisan Bhawan Auditorium. Various competitions and cultural programmers were held on this occasion in which students from College of Veterinary Science & A.H., College of Biotechnology and Institute of Para Veterinary Sciences participated with great exuberance. The celebration concluded with prize distribution to the winners of literary, cultural and fine arts competitions by the chief guest and other higher officials of university.

### **8. Republic Day**

The University celebrated 71<sup>st</sup> Republic Day on the auspicious morning of 26<sup>th</sup> January 2020. Students, staff and faculty members filled with a feeling of patriotism and dedication gathered in the main ground. A Guard of Honour was presented by UP R&V SQN NCC, Mathura as a mark of respect to the Hon'ble Vice-Chancellor, Chief Guest of the occasion. The celebration began with the

unfurling of the Indian National Flag by the Chief Guest followed by the National Anthem. Two saplings were planted in front of main building of College of Veterinary Sciences & Animal Husbandry as a part of long standing tradition of preservation of environment and ecological balance. Floral tributes were paid to the 'Father of the Nation' Mahatma Gandhi. On this auspicious occasion a Blood donation Camp was organized wherein more than 60 volunteers donated the blood for the noble cause. District hospital, Mathura issued the certificate to these volunteers for their exemplary work.

### **9. Ambedkar Jayanti**

The birth anniversary of the principal architect of the Indian Constitution Bhimrao Ambedkar was celebrated on 14<sup>th</sup> April 2020. 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.

### **10. International Yoga Day**

On the occasion of International Yoga Day a Yog Shivar was organized on 21<sup>st</sup> June 2019. Hon'ble Vice-Chancellor Prof G.K. Singh, officers of the University, teachers and students participated in the Yog Shivar.

### **11. Basant Panchmi**

Dedicated to Devi Saraswati Basant Panchmi festival was celebrated at the main hall of University library in the morning of 29<sup>th</sup> January 2020. The pandal of Goddess was decorated with lights and flowers and the students, teaching and non teaching staff participated in the reverence of goddess of knowledge for the blessings.





## 9<sup>TH</sup> CONVOCATION OF DUVASU, MATHURA

The 9<sup>th</sup> Convocation of DUVASU, Mathura was held on 28<sup>th</sup> August 2019. Hon'ble Governor of Uttar Pradesh and Chancellor of DUVASU Smt. Anandiben Patel graced the programme through her splendid presence. As per the tradition, the proceedings of convocation commenced with lighting of lamp, Saraswati Pooja followed by University Song and National Anthem. Hon'ble Vice Chancellor presented the University progress report and Hon'ble chancellor conferred degrees to the students of respective streams. Hon'ble Chief Guest Dr. Mangla Rai, former

Director General, ICAR Chief Guest delivered the convocation address and Hon'ble Guest of Honour Dr. Shri Krishan Garg, founder Vice Chancellor of DUVASU addressed the gathering to motivate the students. Shri Laxmi Narayan Chaudhary, Cabinet Minister, Dairy Development, Animal Husbandry, Fisheries shared the Dias on this occasion.

Fifteen students were awarded medals in various categories for their academic excellence and extra-curricular activities.



## **INAUGURATION OF "PASHU AAROGYA MELA"**

### **BY HON'BLE PRIME MINISTER SHRI NARENDRA MODI JI**

In a landmark event for DUVASU, PM Modi visited the University on 11<sup>th</sup> September 2019 to inaugurate the Pashu Aarogya Mela. The two-day fair was organised for the promotion of animal health for doubling farmer's income and an exhibition of high breed cattle. On this occasion he launched the National Animal Disease Control Programme (NADCP) for eradicating the foot and mouth disease (FMD) and brucellosis in cattle and laid the foundation stone for schemes worth more than Rs 13000 crore.

Uttar Pradesh Chief Minister Shri Yogi Adityanath Ji and Union minister for Animal

husbandry, Dairy and Fisheries Giriraj Singh Ji accompanied the Prime Minister. The State's Minister for Dairy Development, Animal husbandry and Fisheries Laxmi Narain Chaudhary Ji, Minister for Energy Srikant Sharma Ji, were also present at the event.

In the fair, PM visited "Swachhata Hi Seva" stall and helped the women who were segregating the single use plastic waste from the garbage. Launching the Swachhata hi sewa abhiyaan, PM Modi reiterated his call to shun single use plastic by 2022.





## AWARDS AND HONOUR / ACHIEVEMENTS

S. No.	Name	Name of award	Event	Date
1.	Prof. S.K. Yadav	Keynote speaker	Global Conference on Infectious Diseases” at Flora Grand Hotel, UAE, Dubai	22 <sup>nd</sup> -24 <sup>th</sup> Apr, 2019
2.	Dr. Sanjay Kumar Bharti	Best oral presentation award	3 <sup>rd</sup> National conference of SVAHE on livestock development for societal needs: extension and allied sectors initiatives, at COVS, GBPUA&T Pantnagar, (U.K.)	03 <sup>rd</sup> -05 <sup>th</sup> Apr, 2019
3.		Certificate winner for poster presentation	National conference on “Innovative packaging techniques for food and its safety aspect” held at Indian Institute of Packaging (MoFPI) New Delhi	10 <sup>th</sup> May., 2019
4.	Dr. Vijay Pandey	Silver Medal	4 weeks online NPTEL Certification course on “Functional Genomics” 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, Govt of India	27 <sup>th</sup> Aug. -15 <sup>th</sup> Sept., 2019
5.	Dr. Avneesh Kumar	Outstanding/ Best Thesis Award	On global research initiatives for sustainable agriculture & Allied Science, NAARM, Hyderabad	20 <sup>th</sup> -22 <sup>th</sup> Oct., 2019
6.	Dr. Neeraj Kumar Gangwar	Best Ph.D thesis award	IAVP Congress, India-2019 at Aizawl	20 <sup>th</sup> -22 <sup>th</sup> Oct., 2019
7.		Dr. S.K. Nigam Memorial Young Scientist		
8.		Second Best Oral Presentation Award		
9.	Dr. Barkha Sharma	Second Best Oral Presentation Award	National Symposium and first Annual Convention of VIPM at DUVASU, Mathura	08 <sup>th</sup> -09 <sup>th</sup> Nov., 2019
10.	Dr. P.N. Panigrahi	Young Scientist Award on Ethno-veterinary medicine		
11.	Dr. Mukesh Srivastava Dr. Ashish Srivastava Dr. Arvind Tripathi Dr. P.N. Panigrahi	Best Oral Presentation Award		
12.	Dr. Mukesh Srivastava Dr. Ashish Srivastava Dr. Arvind Tripathi Dr. P.N. Panigrahi	Best Poster Presentation Award		
13.	Dr. Neeraj Kumar	Best Poster Presentation		



14.	Dr. Shyama N. Prabhu Dr. Renu Singh	Appreciation Award		
15.	Dr. Ajay Pratap Singh	Best poster presentation award (third)		
16.	Dr. Udit Jain	Best Oral Presentation		
17.	Dr. Jitendra Tiwari Dr. Vikrant Sudan Dr. Pradeep Kumar Dr. Daya Shanker	Best Oral Presentation		
18.	Prof. Daya Shanker Dr. Anjali Devi Dr. Vikrant Sudan	Best Poster Presentation Award		
19.	Dr. Vinod Kumar Singh	Two Reviewer Excellence Awards	Indian Journal of Animal Research, Agriculture Research Communication Center, Karnal	17 <sup>th</sup> Sept., 2019 & 18 <sup>th</sup> Jan., 2020
20.		ACIAR grant	Govt. of Australia to attend 7 <sup>th</sup> International Conference on Sustainable Animal Agriculture for Developing Countries (SAADC-2019) organized by Nepal Veterinary Association at Hotel Pokhara Grande, Pokhara, Nepal	8 <sup>th</sup> -11 <sup>th</sup> Nov., 2019
21.		Professional Certification	Biorisk Management from International Federation of Biosafety Associations, Ontario, Canada	
22.	Dr. Amitav Bhattacharyya	Fellow Indian Poultry Science Association	XXXVI Annual Conference and National Symposium of Indian Poultry Science Association (IPSA) at College of Veterinary Science and Animal Husbandry, Chhattisgarh Kamdhenu Vishwavidyalaya, Durg	11 <sup>th</sup> -13 <sup>th</sup> Dec., 2019
23.		2 <sup>nd</sup> Best oral Presentation		
24.	Dr. Rajneesh Sirohi Prof. P.K. Pandey Prof. R.P. Pandey Dr. A. Bhattacharyya Dr. Yajuvendra Singh Dr. D.N. Singh Dr. S.S. Kashyap Dr. Mamta	Best Poster Award		
25.	Dr. Shalini Vaswani	Best paper award (Poster)	International conference on Animal Nutrition held at Kolkata	17 <sup>th</sup> -19 <sup>th</sup> Dec., 2019
26.	Dr. Rashmi Singh	Organizing Secretary	National Symposium and XIV Biennial Conference of APHV at College of Veterinary Science and Animal Husbandry, DUVASU, Mathura, Uttar	24 <sup>th</sup> -25 <sup>th</sup> Jan., 2020
27.		Best Poster Presentation award (second)		
28.	Dr. Udit Jain	Best oral Presentation		

29.	Dr. Amitav Bhattacharyya	Best oral Presentation	National Symposium and XIV Biennial Conference of APHV at College of Veterinary Science and Animal Husbandry, DUVASU, Mathura, Uttar	24 <sup>th</sup> -25 <sup>th</sup> Jan., 2020
30.	Dr. Shyama N. Prabhu	Best oral Presentation award		
31.	Dr. S.K. Singh	Best oral Presentation award		
32.	Dr. Parul Dr. Barkha Sharma	Dr. Ram Raksha-Kiran Shukla Gold Medal for Best oral presentation		
33.	Dr. Sanjay Kumar Bharti	Best Thesis Award 2020	International conference on Innovative and current advances in agriculture & allied sciences (ICAAAS-2020) Bangkok Thailand	27 <sup>th</sup> Jan.- 01 <sup>st</sup> Feb., 2020
34.	Dr. Vijay Pandey	Best Paper Award	4 <sup>th</sup> National Seminar and Annual Convention of Society of Veterinary Biochemists & Biotechnologists of India (SVBBI) organized at College of Veterinary Science, Sri Venkateswara Veterinary University, Tirupati (Andhra Pradesh)	04 <sup>th</sup> -05 <sup>th</sup> Feb., 2020
35.	Dr. Vikrant Sudan	J.P. Dubey Young Scientist award	IAAVP for PhD research at XXIX National Congress of Veterinary Parasitology and National Symposium at Nanaji Deshmukh Veterinary Science University, Jabalpur	05 <sup>th</sup> -07 <sup>th</sup> Feb., 2020
36.	Dr. Amit Kumar Jaiswal Prof. Daya Shanker Dr. A Singh Dr. Pradeep Kumar	3rd Best oral presentation award		
37.	Dr. Sanjay Kumar Bharti	Young Scientist award and Best oral presentation award	2 <sup>nd</sup> National Conference at International Buddhist Research Institute, VipinKhand, Gomtinagar, Lucknow	07 <sup>th</sup> -08 <sup>th</sup> Feb., 2020
38.	Dr. Vinod Kumar Singh	Certificate of reviewing for Outstanding contribution	International Journal of Livestock Research, Pashupati Foundation India	17 <sup>th</sup> - Feb., 2020
39.	Dr. Dilip Kumar Swain	Dr. J.N. Pandey Memorial Best Poster Award	XXVIII Annual Conference & National Symposium in association with ICAR-CSWRI, Avikanagar at ICAR-Central Sheep and Wool Research Institute, Avikanagar	18 <sup>th</sup> -19 <sup>th</sup> Feb., 2020
40.	Dr. Vikas Pathak	Member of Scientific Panel on 'Meat & Meat Products	Food Safety and Standards Authority of India, Ministry of Health & Family Welfare, Govt. of India	2018 <sup>th</sup> Till now
41.		Vice President		
42.	Dr. Meena Goswami Awasthi	Executive Member	Indian Meat Science Association	2018 <sup>th</sup> Till now
43.	Dr. Barkha Sharma	Elected Member of Editorial board	Indian Journal of VPH, the official journal of APHV	2019-20
44.	Dr. Vinod Kumar Singh	IFBA certification exam scholarship	Workers safety foundation, ltd. (frontline foundation), TX, USA	2019
45.	Dr. Archana Pathak	Reviewer Excellence Award	Agricultural Research Communication Center	2019
46.	Dr. Neeraj Kumar Gangwar	Elected as zonal secretary	North zone of the IAVP society, India	2019-20

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## DETAILS OF NEW CONSTRUCTION/RENOVATION WORK DONE DURING FINANCIAL YEAR 2019-20

### Grant From Government

S. No.	Name of work	Cost in Lakh	Date
1.	Interlocking paver tiles near children park in main campus	07.09	Completed
2.	Aluminium partition and painting work in Gynaecology Deptt.	03.44	Completed
3.	Plaster and painting work outside area of clinical Gynaecology	01.33	Completed
4.	Renovation work of Godown at ILFC	33.34	Completed
5.	Kota stone flooring work in Pasture deptt	01.93	Completed
6.	Construction of interlocking paver tiles behind Teachers Home Guest House	07.21	Completed
7.	Construction of parking shed near Administrative Block	09.21	Completed
8.	Roof replacement work of Kothari Surgeon House	09.98	Completed
9.	Repair and renovation and painting work in Kothari Surgeon	09.95	Completed
10.	Renovation work of poultry shed at ILFC	09.87	Completed
11.	Construction of repair and renovation and painting work of B-02 Quarter	07.54	Completed
12.	Roof replacement work of B-02 Quarter	09.43	Completed
13.	Construction of interlocking paver tiles near Goat shed	03.99	Completed
14.	Renovation work of toilets in Shashtri Girls Hostel	07.25	Completed
15.	Repair and painting work out side area in Shashtri Girls Hostel	04.76	Completed
16.	Construction of parking shed and security room in Shashtri Girls Hostel	07.96	Completed
17.	Construction of ceiling repair and window replacement in shashtri Girls Hostel	09.65	Completed
18.	Renovation work in dining hall and kitchen of Shashtri Girls Hostel	08.14	Completed
19.	Plaster and painting work rooms and corridor in Shashtri Girls	09.26	Completed
20.	Waterproofing roof work in Shashtri Girls Hostel	08.47	Completed
21.	Construction work of electrification room and corridor in Shashtri Girls Hostel	09.26	Completed
22.	P/F Glazed tiles on wall left side 4 nos room and corridor first floor of teachers hostel cum guest house	01.32	Completed
23.	Brick Kharanja on road girls hostel to quarter no C-9 to C-16 and D-33 to D-44 Link Road	02.33	Completed
24.	Painting Work and misc Teachers guest house and international guest house	05.32	Completed
25.	Construction of interlocking paver tiles and aluminium partition in Kothari hospital	06.16	Completed
26.	Construction of interlocking paver tiles approach road for new O.T. surgery deptt	06.16	Completed
27.	Construction of open drain and boundary wall and tile in connecting gallery surgery deptt	07.63	Completed
28.	Construction of parking shed LPT and Para Veterinary Science	09.97	Completed

29.	Fabrication work ms angle iron AC frame with welded wire mesh on Auditorium new campus	06.56	Completed
30.	Construction work of sports department front veranda closed	02.97	Completed
31.	Repairing and renovation painting of G-2/1 Quarter at ILFC	08.37	Completed
32.	Brick work and plaster and painting wall and chain link fencing at ILFC	04.00	Completed
33.	Construction of shed semen lab at ILFC	02.75	Completed
34.	Construction of chain link fencing at semen lab ILFC	06.47	Completed
35.	Aluminium partition work of Centre store	03.52	Completed
36.	Construction of drainage of waste water in B-Type and C-Type Residences	10.28	Completed
37.	Renovation work of Dr. Deep Narayan Singh Residences	10.75	Completed
38.	Construction of drainage of waste water in A-Type, B-Type and LQ-Type and Dean Residences	20.58	Work in Progress
39.	Interlocking tiles & Animal shed Repair & painting work	07.62	Completed
40.	Construction of boundary wall at Primary school in Main	06.03	Completed
41.	Construction of damaged soak pit from D-37 to D-40 Residences at Main Campus	02.29	Work in Progress
42.	Renovation and repair work of forth class residence 40 Nos. Main Campus	70.40	Work in Progress
43.	Renovation & repairing of K.V.K. D-Type Residence 8 Nos	27.49	Work in Progress
<b>Total</b>		<b>409.34</b>	

#### Grant From Indian Council of Agricultural Research, New Delhi

S. No.	Name of work	Cost in Lakh	Progress
1.	Renovation work in Lab VPH Dept	09.93	Work in Progress
2.	Renovation work and fixing FC sheet roofing to Gautam Hostel	24.96	Work in Progress
3.	Renovation Lab I Genetics Department	07.45	Completed
4.	Renovation Lab II Genetics Department	03.98	Completed
5.	Renovation of Lab of Medicine Department	09.95	Completed
6.	Renovation of museum hall in Pathology Department	09.98	Completed
7.	Construction of training centre/Boarding lodge near Goat Farm	22.53	Work in progress
8.	Renovation work of Gynaecology PG Lab	07.87	Completed
9.	Renovation work of Gynaecology UG Lab	06.14	Completed
10.	Back side boundary repair and barbed wire fencing and security room Gautam Hostel	08.38	Completed
11.	Barbed wire fencing front side Gautam Hostel	06.23	Completed
12.	CC Pathway and Soak Pit Sarojini Hostel to kasturba Hostel	09.96	Work in progress
13.	Construction of soak pit and boundary wall and Street light work in Shashtri Girls Hostel	09.96	Work in progress
14.	Construction Anti termite Auditorium new campus	07.62	Completed
<b>Total</b>		<b>134.98</b>	

#### Reciept

S. No.	Name of work	Cost in Lakh	Progress
1.	Construction of Boundary wall at Shashtri Girl Hostel	33.14	Completed



## FINANCIAL STATUS

(Rs in lakhs)

Budget	Salary	Contingency	Total
State government	4602.00	1517.77	6119.77
ICAR development Grant	--	217.45	217.45
KVK	152.00	15.99	167.99
Other Projects		114.46	114.46
RKVY	--	1173.71	1173.71
University Receipt	--	453.86	453.86

## RIGHT TO INFORMATION ACT

In compliance of Govt. of Uttar Pradesh and provision of RTI Act, 2005, PIO received 35 applications out of which 33 applications were cleared and rest 2 are under consideration.



**Shri Chaurdhary Laxmi Narayan Singh, Minister of Dairy Development,  
Animal Husbandry. Fisheries, Uttar Pradesh**



**Dr. Rakesh Chandra Agrawal, Deputy Director General (Agril. Edu.)  
ICAR, New Delhi**





**Shri Surya Pratap Shahi, Cabinet Minister of Agriculture,  
Agriculture Education and Agriculture Research**



**Shri Kesav Prasad Maurya, Deputy Chief Minister and  
Shri Shrikant Sharma, Power Minister of Uttar Pradesh**





**उ.प्र. पं. दीनदयाल उपाध्याय पशु चिकित्सा विज्ञान विश्वविद्यालय  
एवं गो अनुसंधान संस्थान, मथुरा**

**U.P. Pandit Deen Dayal Upadhyaya Pashu-Chikitsa  
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