



वार्षिक प्रतिवेदन

ANNUAL REPORT

2021-2022



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

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



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Vigyan Vishwavidyalaya Evam Go Anusandhan Sansthan
(DUVASU), Mathura-281001 (U.P.)



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FOREWORD

It gives me immense pleasure and satisfaction to present University Annual Report of U.P. Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go Anusandhan Sansthan (DUVASU), Mathura for the year 2021-22. The report highlights the kaleidoscopic view of various activities and achievements of the teaching, research, extension and infrastructure development undertaken during the last one year. During the reporting year a total of 63 research projects were operational in the university. Out of which 14 were funded by RKVY, 4 by ICAR. Eight projects were funded by different agencies like DST, DBT, DRDO, DAHD, CCRH and UPKAR and 03 projects were sponsored by reputed private agencies.



The University has one of the finest Veterinary Clinical Complex well equipped with state of art equipments and diagnostic laboratory. During the year a total of 13,108 clinical cases of small and large animals were presented and 4646 clinical samples were tested. University is also serving the livestock and pet owners of Mathura and adjoining districts with the upgraded diagnostic and treatment facilities.

DUVASU students participated in various activities including sports meet, cultural activities, youth festivals, NCC and NSS at University and All India level and brought laurels to the University. Many webinars were organized for the students under Interactive Sessions for Students with Industry and Academia of Institutional Development Plan (IDP)-National Agricultural Higher Education Project. The experiential learning programmes were also undertaken in various departments of College of Veterinary Science and Animal Husbandry, for providing hands on training to the students, farmers, animal owners and unemployed rural youth for their self sustainability.

Directorate of Extension with the support of faculty of Veterinary College and KVK organized several trainings for knowledge up gradation of farmers/farm women, animal owners, field Veterinarians and unemployed rural youth. University has successfully organized three National level e-quiz competition, one SCSP-ICAR sponsored hands on training, one conference and two ICAR sponsored 21 days training programme, Dr. C. M. Singh Birth Centenary year celebrations cum international webinar, 5 days online faculty development program. In addition to this several trainings and workshops were also successfully organized by the University that would definitely bring about sea change in career of Veterinary professionals. The research papers speak about the quality of research work at any academic institute. Publication of nearly 91 research articles in national and international high NAAS rating and impact factor journals reflect the quality of research work being undertaken at the University. Many teachers were honoured with several prestigious awards and academic accomplishments at national and international level.

I express my sincere thanks and gratitude to Hon'ble Chancellor of the University and Governor of Uttar Pradesh, Additional Chief 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. I take 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 future thrust would be job oriented quality education, need and problem based research, establishing and strengthening close linkages with the stakeholders including livestock and fish farmers, and related industries for increasing income through productivity enhancement, value addition and ensuring quality and safety of animal based foods while protecting environment using sustainable production systems.

The sincere efforts made by the "Editorial Committee" to bring out this Annual Report depicting various activities and achievements of the University is duly acknowledged and appreciated.

(A.K. Srivastva)



प्राक्कथन

उत्तर प्रदेश पंडित दीन दयाल उपाध्याय पशु चिकित्सा विज्ञान विश्वविद्यालय एवं गो अनुसंधान संस्थान (दुवासू), मथुरा के इतिहास के एक और उत्कृष्ट पन्ने के प्रतिबिम्ब वार्षिक रिपोर्ट 2021-22 को प्रस्तुत करते हुए मुझे अपार हर्ष एवं संतोष हो रहा है। यह रिपोर्ट पिछले एक वर्ष के दौरान किए गए शिक्षण, अनुसंधान, विस्तार और बुनियादी ढांचे के विकास की विभिन्न गतिविधियों और उपलब्धियों के बहुरूपदर्शक दृष्टिकोण पर प्रकाश डालती है। समीक्षाधीन वर्ष के दौरान विश्वविद्यालय में कुल 63 शोध परियोजनाएँ चल रही थीं जिनमें से 14 को आरकेवीवाई द्वारा, 4 को आईसीएआर द्वारा वित्त पोषित किया गया था। आठ परियोजनाओं को डीएसटी, डीबीटी, डीआरडीओ, डीएचडी, सीसीआरएच और यूपीकेएआर जैसी विभिन्न एजेंसियों द्वारा वित्त पोषित किया गया था और 03 परियोजनाओं को प्रतिष्ठित निजी एजेंसियों द्वारा प्रायोजित किया गया था।



विश्वविद्यालय के पास अत्याधुनिक उपकरणों और नैदानिक प्रयोगशाला से सुसज्जित बेहतरीन पशु चिकित्सा क्लिनिकल परिसर है। वर्ष 2021-22 के दौरान छोटे और बड़े जानवरों के कुल 13,108 नैदानिक मामले प्रस्तुत किए गए और 4,646 नैदानिक नमूनों का परीक्षण किया गया। विश्वविद्यालय उन्नत निदान और उपचार सुविधाओं के साथ मथुरा और आसपास के जिलों के पशुधन और पालतू जानवरों की भी सेवा कर रहा है।

विश्वविद्यालय के छात्रों ने विश्वविद्यालय और अखिल भारतीय स्तर पर स्पोर्ट्स मीट, सांस्कृतिक गतिविधियों, युवा उत्सवों, NCC और NSS सहित विभिन्न गतिविधियों में उत्कृष्ट प्रदर्शन कर के विश्वविद्यालय को गौरवान्वित किया। आई.डी.पी.-राष्ट्रीय कृषि उच्च शिक्षा परियोजना (IDP-NAHEP) के अकादमिक और उद्योग के साथ संस्थागत विकास योजना के इंटरएक्टिव सत्र के तहत छात्रों के लिए कई वेबिनार आयोजित किए गए। छात्रों, किसानों, पशु मालिकों और बेरोजगार ग्रामीण युवाओं को उनकी आत्मनिर्भरता के लिए प्रशिक्षण प्रदान करने के लिए पशु चिकित्सा विज्ञान और पशुपालन महाविद्यालय के विभिन्न विभागों में अनुभववात्मक शिक्षण कार्यक्रम भी चलाए गए।

विस्तार निदेशालय ने पशु चिकित्सा महाविद्यालय और के.वी.के. के सहयोग से किसानों/खेत महिलाओं, पशु मालिकों, क्षेत्र के पशु चिकित्सकों और बेरोजगार ग्रामीण युवाओं के ज्ञान उन्नयन के लिए कई प्रशिक्षण आयोजित किए। विश्वविद्यालय ने तीन राष्ट्रीय स्तर की ई-क्वज प्रतियोगिता, एक एस.सी.एस.पी.-आई.सी.ए.आर. प्रायोजित प्रशिक्षण, एक सम्मेलन और दो आईसीएआर प्रायोजित 21 दिवसीय प्रशिक्षण कार्यक्रम, डॉ. सी.एम. सिंह जन्म शताब्दी वर्ष समारोह सह अंतर्राष्ट्रीय वेबिनार, 5 दिवसीय ऑनलाइन संकाय विकास कार्यक्रम का सफलतापूर्वक आयोजन किया। इसके अलावा विश्वविद्यालय द्वारा कई प्रशिक्षण और कार्यशालाओं का भी सफलतापूर्वक आयोजन किया गया जो निश्चित रूप से पशु चिकित्सा पेशेवरों के करियर में एक बड़ा बदलाव लाएगा। शोध पत्र किसी भी शैक्षणिक संस्थान में शोध कार्य की गुणवत्ता के बारे में बताते हैं। राष्ट्रीय और अंतर्राष्ट्रीय उच्च एनएएस रेटिंग और प्रभाव कारक पत्रिकाओं में लगभग 91 शोध लेखों का प्रकाशन विश्वविद्यालय में किए जा रहे शोध कार्य की गुणवत्ता को दर्शाता है। कई शिक्षकों को राष्ट्रीय और अंतरराष्ट्रीय स्तर पर कई प्रतिष्ठित पुरस्कारों और अकादमिक उपलब्धियों से सम्मानित किया गया।

मैं विश्वविद्यालय के माननीय कुलाधिपति और उत्तर प्रदेश के राज्यपाल, माननीय राज्यपाल के अतिरिक्त मुख्य सचिव और प्रमुख सचिव, पशुपालन, भारत सरकार के प्रति अपना हार्दिक धन्यवाद और आभार व्यक्त करता हूँ। इस संस्थान के लिए बुनियादी ढांचे और प्रशासनिक समर्थन के संदर्भ में तथा विश्वविद्यालय को समय पर और पर्याप्त वित्तीय सहायता प्रदान करने हेतु उत्तर प्रदेश सरकार, आर.के.वी.वाई., डी.एस.टी., डी.बी.टी., आई.सी.ए.आर., नई दिल्ली और भारत सरकार के प्रति अपना विशेष आभार व्यक्त करने का अवसर लेता हूँ।

विश्वविद्यालय निकट भविष्य में नौकरी उन्मुख गुणवत्ता शिक्षा, आवश्यकता और समस्या आधारित अनुसंधान, पशुधन और मछली किसानों सहित हितधारकों के साथ घनिष्ठ संबंध स्थापित और मजबूत करने और उत्पादकता बढ़ाने, टिकाऊ उत्पादन प्रणालियों का उपयोग करते हुए पर्यावरण की रक्षा के साथ खाद्य पदार्थ के मूल्य संवर्धन और पशु आधारित गुणवत्ता और सुरक्षा सुनिश्चित करने के माध्यम से आय बढ़ाने के लिए कार्य करेगा।

मैं विश्वविद्यालय की विभिन्न गतिविधियों और उपलब्धियों को दर्शाने वाली इस वार्षिक रिपोर्ट को प्रकाशित करने के लिए “संपादकीय समिति” द्वारा किए गए ईमानदार प्रयासों को विधिवत स्वीकार और सराहना करता हूँ।

(डा. ए. के. श्रीवास्तव)



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EXECUTIVE SUMMARY

TEACHING

- During 2021-22, College of Veterinary Science and Animal husbandry admitted 90 students in B.V.Sc. & AH programme out of which 35.56% were girls. In M.V.Sc. and PhD programmes, 38 and 04 students respectively, were admitted.
- 09 students received their PhD and 30 students M.V.Sc. and 64 students B.V.Sc. & A.H. degree from College of Veterinary Science and Animal husbandry in the same year.
- During the year, College of Biotechnology admitted 23 and 03 students to B.Sc. Biotechnology and B.Sc. Industrial Microbiology programmes respectively, and 03 and 24 students received their Ph.D. and B.Sc. degrees respectively, from College of Biotechnology.
- During 2021-22, 60 and 60 students were admitted to Diploma in Veterinary Pharmacy (DVP) and Diploma in Livestock extension (DLE) programmes, respectively and 57 and 59 Students completed their DLP and DLE programmes, respectively. Three months Internship programme for 57 students of Diploma in Veterinary Pharmacy of 2018 batch was also organized.
- Veterinary Clinical complex (VCC) is well equipped with modern facilities which include small and large animal operation theatres, two ICU for pets, C-arm image intensifier, digital X-ray machine, CCTV camera, USG machine, laproscopy set, mobile X-ray machine, small animal anesthesia machine, loading and unloading platform and indoor unit for small animals and handled 13,108 clinical cases. The total revenue generated by VCC during this period was Rs. 6,96,490/- (six lacs ninety six thousand four hundred ninety only).
- Disease diagnostic laboratory of VCC is equipped with digital microscope, dry chemistry analyzer, hematology analyzer, electrolyte analyzer. During 2021-22, the laboratory analysed total 4646 samples comprising of blood samples for various blood parameters, serum samples for biochemical analysis, milk and urine samples for culture sensitivity and histo-pathology tests and other samples generated a revenue of Rs. 4,03,060/- (four lacs three thousand sixty only).
- During the year under report, the clinical services were provided by the faculty members of clinics and post graduate students at farmer's doorstep through clinical camps organized at nearby villages of Mathura district.
- The breeder farm, layer farm and hatchery established under Experiential Learning Unit (ELU) in Poultry Science Department served as models for U.G., P.G. and Ph.D. teaching and also served as models for internship students to train them regarding poultry farming and entrepreneurship. Students were trained in various farm activities pertaining to feeding, watering, hatchery operations and management. The total revenue generated at farm was Rs. 20,45,276.00/- (Rs. twenty lac forty five thousand two hundred seventy six only).
- Experiential Learning Programme on “Milk & meat processing and livestock products manufacturing” in Department of Livestock Products Technology imparted practical trainings on preparation of different milk and meat products to undergraduate and post-graduate students. During the reporting period, 1509.0 liters of milk was processed into Paneer and Khoa. Value added meat products like meat nuggets, meat patties etc. were also processed. The profit generated for the financial year 2021-22 was Rs. 11,347/- (Rs. eleven thousand three hundred forty seven only)
- University Library has 35956 books of various streams like Veterinary Science, Animal Husbandry and Biotechnology, 12 journals including online journals www.cera.jccc.in and various Hindi and English newspapers. The various facilities of the library includes Circulation service, Reference service, Computer/ Internet service, theses reading service etc. CD-ROM - VET CD 1973 to Aug., 2004, CAB CD 1972 to May 2005, CAB Abstract 1990 to Dec., 2005.
- Feed production and processing project under Department of Animal Nutrition has a feed processing unit and one Urea molasses mineral block unit that provides hands-on training to the students to formulate compounded feed as per the nutrient requirement of livestock. Feeds and UMMB produced from these units are available to the animals of university and also to farmers



and goshala during Kisan melas and farmers training. This year (2021-22) departmental sale of mineral mixture earned a revenue of Rs 6.0 lacs (six lacs only).

RESEARCH

- During the reporting year, 29 externally funded projects were running in various departments of College of Veterinary Science and Animal Husbandry. Out of these, 14 projects were funded by RKVY, 04 projects by ICAR, 01 project was funded by Department of Biotechnology (DBT), GOI, 01 project was funded by NIF –DBT, 01 project by NIF-DST, 01 project funded by DADF, Ministry of Agriculture and Farmers Welfare, 01 project by DAHD, GOI, 01 project by Ms. Datt Mediproducs Pvt. Ltd. Gurgaon, Haryana, 01 project by Central Council for Research in Homeopathy, 01 project by DRDO-INMAS, 02 projects by Ayurved Limited, Baddi, Solan, H.P. and 01 project was funded by UPKAR respectively.
- During the same year 30 and 04 intramural university funded projects were running in various departments of College of Veterinary Science and Animal Husbandry and College of Biotechnology respectively.
- During 2021-22, 09 Ph.D. and 24 M.V.Sc. thesis in Veterinary Science and Animal Husbandry subjects, 02 PhD in Biotechnology were submitted as per academic research in various departments.
- During the year under report, University published 91 research publications in the journals of national and international repute.

EXTENSION

- During 2021-22, Directorate of Extension with the assistance of faculty of College of Veterinary Science and Animal Husbandry organized two trainings on campus, 12 visits of farmers, animal owners and others in Pashu Gyan Chaupal, Dairy Farm and Goat Unit. Through these trainings, 75 farmers/ livestock owners were trained and exposed to latest management and entrepreneurial skills. Through visits, 500 farmers were benefited.
- Training manuals, leaflets and popular articles in the form of booklets were developed by Directorate of Extension for the benefit of farmers animal owners and keepers.

- Department of Veterinary and Animal Husbandry Extension also conducted 04 trainings for farmers/livestock owners/ Multi Purpose Artificial Insemination Technicians in Rural India (MAITRI) trainees during the reporting period and exhibited latest technologies in animal husbandry practices. Exposure visit for 140 farmers and 48 students from different districts of Uttar Pradesh, Madhya Pradesh and Chhattisgarh were also conducted. Department also published 04 training manuals in this financial year.
- During this year, various extension trainings were organized by different departments of College of Veterinary Science and Animal Husbandry which included 1 training for Veterinary Officers under AINP-DIMSCA by Department of Veterinary Surgery and Radiology, 11 training/workshops/public awareness programs for rural youth by Department of Animal Nutrition under RKVY project, 2 training programs for Veterinary Officers and 1 training program for animal owners by Department of Parasitology under RKVY project and 4 training programs for Veterinary Officers and 1 training program for rural youth by Department of Veterinary Physiology.
- During this financial year, various programmes were conducted under the flagship of Mahila Adyayan Kendra, DUVASU, Mathura for the women empowerment and socio-economic upliftment of rural women round the year.
- During this year, total of 106 trainings were conducted by KVK scientists for 2746 participants. Out of these, 79 trainings were for the farmers and farm women, 16 for rural youths, and 11 for extension functionaries through which 2070 farmers and farm women, 344 rural youths and 332 extension functionaries were trained.
- To demonstrate the production potential of various proven technologies, the frontline demonstrations on farmers field were conducted for 1047 farmers and livestock owners.
- Under the technology assessment and refinement, technology assessed for crops and livestock were 11 and 1 respectively, with 56 number of trials wherein 56 farmers were benefitted. Total 115 extension activities were conducted by KVK for 13895 participants. KVK provided 550 mobile advisory services to serve the farmers of the adjoining districts of Mathura.



- In year 2021-22, KVK produced 676.00 quintal seeds, 39300 planting material and 2850 kg bio-products and generated total revenue of Rs. 28.00 lac, 2750.00/- and Rs. 7250.00/- respectively, through these productions.
- Gosthies, Diagnostic visits, Kisan Melas, Kisan Samman Diwas were organized for improving connectivity with farmers. During this year, soil and water testing laboratory of KVK analyzed 1015 soil and 49 water samples and on the basis of result recommendations for balance fertilization and watering were given to 580 beneficiaries.

UNIVERSITY FARMS

- During 2021-22, total milk production at LFC was 1,91,386.50 liters, out of which, the production of cow milk was 1,49,890.50 liters and buffalo milk was 41,496.00 liters. The total revenue generated by LFC during this financial year was 62,93,135.00 (sixty two lac ninety three thousand one hundred thirty five only).
- Poultry farm of Veterinary College maintained variety of species and breeds including layers, Chabro, Aseel, Kadaknath, Naked neck, Japanese quail, Turkey, Guinea fowl and Emu. During FY 2021-22, the poultry farm generated a revenue of Rs. 9, 06, 265.00/- (nine lac six thousand two hundred sixty five) from sale of different birds and eggs.
- During financial year 2021-22 University farms generated a revenue of Rs. 93.72 lacs only from the sale of Wheat, mustard, Barley and Bhusa.

HUMAN RESOURCE DEVELOPMENT

- Department of Veterinary Biochemistry organized a National level e-Quiz competition on “Animal Biochemistry” on 5th Sept., 2021 and two days' online workshop on “Intellectual Property Protection” on 20th- 21st Nov., 2021 under the flagship of National Agriculture Higher Education Project (NAHEP) of the University.
- Department of Veterinary Anatomy organized National e-Quiz Competition on “Comparative Osteology, Arthrology and Myology of Domestic Animals” on the occasion of 105th Birth Anniversary of Pandit Deen Dayal Upadhyaya on 25th Sept., 2021.
- Department of Veterinary Pharmacology and Toxicology organized Hands on Training on

“Analytical and Molecular Techniques to Decipher the Role of Phyto-biomolecules in Veterinary Therapeutics” under SCSP of ICAR All India Network Programme on Ethno-Veterinary Medicine from 18th – 27th Oct., 2022.

- Department of Livestock Products Technology organized 21 days online ICAR Sponsored Winter School on “Processing and quality evaluation of functional foods of animal origin” from 18th Jan.-07th Feb., 2022.
- Department of Veterinary Public Health organized Online National e-quiz competition on World Zoonoses Day on 6th July, 2021.
- Department of Veterinary Physiology organized 3rd Annual conference of APA and National symposium in hybrid mode on “Physiological interventions for Augmentation of Sustainable Animal Production” on 24th -25th September 2021. It has also organised 21 days ICAR sponsored winter school from 11th-31st January, 2022.
- College of Veterinary Science & Animal Husbandry, DUVASU, Mathura along with Rajiv Gandhi National Institute for Intellectual Property Management (RGNIIPM), Nagpur organized one day workshop on "Intellectual Property Rights (IPR) Patents and Design Process" as the Centre of Excellence for Intellectual Property Right (IPR) training under the Ministry of Commerce & Industry under the National Intellectual Property Awareness Mission (NIPAM), National IPR Policy 2016, DIPP, Government of India on 24th Jan., 2022.
- DUVASU, Mathura was privileged to host Dr. C.M. Singh Birth Centenary Year Celebrations (30-11-2021 to 30-11-2022) cum International Webinar on Advances of Veterinary Sciences during Platinum Jubilee Year of Indian Independence (1947-2022) on 30th November 2021.
- An Interactive Session for Faculty & Students on “User Awareness Sessions on National Library of India (NDLI) was organized by DUVASU, Mathura on 2nd Feb., 2022.
- Five days online faculty development programme under NAHEP-IDP on “Applications of OMICS tools and techniques for veterinary science using NGS data” was organized by DUVASU, Mathura from 6th-10th July, 2021.



STUDENTS' WELFARE

- During 2021-22, 40 and 22 cadets appeared in 'B' and 'C' certificate examination respectively. Five cadets of NCC participated in online Ek Bharat Shreshtha Bharat (EBSB) held from 23rd-31st August, 2021. Nine cadets of NCC and Capt. (Dr.) Rajneesh Sirohi participated in online Ek Bharat Shreshtha Bharat (EBSB) held from 25th - 30th November, 2021. 42 cadets and Capt. (Dr.) Rajneesh Sirohi participated in CATC-44 camp held from 02nd-08th Feb., 2022.
- Webinars were organized by the office of Dean Students Welfare, DUVASU, Mathura on various relevant topics for the students of the University under Interactive Sessions for Students with Industry and Academia of Institutional Development Plan (IDP)-National Agricultural Higher Education Project granted to this University.

OTHER HIGHLIGHTS AND ACTIVITIES

- University successfully conducted the Pre-Veterinary Test (PVT- 2021) on 29th August 2021, Pre-Diploma Entrance Examinations (PDT-2021) on 19th September 2021 and Postgraduate (M.V.Sc. and Ph.D.) Entrance Examination (PGET-2021) on 10th October, 2021.
- DUVASU celebrated its 20th Foundation Day on 25th October 2021 in which a workshop was organized in morning session on “Understanding mind” followed by cultural program in the evening.
- The 11th convocation of DUVASU, Mathura was held on 21st Feb., 2022. It was presided over by Hon'ble Governor of Uttar Pradesh and Chancellor of U.P. Pt. Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwa-vidyalaya Evam Go Anusandhan Sansthan, Mathura. Smt. Anandi Ben Patel Ji.
- The birth anniversary of the principal architect of the Indian Constitution Dr. Bhimrao Ambedkar was celebrated on 14th April 2021.
- DUVASU, Mathura celebrated 105th birth anniversary of Pandit Deen Dayal Upadhyaya ji on 25th September 2021.

AWARDS AND HONOUR / ACHIEVEMENTS

- Prof. Vikas Pathak was selected as Vice-President of Indian Meat Science Association (IMSA), presented lead lecture and received

Best Teacher Award in IMSACON-X conference and International symposium at Sardar Vallabhbhai Patel University of Agriculture and Technology. (SVPUAT), Meerut. U.P. from 25th -27th Nov., 2021. He also acted as lead speaker in XXVI Annual Convention of Indian Society of Veterinary Immunology and Biotechnology organized by Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana on 4th -5th Feb., 2022.

- Prof. Archana Pathak was elected as Chief Executive Editor of Indian Journal of Veterinary Anatomy in XXXV General Body Meeting of IAVA.
- Prof. Rashmi Singh acted as expert member of DBT-IBSC, ICAR-CIRG, Makhdoom and Nodal Officer for Covid-19 Testing Lab, DUVASU, Mathura during 2021-22.
- Dr. Meena Goswami Awasthi was selected as Executive body member of Indian Meat Science Association (IMSA) at Sardar Vallabhbhai Patel University of Agriculture and Technology. (SVPUAT), Meerut. U.P. from 25th -27th Nov., 2021.
- Dr. Sanjay Kumar Bharti received Reviewer excellence award from Agricultural research communication centre, Asian Journal of Dairy and Food Research, Karnal in 2021. He also received first prize in Research Conclave and International summit for packaging industry on “Packaging the growth driver” by FSSAI and Indian Institute of Packaging, Government of India on 16th March, 2022.
- Dr. Vikas Pathak and Dr. Meena Goswami Awasthi received Best research article award and Best Poster Award in IMSACON-X conference and International symposium at Sardar Vallabhbhai Patel University of Agriculture and Technology. (SVPUAT), Meerut. U.P. from 25th -27th Nov., 2021. Dr. Vikas Pathak, Dr. Meena Goswami Awasthi and Dr. Sanjay Kumar Bharti received Best research article award and Best Poster Award in the same symposium.
- Dr. Varsha Gupta received Dr. G. Rajeshwar Rao Memorial Award and Medal for Applied Anatomy including Biomechanics in XXXV Annual convention of Indian Association of Veterinary Anatomist and International Symposium organized at LUVAS, Hisar, Haryana from 10th to 12th Mar., 2022. Dr. Varsha



Gupta and Dr. Abhinov Verma were nominated as Associate Editor of Indian Journal of Veterinary Anatomy in 2022.

- Dr. Abhinov Verma received Reviewer Excellence Award by The Haryana Veterinarian in 2021. He was also Review Board Member in IRC Scientific and Technical Committee and Editorial Review Board on Animal and Veterinary Sciences-2021 in WASET (World Academy of Science, Engineering and Technologies) in 2021. He also received Dr. B.V.Rao Poultry Entrepreneurs Global Icon Award by Pashudhan Praharee in 2021.
- Dr. Shri Prakash received Dr. B.V.Rao Poultry Entrepreneurs Global Icon Award by Pashudhan Praharee in 2021.
- Dr. Amit Shukla received Best Educationist Award of Global Education Forum & Awards in 2021.
- Dr. Barkha Sharma received Distinguished Scientist Award by International Multi-disciplinary Research Foundation (IMRF), Andhra Pradesh, India in 2021.
- Dr. Amitav Bhattacharyya and Dr. Shanker Kr. Singh were awarded with NAVS Membership by National Academy of Veterinary Science, New Delhi on 23rd Sept., 2021.
- Dr. Vinod Kumar Singh was selected as Member Nominee CPCSEA, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India in 2021. He also got registration sponsorship from Science Alert, Deira, Dubai, UAE under the Science Alert Capacity Building Program. to participate in Asian Council of Science Editors Annual Conference-2021. He was also selected as Assistant Guest Editor Indian Journal of Comparative Microbiology, Immunology & Infectious Diseases in July-December, 2021.
- Dr. Ruchi Tiwari received Highly Cited Researchers (HCR) 2021 Award by Clarivate TM (Clarivate Analytics, Thomson Reuters, Web of Science) in 2021.
- Dr. Alok Kumar Chaudhary, Dr. Ruchi Tiwari, Dr. Vinod Kumar Singh and Dr. Mukesh Kumar Srivastava received third best oral presentation award in 2021.
- Dr. Neeraj Kumar Gangwar was selected as Zonal Secretary North zone by IAVP society, India. He also received appreciation certificate for Contribution in Veterinary Pathology Congress-2021 and International symposium (online mode) organized by RAJUVAS, Bikaner.
- Dr. Ambika Sharma, Dr. Amit Singh and Dr. Muneendra Kumar were awarded with Scroll of Honour in Dr. C. M. Singh Birth Centenary Year Celebrations cum National webinar jointly organized by COVSc & AH, Kamdhenu University, Sardar Krushinagar, Gujarat & Dr C.M. Singh Endowment Trust, Bareilly in 30th Nov., 2021.
- Dr. D. N. Singh received Certificate of Recognition for the article “Veterinarian Response to the COVID-19 Crisis” on World Veterinary Day on 24th April, 2021. He received Dr. V. Kurien Award of Excellence-2021, Awadesh Kumar Singh Memorial Award-2021 and Ram Singh Memorial National Animal Welfare Award in National level Essay Competition on 01st June, 2021, 20th June, 2021 and 29th July, 2021 respectively. He also received Dr. B. V. Rao Poultry Professional National Excellence Award 2021 on 08th Oct., 2021. He was also awarded with Reviewer Excellence Award by Asian Journal of Dairy and Food Research on 19th Feb., 2022.
- Dr. Dilip Kumar Swain received Letter of appreciation and recognition as distinguished reviewer from Animal Reproduction Science, Elsevier/Science Direct journals. He also received Best Poster Award in XXX Annual Conference and National Symposium in SAPICON 2022 from 17th-19th Feb., 2022.
- Dr. Brijesh Yadav received Dr. D.N. Mullick Mid-carrier Award in XXX Annual Conference and National Symposium in SAPICON 2022 held from 17th-19th Feb., 2022. He received Letter of appreciation and recognition for his contribution as Reviewer of The International Journal of Biometeorology, Asian Research Journal of Gynaecology and Obstetrics, Journal of Animal Physiology and Animal Nutrition and Theriogenology. Dr Brijesh Yadav was selected as Zonal Secretary (North), Animal Physiologists Association (APA), Executive Member, Indian Society for Buffalo Development for the year 2021-22. He is acting as Collaborator for Dr. Md. Morshedur Rahman, Professor, Department of Dairy and Poultry Science, Bangbandhu Sheikh Mujibur Rahaman, Agriculture University, Bangladesh for research collaboration in the area of Climate Change and



CPCSEA Nominee CPCSEA, Ministry of Fisheries, Animal Husbandry and Dairying, GOI and Jawahar Lal Nehru Medical College, AMU, Aligarh and Uttar Pradesh Institute of Medical Sciences, Saifai, Etawah, U.P..

FINANCE AND BUDGET

- During 2021-22, University received Rs. 4,878.57 lacs and Rs. 2,078.00 lacs under salary and contingency heads, respectively from Govt. of U.P. In addition of this it received Rs. 169.11 lacs from ICAR.
- Under RKVY University received Rs 0175.00 lacs.
- During the financial year 2021-22, total receipt generated by the University was Rs 0500.00 lacs.

ESTATE AND MAINTAINNANCE ORGANIZATION

- During the financial year 2021-22, University utilized a sum of Rs. 571.39 lacs for the repair and renovation work at LFC, Vice Chancellor's office, International guest house, VIP guest house, scientist's residences and the residences of class 3 and 4, IDP building, transport office estate office etc. Besides, it has constructed boundry wall, main gate and water harvesting system at ETT lab (Embryo transfer technology lab.) of Goat farm.

RIGHT TO INFORMATION ACT

- In compliance of the order of Govt. of Uttar Pradesh and provision of RTI Act, 2005, PIO received 49 applications out of which 28 applications were cleared and rest are under consideration.

कार्यकारी सारांश

पाठ्यक्रम

- वर्ष 2021-22 के दौरान 90 विद्यार्थियों ने पशु चिकित्सा विज्ञान एवं पशुपालन स्नातक कार्यक्रम में प्रवेश प्राप्त किया जिसमें 35.56 प्रतिशत छात्राएँ हैं। पशु चिकित्सा विज्ञान स्नातकोत्तर तथा विद्या वाचस्पति कार्यक्रम में क्रमशः 38 और 04 विद्यार्थियों ने प्रवेश प्राप्त किया। इसी सत्र में पशु चिकित्सा विज्ञान स्नातकोत्तर तथा विद्या वाचस्पति के क्रमशः 30 और 09 विद्यार्थियों ने पशु चिकित्सा एवं पशुविज्ञान के विभिन्न विषयों में उपाधि प्राप्त की, साथ ही 64 विद्यार्थियों ने पशु चिकित्सा विज्ञान एवं पशुपालन स्नातक की उपाधि प्राप्त की।
- वर्ष 2021-22 में जैव प्रौद्योगिकी महाविद्यालय में 23 विद्यार्थियों ने जैव प्रौद्योगिकी स्नातक कार्यक्रम तथा 03 विद्यार्थियों ने औद्योगिकी सूक्ष्म जीव विज्ञान स्नातक कार्यक्रम में प्रवेश प्राप्त किया। इसी सत्र में जैव प्रौद्योगिकी में 03 एवं 24 विद्यार्थियों ने क्रमशः विद्या वाचस्पति एवं स्नातक की उपाधि प्राप्त की।
- वर्ष 2021-22 में वैटरिनरी फार्मसी एवं पशुधन प्रसार में डिप्लोमा के लिए क्रमशः 60 एवं 60 विद्यार्थियों ने प्रवेश लिया जबकि 57 तथा 59 विद्यार्थियों ने वैटरिनरी फार्मासिस्ट डिप्लोमा तथा पशुधन प्रसार में डिप्लोमा प्राप्त किया। इसी दौरान डिप्लोमा वैटरिनरी फार्मसी के 57 विद्यार्थियों ने तीन माह के इंटरशिप कार्यक्रम को पूर्ण किया।
- पशु चिकित्सा नैदानिक परिसर सभी आधुनिक रोग निदान की सुविधाओं से सुसज्जित है तथा इसमें छोटे तथा बड़े पशुओं के शल्य क्रिया हेतु कमरा, पालतू पशुओं के लिए आई. सी. यू. एक्स-रे तथा अल्ट्रासाउण्ड यूनिट की सुविधा उपलब्ध है। वर्ष 2021-22 के दौरान 13108 रोगी पशुओं का उपचार किया गया। इन सेवाओं से वी. सी.सी. को रू. 6,87,650.00 (छः लाख सतासी हजार छः सौ पचास) का राजस्व प्राप्त हुआ।
- पशु चिकित्सा नैदानिक परिसर की रोग निदान प्रयोगशाला अर्धस्वचालित ब्लड एनालाइजर, बायोकेमिकल एनालाइजर, यूरिन एनालाइजर उपकरणों से सुसज्जित है। वर्ष 2021-22 में 4,646 नमूनों की सामान्य खून जाँच, बायोकेमिकल एनालिसिस, मूत्र एवं दूध की जाँच की गई। इन सेवाओं से रू. 4,03,060.00 (चार लाख तीन हजार साठ) का राजस्व प्राप्त हुआ।
- वर्ष 2021-22 में पशुचिकित्सा संकाय के शिक्षकों एवं स्नातकोत्तर विद्यार्थियों के द्वारा पशुओं के लिए मथुरा जिले के विभिन्न गांवों में चिकित्सा शिविरों का आयोजन किया गया।
- पोल्ट्री विभाग के प्रायोगिक प्रशिक्षण यूनिट स्थित पोल्ट्री ब्रीडिंग फार्म, लेयर फार्म तथा हेचरी द्वारा स्नातकोत्तर तथा स्नातक छात्रों को मुर्गी पालन एवं प्रबन्धन व अण्डे सेवन सम्बन्धित विषयों का व्यवहारिक ज्ञान प्रदान करने में महत्वपूर्ण भूमिका निभाई। वर्ष 2021-22 में प्रायोगिक प्रशिक्षण यूनिट द्वारा विश्वविद्यालय को रू. 20,45,276.00 (बीस लाख पैंतालीस हजार दो सौ छिहत्तर) 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 माँस निर्मित उत्पादों को बनाने हेतु प्रशिक्षण दिया गया। इस सत्र में 1,509 लीटर दूध को पनीर एवं खोआ में प्रसंस्कृत किया गया। विभिन्न मूल संवर्धित माँस उत्पाद जैसे चिकिन नगेट, चिकिन पेटिज, इत्यादि भी बनाये गये। वित्तीय वर्ष 2021-22 में विभाग को रू. 11,347.00 (ग्यारह हजार तीन सौ सैंतालीस) का राजस्व प्राप्त हुआ।
- विश्वविद्यालय पुस्तकालय में विभिन्न संकायों जैसे की पशु चिकित्सा, पशुपालन एवं जैव प्रौद्योगिकी की 35956 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 सुविधाएँ CD-ROM = VET CD 1973 से अगस्त 2004, CAB CD 1972 से मई 2005, CAB Abstract 1990 से दिसंबर 2005 इत्यादि उपलब्ध हैं।



- पशुपोषण विभाग में चलाए जा रहे फीड उत्पादन एवं प्रसंस्करण परियोजना के अन्तर्गत फीड प्रसंस्करण इकाई तथा यूरिया मोलासिस खनिज ईट इकाई द्वारा विद्यार्थियों को पशुधन के लिए संतुलित आहार बनाने का प्रशिक्षण दिया जाता है। विभाग द्वारा विश्वविद्यालय के डेरी फार्म के पशुओं के लिए प्रचुर मात्रा में फीड भी उपलब्ध कराया गया। इस वर्ष 2021-22 में विभाग ने खनिज मिश्रण को बेच कर 6.00 लाख (छह लाख) रुपये का राजस्व प्राप्त किया।

अनुसंधान

- वर्ष 2021-22 में विश्वविद्यालय के पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय के विभिन्न विभागों में 29 बाह्य वित्त पोषित परियोजनाएं चल रही हैं, जिसमें से 14 राष्ट्रीय कृषि विकास योजना द्वारा, 04 भारतीय कृषि अनुसंधान परिषद् द्वारा, 01 डी.बी.टी., भारत सरकार के अनुदान द्वारा, 01 ऐन.आई.अफ.- डी.बी.टी. द्वारा, 01 ऐन.आई.अफ.- डी.एस.टी. द्वारा, 01 डी.ए. डी.एफ., 01 यूपी कृषि अनुसंधान परिषद् द्वारा, 01 डी. ए.एच.डी., भारत सरकार द्वारा, 01 मैसर्स दत्त मेडी प्रोडक्ट्स प्राइवेट लिमिटेड, 01 सी.सी.आर.एच., 01 डी.आर.डी.ओ.- इनमास, 02 आयुर्वेद लिमिटेड द्वारा पोषित है।
- वर्ष 2021-22 में विश्वविद्यालय में 30 एवं 04 अन्तःसंस्थानिक परियोजनाएं क्रमशः पशु चिकित्सा विज्ञान एवं पशुपालन तथा जैव प्रौद्योगिकी महाविद्यालय में चल रही हैं।
- वर्ष 2021-22 में विभिन्न विभागों में किये जाने वाले अनुसंधानों पर 09 पी.एच.डी., 24 एम.वी.एससी. पशु चिकित्सा एवं पशु पालन विज्ञान संकाय में एवं 02 पी. एच.डी. जैव प्रौद्योगिकी संकाय में शोधग्रंथ पूर्ण किए गए।
- वर्ष 2021-22 में विश्वविद्यालय द्वारा 91 शोध पत्र विभिन्न राष्ट्रीय एवं अन्तर्राष्ट्रीय शोध पत्रिकाओं में प्रकाशित किये गये।

प्रसार

- वर्ष 2021-22 में प्रसार निदेशालय ने पशु चिकित्सा

विज्ञान एवं पशुपालन महाविद्यालय के सहयोग से विश्वविद्यालय के प्रांगण में 02 प्रशिक्षण कार्यक्रम तथा पशु ज्ञान चौपाल, डेयरी फार्म एवं बकरी फार्म में 12 भ्रमण कृषकों, पशुपालकों एवं अन्य के लिये आयोजित किए। इन प्रशिक्षण कार्यक्रमों द्वारा लगभग 75 किसान/ पशुपालक लाभान्वित हुए। भ्रमण द्वारा 500 किसानों ने लाभ प्राप्त किया।

- प्रसार निदेशालय द्वारा प्रशिक्षण पुस्तिका, लीफलेट्स एवं सामान्य लेखों को पुस्तिका के रूप में किसानों तथा पशुपालकों के हित के लिए प्रकाशित किया गया।
- पशुचिकित्सा एवं पशुपालन प्रसार विभाग द्वारा द्वारा 04 प्रशिक्षण कार्यक्रम किसानों, पशुपालकों एवं MAITRI प्रशिक्षणार्थियों के लिए आयोजित किये गए तथा इन्हें नवीनतम प्रबंधन तथा उद्यमशील कौशल का तकनीकी प्रशिक्षण दिया गया। विभाग द्वारा कुल उत्तर प्रदेश मध्य प्रदेश एवं छत्तीसगढ़ के विभिन्न जनपदों के 140 किसानों एवं 48 विद्यार्थियों के लिए एक्सपोजर विजिट आयोजित किये गए। विभाग ने इस वित्तीय वर्ष में 04 प्रशिक्षण नियमावली भी प्रकाशित की।
- वर्ष 2021-22 में, पशु चिकित्सा एवं पशु पालन महाविद्यालय के विभिन्न विभागों द्वारा कई प्रशिक्षण कार्यक्रमों को आयोजित किया। पशु चिकित्सा शल्य क्रिया विभाग द्वारा AINP-DIMSCA के अंतर्गत पशु चिकित्सा अधिकारियों के लिए 1 प्रशिक्षण, पशुपोषण विभाग द्वारा राष्ट्रीय कृषि विकास योजना परियोजना के अंतर्गत 11 प्रशिक्षण कार्यक्रम, पशु चिकित्सा परजीवी विभाग द्वारा राष्ट्रीय कृषि विकास योजना द्वारा वित्त पोषित परियोजना के अंतर्गत पशु चिकित्सा अधिकारियों के लिए 02 प्रशिक्षण एवं 01 प्रशिक्षण पशुपालकों के लिए तथा शरीर क्रिया विभाग द्वारा 02 प्रशिक्षण पशु चिकित्सा अधिकारियों एवं 01 ग्रामीण युवाओं के लिए आयोजित किये गये।
- इस वित्तीय वर्ष के दौरान ग्रामीण महिलाओं के महिला सशक्तिकरण और सामाजिक- आर्थिक उत्थान के लिए महिला अध्ययन केंद्र, दुवासु मथुरा के तहत वर्ष भर विभिन्न कार्यक्रम आयोजित किए गए।
- कृषि विज्ञान केंद्र द्वारा आयोजित कुल 106 प्रशिक्षणों में



2746 लोगों ने प्रतिभाग किया जिनमें क्रमशः 79 प्रशिक्षण द्वारा 2070 पुरुष एवं महिला कृषकों को, 16 प्रशिक्षणों द्वारा 344 ग्रामीण युवकों को एवं 11 प्रशिक्षणों द्वारा 332 प्रसार कार्यकर्ताओं को लाभ प्राप्त हुआ ।

- 1047 कृषकों एवं पशुपालकों के ईलाकों में उत्पादन क्षमता बढ़ाने वाली विभिन्न सिद्ध तकनीकियों को प्रदर्शित किया गया ।
- प्रौद्योगिकी मूल्यांकन एवं शुद्धिकरण के अंतर्गत, 56 किसानों के लिए 11 फसल एवं 01 पशुधन सम्बंधित प्रौद्योगिकियों के कुल 56 परीक्षण आयोजित किये गए । कृषि विज्ञान केंद्र द्वारा 9389 प्रशिक्षणार्थियों के लिए कुल 221 प्रसार गतिविधियों का आयोजन किया गया । कृषि विज्ञान केंद्र द्वारा 13895 प्रतिभागियों के लिए कुल 115 विस्तार गतिविधियाँ आयोजित की गईं । कृषि विज्ञान केंद्र द्वारा निकटस्थ जनपदों के किसानों को दूरभाष द्वारा 550 परामर्श सेवाएँ दी गयीं ।
- वर्ष 2021-22 में, कृषि विज्ञान केंद्र ने 676.00 कुंतल बीज, 39300.00 पौधे एवं 12850 किग्रा जैव उत्पाद उत्पादित किया । जिससे क्रमशः रुपये 28.00 लाख, रुपये 2750.00 तथा रुपये 7250.00 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 1015 मृदा तथा 49 जल के नमूनों की जाँच मृदा एवं जल जाँच प्रयोगशाला में की गयी, जिनकी रिपोर्ट के आधार पर 580 लाभार्थियों को संतुलित खाद एवं पानी डालने की क्रिया बताई गयी ।

विश्वविद्यालय प्रक्षेत्र

- वर्ष 2021-22 में, एल.एफ.सी. के डी.डी.डी. फार्म पर 1,91,386.50 लीटर दुग्ध का उत्पादन हुआ जिसमें गाय का दूध 1,49,890.50 लीटर तथा भैंस का दूध 41,496.00 लीटर प्राप्त हुआ ।
- इस वर्ष एल एफ सी फार्म को कुल रुपए 62,93,135.00 (बासठ लाख तिरानवे हजार एक सौ पैंतीस रुपये) का राजस्व प्राप्त हुआ ।
- महाविद्यालय के कुक्कुट फार्म पर विभिन्न प्रजातियों की

मुर्गियों जैसे चाबरों, 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 9,06,265.00 (नौ लाख छह हजार दो सौ पैंसठ रुपये) का राजस्व प्राप्त हुआ ।

- वर्ष 2021-22 में माधुरी कुंड फार्म में रबी के मौसम में गेहूँ, जई, जौ एवं भूसे द्वारा रुपए 93.72 (तिरानवे लाख बहत्तर हजार रुपये) का राजस्व प्राप्त हुआ ।

मानव संसाधन विकास

- पशु जैव रसायन विज्ञान विभाग, दुवासु, मथुरा ने 05 सितम्बर 2021 को NAHEP के अंतर्गत एक इ-क्विज प्रतियोगिता 'Animal Biochemistry' एवं 20-21 नवंबर 2021 को दो दिवसीय ऑनलाइन कार्यशाला 'Intellectual Property Protection' का आयोजन किया ।
- पशु रचना विज्ञान विभाग ने NAHEP तत्वाधान के अंतर्गत 'Comparative Osteology, Arthrology and Myology of Domestic Animals' विषय पर एक इ-क्विज प्रतियोगिता को पं. दीन दयाल उपाध्याय जी की 105वीं जयन्ती के उपलक्ष्य में 25 सितम्बर 2021 को आयोजित किया ।
- पशु भेषज एवं विष विज्ञान विभाग द्वारा भा.कृ.अ.प. EVM के SCSP के अंतर्गत 'Analytical and Molecular Techniques to Decipher the Role of Phyto-biomolecules in Veterinary Therapeutics' शीर्षक पर हैंड्स ऑन ट्रेनिंग का आयोजन 18-27 अक्टूबर 2022 को किया ।
- पशुधन प्रौद्योगिकी विज्ञान विभाग ने 'Processing and quality evaluation of functional foods of animal origin' विषय पर भा.कृ.अ.प. प्रायोजित 21 दिनों के ऑनलाइन शीतकालीन स्कूल का आयोजन 18 जनवरी-07 फरवरी, 2022 तक किया ।
- पशु सार्वजनिक स्वास्थ्य एवं महामारी विभाग ने 06 जुलाई 2021 को World Zoonoses Day पर एक इ-क्विज प्रतियोगिता का आयोजन किया ।
- पशु चिकित्सा शरीर क्रिया विज्ञान विभाग ने 24-25 सितंबर 2021 को 'Physiological interventions for



Augmentation of Sustainable Animal Production' विषय पर हाइब्रिड मोड में एपीए और राष्ट्रीय संगोष्ठी का तीसरा वार्षिक सम्मेलन आयोजित किया। साथ ही दिनांक 11 जनवरी से 31 जनवरी 2022 को 21 दिन का आई.सी.ए.आर. प्रायोजित विंटर स्कूल का आयोजन किया।

- पशु चिकित्सा विज्ञान और पशुपालन महाविद्यालय, मथुरा ने राजीव गांधी राष्ट्रीय बौद्धिक संपदा प्रबंधन संस्थान, नागपुर के साथ उत्कृष्टता केंद्र के रूप में राष्ट्रीय बौद्धिक संपदा जागरूकता मिशन (एनआईपीएएम), राष्ट्रीय आईपीआर नीति 2016, डीआईपीपी, भारत सरकार के अंतर्गत वाणिज्य और उद्योग मंत्रालय के तहत बौद्धिक संपदा अधिकार (आईपीआर) प्रशिक्षण हेतु 'Intellectual Property Rights (IPR) Patents and Design Process' पर एक दिवसीय कार्यशाला का आयोजन 24 जनवरी, 2022 को किया।
- दुवासू, मथुरा ने डॉ. सी.एम. सिंह जन्म शताब्दी वर्ष समारोह (30-11-2021 से 30-11-2022) के उपलक्ष्य में भारतीय स्वतंत्रता के प्लेटिनम जयंती वर्ष (1947-2022) 30 नवंबर 2021 को 'Advances of Veterinary Sciences' विषय पर अंतर्राष्ट्रीय वेबिनार का आयोजन किया।
- दुवासू, मथुरा द्वारा 'User Awareness Sessions on National Library of India (NDLI)' पर संकाय और छात्रों के लिए एक इंटरैक्टिव सत्र 2 फरवरी, 2022 को आयोजित किया गया।
- एनएचईपी-आईडीपी के तहत संकाय विकास कार्यक्रम के अंतर्गत पांच दिवसीय ऑनलाइन प्रशिक्षण 'Applications of OMICS tools and techniques for veterinary science using NGS data' पर दुवासू, मथुरा द्वारा 06-10 जुलाई, 2021 को आयोजित किया गया।

छात्र कल्याण

- वर्ष 2021-22 में 40 छात्रों ने 'B' सर्टीफिकेट एवं 22 छात्रों ने 'C' सर्टीफिकेट हेतु परीक्षा दी। 70 कैडेट्स ने एन.सी.सी. के CATC 38 कैम्प शिविर में भाग लिया। एन.सी.सी. के 5 कैडेट्स ने ऑनलाइन एक भारत श्रेष्ठ भारत कार्यक्रम में 23-31 अगस्त 2021 को भाग लिया।

एन.सी.सी. के 9 कैडेट्स तथा कैप्टन (डॉ.) रजनीश सिरोही ने ऑनलाइन एक भारत श्रेष्ठ भारत कार्यक्रम में 25-30 नवंबर 2021 को भाग लिया। 42 कैडेट्स तथा कैप्टन (डॉ.) रजनीश सिरोही ने CATC-44 camp में 02-08 फरवरी, 2022 को भाग लिया।

- विश्वविद्यालय के छात्र कल्याण अधिष्ठाता कार्यालय द्वारा पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय, जैव प्रौद्योगिकी महाविद्यालय एवं डिप्लोमा के छात्रों के लिए IDP-NAHEP परियोजना के अंतर्गत विभिन्न विषयों पर वेबिनार का आयोजन किया गया।

अन्य झलकियाँ एवं कार्यकलाप

- विश्वविद्यालय द्वारा प्री वेटनरी परीक्षा (पी.वी.टी.-2021) 29 अगस्त 2021 को आयोजित की गई, जबकि प्री-डिप्लोमा प्रवेश परीक्षा (पी.डी.टी.-2021) 19 सितम्बर 2021 को तथा स्नातकोत्तर (एम.वी.एस.सी. तथा पी.एच.डी.) प्रवेश परीक्षा (पी जी टी -2020) 10 अक्टूबर 2021 को आयोजित की गई।
- दुवासू ने 25 अक्टूबर 2021 को अपना 20वां स्थापना दिवस मनाया जिसमें सुबह के सत्र में "understanding mind" पर एक कार्यशाला का आयोजन किया गया एवं शाम को सांस्कृतिक कार्यक्रम का आयोजन किया गया।
- दुवासू मथुरा का 11वां दीक्षांत समारोह 21 फरवरी, 2022 को आयोजित किया गया था। दीक्षांत समारोह की अध्यक्षता उत्तर प्रदेश के माननीय राज्यपाल एवं यूपी पं. दीन दयाल उपाध्याय पशु चिकित्सा विज्ञान विश्वविद्यालय एवं गो अनुसंधान संस्थान, मथुरा की कुलाधिपति श्रीमती आनंदीबेन पटेल जी ने मुख्य अतिथि के रूप में की।
- विश्वविद्यालय द्वारा पूरे उत्साह से 14 अप्रैल 2021 को डॉ. भीम राव अम्बेडकर जयन्ती एवं 25 सितम्बर 2021 को पं. दीनदयाल उपाध्याय जी की 105वीं जयन्ती मनाई गयी।

पुरस्कार एवं सम्मान

- प्रोफेसर विकास पाठक को भारतीय माँस विज्ञान संघ 'IMSA' के उपाध्यक्ष के रूप में चुना गया। प्रोफेसर विकास पाठक ने सरदार बल्लभभाई पटेल कृषि और



- प्रौद्योगिकी विश्वविद्यालय, मेरठ में 25 से 27 नवंबर, 2021 तक आयोजित IMSACON-X सम्मेलन और अंतर्राष्ट्रीय संगोष्ठी में प्रमुख व्याख्यान प्रस्तुत किया और सर्वश्रेष्ठ शिक्षक पुरस्कार प्राप्त किया। वह गुरु अंगद देव पशु चिकित्सा और पशु विज्ञान विश्वविद्यालय, लुधियाना द्वारा 4-5 फरवरी, 2022 को आयोजित इंडियन सोसाइटी ऑफ वेटरनरी इम्यूनोलॉजी एंड बायोटेक्नोलॉजी के XXVI वार्षिक सम्मेलन में मुख्य वक्ता रहे।
- प्रोफेसर अर्चना पाठक 2021 में इंडियन जर्नल ऑफ वेटरनरी एनाटॉमी की मुख्य कार्यकारी संपादक बनीं।
 - प्रोफेसर रश्मि सिंह डीबीटी - आईबीएससी, आईसीएआर-सीआईआरजी, मखदूम के विशेषज्ञ सदस्य रहीं। वह दुवासू मथुरा के Covid-19 परीक्षण प्रयोगशाला की नोडल अधिकारी के रूप में इस वर्ष कार्यरत हैं।
 - डॉ. मीना गोस्वामी अवस्थी को सरदार बल्लभभाई पटेल कृषि और प्रौद्योगिकी विश्वविद्यालय, मेरठ में आयोजित IMSACON-X सम्मेलन और अंतर्राष्ट्रीय संगोष्ठी में भारतीय माँस विज्ञान संघ 'IMSA' के कार्यकारिणी निकाय सदस्या के रूप में चुना गया।
 - डॉ. संजय कुमार भारती ने कृषि अनुसंधान संचार केंद्र, एशियन जर्नल ऑफ डेयरी एंड फूड रिसर्च, करनाल से 2021 में समीक्षक उत्कृष्टता पुरस्कार प्राप्त किया। उन्होंने 'Packaging the growth driver' पर एफएसएसएआई और भारतीय पैकेजिंग संस्थान भारत सरकार द्वारा पैकेजिंग उद्योग के लिए 16 मार्च, 2022 को आयोजित अनुसंधान सम्मेलन और अंतर्राष्ट्रीय शिखर सम्मेलन में प्रथम पुरस्कार भी प्राप्त किया।
 - प्रोफेसर विकास पाठक और डॉ. मीना गोस्वामी अवस्थी को सरदार बल्लभभाई पटेल कृषि और प्रौद्योगिकी विश्वविद्यालय, मेरठ में 25 से 27 नवंबर, 2021 तक आयोजित IMSACON-X सम्मेलन और अंतर्राष्ट्रीय संगोष्ठी में सर्वश्रेष्ठ शोध पत्र पुरस्कार तथा सर्वश्रेष्ठ पोस्टर पुरस्कार प्राप्त हुआ। प्रोफेसर विकास पाठक, डॉ. मीना गोस्वामी अवस्थी तथा डॉ. संजय कुमार भारती को इस सम्मेलन में सर्वश्रेष्ठ पोस्टर पुरस्कार प्राप्त हुआ।
 - डॉ. वर्षा गुप्ता ने पशु चिकित्सा विज्ञान कॉलेज, हिसार, हरियाणा द्वारा 10 से 12 मार्च, 2022 तक आयोजित इंडियन एसोसिएशन ऑफ वेटरनरी एनाटॉमिस्ट एंड इंटरनेशनल सिम्पोजियम के 35 वें वार्षिक सम्मेलन में बायोमैकेनिक्स एवं एप्लाइड एनाटॉमी के लिए डॉ. जी राजेश्वर राव मेमोरियल अवार्ड और मेडल प्राप्त किया। डॉ. वर्षा गुप्ता और डॉ. अभिनव वर्मा को 2021 में इंडियन जर्नल ऑफ वेटरनरी एनाटॉमी के एसोसिएट एडिटर के रूप में चुना गया।
 - डॉ. अभिनव वर्मा ने 2021 में The Haryana Veterinarian द्वारा समीक्षक उत्कृष्टता पुरस्कार प्राप्त किया। वे 2021 में आईआरसी वैज्ञानिक और तकनीकी समिति एवं संपादकीय समीक्षा बोर्ड पशु और पशु चिकित्सा विज्ञान-2021 वर्ल्ड एकेडमी ऑफ साइंस, इंजीनियरिंग और टेक्नोलॉजीज में संपादकीय समीक्षा बोर्ड भी थे।
 - डॉ. श्रीप्रकाश एवं डॉ. अभिनव वर्मा ने 2021 में पशुधन प्रहरी द्वारा डॉ. बी.वी.राव पोल्ट्री एंटरप्रेन्योर्स ग्लोबल आइकन अवार्ड भी प्राप्त किया।
 - डॉ. अमित शुक्ला को 2021 में सर्वश्रेष्ठ शिक्षाविद पुरस्कार मिला।
 - डॉ. बरखा शर्मा को 2021 में इंटरनेशनल मल्टी डिस्प्लिनरी रिसर्च फाउंडेशन 'IMRF', आंध्र प्रदेश, भारत द्वारा विशिष्ट वैज्ञानिक पुरस्कार मिला।
 - डॉ. अमिताभ भट्टाचार्य और डॉ. शंकर कुमार सिंह को 23 सितंबर 2021 को राष्ट्रीय पशु चिकित्सा विज्ञान अकादमी (एनएवीएस) द्वारा एनएवीएस सदस्यता से सम्मानित किया गया।
 - डॉ. विनोद कुमार सिंह को 2021 में सीपीसीएसईए, मत्स्य पालन, पशुपालन और डेयरी मंत्रालय, भारत सरकार के नामित सदस्य के रूप में चुना गया था। उन्हें साइंस अलर्ट कैपेसिटी बिल्डिंग प्रोग्राम के तहत Science Alert, Deira, Dubai, UAE से एशियाई विज्ञान संपादक परिषद वार्षिक सम्मेलन-2021 में भाग लेने के लिए पंजीकरण प्रायोजन भी मिला। उन्हें जुलाई-दिसंबर, 2021 में इंडियन जर्नल ऑफ कम्पेरेटिव माइक्रोबायोलॉजी, इम्यूनोलॉजी एंड



इंफेक्शियस डिजीज का सहायक अतिथि संपादक भी चुना गया था।

- डॉ. रुचि तिवारी ने 2021 में Clarivate TM (Clarivate Analytics, Thomson Reuters, Web of Science) द्वारा अत्यधिक उद्धृत शोधकर्ताओं 'HCR' 2021 पुरस्कार प्राप्त किया।
- डॉ. आलोक कुमार चौधरी, डॉ. रुचि तिवारी, डॉ. विनोद कुमार सिंह और डॉ. मुकेश कुमार श्रीवास्तव को 2021 में स्मारिका तीसरा सर्वश्रेष्ठ मौखिक प्रस्तुति पुरस्कार प्राप्त हुआ।
- डॉ. नीरज कुमार गंगवार को IAVP Society, भारत द्वारा जोनल सचिव उत्तर क्षेत्र के रूप में चुना गया। उन्होंने पशु चिकित्सा पैथोलॉजी कांग्रेस- 2021, RAJUVAS बीकानेर द्वारा आयोजित अंतर्राष्ट्रीय संगोष्ठी (ऑनलाइन मोड) में योगदान के लिए प्रशंसा प्रमाण-पत्र भी प्राप्त किया।
- डॉ. अंबिका शर्मा, डॉ. अमित सिंह और डॉ. मुनींद्र कुमार को कॉलेज ऑफ़ वेटरनरी साइंस एंड एनिमल हसबैंडरी, कामधेनु विश्वविद्यालय, सरदार कुशिनगर, गुजरात और डॉ. सी.एम. सिंह एंडोमेंट ट्रस्ट, बरेली द्वारा 30 दिसंबर, 2021 को संयुक्त रूप से आयोजित डॉ. सी.एम. सिंह जन्म शताब्दी वर्ष समारोह सह राष्ट्रीय वेबिनार में स्कॉल ऑफ़ ऑनर से सम्मानित किया गया।
- डॉ. डी.एन. सिंह ने 24 अप्रैल, 2021 को विश्व पशु चिकित्सा दिवस पर 'Veterinarian Response to the COVID-19 Crisis' लेख के लिए मान्यता प्रमाण पत्र प्राप्त किया। उन्होंने डॉ. वी. कुरियन उत्कृष्टता पुरस्कार-2021, अवधेश कुमार सिंह स्मृति पुरस्कार-2021 और राष्ट्रीय स्तर की निबंध प्रतियोगिता में राम सिंह मेमोरियल नेशनल एनिमल वेलफेयर अवार्ड क्रमशः 01 जून, 2021, 20 जून, 2021 और 29 जुलाई, 2021 को प्राप्त किया। उन्होंने 08 अक्टूबर, 2021 को डॉ. बी.वी. राव पोल्ट्री प्रोफेशनल नेशनल एक्सीलेंस अवार्ड 2021 भी प्राप्त किया। उन्हें 19 फरवरी, 2022 को एशियन जर्नल ऑफ़ डेयरी एंड फूड रिसर्च द्वारा समीक्षक उत्कृष्टता पुरस्कार से भी सम्मानित किया गया।

- डॉ. दिलीप कुमार स्वैन को विभिन्न पशु प्रजनन विज्ञान, Elsevier/ Science Direct प्रत्यक्ष पत्रिकाओं से विशिष्ट समीक्षक के रूप में प्रशंसा पत्र और मान्यता प्राप्त हुई। उन्हें 17-19 फरवरी, 2022 तक आयोजित तीसरे वार्षिक सम्मेलन और SAPICON-2022 राष्ट्रीय संगोष्ठी में सर्वश्रेष्ठ पोस्टर पुरस्कार भी मिला।
- डॉ. बृजेश यादव ने 17-19 फरवरी, 2022 तक XXX वार्षिक सम्मेलन और SAPICON 2022 में राष्ट्रीय संगोष्ठी में Dr. D.N. Mullick Mid-career Award प्राप्त किया। उन्होंने The International Journal of Bio-meteorology, Asian Research Journal of Gynaecology and Obstetrics, Journal of Animal Physiology and Animal Nutrition, Goa Theriogenology के समीक्षक के रूप में उनके योगदान के लिए प्रशंसा और मान्यता का पत्र प्राप्त किया। डॉ. बृजेश यादव को वर्ष 2021-22 के लिए क्षेत्रीय सचिव (उत्तर), पशु फिजियोलॉजिस्ट एसोसिएशन (एपीए), कार्यकारी सदस्य, इंडियन सोसाइटी फॉर बफेलो डेवलपमेंट के रूप में चुना गया। डॉ. बृजेश यादव जलवायु परिवर्तन के क्षेत्र में अनुसंधान सहयोग के लिए डॉ. मो. मोरशेदुर रहमान, प्रोफेसर, डेयरी और कुक्कुट विज्ञान विभाग, बंगबंधु शेख मुजीबुर रहमान, कृषि विश्वविद्यालय, बांग्लादेश और CPCSEA नामित CPCSEA, मत्स्य पालन, पशुपालन और डेयरी मंत्रालय भारत सरकार और जवाहर लाल नेहरू मेडिकल कॉलेज, एएमयू, अलीगढ़ और उत्तर प्रदेश आयुर्विज्ञान संस्थान, सैफई, इटावा, यूपी के सहयोगी के रूप में कार्य कर रहे हैं।

वित्त एवं बजट

- वर्ष 2021-22 में विश्वविद्यालय को वेतन मद में रू. 4878.57 लाख एवं कंटीजैन्सी मद में रू. 2078.00 लाख बजट प्राप्त हुआ। इसके साथ ही विश्वविद्यालय को रू. 169.11 लाख भ.कृ.अ.प. द्वारा प्राप्त हुआ।
- राष्ट्रीय कृषि विकास योजना के अन्तर्गत विश्वविद्यालय को रू. 175.00 लाख प्राप्त हुआ।
- इस वर्ष विश्वविद्यालय को कुल रू. 500.00 लाख राजस्व की प्राप्ति हुई।



निर्माण एवं अनुरक्षण

- सत्र 2021-22 में सम्पत्ति विभाग ने रु. 571.39 विश्वविद्यालय के विभिन्न पुनर्निर्माण एवं मरम्मत कार्यों में व्यय किया जिसमें मुख्य रूप से पशुधन फार्म, कुलपति कार्यालय, अन्तर्राष्ट्रीय अतिथि भवन, मुख्य अतिथि भवन, वैज्ञानिकों, तृतीय एवं चतुर्थ श्रेणी कर्मचारियों के निवास, आई.डी.पी. भवन, परिवहन भवन, सम्पत्ति विभाग के पुराने भवन का पुनरोद्धार एवं मरम्मत का कार्य शामिल है।

जनसूचना अधिकार

- उत्तर प्रदेश सरकार के निर्देशों तथा आर.टी.आई. एक्ट 2005 के अनुपालन के क्रम में 49 प्रार्थना पत्र प्राप्त हुए, जिनमें से 28 का निस्तारण किया गया तथा अन्य विचाराधीन है।



MISSION

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

VISION

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

MANDATE

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

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



CHALLENGES

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

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

UNIVERSITY TARGETS

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



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 U.P. with the erstwhile U.P. Veterinary College, Mathura as its main constituent College with its all the movable 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 also 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 permuted 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.

University started two Diploma programmes viz; Diploma in Livestock Extension (DLE) and Diploma in Veterinary Pharmacy (DVP) in 2013-14 under College of Veterinary Science & A.H. Later in 2017 these diploma programmes were strengthened by creation of Institute of Paraveterinary Science.





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. Various bodies and authorities of the University exercise their powers at various levels to coordinate and regulate administration, education, research and extension activities.

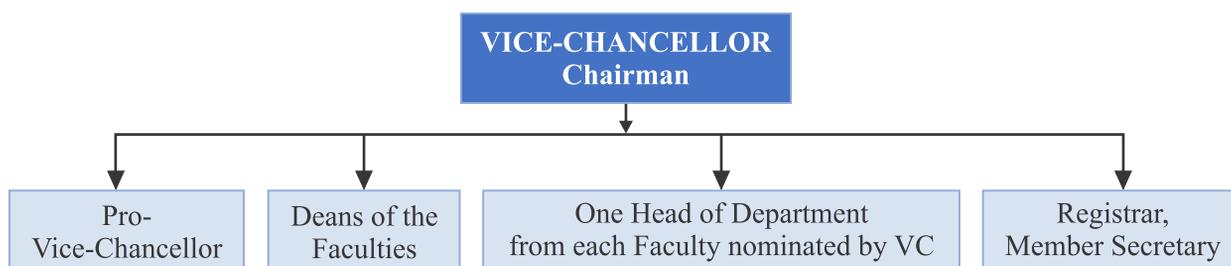
A. AUTHORITIES OF THE UNIVERSITY

1. Executive Council

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

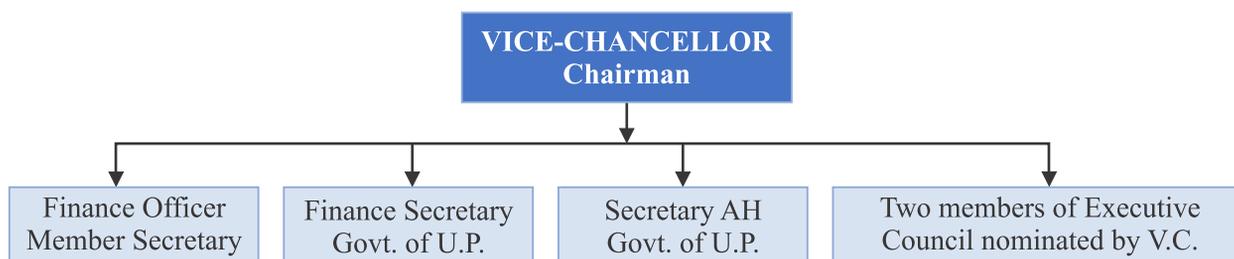
2. Academic Council

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



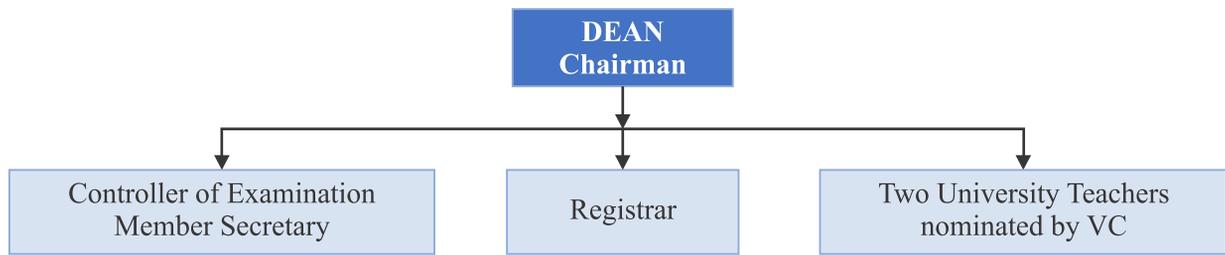
3. Finance Committee

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



4. Examination Committee

Examination Committee of the University coordinates and supervises all the examinations of the University including Pre Veterinary Test (PVT), appointment of examiners, tabulation and moderation of results and make recommendations to the Academic Council for improvement in examination system. The flow chart of the composition of the Examination Committee is presented below:

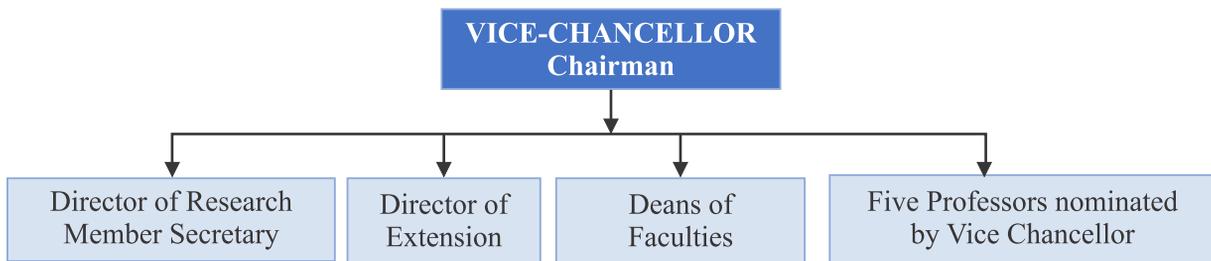


5. Board of Faculty

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

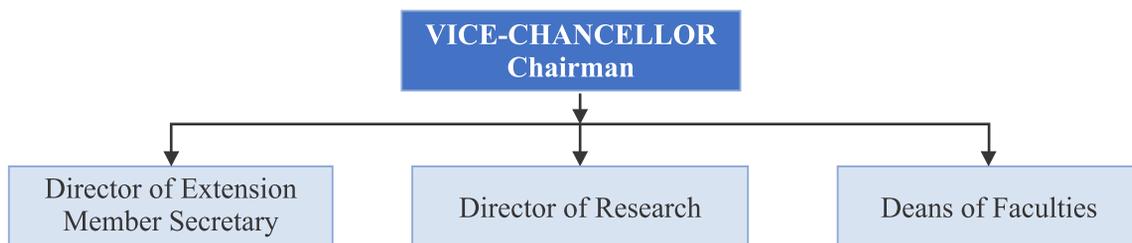
6. Research Advisory Committee

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



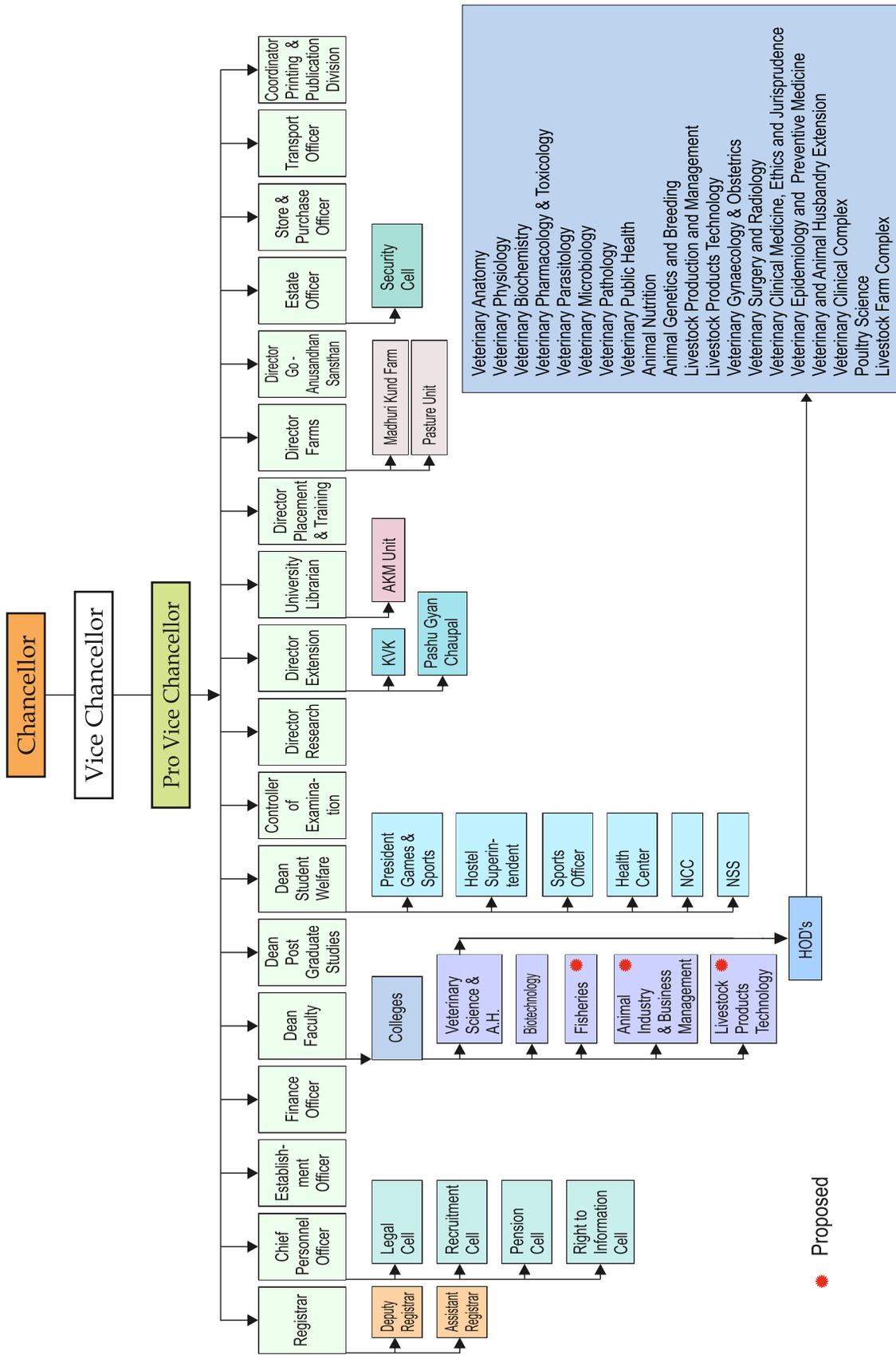
7. Extension Advisory Committee

The 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



● Proposed





B. Organizational Meetings

Executive Council

S. No.	Meeting No.	Date	Venue
1.	41 st	15-07-2021	DUVASU, Mathura
2.	42 nd	20-02-2022	DUVASU, Mathura

Academic Council

S.No.	Meeting No.	Date	Venue
1.	82 nd	11-06-2021	DUVASU, Mathura
2.	83 rd	12-07-2021 13-07-2021 14-07-2021	DUVASU, Mathura
3.	84 th	28-10-2021	DUVASU, Mathura
4.	85 th	16-02-2022	DUVASU, Mathura
5.	86 th	04-05-2022	DUVASU, Mathura

C. Officers of the University

S. No.	Designation/Post	Name of the Officer	Date	
			From	To
1.	Chancellor	Hon'ble Smt. Anandi Ben Patelji, Governor of U.P.		
2.	Vice Chancellor	Prof. G. K. Singh	Mar. 02, 2019	Continuing
3.	Registrar	Prof. P. K. Shukla	Jul. 05, 2016	Continuing
4.	Deputy Registrar	Dr. BrijeshYadav	Jun. 21, 2014	Continuing
5.	Finance Officer	Shri Sushil Kumar	Jun. 02, 2018	Continuing
6.	Controller of Examination	Prof. Daya Shanker	Aug. 29, 2012	Jun. 24, 2021
		Prof. A.K. Madan	Jun. 25, 2021	Continuing
7.	Dean, C.V.Sc. & A.H.	Prof. P. K. Shukla	Sep.14,2020	Continuing
8.	Dean, College of Biotechnology	Prof. Rajesh Nigam	Feb. 05, 2013	Dec. 5, 2021
		Prof. Daya Shanker	Dec. 06, 2021	Continuing
9.	Dean, PGS	Prof. P. K. Shukla	Jan. 15, 2013	Dec. 2, 2021
		Prof. Ajay Prakash	Dec. 03, 2021	Continuing
10.	Dean, Student Welfare	Prof. Vikas Pathak	Nov.14, 2018	Continuing
11.	Director Clinics	Prof. R. P. Pandey	Sep. 18, 2010	Continuing
12.	Director Research	Prof. Atul Saxena	Nov.24, 2009	Continuing
13.	Director Extension	Prof. SarvajeetYadav	Nov. 24, 2009	Continuing
14.	Director Gau-Anusandhan	Prof. Vikas Pathak	Jan. 03, 2018	Continuing
15.	Director, Farms	Prof. Ajay Prakash	May 20, 2015	Jun. 23, 2021
		Prof. Vinod Sidhu	Jun. 24, 2021	Continuing
16.	University Librarian	Prof. Sanjay Purohit	Nov. 26, 2016	Jun. 21, 2021
		Dr. S.P. Singh	Jun. 22, 2021	Continuing

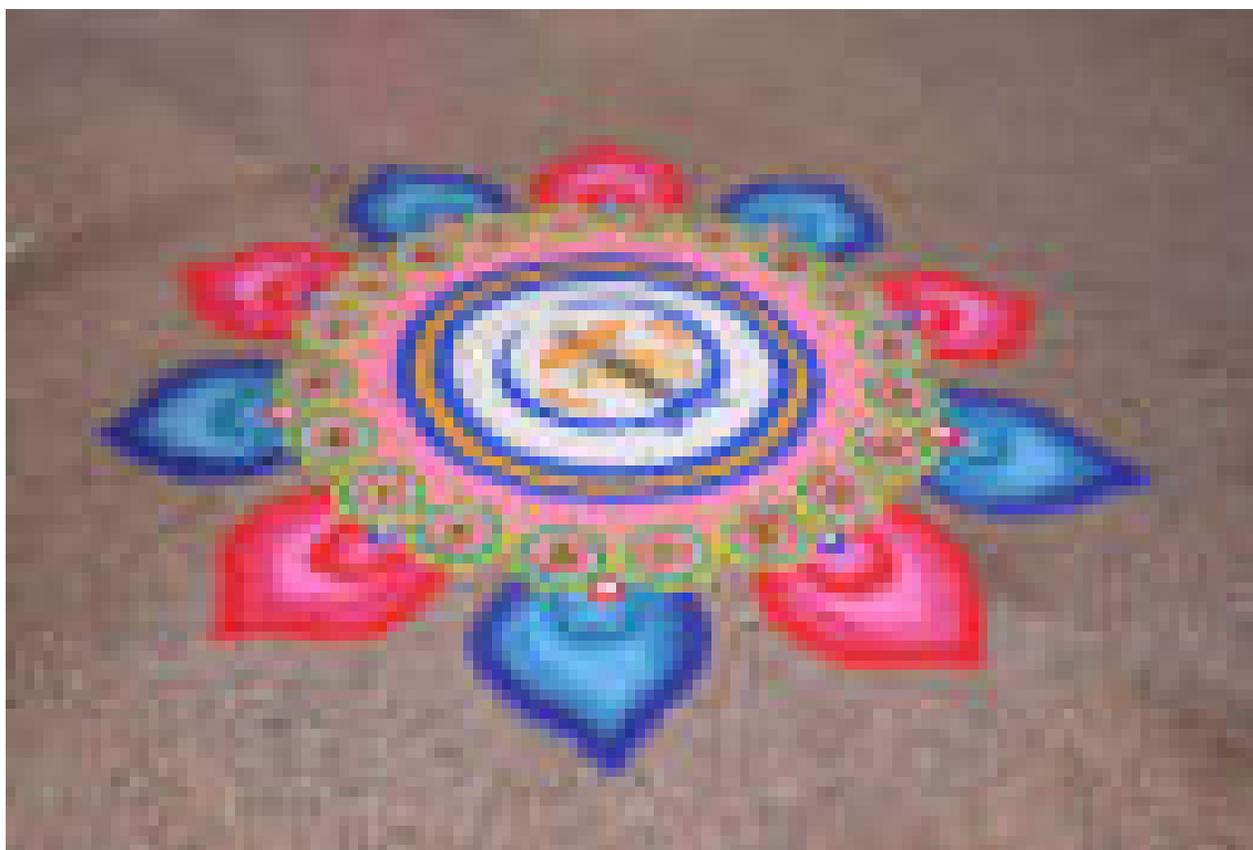


Institutional Animal Ethics Committee

Institutional animal Ethics committee of the university is registered with CPCSEA, New Delhi since the year 2000 with Registration number No. 386/PO/ReBi/SL/01/CPCSEA. All the research proposals involving use of small animals are approved after deliberations by IAEC itself; whereas the research proposals involving use of large animals are recommended to CPCSEA, New Delhi for approval. In the year 2021-22, the IAEC was reconstituted by CPCSEA and the details of the committee are as follows.

- i. Prof. Pankaj Kumar Shukla, Chairman, IAEC
- ii. Prof. Rashmi Singh, Professor, Scientist from different discipline
- iii. Dr. Brijesh Yadav, Associate Professor, Member Secretary
- iv. Dr. Neeraj Kumar Gangwar, Scientist from different discipline
- v. Dr. Amit Shukla, Veterinarian for animal house facility
- vi. Dr. Poonam Vishwakarma, Main Nominee, CPCSEA
- vii. Dr. Anugrah, Gaziabad, Link Nominee, CPCSEA
- viii. Dr. Satya Prakash Vishnoi, Scientist from outside Institute, CPCSEA
- ix. Shri Kamal Shah, Socially Aware Nominee, CPCSEA

IAEC meeting was held in month of January 2022 in which a total of 22 projects were discussed and approved by IAEC and one project proposal was recommended for the approval of CPCSEA, New Delhi.





TEACHING & EDUCATION

College of Veterinary Science and Animal Husbandry and College of Biotechnology are two constituent colleges of DUVASU, Mathura. Both colleges are running their degree Programmes. The University has Institute of Paraveterinary Science which give Diploma in Veterinary Pharmacy and Diploma in Livestock extension.

A. College of Veterinary Science and Animal Husbandry

College of Veterinary science & Animal Husbandry, established in 1947 as U.P. Veterinary College became the constituent college of DUVASU, Mathura in the year 2001. The aim of this College is to generate qualified and well trained Veterinarians and address Veterinary health and

animal husbandry issue in the state, undertake research and ensure extension services to the society mainly the rural areas of the state and country with the kind service of qualified budding Veterinarians.

The college is running its undergraduate programme as Bachelor of Veterinary Science and Animal Husbandry (B.V.Sc. & A.H.) as per VCI regulations, Master's programme as Masters of Veterinary science (M.V.Sc.) in eighteen disciplines and Doctor of Philosophy (Ph.D.) in fifteen disciplines as per ICAR academic regulations for higher agricultural education with a strong faculty strength of 75 during the year 2021-2022. Besides performing the teaching, faculty members are engaged in research and extension activities. Apart from these, many faculty members are involved in administrative responsibilities of the University.

Students admitted during 2021-22

S. No.	Academic programme	Intake Capacity	Total students Admitted	Male	Female
1.	B.V.Sc. & A.H.	80+8	90	58	32
2	M.V.Sc.	50	38	20	18
3.	Ph.D	23	04	01	03

B. College of Biotechnology

There are two undergraduate academic programmes in the College of Biotechnology viz;

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.

Students admitted during 2021-22

S. No.	Academic programme	Intake capacity	Total students admitted	Male	Female
1.	B.Sc. (H) Biotechnology	45	23	12	11
2	B.Sc. (H) Industrial Microbiology	15	03	01	02

C. Institute of Paraveterinary Science

The Institute of Paraveterinary Science earlier initiated as Diploma programmes in Veterinary Pharmacy (DVP) and Livestock Extension (DLE) by College of Veterinary Science and A.H. in 2013-14

with the financial assistance of R.K.V.Y., were further strengthened in the year 2017 and renamed as Institute of Paraveterinary Science. The teaching is taken care of by the qualified Veterinary post graduate contractual staff appointed by the University administration.

Students admitted during 2021-22:

S. No.	Academic programme	Intake capacity	Total students admitted	Male	Female
1.	Diploma in Livestock Extension (DLE)	60	60	55	05
2.	Diploma in Veterinary Pharmacy (DVP)	60	60	46	14



D. Activities of College of Veterinary Science and Animal Husbandry

1. Veterinary Clinical Complex (VCC)

Veterinary Clinical Complex, the erstwhile Kothari veterinary hospital, is a multi-specialty veterinary clinic. It imparts practical teaching to the students of the college of Veterinary Science and A.H. in terms of diagnosis, its interpretation and line of treatment of various animals coming to the clinical complex. It has different units for surgery, gynecology and medicine with round the clock learned and experienced faculty. Further, VCC is well equipped with C-Arm image intensifier, digital X-ray machine, CCTV camera, USG machine, Laparoscopy set, mobile X-ray unit and small animal anesthesia machine. In addition to these facilities, there are well-equipped operation theatres for small and large animal surgery, well equipped two small animals ICU for dogs, loading and unloading platform and indoor units for small and large animals. A total of 13108 clinical cases and 158 cases of artificial insemination were presented during the year 2021-2022 and the total revenue generated during this year was Rs. 6,96,490/- (Rupees six lacs ninety six thousand four hundred and ninety only). Final year students undergo a rotatory internship programme in the VCC.

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 2021-2022, the laboratory processed total 4646 samples for various blood parameters, histopathology tests, milk and urine samples and generated revenue of Rs. 4,03,060/- (Rupees four lac three thousand sixty only)

3. Ambulatory Services and Clinical Camps

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

E. Experiential Learning

Different departments of College of Veterinary Science and A.H. impart hands on experiential

learning programme to the students.

1. Poultry production and management

- The Department of Poultry science has breeder farm, layer farm and hatchery of Experiential Learning Unit in Poultry (ELU) at LFC which served as models for U.G, P.G and PhD students to train them on the activities in these subunits.
- The above sub units also served as models for internship students to train them on the various farm activities pertaining to feeding, watering and management. They have also imparted hands on training on rearing of Chabro birds and layers in the sub units of ELU during the internship training. In addition, the students were also trained on the hatchery operations.
- The sub units have also been used to cater the training needs of the army persons during their training courses on poultry conducted by Department of Extension.
- The resources of ELU viz. dead birds and embryonated eggs of different stages of development were used to cater the educational and research needs of students and staff of Anatomy, Pathology, Biotechnology and Microbiology departments.

2. Milk and meat processing Unit

The department of Livestock products technology is running a Revolving Project on "Processing of milk, meat and eggs for value added products". The under-graduate students of 3rd Professional B.V.Sc. & A.H. and post-graduate students of the Department were imparted practical training for preparation of different milk and meat products which were made available to employees of the University at nominal rates approved by the competent authority of the University. During the reporting year, 1509.0 liters of surplus milk from Livestock Farm Complex was processed into 228.5 kg paneer and 27.6 kg khoa which was sold to university employees and students at approved rates. The profit generated for the financial year 2021-22 was Rs. 11,347/- (Rupees eleven thousand three hundred forty seven only)

3. Feed production and processing

- a. Experiential learning on "Feed production and Processing" project sanctioned in budget session 2010-11 by ICAR, New Delhi. Under this project a total of Rs 55.6 lacs were sanctioned. A feed processing unit and one Urea molasses mineral block unit were installed. Since the inception of this feed processing unit, a total of



38300 quintal concentrate feed of about Rs 7.00 crore values was prepared from July 2012-March 2022 and more than 1000 students has been given hands on training to formulate compounded feed as per the nutrient requirement of livestock. Since the installation of unit, University has not procured compounded feed for its farm animals from outside. Feeds produced from this unit is also available to farmers and goshala during Kisan melas and farmers training. Practical training of students make them self reliant and it can serve as microenterprise for student to start their ventures after B.V.Sc. & A.H. Experiential learning on feed production and processing is very successful asset with University. Unit also prepared area specific mineral mixture about 100 quintal/yr and provided to farmers on nominal cost. During financial year 2021-22 Departmental sale of mineral mixture was about 100 quintal which cost Rs. 6 lacs.

- b. Construction of Laboratory, Feed unit, Mineral mixture and UMMB unit at Livestock farm complex and at main campus was completed.

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 35956 books of various streams like Veterinary science, Animal Husbandry and Biotechnology, 12 journals including online journals 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 online e-books 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 2021-22.

a. Campus interviews

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

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

b. Classes organized

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

c. Online test series (CBT) organized by training and placement cell for ICAR-JRF entrance examination-2021 (Veterinary Science and Animal Science). During the year two students achieved general rank below 100 in Animal science (ICAR-JRF examination 2021-22) and four students secured general rank below 100 in Veterinary science (ICAR-JRF examination - 2021-22).

d. Three students named Ankit Verma (M.V.Sc. Poultry Science), Dr. Ramdev Yadav (B.V.Sc. & A.H.) and Dr. Akshay Kumar (M.V.Sc. Vety. Gynaecology and obstetrics) were selected for the post of Assistant Commandant in ITBP.

e. Campus placement of students

Sixteen students of B.V.Sc.&A.H. were selected in GVK-Gujarat, Kairos Veterinary Officer, Janaki Kund Hospital, Chitrakoot, Slaughter House, Agra and SPCA, Pathankot.



RESEARCH

A. Extra-mural Projects

S. No.	Name of the Project	Name of PI and Co-PI	Funding Agency	Total Budget (Rs in lacs)
A1.	Entrepreneurial promotion by preparation of specimens from fallen animals	Prof. Archana Pathak Prof. Ajay Prakash Prof. MM Farooqui Dr. Abhinov Verma Dr. Neeraj Gangwar	RKVY	59.50
A2.	Establishment of referral laboratory for quality evaluation of milk and milk products	Prof. Vikas Pathak Dr. Meena Goswami Awasthi Dr. S. K. Bharti	RKVY	183.40
A3.	Strategic control of subclinical parasitism for better animal health and enhanced productivity in UP	Prof. Daya Shanker Dr. Jitendra Tiwari Dr. Vikrant Sudan	RKVY	124.31
A4.	Strengthening of clinical diagnostic and therapeutic facilities at university referral hospital for benefit of farmers and livestock owners.	Prof. Sanjay Purohit Dr. Mukesh Srivastava Dr. Sankar Kumar Singh Dr. Vikas Sachan	RKVY	223.20
A5.	Establishment of A2 genotype testing laboratory for cattle of Uttar Pradesh	Prof. Deepak Sharma Dr. Mukul Anand Dr. Satyendra Pal Singh Dr. Madhu Tiwari Dr. Avneesh Kumar Prof. Sanjeev Kumar Singh	RKVY – RAFTAAR	99.95
A6.	Capacity building & entrepreneurship development of farming community through establishment of community radio station.	Prof. Sanjeev Kumar Singh	RKVY	98.57
A7.	Propagation of insemination techniques in goats and establishment of semen bank for enhanced productivity and socio-economic upliftment in state of Uttar Pradesh	Dr. Mukul Anand Dr. Brijesh Yadav Dr. Anuj Kumar Dr. S.P. Singh Dr. Shalini Vaswani	RKVY	312.15
A8.	Establishment of Modernized Goat Farm for strengthening Goat Husbandry Practices in State of Uttar Pradesh (Part I & II)	Dr. Mukul Anand Dr. Madhu Tiwari Dr. Deep Narayan Singh Dr. Mukesh Srivastava	RKVY	Part I- 449.11 Part II- 163.00



A9.	Establishment of semen analytical laboratory for semen certification and quality assurance of breeding buck semen (Part I& II)	Dr. Mukul Anand Prof. Sarvajeet Yadav Prof. Arun K. Madan Dr. Brijesh Yadav Dr. Dilip Swain	RKVY	Part I- 169.00 Part II-138.00
A 10.	Establishment of environment-controlled chamber and calorimetric unit to enhance productivity of livestock in the scenario of climate change in Uttar Pradesh	Dr. Brijesh Yadav Prof. Sarvajeet Yadav Prof. Arun K. Madan Dr. Dr. Mukul Anand Dr. Dilip Swain	RKVY	260.14
A 11.	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	Dr. Mukul Anand Prof. Sarvajeet Yadav Dr. Anuj Kumar Prof. Atul Sexana	RKVY	743.51
A 12.	Demonstration unit for silage making and popularization of low cost silage technology for year round fodder availability for small-scale farmers	Dr. Shalini Vaswani	RKVY	90.91
A 13.	Establishment of small-scale feed processing demonstration unit to promote rural youth entrepreneurship (Part I and Part II)	Dr. Shalini Vaswani	RKVY	Part I- 236.27 Part II- 90.27
A 14.	AICRP on nutrition and physiological approaches for enhancing reproductive performance in cattle and buffalo	Prof. Atul Saxena	ICAR	9.5514
A 15.	National Agricultural Higher Education Project - Institutional development plan (NAHEP-IDP).	Prof. Atul Saxena	ICAR	2375.28
A 16.	All India Network Programme on Diagnostic imaging and management of surgical conditions in animals (AINP-DIMSCA)- ICAR	Prof. Sanjay Purohit Dr. Gulshan Kumar	ICAR	12.00 (for year 2020-21)
A 17.	Pharmacological studies and development of polyherbal formulation for reproductive disorders in animals	Dr. Soumen Choudhury Dr. Amit Shukla	ICAR	98.80
A 18.	Integrated indigenous cattle centre for conservation and improvement of indigenous milch breeds of cows (Gokul Gram Project)	Dr. Yajuvendra Singh	DADF, Ministry of Agriculture and Farmers Welfare, GOI	421.00
A 19.	NADCP-FMD	Dr. Ajay Pratap Singh	DAHD, GoI	4.00



A 20.	Mechanistic insights into the signal transduction pathways of Progesterone in regulating functional dynamics in bovine and caprine spermatozoa- [BT/PR27446/AAQ/1/717/2018]	Dr. Dilip Kumar Swain	Deptt. of Biotechnology (DBT), Ministry of Science and Technology GOI	84.98
A 21.	Evaluation and efficacy of amino nutrient based feed supplementation on quality and quantity of milk production in dairy cattle	Dr. Alok Kumar Chaudhary	NIF- (DBT), India	3.63
A 22.	Clinical evaluation of some homeopathic medicines against mites induced dermatitis in dogs	Dr. Shanker K Singh Dr. Ashish Srivastava	Central Council for Research in Homeopathy (CCRH), New Delhi	11.47
A 23.	Wound healing efficacy assessment of sscorbate formulation on large animals (Goat Sheep/Cattles)	Dr. Amit Shukla Dr. Soumen Choudhury	INMAS-DRDO	7.25
A 24.	Evaluation of the efficacy of velgraft/velvert in reconstitutions of surgical wounds in goats	Dr. Amit Shukla Dr. Soumen Choudhury Dr. Neeraj Kumar Gangwar	M/s Datt Mediproducs Pvt. Ltd., Gurgaon, Haryana	5.95
A 25.	Evaluation and popularization of indigenous acaricidal medication against tick infestation in regions of Uttar Pradesh	Dr. Jitendra Tiwari Dr. Vikrant Sudan Prof. Sanjeev Singh	NIF, Autonomous Body of DST, Govt. of India	6.38
A 26.	Establishment of modern referral veterinary disease diagnostic laboratory with special reference to animal tumours	Dr. Neeraj Kumar Gangwar Dr. Shankar Kr. Singh	RKVY	124.10*
A 27.	Evaluation of the efficacy of a Polyherbal Immunomodulator at improving the response to Foot-and-Mouth disease and Hemorrhagic Septicemia vaccination in Cattle	Prof. Rashmi Singh Dr. Rajneesh Sirohi	Ayurvet Limited, Baddi, Solan, H.P.	4.00
A 28.	Evaluation of efficacy of some phytogetic supplements for improving meat quality in broiler chicken	Dr. Meena Goswami Awasthi Prof. Vikas Pathak Prof. P K. Shukla Dr. Amitav Bhattachryya	Ayurvet Limited Katha, Baddi	3.09
A 29.	Boosting feeding value of paddy straw as animal fodder by means of different treatments	Dr. Muneendra Kumar	UPKAR	16.1*

* A 26 and A 29 projects are sanctioned but funds are not released.



B. Intra-mural Research Projects

S.No.	Name of the Project	Name of PI and Co-PI	Funding Agency	Total Budget (Rs in lacs)
College of Veterinary Science and Animal Husbandry				
B1.	External morphological traits of the mammary gland of Jamunapari and Barbari goats and their relationship with somatic cell count (SCC)	Dr. Varsha Gupta Dr. Mukul Anand	DUVASU, Mathura	1.4
B2.	Structural and Functional status of lymphoid organs in boilers during different seasons	Dr. Shriprakash Dr. Abhinov Verma Dr. Amitabh Bhattacharya	DUVASU, Mathura	1.80
B3.	Mechanistic insights into melatonin signaling in bull spermatozoa and understanding its role in regulation of sperm capacitation and acrosome reaction	Dr. Dilip Kr. Swain Dr. Vikas Sachan	DUVASU, Mathura	2.00
B4.	Effect of increasing THI on physiological acclimatization in Sahiwal calves	Dr. Brijesh Yadav	DUVASU, Mathura	2.00
B5.	Studies on Drug Resistance Profile of <i>Staphylococcus aureus</i> and <i>Escherichia coli</i> Isolates recovered from clinical samples of animals and their biological control through Bacteriophages	Dr. Barkha Sharma	DUVASU, Mathura	2.00
B6.	Evaluation of therapeutic potential of some medicinal plants on calf diarrhoea	Dr. Arvind Tripathi Dr. Ashish Srivastava Dr. Ambika Sharma	DUVASU, Mathura	1.90
B7.	Evaluation of therapeutic potential of poly herbal formulation on mastitis	Dr. P. N. Panigrahi Dr. Mukesh Kr. Srivastava	DUVASU, Mathura	1.8
B8.	Evaluation of effect of vitamin D status on health and growth of dairy calves	Dr. Ashish Srivastava Dr. Arvind Tripathi	DUVASU, Mathura	1.36
B9.	Phytochemical screening and evaluation of antibacterial activities of Plumeria	Dr. Rajkumar Singh Yadav Dr. Ajay Pratap Singh	DUVASU, Mathura	1.947
B10.	Investigation on serum and milk biomarkers for subclinical mastitis in goats and cows during summer and winter seasons	Dr. Pawanjit Singh Dr. Vijay Pandey Dr. Mukul Anand	DUVASU, Mathura	1.10
B11.	Analysis of the canine tumor proteome as an exploratory study for future implication in tumor biomarker discovery	Dr. Vijay Pandey Dr. Neeraj Gangwar Dr. BrijeshYadav	DUVASU, Mathura	2.08



B12.	Standardization of urinary protein markers as diagnostic aid of anestrus in farm animals	Dr. Ambika Sharma Dr. A. K. Tripathi Dr. Vikas Sachan	DUVASU, Mathura	2.00
B13.	Comprehensive studies on health promoting dairy products prepared from milk of indigenous breeds of different milch animals	Dr. Meena Goswami Dr. Sanjay Kumar Dr. Bharti	DUVASU, Mathura	1.98
B14.	Packaging potential of whey protein based nanocomposite active edible film with antimicrobial functionality for muscle food	Dr. Sanjay Kumar Dr. Bharti Dr. Meena Goswami Dr. Awasthi Dr. Vinod Kumar Dr. Singh	DUVASU, Mathura	1.25
B 15.	Estimation of threshold THI for Sahiwal calves in semi-arid India	Dr. Rajneesh Sirohi Dr. Brijesh Yadav Dr. Varsh Gupta	DUVASU, Mathura	1.985
B16.	Differential pattern in milk somatic cell count and composition of Sahiwal and Haryana cows during different stages of lactation	Dr. Yajuvendra Singh Dr. Rajneesh Sirohi Dr. Muneendra Dr. Kumar	DUVASU, Mathura	0.95
B17.	Identification, prediction of age and production performance using Muzzle Printometry Technique in Sahiwal Cattle	Dr. Deep Narayan Dr. Singh Dr. Yajuvendra Singh Dr. Rajneesh Sirohi	DUVASU, Mathura	2.953
B18.	Effect of flooring on performance of Haryana calves	Dr. Mamta Dr. Rajneesh Sirohi Dr. Brijesh Yadav	DUVASU, Mathura	1.24575
B19.	Expression profile of cytokines and TLRs in cattle and buffalo with natural tropical theileriosis	Dr. Vikrant Sudan Dr. Jitendra Tiwari Dr. Shanker Kr Dr. Singh Dr. Brijesh Yadav	DUVASU, Mathura	2.00
B 20.	Study of Immune Responses in cutaneous tissue of cattle phenotypically resistant and susceptible for ticks	Dr. Jitendra Tiwari Dr. Vikrant Sudan Dr. Rajneesh Sirohi	DUVASU, Mathura	2.00
B 21.	Evaluation of acaricidal potential of herbal essential oils against bovine ticks	Dr. Amit Kumar Dr. Jaiswal Dr. Pradeep Kumar Dr. Shanker Kr Dr. Singh	DUVASU, Mathura	1.90
B 22.	Assessment of epithelial mesenchymal transition (EMT) through immunohistochemical identification of biomarkers in canine tumors	Dr. Shyam N. Prabhu	DUVASU, Mathura	2.00



B 23.	Clinico-pathological and Immuno-histochemical Study on the Expression of biomarkers of canine mammary tumors	Dr. Neeraj Gangwar	DUVASU, Mathura	2.12
B 24.	Studies on bacterial isolates from dairy environment with special reference to biofilm production	Dr. Parul Dr. Barkha Sharma Dr. Ajay Pratap Singh	DUVASU, Mathura	1.40
B 25.	Participatory development of plan for promoting scientific knowledge and better production in small ruminants: An Action Research	Dr. Amit Singh	DUVASU, Mathura	2.00
B 26.	To evaluate the effect of ozone therapy and cephalixin in treatment of sub-clinical endometritis in cattle and buffaloes	Dr. Jitendra K. Agarwal	DUVASU, Mathura	1.22
B 27.	Clinico-Microbiological investigation of ascites cases in canines and their need-based therapeutic interventions	Dr. Ruchi Tiwari	DUVASU, Mathura	2.00
B 28.	Development of a rapid skin test for the diagnosis of Johne's disease	Dr. Vinod Kumar Singh	DUVASU, Mathura	2.00
B 29.	Ameliorating insulin resistance in preruminant calf by dint of Chromium supplementation	Dr. Muneendra Kumar	DUVASU, Mathura	1.79
B 30.	Development of package of practices using locally available feed resources for balancing ration for optimum production of cattle and buffalo in Mathura District	Dr. Avinash Kumar	DUVASU, Mathura	2.00
College of Biotechnology				
B 31.	Demonstration unit of Mushroom farming to promote entrepreneurship	Dr. Vijay Laxmi Tripathi Dr. Priyambada Singh Mr. Faizan ul Haque Nagrami	DUVASU, Mathura	3.68
B 32.	Demonstration unit of Spirulina cultivation	Ms. Shweta Sharma Ms. Parul Singh	DUVASU, Mathura	0.45839
B 33.	Bioremediation of waste water using Effective Microorganisms Technology.	Dr. Nupur Raghav Dr. Vijay Laxmi Tripathi	DUVASU, Mathura	1.50
B 34.	Demonstration unit of plant tissue culture and green house.	Ms. Uma Sharma Mr. Faizan ul Haque Nagrami	DUVASU, Mathura	1.59910



PROJECT REPORT

A. Extra-mural Projects

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

In R.K.V.Y project, during 2021-22, complete Plastination unit with gas curing unit was procured. Different types of dry, wet and plastinated specimens were prepared.

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

Compositional and quality characteristics of milk and milk products from different breeds of cattle, goat and buffalo were evaluated under RKVY scheme on “Establishment of referral laboratory for quality evaluation of milk and milk products.

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

Department of Parasitology organised three trainings of one day each for animal owners of *Bharou garh*, *Vanse* and *Bhijari* villages of Raya block of Mathura on 28th -30th December 2021 and Two trainings of three days for ten Veterinary Officers of U.P. from 06th -08th September 2021 and 09th -11th September 2021 under RKVY sponsored project on “Strategic control of subclinical parasitism for better animal health and enhanced productivity in U.P.”.

Project A4. 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, Operating Ophthalmic microscope, Slit lamp, Indirect ophthalmoscope, panoptic ophthalmoscope, Binocular magnifying loupe, Head mounted lights, ECG machines, Infant warmers etc were procured.

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

A total budget of Rs. 99.95 Lakh was released by RKVY for project entitled “Establishment of A2 Genotype Testing Laboratory for Cattle of Uttar Pradesh”. The proposed lab under project is under construction during this financial year. The purchase and installation of all proposed instruments and equipments are under process.

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

The whole budget was divided into two parts in financial year 2021-22. One part was transferred to construction agency for modification or renovation of building and another part was transferred to BESIL for establishment of community radio station.

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

Goat FSD from 10 different goat breeds are being produced and supplied to 14 different states across country for genetic improvement in goats. Regular training Programme for Veterinary Officers and AI workers from different states are being conducted to propagate Artificial insemination in goat.

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

Dairy goat farm and Buck mother farm has been established under the project. Animal with superior germplasm are being made available to farmers. Goat Milk processing plant and automatic machine milking plant has been established to channelize and promote goat milk as an alternate income source for farmers. Regular training on scientific goat rearing is being imparted to both male and female farmers.

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

Regular semen analysis for quality control of semen produced and supplied by University is being carried out at this laboratory. Students from various department and different Universities are conducting their research at this farm. Semen evaluation and quality control of ABS genetic Pvt Ltd. That is supplying semen to States of U.P. is being carried out in this lab. Training for quality control of semen doses is being conducted for Veterinary Officer and AI workers to improve conception rate under field condition. The lab for semen evaluation has been upgraded as an ultra modern lab with facility of genomic, proteomic, blood biochemical and semen



evaluation with use of flow cytometer and CASA under single roof.

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

The infrastructure facility developed in the department is being used by students from department of LPM, Animal Nutrition, Gynecology, Poultry Science, Biochemistry and Microbiology of College of Veterinary Sciences apart from College of Biotechnology, assisting them for their post graduate research. The best THI model for Goats under semi-arid conditions have been identified as $THI = 1.8 \times Tdb + 32 - [(0.55 - 0.0055 \times RH) \times (1.8 \times Tdb - 26.8)]$ and $THI = (0.8 \times Tdb) + [(RH/100) \times (Tdb - 14.4)] + 46.4$. Further, it has been found that PR is the most sensitive physiological parameter and first to alter after the onset of heat stress, Barbari goats are better adapted in semi-arid region as compared to Jamunapari and threshold THI can be used as tool to compare the adaptability of different breeds of a livestock species. Dr. Poonam Yadav from department of veterinary Physiology did a comprehensive work on the epigenetic regulation adaptability of buffalo heifers and her work has been published in the Journal of Thermal Biology. It was found that even at a very high THI (87-90) buffalo heifers experience a moderate level of heat stress. It was also found that adaptability in buffaloes is also mediated by non-genetic factors like miRNAs. Both the papers have been published in Journal of Thermal Biology. It has also been established that Barbari exhibited lower intraday variation in physiological parameters as compared to Jamunapari and Barbari goats are more thermo-tolerant than Jamunapari goats in the semi-arid regions of India. The paper has been communicated to Journal of Bioclimatology. The effect of heat stress on rumen microbiota in buffalo heifers was also studied and it was found that under given heat stress exposure (THI; 87-90), resilience of rumen microbial population invoked overwhelmed adaptive responses and did not produce any adverse effect on fermentation and digestibility. However, comprehensive research on changes in microbial population and their corroboration with rumen fermentation, methane emission and gut health should be undertaken to decipher many enigmas. Dr. Anandita Srivastava, a PhD scholar is presently working on adaptability of lactating Sahiwal cattle during increasing THI.

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

To promote superior germplasm of indigenous cattle breeds, the lab is under the process of its establishment to develop facilities for ETT and IVF. Soon after the commitment the lab will propagate germplasm of indigenous cattle through on field transfer of embryo.

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

The inauguration of "Silage Production Unit" under the RKVY funded project was held on 06/10/2018 by Hon'ble Minister of Agriculture, Agriculture Education and Agriculture Research, Government of U.P. Shri Surya Pratap Shahi Ji at LFC, DUVASU, Mathura. Under the project two bunker silos along with the store unit has been constructed. About 40 tonnes silage of sorghum and 250 tonnes silage of maize was prepared in the bunkers and about 5 tonnes of bag silo were prepared and distributed to farmers. Research trials of six MVSC scholars in Department of Animal Nutrition were conducted from the prepared silage. The silage preparation technique using silo pack machine was also demonstrated to about 5000 farmers and livestock owners at Krishi Kumbh Lucknow. Presently we are also receiving the demand for silage from the near by areas. In view, of that reasonable price was fixed for the purchase of quality silage by the livestock owners: Rs 8.0/kg for bunker silo silage and Rs 8.5/kg for bag silo. Till now silage amounting of Rs 5.20 lac has been given to Goat unit of university. Three one-day Public Awareness activity were organized on silage technology, in which about 200 farmers, women, livestock owners participated and were given hand-on training on silage making. Three One-day workshop on silage was also conducted and about 600 farmers participated and were trained. Under the project various instruments were purchased that are now utilized for sample analysis by the faculty and students of the university. The silage samples are also received from various farmers, private and government organization for detailed quality analysis. The silage preparation technique using silo pack machine was also demonstrated to about 5000 farmers and livestock



owners at Krishi Kumbh Lucknow. Bunkers are regularly being utilized for silage preparation and various locally available non-conventional feeds are utilized for silage making. Various workshops and public awareness activities were conducted under this project in this financial year.

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

The established Feed Analytical Laboratory, Feed Processing Unit and Mineral Mixture and feed block Unit established under RKVY funded project on “Establishment of small-scale feed processing Demonstration unit to promote rural youth entrepreneurship”. Inauguration of Feed Analytical Laboratory was held on 23/07/2021 by Hon'ble APC, Govt. of U.P. Shri Alok Sinha, in the gracious presence of Hon'ble Principal Secretary, Animal Husbandry, Fisheries and Dairy Development Shri Sudhir Garg and Hon'ble Vice Chancellor, DUVASU, Mathura Prof. G.K.Singh. The laboratory is well equipped with advanced instruments like ICP-OES, GC FID, HPLC, Microwave digester and have facilities to conduct macro and micro minerals estimation, fatty acids composition, Microwave digestion of samples, gross energy, blood biochemical analysis, milk composition, Somatic cell count, estimation of enzymes and hormones through ELISA, Laboratory analysis of silage samples etc in the samples of feed, urine, faeces, blood, serum, milk, water, silage. The students and scientist from various departments of university are utilizing the facilities in their researches. Currently the rates of mineral analysis through ICP-OES and fatty acid analysis through GC have been fixed and samples are obtained for the analysis of same from various central institutes like CIRG, IVRI, State Agricultural Universities like LUVAS, GBPUAT and from other non-government institutes. The revenue of about Rs. 9,00,000.00 (Nine Lakhs Only) was generated in about eight months period (04-08-21 to 07-04-22). Inauguration of Mineral Mixture and feed block Unit was held on 08/01/2022 by Hon'ble Union Cabinet Minister of Fisheries, Animal Husbandry and Dairying- Govt. of India, Shri Parshottam Rupala in the gracious presence of Hon'ble Cabinet Minister, Dairy Development, Animal Husbandry, Fisheries., Govt. of U.P. Shri Laxmi Narayan Chaudhary and Hon'ble Vice-Chancellor, DUVASU, Mathura Prof. G.K.Singh. The Feed Processing Unit and Mineral Mixture and

feed block Unit established are producing concentrate feed as mash, pellets, Mineral Mixture, UMMB, fodder blocks for large and small ruminants. The produce is being made available to the beneficiaries at fixed price. The quality product at reasonable rate is purchased by nearby Gaushalas, dairy farms, farmers, livestock owners. The revenue of about Rs. 12,00,000.00 (Twelve lakhs only) was generated in about eleven months period (13-05-21 to 07-04-22). Products are supplied to Gaushalas, Dairy farms, farmers and Livestock owner. Two one-day workshop, two one-day Public awareness activity, four- Three days training program for rural youth, one-Three days training program for veterinary officers U.P., and one-one-day workshop for target group were organized. About 500 farmers, rural youth, students, drop-outs, women farmers and veterinary officers participated and were imparted technical know-hows and hands-on training on feed processing techniques. Various workshops, trainings and public awareness activities were conducted under this project in this financial year.

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

(1) Effect of feeding on reproductive performance:

(a) Heifers

- In control group heifers (control) , the response to treatment was 70% (7/10) with a mean induction interval of 18.0 days. The respective values in treatment groups T1, T2 and T3 were 90% (9/10), 90% (9/10), 80% (8/10) with a mean induction interval of 17.44, 11.77 and 13.13 days.
- The conception rate in control group heifers were found as 57.14 (4/7) percent. The respective values for treatment groups T1, T2 and T3 were 22.22 (2/9), 33.33 (3/9) and 50.00% (4/8) percent.
- The total numbers of antral follicles in control group were 9.27 ± 0.77 (Left ovary, 4.93 ± 0.49 ; Right ovary, 4.33 ± 0.35). The respective value in T1, T2 and T3 groups were 8.83 ± 0.64 (Left ovary 4.78 ± 0.29 ; Right ovary, 4.06 ± 0.49), 7.83 ± 0.57 (Left ovary, 3.61 ± 0.36 ; Right ovary, 4.22 ± 0.39) and 8.67 ± 0.52 (Left ovary, 4.93 ± 0.36 ; Right ovary, 3.73 ± 0.43). Statistically, no significant effect was observed on total number of antral follicle count between treatments and control group.



(b) Cows

- In control group parous cows, the response to treatment was 75% (6/8) with a mean induction interval of 29.83 days. The respective values in treatment groups T1, T2 and T3 were 50% (4/8), 62.5% (5/8) and 87.5% (7/8) with a mean induction interval of 71.25, 46.8 and 85.42 days.
- The conception rate in control group parous cows was found as 33.33% (1/3) percent. The respective value for T1, T2 and T3 groups were 50.0 % (2/4), 40.0% (2/5) and 57.14% (4/7) percent.
- The total numbers of antral follicles in control group were 15.00 ± 2.43 (Left ovary, 8.33 ± 1.46 ; Right ovary, 6.67 ± 1.31). The respective value in T1, T2 and T3 groups were 15.00 ± 0.58 (Left ovary 6.33 ± 0.88 ; Right ovary, 8.67 ± 0.33), 17.08 ± 1.52 (Left ovary, 8.33 ± 0.99 ; Right ovary, 8.75 ± 1.24) and 11.00 ± 0.58 (Left ovary, 5.00 ± 0.00 ; Right ovary, 6.00 ± 0.58). Statistically, no significant effect was observed on total number of antral follicle count between treatments and control group.

(2) Effect of feeding bypass nutrients on growth performance, haematology and blood bio-chemical parameters in heifers.

- The mean body weights of all the experimental animals at fortnightly intervals did not differ significantly ($P > 0.05$) between the groups. However, fortnightly body weight gain and average daily weight gain was significantly ($P < 0.05$) higher in supplemented groups than control. The highest gain was observed in T3 (BPF) group followed by BP (T1) and BF (T2) groups.
- The haematological parameters (Hb, WBC, RBC) analysed did not showed any significant difference among the experimental groups, but the values were within the normal physiological range.

Among the biochemical parameters, mean values of plasma glucose, cholesterol, triglycerides, total protein, albumin, globulin, ALT and AST showed no significant ($P > 0.05$) difference in control and treatment groups and the values were within the normal physiological range. However, the plasma urea nitrogen was significantly ($P > 0.05$) lower in T1 (BP) and T3 (BPF) supplemented groups as compared to control and T2 (BF).

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

As per the approved plan of the project, for FY 2021-22 a sum of Rs 642.99 lakhs was approved, of which Rs 100.11 lakhs was towards capital and Rs 542.88 lakhs was towards revenue. Against the approved budget, the released budget was Rs 696.60 lakhs under capital and Rs 95.65 lakhs under revenue head. With the released amount of Rs 792.55 lakhs, the cumulative utilization was of Rs 635.88 lakhs corresponding to 56.64 % utilization. A total of 82.5% of the procurement plan has been completed. University have dedicated one building for the work of IDP and majority of the activities are concentrated in the building itself. Presently, digital classroom, virtual classroom, language lab, incubation center, conference rooms, skill center, student activity room, alumni centre, IIC, cafeteria for students and faculty are housed in the building. Rooms are also for all the nodal officers related to IDP work. The entire building is supported with roof-top 50KW solar system. Besides, two green toilets and rain water harvesting system is established in the building. All major lecture halls in the University have been covered with digital / smart class rooms and five major classrooms were made air-conditioned. Three virtual skills have been established. They are in the subject of Pharmacology, Physiology and Gynaecology. A system of artificial intelligence in farm animals has been purchased and is to start functioning shortly. With respect to the capacity building of students and faculty, sixteen (16) students are undergoing International training in the area of Radio-imaging diagnosis, twenty two (22) lecture sessions has been conducted with different industries, ninety-nine (99) remedial classes were held for 1st to 5th professional students, all lectures were conducted by renowned faculties across the country. All lectures were focused with UG teaching and eminent professors who have their interest in teaching were selected for such deliberations, thirty-seven (37) guest lecturers were held on different topics of concern for the benefit of students. Six (06) activities related to soft skills, five (05) certificate course on the theme of Modern Dairy Husbandry Practices and Management was conducted. Three (03) faculties have been selected for International Training. Two amongst them is shortly joining (June-July) the training program in the area of microbiology. One workshop on Bioinformatics was conducted for the benefit of faculty. Besides, six (06) MOU were signed with different industries and



Institutions in order to promote teaching, research and extension activities. Toward improvement in academics and administrative system, University has implemented AMS and PIMS system of NAHEP component 2. Further, digitalization of key working areas with support from U.P Govt initiative for digitalization has been completed and momentum towards digitalization has started. All these efforts in terms of infrastructure development and drive towards innovation and skill development have created an atmosphere of teaching and learning in the campus. Further, use of digital means in day to day working has hastened the process of work culture. These initiatives will certainly bring changes in the focused area of the project in times to come.

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

All India Network Programme on Diagnostic Imaging and Management of Surgical Conditions in Animals (AINP-DIMSCA)- ICAR-During 2020-21, Total budget Rs 12.0025 lakhs was received from ICAR. A six days training on “Application of diagnostic imaging technology and management of surgical conditions in animals” was organised under (AINP-DIMSCA) for 10 veterinary officers of Animal Husbandry Department of U.P. from 13-18 December, 2021. Total 8 theory lectures and 12 Hands on training were conducted. The training was highly fruitful to veterinary officers and they further recommended specialized training of orthopedic and ophthalmic affections. Availing facilities developed under DIMSCA, the clinical cases are treating with good outcome.

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

- From the clinical cases of endometritis (23 cows and 19 buffaloes), total 42 bacterial samples were collected. Among them 23 isolates were found to be positive for *E. coli*. Further based on the culture characteristic, biochemical tests, presence of virulence genes and ability to produce biofilm production, two isolates were selected for further study.
- The alcoholic extract of leaves of babool plants were prepared and subjected to gas-chromatographic analysis for phytochemical characterization. The extract was found to contain good amount of total flavonoid and phenolic acids. The total antioxidant action of the extract was found to be significant.

- The leaves extract showed prominent anti-bacterial activity against the selected *E.coli* isolates with MIC value of 0.392 mg/ml. However, it produced indifferent antibacterial action when combined with cefotaxime.
- To elucidate the mechanism of antibacterial action of the extract, the cell membrane integrity of the bacterial isolate was evaluated following exposure to the plant extract. A significant loss of the membrane integrity was detected as evidenced by the uptake of propidium iodide (PI) dye.

Project A18. Integrated indigenous cattle centre for conservation and improvement of indigenous milch breeds of cows (Gokul Gram Project)

This DADF, GOI sponsored project is running on at LFC, DUVASU, Mathura. As per mandate of the project nucleus herds of Sahiwal and Hariana breeds of cows were established at our farm. Under this project Sahiwal and Hariana breeds of cows are being conserved and their elite germplasm is being distributed to different institutions, farmers, goshalas, NGOs which are engaged in animal husbandry practices. Till date more than 100 cows, calves and heifers of both breeds of cows have been distributed to husbandry people and institutions.

Project A19. NADCP-FMD

- A total of 17 FMD incidence has been reported in the year in the district Mathura, Badayun, Bulandshahar, Meerut and Azamgarh .
- 20 clinical samples were processed for virus typing out of which 14 samples were typified as FMD serotype 'O' . During the year of reporting FMD FMD serotype 'O' was found to be the dominant serotype. During the period under report, a total of 20 specimen (vesicular tongue epithelium) were collected from clinically affected cattle and buffaloes from 5 outbreaks recorded at the Centre. Of these 20 specimens collected, 14 specimen was typed as virus type 'O'.
- A total of 9379 serum samples were tested for presence of antibody against non structural protein NSP-3AB3 using DIVA ELISA test under FMD serosurveillance. Overall 11.65 % animals were found positive for DIVA ELISA. The DIVA positivity was higher in Cattle (15.26%) compared to Buffaloes (9.44 %). Regional distribution of % NSP reactors in Uttar Pradesh showed high reactivity in Eastern Uttar Pradesh followed by Central and Western Uttar Pradesh.



- A total of 879 Pre-vaccination and 689 Post-vaccination sera samples of the NADCP phase-II were tested. The overall percentage of protective animals was 37.99%, 18.08 % and 36.51% against FMDV type 'O', 'A' and 'Asia-1', respectively. Similarly, the percentage of protective animals after vaccination was found to be 54.13%, 56.74.% and 48.18% in comparison to pre vaccination.
- A total of six awareness activity/ training/ capacity building were undertaken during the year of reporting benefiting more than 260 participants.



Project A20. Mechanistic insights into the signal transduction pathways of Progesterone in regulating functional dynamics in bovine and caprine spermatozoa- [BT/PR27446/AAQ/1/717/2018]

Studies from *in vitro* experiments in bull and caprine spermatozoa revealed existence of three sub-populations which are differently responsive to progesterone (P4). Free radicals and intracellular alkalization play major role in P4 signaling and spermatozoa non-responsive to P4 do not show free radical generation and *vice versa*. Tracking and sorting depict the presence of different kinetic population of sperm cells and fast moving spermatozoa are highly responsive to P4 in induction of capacitation and acrosome reaction compared to slow or local moving spermatozoa. P4 signaling is mediated through novel GABA and endocannabinoid pathway and possibly these are new pathways during the study in bull spermatozoa. However, these pathways are not significant in caprine spermatozoa. P4 uses kinases and tyrosine phosphorylation as key pathways for induction both capacitation and acrosome reaction, and MAPK acts as one of the major regulating molecule of downstream pathways, and c-JNK serves as a potential regulator of sperm capacitation and acrosome reaction specifically in bull spermatozoa.

In conclusion- our studies show that, responsiveness of spermatozoa to progesterone is species specific and involves complex interplay of multiple signaling molecules.

Project A21. Evaluation and Efficacy of amino nutrient based feed supplementation on quality and quantity of milk production in dairy cattle

Received fund has been mostly utilized. Most of the required materials /chemicals have been purchased clinical trial will be started as soon as possible.

Project A22. Clinical Evaluation of Some Homeopathic Medicines against Mites Induced Dermatitis in Dogs

Received fund of the first year is utilized, clinical trial of some of the proposed homeopathic medicines started. Therapeutic effects evaluation of two out of four proposed homeopathic medicines is ongoing in enrolled dogs with demodectic or sarcoptic mange. A total of 33 dogs suffering from sarcoptic mange and 17 dogs suffering from demodectic mange have been enrolled.

Project A23. Wound healing efficacy assessment of Ascorbate formulation on large animals (Goat Sheep/Cattles)

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

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

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

Project A25. Evaluation and popularization of Indigenous Acaricidal Medication against tick infestation in regions of Uttar Pradesh

Under the NIF sponsored project on "Evaluation and popularization of indigenous acaricidal medication against tick infestation in regions of Uttar Pradesh" In-vitro efficacy trials of neem and Nirgundi leaf extracts were conducted and field demonstration of acaricidal activities of Neem and



Nirgundi decoctions were conducted in Twenty villages of Raya (23-25 September 2021), Farah (28-30 September 2021), Nand Gaon (11-13 September 2021) and Chhata (16, 22 and 23 October 2021) blocks of Mathura district. Under this programme animal owners were making aware about the life cycle of ticks and method of indigenous control of tick infestation on cattle and buffalo. Method of preparation of decoction and application on the animals was demonstrated to the animal owners on first day of visit to the area and effect of this preparation was shown to them in the subsequent visits.

Project A26. Establishment of Modern Referral Veterinary Disease Diagnostic laboratory with special reference to animal tumours

The said project has been sanctioned but the financial assistance has not been received.

Project A27. Evaluation of the efficacy of a Polyherbal Immunomodulator at improving the Response to Foot-and-Mouth disease and Hemorrhagic Septicemia vaccination in Cattle

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

Project A 28. Evaluation of efficacy of some phytogenic supplements for improving meat quality in broiler chicken

Total budget has been transferred from the funding agency. All the glasswares and chemicals have been procured in this financial year. Now day old chicks will be procured and reared for 6 weeks in different groups. The meat of these broilers will be evaluated for various carcass characteristics.

Project A 29. Boosting feeding value of paddy straw as animal fodder by means of different treatments

The said project has been sanctioned but the financial assistance has not been received.

Intra-mural research projects

College of Veterinary Science and Animal Husbandry

Project B1. External morphological traits of the mammary gland of Jamunapari and Barbari goats and their relationship with somatic cell count (SCC)

The study was conducted on 40 Barbari and 40 Jamunapari goats. The bowl and cylindrical shaped udder was observed in both breeds of goats. Different shapes of teat viz. funnel, cylindrical and bottle shaped teats were identified. In Barbari breed of goat no. of goats with bowl shaped udder was more than the cylindrical shaped udder. Various dimensions of udder viz. length, diameter, depth and cleft were higher in bowl shaped udder. Teat diameter and inter teat distance of funnel shaped teat of goat were higher than the cylindrical and bottle shaped teat in both in bowl and cylindrical shaped udder. The goats with bowl shaped udder and funnel shaped teat had more milk yield as compare to other shape of the teat. Milk yield in funnel shaped teat goat was correlated with descriptive parameters of udder viz. length, diameter, cleft and depth in both bowl and cylindrical shaped udder. In Barbari goats with bowl shaped udder milk fat was higher in bottle shaped teat followed by cylindrical and funnel teat goats. Milk protein and lactose was more in bottle followed by funnel and cylindrical shaped teat. It seems that the goats with cylindrical shaped udder were more prone for subclinical mastitis due to higher number of somatic cell count. In Jamunapari goats In Jamunapari goat udder length and diameter decreased with advancement of age. Udder parameters were correlated with each other. Parameters for teat viz. teat length increased and diameter decreased significantly in bowl shaped udder goat while in cylindrical shaped udder goats the changes were non-significant. SCC increased in both type of udder but count was more in bowl shaped udder. In goats of bowl and cylindrical shaped udder all the udder parameters were decreased with advancement of lactation in all funnel, bottle and cylindrical shaped teat. Milk yield from cylindrical shaped udder was slightly less than bowl shaped udder but SCC was less and milk protein and lactose percentage was also high in Jamunapari goats.

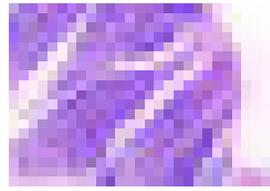
Project B2. Structural and Functional status of lymphoid organs in chabro fowl during different seasons

The bursa of Fabricius of chabro bird was located on the dorsal aspect of cloaca and connected to the dorsal wall of the proctodeum by small stalk. The weight of bursa was significantly higher in winter seasons. There was significantly lower weight of l thymus in the summer seasons than the autumn and winter seasons. The weight, length, width and thickness of spleen was significantly lower in the summer seasons. Histological changes

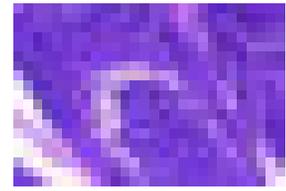


were observed in bursa during summer seasons were eosinophilic, elongated and flask shaped follicles of various size were evident. Depletion of the lymphocytic population from the periphery of the cortex, medulla and separation of cortex from adjacent follicles were sign of beginning of involution. The depletion of lymphocytes and replaced by fibroblast cells and adipose tissue, extension of follicular medulla and accumulation of eosinophilic aggregates containing degenerating lymphocytes with pyknotic nuclei were observed. The cysts were noticed in epithelium and medulla of lymphoid follicles. Area of epithelial attenuation, vacuolations, folding and detachment were noted over the plical surface and in the interplical areas. With the loss of lymphocytes from the medulla, the FAE dipped in to the follicle giving a button like appearance was the characteristics feature of bursa in the summer seasons. In the Thymus, the infiltrations of the adipocytes in the parenchyma were observed, more numbers of Hassall's corpuscles were found in the medulla of the thymus in the summer seasons. Decrease in the thickness of capsule in summer seasons as compare to spring and winter seasons. A decreased in the amount of collagen fibres, lymphocytic degeneration especially at the periphery of lymphoid nodules lymphocyte infiltration also observed. In few spleen, massive congested areas within the splenic red pulp and congested blood vessels were noticed. Severe vascular congestion of red pulp and atrophy of peri-arteriolar lymphoid tissue in white pulp. There was no significant difference in total immunoglobulins among the different experimental groups. However, IgG titre was significantly higher ($P < 0.01$) in the birds reared during winter season than reared in autumn and summer seasons. Further, IgM titre was significantly higher ($P < 0.01$) in birds reared during autumn and winter compared to birds reared in summer. Cell mediated immune response to PHA-P at 9 weeks of age indicated that birds reared in winter season had significantly higher ($P < 0.05$) index than birds reared in autumn and summer seasons. There were non-significant difference incortisol and H/L ratio among the birds reared in different seasons. The IgG level was non-significantly higher in the winter seasons than autumn and summer seasons. birds reared during winter season had significantly higher ($P < 0.05$) concentration of Ig M compared to other birds reared in the other two seasons. Due to the birds taken from the well managed poultry farm so the effect of summer was there but no significant effect of summer on weight of bursa, Thymus & spleen, and Immunologically Cortical level, H/L ratio, Ig G

level were also non significantly lower in summer seasons.



Elongated and flask shaped follicles in summer seasons (H& E, 10X)



Bursa of Fabricius of summer season presence of cyst and Vacuolation in medulla (H&E, 10X)

Project B3. Mechanistic insights into melatonin signaling in bull spermatozoa and understanding its role in regulation of sperm capacitation and acrosome reaction

The study reported the presence of both M1 and M2 receptors in bull spermatozoa and are functionally involved in regulation of motility, kinematic parameters and terminal events like capacitation and acrosome reaction. The findings of the study suggested the existence of putative interplay between progesterone and melatonin receptors in regulation of sperm capacitation and acrosome reaction. Compared to M2, the signaling and the functional role of M1-receptors were dominant in regulation of sperm capacitation and acrosome reaction as evident from the functional receptor blocking studies. The study correlated the findings and proposed possible interplay mechanisms between progesterone and melatonin hormone which has to be studied in more detail. Both these hormones and their associated molecules can be targeted for the better understanding of sperm function and improvement of male fertility and in specific, functional attributes of spermatozoa.

Project B4. Effect of increasing THI on physiological acclimatization in Sahiwal calves

Best THI model for analyzing the effect of heat stress in goats were identified to be $\{THI1=(1.8 \times Tdb + 32) - [(0.55 - 0.0055 \times RH) \times (1.8 \times Tdb - 26.8)]\}$; and $THI8=(0.8 \times Tdb) + [(RH/100) \times (Tdb - 14.4)] + 46.4\}$. Threshold THI can be used to identify differential thermotolerance among the breeds of different species. Based on differential critical THIs with respect to physiological parameters, it can also be concluded that Barbari is better adapted than Jamunpari goats. In Sahiwal cattle, misting and splashing was more effective during hot dry period whereas splashing was more effective during hot-humid period. A study was conducted to study the rumen microbial diversity



and fermentation in heat stressed in buffaloes. Six Murrah buffalo heifers (age; 1.5 to 2.0 years, body weight; 250 to 300 kg) were first exposed to thermoneutral (THI=72) and then to heat stress (THI=87–90) conditions for 6 h between 1000 and 1600 hours for 21 days in the climatic chamber. A digestibility trial with four-day collection period was conducted at the end of the study and rumen liquor was collected on day 21. Illumina MiSeq Platform was used for sequencing of 16S (V3-V4) rRNA and the analysis was done using QIIME software. Volatile fatty acids (VFAs) in the ruminal fluid were estimated using gas chromatography. At the phylum level, an increased ($p<0.05$) abundance of *Firmicutes* and a decreased ($p<0.05$) abundance of *Proteobacteria* and *Planctomycetes* was observed during heat stress as compared to thermoneutral condition; whereas *Spirochetes* were not detected during heat stress. The relative population of genus *Butyrivibrio*, *Clostridium*, *Ruminococcus*, *Coprococcus*, two unclassified genera (family *Lachnospiraceae* and *Ruminococcaceae*) and *Stenotrophomonas* was increased ($p<0.05$), whereas the number of *B. firmus*, *Akkermansia*, *Erwinia*, unclassified genus (family *Enterobacteriaceae*) and *Methanobrevibacter* decreased ($p<0.05$) after exposure to heat stress as compared to control. Genus *YRC22*, unclassified genus (family *BS11*), *Stenotrophomonas*, unclassified genus (*Moraxellaceae*), *Achromobacter* and two unclassified genera (phylum *Verrucomicrobia*) were detected in the rumen after heat stress exposure. Acetate level increased ($p>0.05$) and butyrate level decreased ($p>0.05$); whereas digestibility did not change ($p>0.05$) during heat stress as compared to thermoneutral condition. Functional aspect of change in microbiota suggested that heat stress caused an increase in fiber degrading bacteria and decrease in methane producing bacteria. It can be concluded that heat stress invoked changed in rumen microbiota which resisted appreciable change in rumen fermentation; however, gut health seemed to be compromised.

Project B5. Studies on drug resistance profile of *Staphylococcus aureus* and *Escherichia coli* isolates recovered from clinical samples of animals and their biological control through Bacteriophages

A total of 70 samples of mastitis milk/ pus were collected from TVCC, U.P. Veterinary University, Mathura and 35 *S.aureus* and 13 *E.coli* could be isolated. The isolation of *S.aureus* (50%) was much more than *E.coli* (18.5%) in clinical samples. Of all

the 13 biochemically confirmed *E.coli* isolates, 4 *E.coli* had verocytotoxic genes (stx1 gene ,30.7%). No other virulent gene could be detected in any of the isolates. All the 35 *Staph aureus* isolates had nuclease gene (nuc) 270 bp. No isolate was positive for the virulence genes (sea and pvl) and VanA. On the basis of presence of mecA gene, 13 *S aureus* were confirmed as MRSA. Chloramphenicol was 100% sensitive against all *E.coli* the isolates followed by Imipenem and enrofloxacin which were 84.61% sensitive and Kanamycin (76.69%). 9/13 *Ecoli* isolates (69.2%) showed more than 5mm increase in zone of inhibition with Ceftazidime- Clavulanic acid or cefotoaxime-Clavulanic acid, thus were phenotypically confirmed as ESBL *E.coli*. 6/13 isolates (46.15%) were positive for DDST. The MIC value for ESBL *E.coli* was 0.094 $\mu\text{g/ml}$. Linezolid was the most sensitive drug for *S. aureus* and 77.14% isolates were resistant to vancomycin. Inducible resistance and MS phenotype were found to be higher in MRSA as compared to MSSA (27.6%, 24.3% and 1.6%, 4% respectively). In 20 sewage samples, 11 phages could be obtained (recovery of 7 *E. coli* host specific (EcD) phage as against 4 *S. aureus* host specific phages (SaD). Plaque types ranged in size with small plaque categorized as being under 2 mm, medium plaque being 2 mm, and large plaque being more than 2 mm.

Project B6. Evaluation of therapeutic potential of some medicinal plants on calf diarrhoea

In present investigation evaluation of therapeutic efficacy of *Dalbergia sissoo*, *Aegle marmelos* and *Punica granatum* in acute calf diarrhoea was ascertained. The diarrhoeic calves were divided in five treatment group and one group was healthy control group (Hc). Powder was supplemented at dose rate of 50gm bid for five days. In addition to powder Ringer lactate fluid @ of 25 ml/kg iv along with anti-inflammatory and multivitamin. The therapeutic efficacy of above therapeutic regimens was evaluated on the basis clinical recovery (days of recovery) and improvement in the altered values of the clinical score, hemato-biochemical alterations and electrolyte values towards normalcy (as par to the values in healthy control calves) on day 6th after treatment. Clinical observations and blood sampling will be done on the day of occurrence of diarrhoea and on day 6th post treatment. Clinical signs viz. general condition, rectal temperature, heart rate, respiration rate, consistency of faeces, depression, dehydration etc. was recorded. Vital parameter like heart rate, rectal temperature, respiration rate were



elevated. Complete blood count was done by hematology analyzer. Haemoglobin (Hb) concentration, packed cell volume (PCV), total erythrocyte count (TEC), total leukocyte count (TLC) were significantly higher in diarrhoeic calves than healthy calves. Biochemical parameter viz. sodium, potassium, chloride, total protein, albumin, globulin and glucose level and cytokine (IL10, TNF α , INF γ) were determined. Potassium, Total protein, albumin was significantly higher and sodium, chloride, glucose level, globulin were significantly lower in diarrhoeic calves than healthy calves. Cytokine IL 10 was significantly lower and TNF α , INF γ was significantly higher in diarrhoeic calves than healthy calves. It may be concluded that all therapeutic regimen adopted in present study were found to be effective in curing the diarrhoea as evident by alteration in various parameter on day 6th post treatment. Therapeutic regimen adopted in the treatment of acute diarrhoeic calves under groups T5 in which *Dalbergia sissoo*, *Aegle marmelos* and *Punica granatum* powder was given found to be most efficacious as evident by the improvement in clinical score in terms of rehydration, improved faecal consistency, suckling reflex and improved haemato-biochemical alteration.

Project B7. Evaluation of therapeutic potential of poly herbal formulation on sub clinical mastitis

The present study was conducted to determine efficacy of poly herbal formulation (combination of *Moringa oleifera*, *Ocimum sanctum* and *Azadirachta indica* leaves and *Curcuma longa* rhizome) on sub clinical mastitis in goats. For this study, Three cows (12 quarters) were considered apparently healthy control group (group A) after thorough physical examination and various diagnostic tests. A total of nine cows (36 quarters) found positive for subclinical mastitis on screening were randomly divided into three groups with three animals (12 quarters) each. Polyherbal formulation was administered orally for seven days twice daily at 10 mg/kg in group B animals. Group C animals were treated with conventional treatment for seven days. Group D animals were treated with combination of Polyherbal formulation and conventional treatment. Therapeutic efficacy of poly herbal formulation was evaluated based on alteration of somatic cell count of milk and qualitative changes in milk. A significant increased concentration of SCC and pH of milk and significantly decreased concentration of fat and solid not fat % was reported in SCM affected animals as compared to healthy control before treatment. Poly herbal formulations significantly reduced the SCC

and pH as well as significantly increased the fat and SNF % as that of conventional therapy. The combination of poly herbal formulation and conventional treatment accelerate the recovery. Hence, the present poly herbal formulation may be advised along with conventional treatment for early recovery in sub clinical mastitis.

Project B8. Evaluation of effect of vitamin D status on health and growth of dairy calves

This study was designed to assess the vitamin D3 status of newborn dairy cattle calves (1-2 weeks of age) and also to study the effect of vitamin D3 supplementation in early life on growth, disease susceptibility, blood levels of vitamin D3, calcium, phosphorus, alkaline phosphatase, tumor necrosis factor - alpha (a proinflammatory cytokine) and interleukin - 10 (an antiinflammatory cytokine). For the trial, 24 healthy newborn calves (01 - 02 weeks of age) of either sex (12 Haryana and 12 Sahiwal) maintained at livestock farm complex (LFC) of the university were sequentially allocated to four groups of 06 each as they were born for effective randomization. Calves of experimental groups (H & S) were administered four doses of injection Caldee-12® @ 01 ml/ 10 kg body weight, intramuscular every seven days (01 ml of injection containing 5000 IU vitamin D3, 76.4 mg calcium levulinate and 50 mcg cyanocobalamin). Blood was collected from the calves at the time of induction into the trial and at 90 days of age for estimation of plasma vitamin D3, calcium, phosphorus, total alkaline phosphatase, TNF- α and IL-10. Calves were observed daily till 90 days of age for any incidence of infection (diarrhoea, pneumonia, septicemia, naval ill, joint ill etc.). Body weight of all the calves were recorded at 90 days of age to assess effect of vitamin D3 supplementation on growth. In the trial, it was observed that all the calves were vitamin D sufficient (plasma concentration was greater than 30 ng/ml) at the time of induction into the trial and also at 90 days of age. It was also observed that parenteral periodic supplementation with vitamin D3 in early postnatal period did not result in improved vitamin D3 status at 90 days of age. However, day 0 as well as day 90 plasma vitamin D3 concentrations of Haryana calves was marginally higher than that of Sahiwal calves. This might be due to darker coat of Sahiwal breed. No statistically significant difference was observed between supplemented and unsupplemented group in plasma calcium, phosphorus and total alkaline phosphatase concentration at 90 days of age. Day 0 plasma calcium level in all the groups was significantly higher than day 90 plasma calcium



level. No variation was observed in levels of cytokines estimated (TNF- α and IL-10) among the groups at 90 days of age except significantly higher TNF- α levels in unsupplemented/ control Sahiwal group at 90 days of age (CS90) which might be due to higher incidences of diarrhoea in that group. It is concluded that 1. All the calves are vitamin D sufficient (plasma D3 concentration > 30 ng/ml) with present plane of nutrition and management practices. 2. Supplementation with vitamin D3 in early neonatal period in vitamin D sufficient calves does not provide any significant advantage/ benefit in growth and health parameters.

Project B9. Phytochemical screening and evaluation of antibacterial activities of *Plumeria*

After collection and shade drying of leaves and flowers of *Plumeria alba*, different type (Aqueous, Alcoholic, Hydroalcoholic etc) of extract of leaves and flowers were prepared. Alcoholic extract of flowers of *Plumeria alba* showed antibacterial activity against both gram +Ve and gram -Ve bacteria and it was found more effective against gram +Ve bacteria (*Staphylococcus* sp) compared to gram -Ve bacteria (*E. coli*). Phytochemical analysis of the extract showed presence of alkaloids, carbohydrates, tannins, xanthoproteins and resins etc in the extract. GC-MS analysis of the alcoholic extract of flowers revealed the presence of Diethyl Phthalate and Phthalic acid compound in the extract and HPTLC result showed presence of six peaks of different compounds in the extract at 254 nm wavelength. Alcoholic extract of flowers of *Plumeria alba* showed antagonistic action with amoxicillin antibiotic against the staphylococcus as shown in the FIC test (Checkerboards assay).

Project B10. Investigation on serum and milk biomarkers for subclinical mastitis in goats and cows during summer and winter seasons

This study was carried out on lactating Barbari and Jamunapari goats reared at goat farm along with Sahiwal and Haryana cows maintained at ILFC of College of Veterinary Science, DUVASU Mathura. The milk and serum samples were collected from goats along with milk samples of cows. Samples were stored at -20°C prior to analysis. The animals were divided into four groups according to breeds two of each goat and cows. The samples are collected in two different seasons namely summer and winter. Total 360 samples of milk and 200 samples of serum were collected. Now the milk and serum samples were further be divided in to two subgroups, namely control/healthy group, subclinical mastitic group on

the basis of screening by using somatic cell count (SCC), Electrical Conduction and pH on the milk samples. 1) Milk metabolic profile of healthy Sahiwal cows and found significant difference in Ph values during summer and winter season. Milk metabolic profile of healthy and subclinical mastitic Sahiwal cows found significant difference in SCC & AST values during summer season and SCC, pH & AST during winter season. 2) Milk metabolic profile of subclinical mastitic Haryana cows and found significant difference in A/G ratio values. Milk metabolic profile of healthy and subclinical mastitic Haryana cows and found significant difference in AST values during summer season. 3) Milk metabolic profile of healthy Barbari goats and found significant difference in A/G ratio values during summer and winter season. Milk metabolic profile of healthy and subclinical mastitic Barbari goats and found significant difference in SCC, ECT, K and AST values during summer and winter season. 4) Serum metabolic profile of healthy & subclinical mastitic Barbari goats respectively. Serum metabolic profile of healthy and subclinical mastitic Barbari goats and found significant difference in Total protein, Albumin, A/G ratio, AST, LDH and ALP values during summer and winter season respectively. 5) Milk metabolic profile of healthy Jamunapari goats and found significant difference in A/G ratio during summer and winter season. Milk metabolic profile of healthy and subclinical mastitic Jamunapari goats and found significant difference in SCC, ECT, K and AST values during summer and winter season respectively.

6) Serum metabolic profile of healthy Jamunapari goats and found significant difference in A/G ratio during summer and winter season. Serum metabolic profile of healthy and subclinical mastitic Jamunapari goats and found significant difference in Total protein, Albumin, AST & ALP values during summer and winter season respectively.

Project B11. Analysis of the canine tumor proteome as an exploratory study for future implication in tumor biomarker discovery

For the SDS-PAGE analysis of serum proteins and tumor tissue proteins from healthy and tumor affected animals, total 07 canine mammary tissue samples and 07 serum samples were collected from mammary tumor affected dogs. For extraction of proteins from mammary tissue samples, approximately 100 mg of mammary tissue sample was homogenized in 2 ml of RIPA buffer with protease inhibitor cocktail at 4°C. Then homogenate was centrifuged at 15000g for 20 minutes at 4°C and



the supernatant was collected in separate vial and stored at -20°C . The proteins extracted from tissues and the serum protein was estimated by Bradford method and concentration of the protein in the sample was determined. The recovery of the protein was 25.64, 18.75, 21.34, 22.43, 18.94, 20.24 and 19.86 in 7 tissue samples.

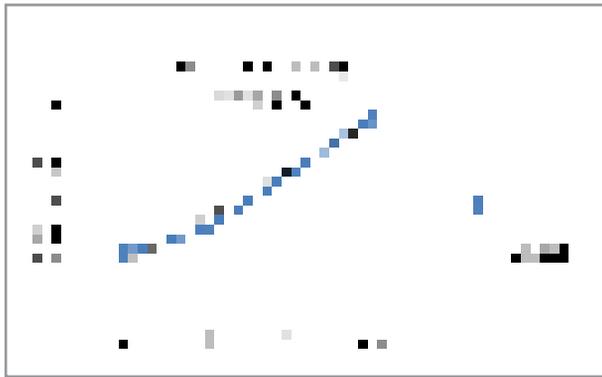


Figure : Protein standard curve (Bradford method)

Then proteins samples were electrophoresed on 10% polyacrylamide gel (Laemmli 1970) using vertical slab gel assembly. Electrophoresis was run at constant voltage of 80V at room temperature for 30 minutes through the stacking gel and at voltage 100V through the separating gel till tracking dye front reached close to the bottom of gel slab. At the end of electrophoresis, the gels were stained with 0.1% Coomassie Brilliant blue-R solution for 20 minutes and then de-stained with three changes of de-staining solution (water: methanol: acetic acid) at room temperature. SDS-PAGE of serum proteins revealed 18 bands in 10% polyacrylamide gel (Fig 02). However there is appearance of broad band of most abundant protein albumin that appears to mask the smaller proteins on the gel. For getting clear gel electrophoretogram, further procedures for depletion of high abundant protein need to be followed to get the smaller proteins visible.

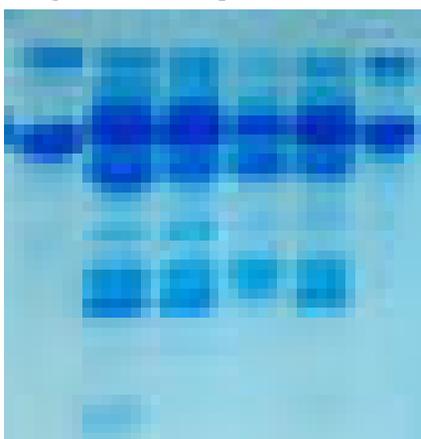


Figure: SDS-PAGE of serum proteins

Project B12. Standardization of urinary protein markers as diagnostic aid of anestrus in farm animals

Anestrus is one of the major causes of economic losses to the dairy farmers. Extensive efforts, worldwide, have been put into research to limit the occurrence of this disorder. However, despite all these efforts, postpartum infertility is still a significant problem in dairy herds. Urine is a reliable indicator of the physiological status of an animal. The electrophoretic pattern of urine samples can be used to identify the type of proteins leaking into the urine and has diagnostic and prognostic value. This may also serve a basis for investigating the urinary protein pattern during anestrus in cows. We have earlier been able to identify antimicrobial peptides namely Defensin, S10A8 from normal cycling healthy cow's urine using different electrophoretic and mass spectrometric methods. We assume that these proteins may show variation in its expression in disease conditions. We tried to construct an electrophoretic pattern of cow urine as a probable biomarker for detecting anestrus by using Matrix-Assisted Laser Desorption Ionization Time-Of-Flight mass spectrometry (MALDI-TOF MS) followed by Peptide Mass Fingerprint (PMF) searching of databases to isolate and identify the proteins. Proteins were isolated from urine obtained from normal cycling as well as anestrus cows by ultracentrifugation, separated by tricine-SDS-PAGE and identified by MALDI-TOF MS followed by PMF. Four randomly selected gel bands were analysed by MALDI-TOF-MS and MASCOT ion searches of the UNIPROT database. The resulting sequences were subjected to BLAST searches of the NCBI protein database to provide annotation of the proteins and confirm concordance in protein identity. Four proteins, two each from both groups were identified with MALDI-TOF. Presence of Cathelicidin-1 in the urine of anestrus animals indicates the secretion of antimicrobial peptides in response to an infection or a pathophysiological condition like anestrus. Proteomic analysis of urinary proteins is a promising tool to study reproductive physiology and pathophysiology and to determine biomarkers for anestrus.

Project B13. Comprehensive studies on health promoting dairy products prepared from milk of indigenous breeds of different milch animals

Total 150 samples from indigenous breeds of different breeds of cow (Sahiwal, Harijana), buffalo (Murrah) and goat (Jamunapari, Barbari) were evaluated for various compositional and quality

characteristics and baseline data of comparative nutritional content in milk from indigenous breeds of different milch animals was prepared. Milk samples showing best results were processed into health promoting milk products viz. khoa, ghee, and paneer. Complete product profile analysis of these developed milk products as well as commercially available dairy products (khoa, ghee and paneer) in market was carried out to compare compositional, nutritional and quality parameters as well as sensory evaluation using standard procedures. Significant difference was observed in fatty acid profile, amino acid profile as well as mineral content of products prepared from different species (cow, buffalo and goat). Again different breeds from same species also had variation in quality characteristics of khoa, paneer as well as ghee. These products also showed significant differences with samples procured from market and had good quality nutrients in higher amount than respective market sample. Health promoting products prepared from goat milk were also well acceptable in terms of texture analysis and sensory evaluation. Therefore, dairy products prepared from milk of indigenous breeds might be an excellent option for growing children and people suffering from various life style diseases.

Project B14. Packaging potential of whey protein based nanocomposite active edible film with antimicrobial functionality for muscle food

- Development of nanocomposite film containing Cupper oxide
- The composite blend can be potentially fabricated into edible films
- Caraway and citronella grass essential oil were successfully incorporated and the formed films were found with augmented antimicrobial functionality
- In practical antimicrobial property was enhanced
- The film can be commercially exploited for wrapping of more semi dried meat products

Project B 15. Estimation of threshold THI For Sahiwal calves in semi-arid India

To identify climate-resilient breeds of cattle on the basis of heat tolerance indices, metabolic, endocrine and molecular marker requires a subjective and comprehensive approach. A peculiar chronology of the physiological, biochemical, metabolic and endocrine response to increasing heat stress in cattle suggests a crosstalk and an interaction

between various stress markers. Different THI ranges have been suggested to define the degree of environmental stress with paramount variation depending on the species, physiological status and geographical area. Present study was conducted to study the critical THIs with respect to different stress markers in Sahiwal calves. The experiment was performed at Livestock Farm Complex DUVASU, Mathura, from April 2021 to July 2021 on Twenty eight Sahiwal calves. The animals were kept in ambient temperature and humidity conditions. During the experimental period (THI/temperature) physiological parameters (Rectal temperature, Respiratory rate and Pulse rate) was recorded, while blood sampling was done 1500 hours for hematological (hemogram and leucogram), hormonal (cortisol) HSP70, IL-6 and TNF α analysis. The segmented regression analysis was performed using program SegReg (Oosterbaan, 2017) to determine the threshold THI with respect to different stress parameters. The segmented linear regression with respect to THI and body weight and rectal temperature was not exhibited break point. The segmented linear regression with respect to THI and respiratory rate exhibited breakpoint at THI 80.36 and pulse rate exhibited non significant breakpoint at THI 70.06. The segmented linear regression with respect to THI and total red blood cell count and total white blood cell count was found to exhibit non significant breakpoint at THI 85.06. The segmented linear regression with respect to THI and haemoglobin exhibited non significant breakpoint at THI 73.71. The segmented linear regression with respect to THI and cortisol exhibited breakpoint at THI 73.71. The segmented linear regression with respect to THI and HSP 70 exhibited breakpoint at THI 85.06. The segmented linear regression with respect to THI and interleukin -6 exhibited non significant breakpoint at THI 73.97 For the segmented linear regression with respect to THI and TNF alpha no break point was observed.

Project B 16. Differential pattern in milk somatic cell count and composition of Sahiwal and Haryana cows during different stages of lactation

The present investigation is being carried out with the objectives; to estimate the value of milk SCC in Sahiwal and Haryana cows during different stages of their lactation; to establish relationship between milk composition and SCC of Sahiwal and Haryana cows and to isolate and identify mastitis causing organisms from these animals. The present experiment is being carried out at LFC and department of Livestock Product Technology of



DUVASU, Mathura. A total of twenty four (24) post-parturient, healthy Sahiwal and Haryana cows (Twelve of each breed) have been selected as experimental animal. Their feeding, housing, milking, cleaning etc. management are normal as is being practiced for other animals at LFC, DUVASU, Mathura. These cows are living with their herd mates in loose housing system. 100 ml of milk samples is being collected from these cows at 1st, 10th, 30th, 60th, 90th, 120th, 150th and 180th days of their lactation. The milk SCC and milk composition for each sample is being estimated as per standard protocol. The trial is still going on. The data thus generated will be analyzed by using suitable statistical model and tool.

Project B 17. Identification, prediction of age and production performance using Muzzle Printometry Technique in Sahiwal Cattle

Muzzle print images are considered as best suitable biometric identifiers for biometric-based identification and traceability without any damage over the animal body. Various other temporary and permanent methods are ideal under all conditions but have their own limitations and damaging to the animal body. The print of muzzle can be used as a permanent method of identification, which can overcome the limitations as well as check the problem of false identification in case of mis-chief and stealing of animals. The 24 lactating Sahiwal were used for experiment having the wide variation in their average milk yield in about 300 days

lactation length, ranges from 1292.34 litre to 2211.50 litre, while the average age varies from 4.5-14.5 years. It was also observed that with pronouncement of age the surface area and size of The various muzzle measurements viz. basal length, central length, upper length, distance between nostrils (DBN) were varied from 7.2 to 10.24 cm, 6.81 to 9.15 cm, 7.8-10.61 cm, 4.82-9.90 cm, respectively while the muzzle characteristics viz. number of beads and ridges were varied from 104-249 and 6-25, respectively. The values of correlation co-efficient (r) for average age, basal length, central length, ratio of basal length & central length and upper length were positively correlated. The distance between nostrils (DBN) and ridges were significantly correlated ($r= 0.592$ and 0.543) with average milk production of lactating Sahiwal, while number of beads were negatively correlated ($r= -0.390$).

The muzzle measurements viz. Basal length, upper length, central length and distance between nostrils will be measured in cm by using measuring scale with muzzle characteristics viz. beads and ridges were counted. The correlation between muzzle characteristics and muzzle measurements with average lactation yield and age were established.

Project B 18. Effect of flooring on performance of Haryana calves

Livestock markets then began producing different kinds of flooring mats and bedding

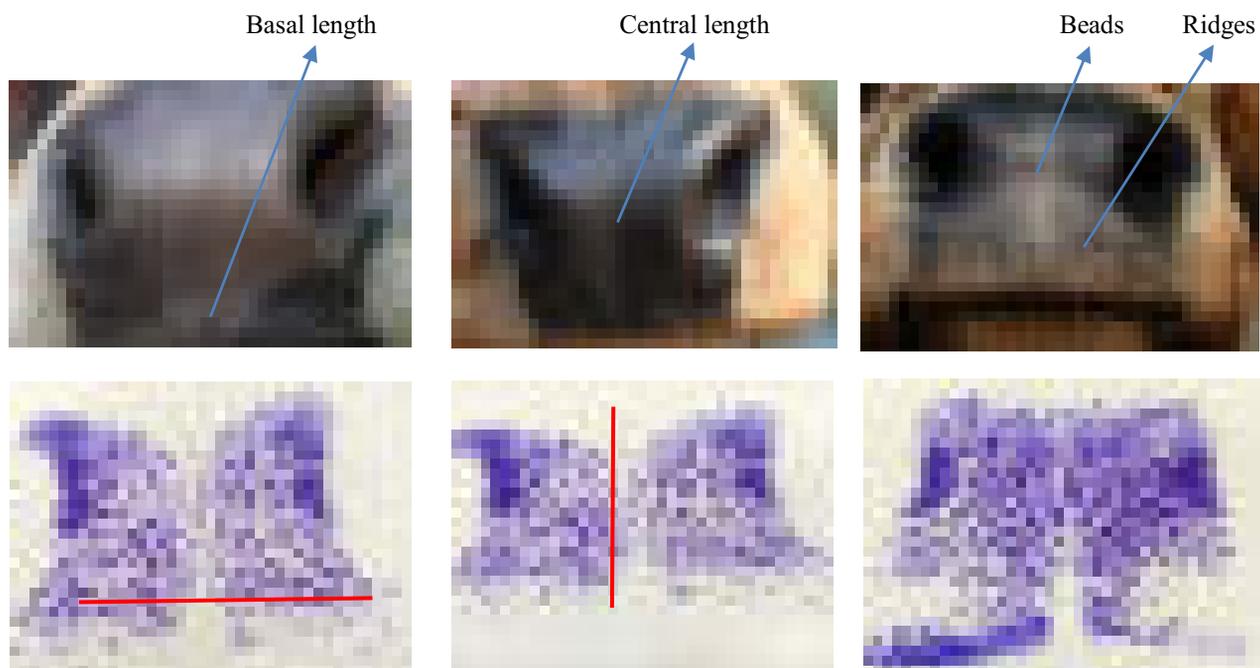


Fig 1. Muzzle Photograph and Muzzle Print



materials, which, along with increased demand, claimed to be of utmost significance in cow growth and health. Although the claims of these available bedding materials such as rubber mat are very high, meager information is available about the effect of floor type on various health and welfare related attributes. In an effort to fill this gap the experiment was conducted to study the effect of different flooring types on growth performance of Haryana calves at the Livestock Farm complex on eighteen (18) Haryana calves in two seasons April to June 2021 for summers and December to February 2022 for winter. The animals selected for the study were randomly divided into three groups, containing six animals in each group. (T1-Control) Concrete flooring (T2) Compost/cow dung bed flooring, (T3) Rubber mat installed flooring. General attributes, hematological, blood biochemical, hormonal profile, behavioural, hygiene score and hock score related attributes were studied. Blood samples were collected from experimental animals at fortnightly intervals for hematological examination and plasma harvesting for estimation of blood biochemical and hormone profile of animals. behavioural attributes of calves were investigated by using Video recording system. It was observed that the overall mean values of BCS in T1 and T2 were non significantly differ season wise whereas in T3 the values were significantly higher during summer season compared to winter season. The overall haemoglobin values were not found significantly different between the treatment groups during summer. In winter season haemoglobin values were found significantly higher in T1 compared to T2 and T3. Total protein (g/dl), albumen (g/dl), BUN (mg/dl) there was found no significant difference between the treatment groups also no significant difference season wise. For creatinine (mg/dl) the overall values were significantly higher for summer season compared to winter season. Cortisol (ng/ml) values were not found significantly different in different treatment groups either in summer and winter season yet there was significant difference for summer and winter season in all the groups. The overall lying duration was found significantly different between the treatment groups as T1<T3<T4 during summer and T1<T2<T3 during winter. The overall duration for lying in leg tucked position was found significantly different between the treatment groups as T1<T3<T2 during summer and T1<T2<T3 during winter. The hygiene scoring of lower leg was significantly higher in T3 compared to T2 and T1 during summer season and no

significant difference found between the treatments in winter season. In all treatment groups the hock scoring was significantly higher during winter season compared to summer season. It was concluded that, Cow dung bed and rubber mat flooring have better comfort yet hygiene is compromised on rubber mat during summer season, both the floorings were better for hock condition over the conventional concrete flooring.

Project B19. Expression profile of cytokines and TLRs in cattle and buffalo with natural tropical theileriosis

Tropical theileriosis is a lympho-proliferative disease of cattle caused by *Theileria annulata*. Previous studies suggest that an imbalance between the host-immune response and parasite evasion mechanism results in clinical theileriosis. *T. annulata* causes leuco-proliferative disorder in infected animals. The parasite infected lymphocytes results in proliferation of proinflammatory cytokine secretion. Most of the studies on cytokine profiling in theileriosis revolve around other species of *Theileria* and except a few studies on cell culture very limited information is available on this aspect in *T. annulata* infection. Therefore, the present study was designed to unravel the innate and adaptive immune regulation of cattle and buffalo against natural tropical theileriosis and to correlate the clinical manifestations of tropical theileriosis with immunological alterations.

In the present study, differential expressions of various immunological markers viz. IL-2, IL-4, IL-10, IL-18, TNF- α , IFN- γ and TLRs 2,4,6 were studied using real time assay. Real time PCR data was analysed using comparative Cycle thresholds (CT) method given by Livak and Schmittgen (2001). Results indicate a six fold rise in expression of IL10 gene in infected cattle and buffaloes in comparison to the control animals. Likewise, 14 fold increase in expression of IL18 gene and six fold increase in expression of TLR6 gene was observed in *Theileria* infected buffaloes comparison to non infected control animals. This is the first clinical study where innate immune regulation of tropical theileriosis in clinical cases of *T. annulata* was detected in cattle and buffaloes.

In conclusion, natural infestation of *T. annulata* produce an up-regulation of IL10, IL18 and TLR6 genes in infected buffaloes and up-regulation of IL10 cytokine in cattle suggesting their role in protective immunity against this pathogen. These findings will provide novel information to help



determine the involvement of TLRs and cytokines in protection against *T. annulata* infection. These genes can be act as possible markers for immune regulation of *T. annulata* in cattle and buffalo. However, further comprehensive research is needed for establishing their role in control of the ileriosis in animals.

Project B20. Study of Immune Responses in cutaneous tissue of cattle phenotypically resistant and susceptible for ticks

The aim of the study was to evaluate the efficacy of ozone therapy and cephalixin in treatment of sub-clinical endometritis in cattle and buffaloes. A total of 54 post-partum lactating parous cattle and buffaloes were selected from VCC, College of Veterinary Science & Animal Husbandry, DUVASU, Mathura (U.P). Reproductive data were recorded. These animals were examined for subclinical endometritis by cytobrush technique. Sample with more than 5 % PMNs was considered as positive for subclinical endometritis. All animals which were confirmed for subclinical endometritis were subjected for treatment. These animals were divided into two groups. Group I: (Intrauterine Ozone treatment; n=27): at estrus, administered ozone @ 55 µg/ml (60 ml) intrauterine on day 1 and 2 of estrous cycle via syringe. Group II: (Cephalixin; n=27): At estrus, administered cephalixin @ 500 mg intrauterine on day 1 of estrous cycle via syringe. All treated animals were examined on next estrus and were subjected for artificial insemination for up to two consecutive estrus. Pregnancy was diagnosed 40-60 days post-insemination. Based on the findings recorded in the present study, following conclusions were drawn. 1. The lower PMN% after treatment in both groups indicated that endometrial cytology could be used effectively to diagnose subclinical endometritis in cattle and buffaloes. 2. Intrauterine ozone gas therapy is useful in treatment of subclinical endometritis and can be used as an alternative to intrauterine antibiotics. 3. Intrauterine ozone therapy was comparatively more effective than compared to cephalixin treatment group.

Project B21. Evaluation of acaricidal potential of herbal essential oils against bovine ticks

The present investigation was conducted to evaluate the *in vitro* acaricidal efficacy of eugenol, 1,8 cineol and their two combination against *Rhipicephalus microplus* ticks by adult immersion test (AIT) and larva packet test (LPT). Both essential oils and their combinations were found effective to reduce ticks number, egg weight, and hatching capability by AIT. By this data product effectiveness

(PE) were calculated. The cent percent product effectiveness were calculated for eugenol and combination 2 at the concentration of 80 mg/ml. The LC₅₀ (95%CI) for eugenol, 1,8 cineol and combination 1 and combination 2 were calculated 4.202 (3.297 to 5.203), 5.695(4.03 to 7.586), 4.62 (2.635 to 7.653) and 3.331(2.675 to 4.148) mg/ml respectively. The LPT data revealed that eugenol, combination 1 and combination 2 kill cent percent larvae at the minimal concentration of 6.25mg/kg. The calculated LC₅₀ (95%CI) value of LPT for eugenol, 1,8 cineol and combination 1 and combination 2 were 1.808(1.680 to 1.886), 16.34(13.10 to 20.35), 2.521(2.448 to 2.595) and 1.691(1.632 to 1.756) respectively. The combination 2 in the present study was found most effective to kill adult ticks and their larvae by AIT and LPT. The percent reduction of tick protective enzymes superoxide dismutase (SOD) and acetylcholinesterase (AChE) for most effective combination (combination 2) were calculated 60.27% (±5.45) and 21.45% (±1.86) respectively in comparison to control ticks.

Project B22. Assessment of epithelial mesenchymal transition (EMT) through immune histochemical identification of biomarkers in canine tumors

Cancer is regarded as one of the most common pathological conditions in canines. The present study was conducted with an aim to study the different tumours affecting the canines during a period of one year. The different age group, breeds, sex, anatomical location were evaluated. The tumours were classified and graded histopathologically. Epithelial mesenchymal transition (EMT) which is considered as an important step involved in initiation of tumour invasion and metastasis was evaluated immunohistochemically. The present study shows that tumours in canines are very common in animals aged more than 7 years of age. Most common tumours encountered included the mammary tumours, cutaneous tumours and soft tissue sarcomas. Mammary tumours are common in female animals as compared to the males. Tumour incidence was mostly seen in Labrador retrievers followed by German Shepherds and non-descript breeds. Fine needle aspiration cytology provides a valuable insight to the possible type of tumour and its cellular origin but histopathology is a method of choice for confirmatory diagnosis. Immunohistochemistry using the biomarkers for epithelial mesenchymal transition namely e-cadherin, n-cadherin and vimentin can serve as a valuable



diagnostic aid in deciding the tumour transition and possible metastasis.

Project B23. Clinico-pathological and Immunohistochemical Study on the expression of biomarkers of canine mammary tumours

The present study was undertaken to know the occurrence of canine mammary tumours, to classify and study their gross and microscopic lesions, evaluate different tumour markers by IHC and to determine the prognostic significance of the presence and absence of markers. In the present study, the animals having mammary tumours ranged from 2 to 12 years of age with highest occurrence in 7-10 years age group and noticed mainly in female animals, with one male dog. Highest occurrence of canine mammary tumours was recorded in German shepherd dogs followed by Labrador and Spitz. The highest occurrence was recorded in intact bitches when compared to spayed dogs. Out of 37 cases presented, 22 having single mammary gland affected whereas 15 cases have tumours in multiple glands. The highest occurrence was recorded in inguinal (37.09%) followed by caudal abdominal (27.41%) gland. Majority of the cases showed TNM stage III (80.48%) followed by stage II (9.75%) and stage IV (4.87%) and stage I (4.87%). Overall, the cytological diagnosis had 75% correlation to histopathological diagnosis. The cytologic diagnosis correlated with histologic diagnosis for benign and malignant tumours in 60% and 75% of cases respectively. Grossly, the size of tumours ranged from 1.5 to 20 cm in diameter approximately with different shapes and consistencies. Out of 37 cases presented samples were possibly obtained from 20 cases and out of these 20 cases, fourteen cases (70%) had malignant tumours while 06 cases (30%) showed benign tumours. Histologically they were classified into 17 major subtypes and among them intraductal papillary carcinoma had highest frequency followed by ductal carcinoma among malignant and fibroadenoma followed by benign mixed mammary tumour among benign tumours. In present study metastasis of CMTs to lymphatics, lymph nodes and visceral organs were recorded in 02 cases. Maximum no. of carcinoma was of grade II (55%) followed by grade I and grade III. Of the 20 canine mammary tumours samples subjected to immunostaining of different tumour markers, 55% of tumours showed p53 expression, 30% showed ER, 35% showed PR and 50% of cases showed HER expression. In the present study, various factors such as tumour stage, histological grade and features, expression of

different tumour markers along with epidemiological data were evaluated in CMTs. It was revealed that the factors like TNM stage and expression of tumour markers have significant prognostic value and can influence clinical outcome of canine mammary tumours.

Project B 24. Studies on bacterial isolates of dairy environment with special reference to biofilm production

Microbial biofilms may be defined as microbial aggregates, embedded in matrices of exopolymers, which attached to either biotic or abiotic surfaces. Biofilm production is a natural mechanism by which some microorganisms adhering to a wet surface and secrete a complex extracellular matrix and get embedded inside it. Many food-borne outbreaks have been associated with dairy products as main vehicles for transmission of biofilm forming *S. aureus*, STEC, *B. cereus* and *Streptococcus*. In this study, a total of 310 samples were collected from different places dairy farms, gaushala, local shops and vendors of Mathura region from various sources like milking buckets (50), dippers (64), canes (56) and raw milk (140) from cows. Samples were screened for *S. aureus*, STEC, *B. cereus* and *Streptococcus* by phenotypic identification followed by series of biochemical tests. The cumulative prevalence of *S. aureus*, STEC, *B. cereus* and *Streptococcus spp* was 80.64%, 7.41%, 35.16% and 20.0%, respectively. *S. aureus* were identified on molecular basis for species specific *nuc* gene and it was prevalent in 80.64% isolates. 7.41% *E. coli* isolates were STEC having *stx1*, *stx2*, *eaeA* and *hlyA* genes. The haemolytic and non-hemolytic complex of genes were revealed in 35.5% *B. cereus*. On the genotypic basis confirmed *S. aureus*, STEC, *B. cereus* and *Streptococcus spp* isolates were screened by three different methods congo red agar (CRA) assay, Tube Method (TM) and Tissue Culture Plate method (TCP). Among the three tests TCP, TM and CRA the rate of biofilm detection for *S. aureus* was 97.2% (243/250), 91.6% (229/250) and 9.2 (23/250) while in STEC rate of biofilm formation was 82.60% (19/23), 69.56 % (16/23) and 34.78% (8/23) for TCP, TM and CRA respectively. In *B. cereus* rate of biofilm detection was 89.90% (98/109), 80.73 % (88/109) and 11.00% (12/109) for TCP, TM and CRA while in *Streptococcus spp* 87.09 % (54/62), 79.03% (49/62) and 14.51% (9/62) for above these assay. TCP was found superior to TM and CRA in detection of biofilm formation. Results showed that highest prevalence of biofilm forming *S. aureus* was



found in raw milk of cows (91.42%), followed by milking buckets (82%), canes (76.78%) and dippers (59.37%). The highest prevalence of biofilm forming STEC was found in milking buckets as 18%, dippers 6.25%, canes 7.14 % and lowest prevalence in raw milk of cows 4.28%, while highest prevalence of biofilm forming *Bacillus cereus* was found in milking buckets 42.0% followed by raw milk of cows 37.14%, dippers 34.37% and cane 25%. Results also revealed highest prevalence of biofilm forming *Streptococcus* was reported in raw milk of cows 22.14% followed by cane 21.42%, buckets 20.0% and dippers 14.60%. In SEM all the strong biofilm producers strains of *S. aureus*, STEC, *B. cereus* and *Streptococcus*, it was observed that produced biofilms well structured communities of cell adherent to surface and embedded in a self produced polymeric matrix. This study revealed that biofilm forming *S. aureus*, STEC, *B. cereus* and *Streptococcus spp* were obtained from utensils along with raw milk of animals and may be a sustainable source of contamination of dairy products with this pathogens. So, there is need of paying more attention to the cleaning and sanitizing processes of food contact surfaces to ensure the public health.

Project B 25. Participatory development of plan for promoting scientific knowledge and better production in small ruminants: An Action Research

The livestock sector has a significant potential for round the year employment generation particularly in rural areas. However, in case of landless and marginal farmers rearing of large ruminants specially the high yielder are mostly not possible due to shrinkage of common property resources (grazing land) and financial constraints but farming of small ruminants has more or less overcome these problems and can contribute additional income for the family. Among all species of farm animals, Goats have the widest ecological range and have been poor people most reliable livelihood resource since their domestication during Neolithic Goat, in true sense, is called as poor man's cow due to its tremendous economic importance in contributing milk, meat and ultimately the household nutrition security and livelihood to the downtrodden people. Goat farming is highly prone to a number of diseases and the mortality in kid is a major concern. As per the National Sample Survey Organization (NSSO 2005), only 5.1% of the farmer households in India are able to access any information on animal husbandry. Therefore the

present study was undertaken with the following objectives to study the existing animal health management practices and knowledge of goat farmers regarding scientific animal health management practices, to develop participatory animal health plan and disseminate the same through training and capacity building, to identify the package of practices based on the existing situation and to undertake an impact assessment among the respondent about the intervention. The present study was conducted in Mathura district of Uttar Pradesh, the rainbow land where the multi-hued Indian Culture has blossomed from times immemorial. Mathura district is purposively selected. Cluster of villages having a fair goat population and among which only respondents having adequate experience in goat rearing were selected for the study. The primary data was collected through pretested structured interview schedule, group discussion and appropriate PRA method. The average flock size 34 goats per household, respectively. The flocks were predominated by adult/ yearling females. The breeding bucks were available with merely 52.00% of the goat keepers, viz. only with large flock owners. The developed knowledge test was administered to the respondents and it was found the respondents were having knowledge about the kid calf management practices on period (53.50%), general management practices (54.72.72%), healthcare practices (47.12%) and feeding management (53.14%) respectively. The extent of adoption for management practices, feeding practices, healthcare practices and breeding practices were 46.86%, 53.20%, 46.00% and 51.00% respectively. The overall extent of adoption of practices among respondents was found to be 49.26%. It reveals that lack of fertile and non-availability of green fodder was the most important constraint with a cent percent of and inadequate knowledge about balanced feeding practices (71.66%), inadequate knowledge about importance of mineral mixture (70.83%), problems in availing good quality feed for goats (53.83%), inadequate clean water facilities (44.17%), and high cost of feed and fodder with a percentage 31.35% were other important constraints.

Project B26. To evaluate the effect of ozone therapy and cephalosporin in treatment of sub-clinical endometritis in cattle and buffaloes

Based on the findings recorded in the present study, following conclusions were drawn.

1. The lower PMN% after treatment in both the

groups indicated that endometrial cytology could be used effectively to diagnose subclinical endometritis in cattle and buffaloes.

2. Intrauterine ozone gas therapy is useful in the treatment of subclinical endometritis in cattle and buffaloes.
3. Intrauterine ozone gas therapy can be used as an alternative to intrauterine antibiotics.
4. The intrauterine ozone therapy was comparatively more effective than compared to cephalosporin treatment group in cattle and buffaloes.

Project B27. Clinico-Microbiological investigation of ascites cases in canines and their need-based therapeutic interventions

Ascites is mainly characterized by general systemic state and is the abnormal accumulation of fluid in the peritoneal cavity and it is different than the septic peritonitis. It is usually caused by multiple etiologies involving cardiac, hepatic, renal, splenic, hypoproteinemia, and in certain conditions parasitic or microbiological diseases. To address this health problem in dogs, current study was conducted with the objective of proper diagnosis of ascites in dogs and their need based therapeutic management. In the present study, dogs with abdominal enlargement, as confirmed by abdominal ultrasonography, were studied. A total of 104 suspected dogs were screened to study the cases of ascites irrespective of gender and age from clinical cases presented to TVCC,

Kothari, Mathura between April, 2021 to March 2022. They were further classified as per gender, age group, types of breed and based on the pathophysiology of its formation. Ten dogs were selected as healthy control. After history taking, physical examination and thorough clinical examination of these dogs, faecal samples, ascitic fluid and blood samples (from cephalic vein in medium/large sized dogs and from jugular in small sized dogs) were collected for laboratory investigation including complete blood count (CBC), blood smear examination, plasma/serum biochemistry analysis, ascitic fluid analysis, microbial examination, and other diagnostic tests essential to establish the cause of ascites. Study results based on 104 samples reflected multiple etiological factors responsible for abdominal distension/ascites in dogs. Out of total 104 cases, ten cases were due to hypoproteinemia of unknown origin while five were of septic peritonitis. Maximum 40 cases (38.46 %) were of Ehrlichiosis based ascites, followed by other etiologies based on liver (24%), heart (9.6%), kidney (6.73%) and splenic (1.92%) dysfunction. Among Microbial agents, 4.8 % showed presence of bacterial agents (Gram positive cocci as Micrococcus and Gram negative rods) and 4.8 % were due to parasitic (Ancylostoma) cause. Isolated bacterial strains were subjected to antibiotic sensitivity testing (ABST) and showed sensitivity only to gatifloxacin, while were intermediately susceptible to ampicillin/sulbactam, amikacin and tetracycline. Study results



Fig-1 Abdominal distension



Fig-2 white mucous membrane of eye



Fig-3 USG Guarded Abdominocentesis

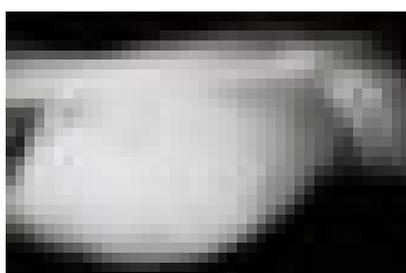


Fig-4 Glass appearance of abdominal cavity in dog



Fig 5 Gram positive cocci



Fig 6 Gram negative small rods



based on hematological, cytological, biochemical analysis of blood, serum, ascetic fluid along with microbial/parasitic investigation of blood, fecal samples and ascetic fluid of 104 samples reflected multiple etiological factors responsible for ascites in dogs, hence medication should be given after proper diagnosis along with nutritionally protein enriched diet with moderate restriction on sodium intake.

Project B28. Development of a rapid skin test for the diagnosis of Johne's disease

Paratuberculosis/Johne's disease (JD) leads to significant economic loss to livestock industry globally and there are evidences on the role of MAP in human Crohn's disease which makes restriction of MAP infection very important for both economic and public health concerns. Among the available diagnosis tests, DTH assay has advantage in early stages diagnosis as CMI response dominates the early stages of MAP infection. Also, only DTH can be performed at pen-side and do not required any costly or sophisticated instrument. Therefore, in present study a modified rapid skin test based on the hypothesis of combining arthus reaction and allergic skin test was developed in guinea pig model for screening paratuberculosis. For the investigation, guinea pigs were divided into two groups. All the animals in Test Group (B) were inoculated with MAP bacterintwo while the Control Group (A) animals were inoculated with the same volume of PBS and the development of immune response to MAP was assessed on 0, 14 and 30th day post inoculation of MAP antigen using INF- γ assay. Skin testing was performed at 30th day post inoculation using detector solution comprise of PPD-J as MAP antigen and complement sera, poly-L-arginine and poly-histidine @ 10 μ g, 40 μ g, 20 μ g, 15 μ g, respectively in final volume of 50 μ L per inoculation site. The inoculation site was grossly observed for redness and inflammation at different time intervals and skin samples were collected histopathology. The results obtained for IFN-gamma assay in both control and test group revealed that the animals responded well to the MAP sensitization. Based on the macro and micro observation of inoculation site in skin test it can be concluded that the developed test has promising potential for rapid screening of MAP infection. The study can be further recommended for additional optimization of the concentration of complement and electrolytes. The test can also be optimized with MAP specific recombinant proteins or peptides in place Johnin for improving the specificity of the test.

Project B29. Ameliorating insulin resistance in preruminant calf by dint of Chromium supplementation

The aim of this study was to assess the effect of chromium (Cr) supplementation on the growth performance, insulin sensitivity, antioxidant and immune response and health status of pre-ruminant Haryana calves. A total of 20 pre-ruminant (<3 months age) Haryana calves were randomly assigned into two groups (n=10) on body weight (27.0 \pm 0.20 kg) and age (22.0 \pm 3.0 days) basis. Experimental calves either received a basal diet devoid of supplemental Cr (control group) or were supplemented with 0.15 mg of Cr-picolinate/kg BW^{0.75}. Experimental calves were monitored fortnightly for body weight (BW) gain and average daily gain (ADG). Insulin resistance was determined by conducting intra venous glucose tolerance test (IVGTT) and oral glucose tolerance test (OGTT) while OGTT was also used for the determination of lactose intolerance. Apart from this, monthly blood samples were collected for the determination of plasma glucose, insulin, cortisol, antioxidant status and immune response and plasma mineral levels. Occurrence and duration of the diarrhoea, pneumonia occurrence, joint and navel ill and calf mortality parameters were used to access the health status of experimental calves. Cr supplementation did not exert any effect on growth performance. Eventhough, dietary Cr supplementation did not exert any effect on plasma insulin concentration but its supplementation improved insulin sensitivity which was evidenced from better glucose kinetics during IVGTT. Plasma glucose and insulin concentration attain their peak then declined and did not return to their basal concentration within 63 min. However, a peak level of plasma glucose was lower in the Cr supplemented calves. It denoted that there was insulin resistance present in all the experimental calves and Cr supplementation improved the insulin resistance. Similar to the IVGTT, plasma glucose concentration was lower (P<0.05) in Cr supplemented calves during OGTT while plasma insulin, insulin: glucose ratio and IRS-1 remain similar among both the groups. During OGTT, plasma glucose and insulin concentration attain their peak at 60 min in both the groups, then declined and did not return to its basal concentration within 180 min. It further confirms that the experimental calves used in this study were insulin resistant as well as lactose intolerant and supplementation of Cr reduces risk of insulin and lactose tolerance in pre-ruminant calves. The monthly plasma glucose concentration



was found lower ($P < 0.05$) in the Cr supplemented calves while monthly plasma insulin level remained similar. Cr supplementation showed a significant ($P < 0.05$) effect on insulin: glucose ratio and ratio was higher in Cr supplemented calves. Cr supplementation did not exert any effect on the biomarkers of antioxidant and immune status and plasma concentration of calcium (Ca), phosphorus (P) and iron (Fe). The plasma Cr concentration showed a positive association with the dietary Cr supplementation. The dietary supplementation of the Cr had no impact on the health status and incidence of diarrhea in pre-ruminant Haryana calves. In conclusion, dietary Cr supplementations improve insulin sensitivity and reduce risk of lactose intolerance in pre-ruminant Haryana calves without affecting performance and health status.

Project B30. Development of package of practices using locally available feed resources for balancing ration for optimum production of cattle and buffalo in Mathura District

In the present study the survey were conducted on mineral profiling of soil, water, milk and feedstuffs as well as on current feeding practices in five blocks of Mathura District. Ten villages from five blocks (two from each block) i.e. Chhata, Baldeo, Goverdhan, Mahtura and Farah were selected for survey and collection of data. Ten farmers from each village were indentified for collection of information on feeding practices and locally available feed and fodder commonly fed to livestock. Soil, water, feed and milk samples were collected from each village. Feed and fodder used for feeding animals were collected under three broad categories viz. straws, concentrate / concentrate mixture and green fodder / other resources. Milk samples of cattle and buffalo were collected to assess their mineral status. More than 900 samples of soil, water, feed, fodder and milk of cattle and buffalo will be collected randomly and used for mineral profiling. Analysis of feeds showed deficiency of Co and Zn in wheat straw and Co and Na in berseem. The cereal grains were deficient in Ca, Na, Cu, Co and Mn. Maize and sorghum fodders were deficient in Na, Cu and Co content than recommended critical level. Milk samples of both cattle and buffaloes were found low in Fe, Co and Cu with Zinc is at marginal level. A questionnaire based survey on present feeding practices were also conducted along with sampling with the farmers and on the spot ration balancing advisory were given to them to improve the health and production of their livestock animal. As they were not adding the

mineral mixture in the livestock ration on regular basis. Based on the analysis of milk, feed and fodder the mineral mixture were distributed among the farmers (2 kg/farmer) of given five blocks for promoting the use of mineral mixture for improving the health and production of their livestock animal.

College of Biotechnology

Project B31. Demonstration unit of Mushroom farming to promote entrepreneurship

The establishment of a demonstration unit of mushroom cultivation aimed to encourage and promote small scale entrepreneurship among students which will enhance their skills and get trained simultaneously during their undergraduate study programme of B.Sc. (H) Biotechnology/ Industrial Microbiology. In India the mushroom cultivation is of mixed type i.e seasonal farming as well as high-tech-Industry. It can help to reduce vulnerability to poverty and strengthens livelihoods through the generation of a fast yielding and nutritious source of food and a reliable source of income. As it does not require access to land, its cultivation is a viable and attractive for both rural and urban farmers. They can be cultivated on a part-time basis, and require little maintenance. Indirectly, mushroom cultivation also provides opportunities for improving the sustainability of small farming systems through the recycling of organic matter, which can be used as a growing substrate, and then returned to the land as fertilizer. Through the provision of income and improved nutrition, successful cultivation and trade in mushrooms can strengthen livelihood assets, which can not only reduce vulnerability to sudden losses, but also enhance an individual's and a community's capacity to act upon other economic opportunities. Therefore, mushroom cultivation is not only of economic importance but also has important role to promote small scale entrepreneurship in integrated rural development programme by increasing income and self-employment opportunities for village youths, students who wants to earn for their livelihood, woman folk and housewives to make them financially independent. This project got sanctioned on 23/10/2021 having total estimated budget of Rs. 3,68,600/- only funded by college of biotechnology, DUVASU, Mathura. Presently the project is in very early stage and expected completion to take at least 12-15 months from now. This demonstration unit is established at ground floor of College of biotechnology having two air conditioned rooms



along with other facilities and equipments required for the establishment of demonstration unit.

Project B32. Demonstration unit of Spirulina cultivation

Development of Bio-entrepreneurs has become very essential so as to bring employment and utilize their theoretical knowledge and develop different programmes. In lieu of it we are initiating this project so that we can promote our students in this manner so that they can lead their success. Spirulina is economically important as it can be grown easily on an industrial scale on cheap material like waste water from potato processing plant, molasses etc. However, we are initiating this at lab scale and with chemical aids. Spirulina has effectively shown some crucial health benefits and thus can be considered a Superfood. Indian Ocean commission report on Spirulina – a Livelihood and a Business Venture, March 2011 has also mentioned its nutritional role as it is composed of 60% highly digestible vegetable protein, has extremely high concentrations of beta carotene, vitamin B-12, iron and trace minerals. This project is running in its initial stage in order to collect all the prerequisite materials required for the main experimental work. The duration it may require is approximately 12 months.

Project B33. Bioremediation of waste water using Effective Microorganisms Technology

Water purification technology is often complicated and requires sophisticated equipment. It is also expensive to run and maintain. The Effective microbe technology could prove a simple answer to the problem. Effective microbes could be used to remove toxic chemicals, bacteria, viruses and other hazardous materials from water much more effectively and at lower cost than other conventional water purification methods. Organic pollutants from industrial waste water from pulp and paper mills textiles and leather factories, steel foundries and petrochemical refineries are a major cause of illness in parts of the world where regulations do not necessarily protect the people from such industrial outflows. The Effective microbes approach to water purification could help in preventing diseases and poisoning for potentially millions of people. Biological degradation is environmentally friendly and cost-effective; but it is usually time-consuming. Use of EM also saves land and capital required for setting up a tertiary plant for cleaning the effluent in some cases. It also helps to reduce pollution caused

by crude oil. EM also converts hydrocarbon sulphide and oxide compounds into amino acids, organic oxygen and sugars that fertilize the soil. EM technology is not only environmental friendly, but goes a step forward too actually protect the environment. EM technology is best and cheapest technology for treatment of waste water. The treated waste water can be used in agriculture and irrigation process. Effective microorganisms convert a degraded ecosystem to one that is productive and contains useful microorganisms. Bacterial cultures for the preparation of Effective microorganism solution has been ordered from MTCC, Chandigarh. Bioremediation is considered to be an attractive option for minimizing the pollution load from contaminated water due to its high efficiency and economical impact than chemical remediation. Thus the current study clearly states that, application of bacterial consortia can be used for the treatment of toxic effluents from waste water.

Project B34. Demonstration unit of plant tissue culture and green house

Plant Tissue culture (PTC) is the cultivation of plant cells, tissues, or organs on specially formulated nutrient media. Under the aseptic conditions, an entire plant can be regenerated from a single cell. The controlled conditions provide the culture an environment conducive for their growth and multiplication. These conditions include proper supply of nutrients, pH medium, adequate temperature and proper gaseous and liquid environment. Plant tissue culture is a technique that has been around for more than 30 years. Tissue culture is seen as an important technology for developing countries for the production of disease-free, high quality planting material and the rapid production of many uniform plants. Plant tissue cultures offers remarkable opportunities in in-vitro propagations, plant quality improvement and production of plants with desirable agronomical quality and quantity. It's now possible to develop virus-free plant regeneration, herbicide resistance, salinity tolerance, disease resistance, incorporation of high protein content and genetically engineered plants for desirable traits. Micro propagated plant cells and tissues have been widely used for the production of secondary metabolites, which are the rich source of many pharmaceutical and industrial products (eg. Shikonin from *Lithospermum erythrorhizon*, Taxol from *Taxus* sp).



PROJECTS OF POST GRADUATE STUDENTS COMPLETED DURING 2021-22

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

S. No.	Title of Thesis	Name of the Student	Name of the Guide	Subject
PhD: Veterinary Science				
1	Histomorphological and histochemical observations on the breast and leg muscles of chabro chicken in relation to Meat quality	Dr. Yogita Pandey	Prof. Archana Pathak	Veterinary Anatomy
2	Gross anatomical, histological and histochemical studies on the intestine of prenatal goat (<i>Capra hircus</i>).	Dr. Abhinov Verma	Prof. M. M. Farooqui	Veterinary Anatomy
3	Shelf life extension of functional chicken meat loaf incorporated with nanoemulsified essential oils	Dr. Sanjay Singh	Prof. Vikas Pathak	Livestock Products technology
4	Studies on cardiovascular dysfunction and nephropathy in type 2 diabetic rats following concurrent exposure to arsenic and chromium	Dr. Mohd. Saif	Dr. Soumen Choudhury	Pharmacology and Toxicology
5	Molecular characterization of <i>mycobacterium avium</i> subspecies paratuberculosis (MAP) and development of rapid nucleic acid based diagnostic assay for Johne's disease	Dr. Vinod Kumar Singh	Prof. Sharad Kumar Yadav	Veterinary Microbiology
6	Effect of inorganic and nano copper supplementation on performance and immune response in growing heifers	Dr. Raju Kushwaha	Prof. Vinod Kumar	Animal Nutrition
7	Morphological identification and molecular characterization of <i>Eimeria</i> species in dairy cattle of Mathura	Dr. Pradeep Kumar	Prof. Daya Shanker	Veterinary Parasitology
8	Acaricidal effect of biofabricated silver nanoparticles using <i>Calatropis procera</i> and <i>Lantana camara</i> leaf extract on <i>Rhipicephalus microplus</i> ticks of cattle	Dr. Anuruddha Singh Niranjana	Prof. Daya Shanker	Veterinary Parasitology
9	A study on heat tolerance of lactating <i>Sahiwal</i> cattle in semi-arid climate of India	Dr. Anandita Srivastava	Dr. Brijesh Yadav	Veterinary Physiology
PhD: Biotechnology				
1	Studies on isolation, characterization and differentiation of Caprine bone marrow derived mesenchymal stem cell	Sonam Rani	Dr. S. D. Kharche	College of Biotechnology
2	To study on effect of addition of L-Glutamine on HSP70 expression and redox status of cryopreserved goat semen.	Rahul Dhariya	Prof. Sarvajeet Yadav	College of Biotechnology



M.V.Sc.: Veterinary Science				
1	Gross anatomical, histological and histochemical studies on the tongue of Prenatal Goat (<i>Capra hircus</i>)	Dr. Aarti	Prof. M. M. Farooqui	Veterinary Anatomy
2	Effect of natural antioxidants on quality attributes of ghee prepared from Sahiwal, Cross breed and Murrah buffalo milk	Dr. Vickrant Raina	Prof. Vikas Pathak	Livestock Products Technology
3	Utilization of poultry byproducts for development of cost effective pet food	Dr. Rishav Kumar	Dr. Meena Goswami Awasthi	Livestock Products Technology
4	Development of functional chicken nuggets coated with Aloe vera gel containing natural antioxidant	Dr. Priya Patel	Dr. Sanjay Kumar Bharti	Livestock Products Technology
5	Molecular insight into wound healing efficacy of Mangiferin in immunocompromised excisional rat model	Dr. Virendra Pratap Yadav	Dr. Amit Shukla	Veterinary Pharmacology and Toxicology
6	Studies on cartap toxicity in male rats and its amelioration by α -tocopherol	Dr. Sugam Thakur	Dr. Rajkumar Singh Yadav	Veterinary Pharmacology and Toxicology
7	Evaluation of therapeutic potential of <i>Moringa oleifera</i> leaves on subclinical mastitis in goats	Dr. Arzo Nisha	Dr. P.N. Panigrahi	Veterinary Medicine
8	Evaluation of therapeutic effects of chewable fluralaner against canine sarcoptic mange	Dr. Richa Khushboo	Dr. Shanker K. Singh	Veterinary Medicine
9	Evaluation of therapeutic potential of <i>Dalbergia sissoo</i> and <i>Punica granatum</i> on calf diarrhoea	Dr. Himanshu Agrawal	Dr. A.K. Tripathi	Veterinary Medicine
10	Molecular characterization and antimicrobial resistance profile of <i>Staphylococcus aureus</i> and <i>Escherichia coli</i> isolated from subclinical mastitis in dairy animals	Dr. Swati Tripathi	Prof. Rashmi Singh	Veterinary Microbiology
11	Molecular characterization of carbapenem-nonsusceptible Enterobacterial isolates of animal origin	Dr. Usha Jaiswal	Dr. Ajay Pratap Singh	Veterinary Microbiology
12	Effect of nickel supplementation on growth performance of heifers fed urea based diet	Dr. Rashmi Singh	Prof. Vinod Kumar	Animal Nutrition
13	Amelioration of insulin resistance in dairy animals by dint of nutritional strategies	Dr. Shivam Khare	Dr. Muneendra Kumar	Animal Nutrition
14	Effect of different sources of selenium supplementation on performance of bucks	Dr. Sunil Kumar	Dr. Shalini Vaswani	Animal Nutrition
15	Effect of Boron supplementation on performance and bone health markers of heifers	Dr. Bipin Bihari	Dr. Avinash Kumar	Animal Nutrition



16	Effect of dietary supplementation of oregano and thyme oil on the performance of turkey poults	Dr. Abhilasha Rai	Dr. Amitav Bhattacharyya	Poultry Science
17	Comparative evaluation of thiopental and Propofol as induction agent in dogs	Dr. Kaushal	Prof. R. P. Pandey	Veterinary Surgery and Radiology
18	Observations on upper gastrointestinal endoscopy in clinical cases of dog	Dr. Ankit Negi	Prof. R. P. Pandey	Veterinary Surgery and Radiology
19	Study on surgico-chemo-therapeutic management of mammary tumour in dogs	Dr. Atul Yadav	Prof. S. Purohit	Veterinary Surgery and Radiology
20	Ultrasonographic biometry and color Doppler assessment of eyes in dogs.	Dr. Arpit Kaushal	Prof. S. Purohit	Veterinary Surgery and Radiology
21	Studies on ultrasonography of the eye in Sahival calves	Dr. Puli Vishnu Vardhan Reddy	Dr. Gulshan Kumar	Veterinary Surgery and Radiology
22	Studies on effect of resveratrol on cryopreservation of Haryana bull spermatozoa	Dr. Mahesh Kumar	Dr. Anuj Kumar	Veterinary Gynaecology and Obstetrics
23	Studies on effect on parity on postpartum follicular dynamics of Haryana cows	Dr. Asif Pasha	Dr. Anuj Kumar	Veterinary Gynaecology and Obstetrics
24	Studies on effect of carnitine on cryopreservation of haryana bull spermatozoa	Dr. Brijesh Kumar Yadav	Dr. Jitendra Kumar Agrawal	Veterinary Gynaecology and Obstetrics



STUDENTS' RESEARCH

PhD

College of Veterinary Science and Animal Husbandry

1. Histomorphological and histochemical observations on the breast and leg muscles of Chabro chicken in relation to Meat quality

The gross anatomy, histology, histo-chemistry of breast and leg muscles in relation to quality analysis were investigated in 36 Chabro chicken divided in to three age groups viz; Group I (6 weeks), Group II (8 weeks) and Group III (10 weeks) comprising 12 birds (6 male and 6 female) in each. The live weight, dressed weight eviscerated weight, weight of breast region and weight of leg region were recorded. In male birds all these parameters were more than female of the same age. All these parameters increased with age in both male and female birds. Grossly, the superficial and deep pectoral muscles were pale to white in colour, formed the major fleshy mass of the breast region. Both the muscles were elongated triangular or prismatic in shape and originated from the sternum including keel and metasternum and clavicle. These muscles were longer wider, thicker and more voluminous in male than female birds of same age; and all these parameters increased with age in all birds. The biceps femoris, quadriceps femoris, gastrocnemius, peroneus longus and tibialis cranialis muscles constituted the main fleshy component of leg region. All the gross morphometrical parameters of muscles increased continuously with age in male as well as female birds except the width of biceps and thickness of quadriceps femoris, gastrocnemius and peroneus longus muscles. Histologically, the muscles of breast region comprised of muscle fibers, connective tissue, blood vessels and nerve fibers. Each muscle fiber, muscle fascicle and whole muscle was enveloped by the connective tissue sheath of endomysium, perimysium and epimysium respectively. These were composed of collagen and reticular fiber with very few elastic fibers. The collagen fibers were more in female birds than male. Further the collagen content increased with age in the birds of both sexes. Intermuscular fat was more in female birds and increased with age. Three types of muscle fibers were identified in the breast region viz; large, intermediate and small fibers. The number of large fibers ranged from 0-5 in each fascicle and were mostly located in the angle or along the

periphery of the fascicle. The intermediate fibers were scattered and predominantly present in the fascicles whereas, the small fibers were only few in number and occurred randomly in the fascicles. All the histomorphometrical parameters such as (diameter of myofiber, cross sectional area of myofibers, number of myofibers per fascicles, fascicular diameter, cross sectional area of fascicles and interfascicular distance) were more in male Chabro birds than female. The histo-architecture of muscles of leg was similar to breast muscles, but the leg muscles were much more vascularized and innervated. The endomysium also contained capillaries filled with RBCs'. The adipose tissue was abundant in the perimysium. Amount of collagen increased with age in the birds of both sexes. The number of large fibers ranged from 0-5 per fascicle except in gastrocnemius muscle where it ranged between 0-12 per fascicle. All the histomorphometrical parameters such as muscle fiber diameter, cross sectional area of myofibers, number of myofibers per fascicles, fascicular diameter, cross sectional area of fascicle and interfascicular distance were more in male birds at all ages except in gastrocnemius where it was more in female birds. The connective tissue of muscles of the breast and leg region was more intensely positive for Best's carmine reaction (glycogen) and BPB reaction (basic protein) in male birds than female. The AMPS and SBB reaction were more intense in female than in male birds. The PAS, Best's carmine, AMPS, SBB and BPB reactivity in the connective tissue of epimysium, perimysium and endomysium (connective tissue) of muscles increased with increase in age in birds of both sexes. The AKP was negative in the connective tissue of both the breast muscles. The ACP showed mildly to moderately positive reaction in the connective tissue of epimysium and perimysium, but the endomysium did not show any reaction. Age and sex had no effect on the enzyme activity of the connective tissue. The PAS reaction was negative to moderately positive in sarcolemma and myofibrils. The carbohydrate concentration increased in the muscle with age without any sign of sexual difference in PAS reactions. The sarcolemma was mildly to moderately positive with Best's carmine stain for glycogen. The myofibrils stained moderately to intensely in female birds indicating increasing concentration of



glycogen with age. The AMPS reaction in the sarcoplasm became mild to moderate indicating similar increasing trend of accumulation of AMPS in the muscle with age. The sarcolemma and myofibrils showed moderate to intense AMPS in male as well as female birds. The sarcolemma and myofibrils showed more intense SBB reactivity in female than in male. The sarcoplasm was mildly positive for SBB in all birds of all age groups. The AKP was not demonstrable in the sarcoplasm and sarcolemma of muscles in all birds of all age groups. Myofibrils were however, intensely AKP positive in both sexes at all ages. These were also moderately to intensely reactive for ACP. The sarcolemma was negative to mildly positive for ACP in the birds at all ages. The BPB reaction for protein increased with increase in age in the sarcoplasm, sarcolemma and myofibrils of muscles. The reaction was much stronger in male birds than female, indicating a higher protein concentration in the muscles of male than female. It also increased in all the components of muscle cell with age. The biochemical analysis of muscles revealed that the fat and moisture content in breast muscles was always more in female birds than male. The protein percent was always more in male birds than female at all ages. The fat, protein and moisture content of breast region muscles increased with age in the birds of both sexes. Similarly, analysis of the muscles of leg region, revealed that the protein percent was always more in male birds whereas, fat percent was always more in female birds at all ages. The moisture percent was higher in female birds at 6 and 10 weeks but at 8 weeks it was more in male. The ash percent was higher in male birds at 6 weeks but at 8 and 10 weeks it was more in female birds. The protein and fat content increased continuously with age in the birds of both sexes whereas, moisture of muscle decreased with age.

2. Gross Anatomical, histological and histochemical studies on the Intestine of Prenatal Goat (*Capra hircus*)

On perusal of literature it has been revealed that very meager attention has been paid on the sequential changes in the development of goat intestine during various stages of gestation. Therefore, the present study was designed. The gross anatomical, histological and histochemical studies were conducted on the intestine of 36 goat embryos/foeti of either sex in different stages of gestation. The embryo/foeti were grouped into I (0-50 days), II (51-100) and III (101-till term). Different biometric parameters of each segment were recorded. Fixed

tissues from different segments were processed by routine paraffin embedding technique. 6 μ thick paraffin sections were cut and stained by various staining procedure. Tissues fixed in cold acetone were processed through acetone benzene schedule and then embedded in paraffin of low melting point (48-50°C) for localization of enzymes. Different histological and histochemical observations were conducted in the stained slides under light microscope. Micrometric observations were conducted for various parameters in each segment of intestine in haematoxyline and eosin stained slides. All the segments of intestine were visible from 45 days of gestation onward. The jejunum was the longest segment and ileum was the shortest segment among all the segments of intestine. The diameter of rectum and jejunum was largest and smallest, respectively among all the segments of intestine. Statistical analysis revealed that there was highly significant increase in all measured biometrical parameters of intestine from group I to II and from group II to group III. Villi were appeared first time in duodenum at 50 days of gestation followed by jejunum (51 days), while in other parts it appeared at 58 days of gestation. Most of the villi were leaf/finger shaped in duodenum and caecum, finger shaped in jejunum, club shaped in ileum and cone shaped in colon and rectum. Surface epithelium was poorly differentiated stratified to pseudo-stratified columnar type in group-I (0-50 days of gestation), stratified columnar to simple columnar in group II (51-100 days of gestation) and simple columnar in group III (101-150 days of gestation). Goblet cells were appeared first in duodenum at 55 days of gestation followed by rectum (58 days of gestation), jejunum/ileum/colon (66 days) and in caecum at 75 days of gestation. Paneth cells and argentaffine cells were noticed in small intestine in late gestation period. Primordia of intestinal gland were appeared first time in jejunum (51 days) followed by duodenum, ileum/colon, caecum, and rectum at 55, 66, 70 and 75 days of gestation, respectively. Submucosal nerve plexus were first appeared in caecum at 58 days of gestation followed by duodenum (70 days), ileum/colon/rectum (75 days) and jejunum (92 days of gestation). Myenteric plexus appeared in duodenum at 58 days of gestation followed by ileum (75 days), rectum (92 days), caecum (97 days) and colon/jejunum (104 days of gestation). Reticular fibers appeared first time in digestive tube at 25 days of gestation and on 45th days in all segments of intestine. Collagen fibers appeared first time in duodenum and jejunum simultaneously



at 75 days of gestation followed by rectum (104 days), ileum (127) and caecum/colon (150 days of gestation). Elastic fibers appeared first time in duodenum and rectum simultaneously at 107 days of gestation followed by jejunum (127 days), ileum/caecum/colon (150 days of gestation). The thickness of all stratum increased as age advanced except epithelium, which decreased as age of gestation advanced. All histochemical reactions viz; PAS, AMPs, Sudan black-B, Alkaline phosphatase, Acid phosphatase and Feulgen's reaction were mild in group-I, mild to moderate in group-II and moderate to intense in group-III. From the above study it can be concluded that the organogenesis and histogenesis of different segments of intestine were almost completed in prenatal life and structures were almost identical to adult prior to birth. Intestine was come in functional stage also before birth as luminal border of epithelial cells showed enzymatic reactions, PAS and AMPs intense reaction, and presence of paneth cells and argentaffine cells.

3. Shelf life extension of functional chicken meat loaf incorporated with nanoemulsified essential oils

The present investigation was carried out to extend shelf life of functional chicken meat loaf incorporated with nanoemulsified essential oils. In first experiment, formulation of chicken meat loaf was optimized following the method as per Devatkal et al. (2004). Next sub experiment was undertaken to optimize the cooking method using three different cooking methods viz. oven cooking at 180°C, steam cooking without pressure and microwave cooking for 15, 20 and 25 minutes separately. Oven cooking for 20 minutes, steam cooking without pressure for 25 minutes and microwave cooking for 15 minutes were found optimum. These selected treatments were further compared for quality characteristics and finally chicken meat loaf prepared by steam cooking without pressure for 25 minutes was selected and taken as control in next experiment. Second experiment was conducted to develop low fat chicken meat loaf with incorporation of fat replacers viz. Poppy seeds, grape seeds and flaxseeds separately replacing 50% vegetable fat at 0.5, 1.0 and 1.5% level. Incorporation of grape seeds showed significant ($P<0.05$) difference for various physico-chemical, textural, colour values and mineral content between control and treatments. The sensory scores decreased significantly ($P<0.05$) in treatments and poppy seeds at 0.5% level was selected. For grape seeds, various physico-chemical, textural, colour

values and mineral content showed significant ($P<0.05$) difference between control and treatments. The sensory scores decreased significantly ($P<0.05$) in treatments and grape seeds at 0.5% level was selected. For flaxseeds, various physico-chemical, textural, colour values and mineral content showed significant ($P<0.05$) difference between control and treatments. Sensory scores of overall acceptability were comparable upto 1.0% flaxseeds level, therefore selected as the best treatment. The selected treatments were further compared with control for different quality characteristics and finally low fat chicken meat loaf with 1.0% flaxseeds replacing 50% vegetable fat was selected and taken as control in next experiment. In third experiment, low fat chicken meat loaf was incorporated with different natural dietary fibers viz. wheat bran, rice bran and oat bran separately at 5.0, 10 and 15% level. Fat and cholesterol content decreased significantly ($P<0.05$) on incorporation of dietary fibers; however rice bran incorporated chicken loaf has significantly ($P<0.05$) higher fat content. There was significant ($P<0.05$) effect of wheat, rice as well as oat bran on various textural, colour parameters and mineral content. On the basis of physico-chemical properties and sensory evaluation, 10% wheat bran, 5% rice bran and 10% oat bran was selected. These selected treatments were compared for different quality characteristics and finally chicken meat loaf with 10% oat bran was selected. In the following experiment, the developed functional chicken meat loaf was incorporated with nanoemulsified essential oils viz. cinnamon oil, thyme oil and nutmeg oil separately at 5, 10 and 15% level, where nanoemulsified essential oil i.e. cinnamon, thyme and nutmeg @10, 5 and 10% level were selected. Nanoemulsified cinnamon essential oil showed best antimicrobial activities than other treatments. In fifth experiment three treatments selected from previous experiment along with control were stored at under $4\pm 2^{\circ}\text{C}$ and evaluated for physico-chemical, microbiological and sensory properties at every 4 days interval. There was no *Coliform* and *Salmonella* count throughout the storage period. All sensory attributes including overall acceptability scores decreased significantly ($P<0.05$) in control and treatments with progression of storage. The control was not evaluated after 12th day due to microbiological spoilage and rejection by sensory panelists, whereas treatments could be evaluated upto 36th day. Among the treatments, Nanoemulsified cinnamon essential oil incorporated functional chicken meat loaf had significantly ($P<0.05$) higher overall acceptability scores till the



end of storage. For droplets size, polydispersity index and zeta potential of essential oils and nanoemulsified essential oils on 0 and 36th day, nanoemulsified cinnamon essential oil exhibited highest stability. It is concluded that well acceptable chicken meat loaf can be prepared by steam cooking without pressure for 25 minutes. Functionality of product can be improved with incorporation of 1% flaxseeds powder replacing 50% added fat, 10% oat bran as natural fiber. The shelf life of low fat fiber fortified functional chicken meat loaf can be improved with incorporation of 10% cinnamon nanoemulsified essential oil. This product was very well acceptable up to 36th day of storage under refrigeration in terms of lipid oxidation, microbiological studies and sensory evaluation.

4. Studies on Cardiovascular Dysfunction and Nephropathy in Type 2 Diabetic rats following concurrent exposure to Arsenic and Chromium

The present study was designed to evaluate the effect of pre-exposure to arsenic and chromium either alone or in combination on cardiovascular and renal dysfunctions associated with type-2 obese diabetes. Further an attempt was made to assess the ameliorative potential of ITK formulation against these disorders. Type-2 obese diabetic model was produced by feeding HFD to male Wistar rats for 90 days followed by intraperitoneal injection of streptozotocin (STZ). Some animals were pre-exposed to arsenic and/or chromium either alone or in combination for 90 days before injecting STZ. To evaluate the therapeutic potential of ITK formulation, animals from certain groups were treated with ITK for 60 days after induction of diabetes and pre-exposed to these metallic pollutants either alone or in combination. Induction of diabetes in obese rats significantly increased the bodyweight along with increase in fasting blood glucose and glycated haemoglobin (HbA1c) levels. Pre-exposure to arsenic significantly reduced the body weight along with the abdominal and thoracic circumference and their ratio. The fasting blood glucose and HbA1c levels were further increased with corresponding decrease in plasma insulin level in As-pre-exposed animals. Moreover, a significant decrease in the enzymatic and non-enzymatic antioxidant level with corresponding increase in the lipid peroxidation in kidney and cardiac tissues were also observed in the arsenic pre-exposed obese diabetic rats as compared to obese diabetic control and/or healthy control. Significant elevation in the kidney injury biomarkers (serum BUN, serum

creatinine, urinary albumin, creatinine) were also observed in these groups of animals. In addition, the mRNA expression of cystatin-3 in kidney tissues was significantly increased in the As pre-exposed animals. On the other hand, pre-exposure to chromium produced nephro-protective effect as evidenced by the improvement in antioxidant status, reduction in lipid peroxidation and improvement in altered biomarkers of kidney injury. Further, chromium was also found to reduce or dampen the arsenic-induced kidney injury when administered concurrently in obese diabetic rats. Oral administration of ITK promoted the protective role of chromium. However, besides the presence of abnormalities in serum lipid profiles (HDL, LDL, total cholesterol) and oxidative insults in the heart tissues in the obese diabetic rats, no significant alterations in the cardio-specific biomarkers viz. cardiac troponin, matrix metalloproteinase (MMP) were observed in these groups. Further, pre-exposure to arsenic or chromium did not produce any significant changes in the expression of MMP and/or level of cardiac troponin in the cardiac tissues. Based on the above findings, it may be inferred that, pre-exposure to arsenic aggravated the diabetes associated nephropathy in the obese rats while chromium had protective effect. Further, when given concurrently with arsenic chromium also reduced arsenic-induced kidney damage. This nephro-protective role of chromium was attributed to its ability to improve antioxidant status and reduction of lipid peroxidation as well as modulation of expression level of cystatin-3. Oral administration of ITK also promoted the nephron-protective effect of chromium by reducing the oxidative stress and may be recommended to reduce diabetes associated complications.

5. Molecular characterization of *Mycobacterium avium* subspecies *paratuberculosis* (MAP) and development of rapid nucleic acid based diagnostic assay for Johne's Disease

Johne's disease or paratuberculosis is caused by *Mycobacterium avium* subsp. *paratuberculosis* (MAP), is chronic, progressive granulomatous enteritis in a wide range of domestic and wild animals. Paratuberculosis is prevalent worldwide and responsible serious economic losses and animal health consequences. Equally alarming is the possible association of paratuberculosis with Crohn's disease in humans. Early diagnosis of and effective vaccine for paratuberculosis is crucial for control and eradication of disease. Therefore, in



present study, the status of MAP bio-load was estimated among the cattle, buffalo, sheep, and goats and their environment and wildomestic and wild animals. Molecular characterization and typing of MAP isolates was also performed followed by whole genome sequence and *in-silico* sequence analysis to assess the unique immunodominant protein. The study also aims at development and optimization of novel polymerase spiral reaction (PSR) assay for rapid detection of MAP. A total of 1612 samples including 1242 from cattle, buffalo, sheep, goats and 28 different wild and wildomestic animals species (532 feces, 150 milk, 460 serum and 100 tissue) and 370 environment samples (20 cattle slurry and 350 environment fecal samples of nilgai and deer) were investigated to estimates MAP bio-load/prevalence using acid fast staining, direct PCR, culture and ELISA followed by molecular confirmation and typing employing DMC-PCR and IS1311-PCR-REA methods. Among the fecal, milk and environment samples subjected to AFS, IS900-PCR and culture, the MAP occurrence was found to be 19.09%, 10.14% and 9.96%, respectively. Among the AFS positive samples 13.85% were +1 grade, 3.89% were +2 grade, 1.18% were +3 grade and 0.17% were +4 grade shedders. The occurrence of MAP based on detection of anti-MAP antibodies in serum samples of different livestock species was 24.35% with 20.52% in cattle, 28.21% in buffalo, 62.96% in goats and 22.22% in sheep. Out of the 50 ileum samples observed for presence of different grade of microscopic lesions associated with Paratuberculosis, 26 samples were considered as positive for MAP infection. Similarly, 30 out of the 50 lymph nodes samples were considered positive. In IS900 sequence based phylogenetic analysis, MAP-Ct-1 isolate showed highest identity match of 98.7% with 387/Goat/Env Sample/2014/TN isolate from Tamilnadu. The whole genome sequence analyses of MAP-Gt-9 isolate demonstrated 11 unique protein containing 12 B-cell epitopes and 11 MHC-I and 4 MCH-II T-cell epitopes. The genotyping of MAP from different sources revealed S-type and C-type MAP circulation in the region with dominance of S-type. The devolved MAP-PSR assay was found to be a rapid, highly sensitivity and specific technique for detection of MAP with minimum aid of instruments.

6. Effect of inorganic and nano copper supplementation on performance and immune response in growing heifers

This study was conducted to evaluate the effect

of inorganic and nano copper supplementation on feed intake, nutrient utilization, growth performance, nutrients metabolism, enzymatic activity, antioxidant status and immune response in growing Sahiwal heifers. Twenty four growing Sahiwal heifers were randomly allocated into four groups having six heifers in each groups and fed for 120 days. Feeding regimen was similar in all the groups except that treatment groups were supplemented with 0.0 mg copper, 10.0 mg inorganic copper, 5.0 and 10.0 mg of nano copper per kg dry matter (DM; ppm) in four respective groups. Nutrients requirement of experimental heifers were met by feeding concentrate mixture, berseem and wheat straw as basal diet. Group fed on basal diet supplemented with 0.0 mg copper/kg DM served as a control. Experimental heifers were monitored daily for DM intake (DMI) and fortnightly body weight change. At the end of the study, a digestion trial of 7 days was conducted to study the effect of inorganic and nano copper supplementation on nutrients utilization. Blood samples were collected at 0, 30, 60, 90 and 120 days post-Cu supplementation and analyzed for haematological attributes, biomarker of energy and lipid metabolism, biomarker of protein metabolism, biomarker of liver and kidney function, biomarker of antioxidant status and oxidative stress, biomarkers of immune response, and plasma mineral levels. Feed intake, nutrient digestibility and growth performance were similar in growing Sahiwal heifers fed on basal diet with or without supplemental Cu. Dietary supplementation of inorganic Cu and nano Cu did not exert any effect on absorption of Ca, P, Zn and Fe in different groups. Although, absorption of Cu in nanoCu supplemented groups were higher ($P < 0.05$) than other groups. Supplemental Cu exerts significant effects ($P < 0.05$) on haematological attributes therefore, haemoglobin content, haematocrit value and RBCs count was higher in treatment groups than control group. Dietary supplementation of Cu did not ($P > 0.05$) exert any effect on biomarkers of energy and lipid mobilization i.e. plasma glucose, cholesterol, triglycerides, non esterified fatty acids (NEFA) and beta hydroxyl butyrate (BHBA) concentration, Plasma total protein, albumin, globulin, urea nitrogen (PUN) and creatinine used as protein metabolism biomarkers, found similar trend of variation in Cu supplemented heifers and non supplemented group. Eventhough the plasma level of alkaline phosphate (ALP) was lower ($P < 0.05$) in supplemented group but values for all studied biomarkers of liver functions i.e. aspartate



aminotransferase (AST), alanine aminotransferase (ALT) and bilirubin were reported within normal physiological range. Antioxidative variables like SOD, catalase, ceruloplasmin, FRAP and GSH-Px were found higher in Cu supplemented groups than control. Variables like MDA, LPO and LDH were found lower in treatment groups than control. Total Ig and IgG were higher in treatment groups than control. Although, IL-6 was similar in all groups. Plasma Cu level was higher in Cu supplemented groups than control group. Whereas, there were no change in plasma levels of Ca, P, Zn and Fe in all groups. There were upregulation of mRNA expression of SOD and catalase genes in experimental animals fed on Cu supplemented diet while mRNA expression of IL-6 and IL-10 genes were not altered by dietary treatment. Finally, it was concluded that level of 5 ppm nano Cu can be selected for feeding in growing cattle as it exerts similar effects as showed by 10 ppm inorganic Cu.

7. Morphological identification and molecular characterization of Eimeria species in dairy cattle of Mathura

The study was carried out from January, 2020 to December, 2020. To study the epidemiology of Rhipicephalus microplus tick infestation on cattle population of Mathura, a total of 1005 cattle were examined. The overall prevalence of ticks among cattle was recorded 61.89%. Age wise maximum prevalence was reported in animals of less than 1 year age group (75%). Prevalence among female animals (66.80%) was found higher as compared to male (49.10%). Breed wise prevalence revealed that cross bred (83.10%) animals were more susceptible than indigenous breed of cattle (53.03%). Season wise highest and lowest prevalence was reported in monsoon season (80.15%) and winter season (38.95%) respectively. To study the epidemiology of piroplasms infection in cattle population of Mathura, a total of 215 blood samples were collected. The overall prevalence of piroplasms among cattle was recorded 34.41%. Age wise maximum prevalence was reported in animals of less than 1 year age group (45.20%). Breed wise prevalence revealed that cross bred (59.75%) animals were more susceptible than indigenous breed of cattle (18.79%). Season wise highest and lowest prevalence was reported in monsoon season (54.00%) and winter season (17.64%) respectively. Out of 74 samples examined 31.16% samples were positive for Theileria sp. and 3.25% for Babesia sp. Molecular detection of Babesia bigemina was done in R. microplus ticks of

cattle based on 18S rRNA gene, a band of 448 bp was amplified by the primer pair that has been observed upon 1.5% agarose gel. B. bigemina subjected to phylogenetic analysis revealed that B. bigemina of Mathura isolate had similarity with Sri Lanka and Vietnam isolates. To study the acaricidal activity of aqueous and ethanolic extracts of Calotropis procera and Lantana camara against R. microplus tick, Adult Immersion Test (AIT) and Larval Packet Test (LPT) were performed. The percent inhibition of oviposition (IO %) was recorded maximum for ethanolic extract of C. procera (100%) at 100 mg/ml concentration and lowest for aqueous L. camara extract (17.33%) at 6.25 mg/ml concentration. The maximum larval mortality (75.99%) was recorded for ethanolic extract of C. procera at 100 mg/ml concentration and lowest mortality (14.11%) recorded for aqueous extract of L. camara at 6.25 mg/ml concentration. To study the acaricidal activity of biosynthesized silver nanoparticles of C. procera and L. camara against Rhipicephalus microplus ticks, Adult Immersion Test (AIT) was performed. The % inhibition of oviposition (IO %) was recorded maximum for C. procera leaf extract synthesized silver nanoparticles (70.14%) at 50 µg/ml concentration and lowest for L. camara leaf extract synthesized AgNPs (14.66%) at 3.125 µg/ml concentration. UV- vis spectrum were recorded at 440 nm and 445 nm for AgNPs synthesized using C. procera and L. camara leaf extracts respectively. The TEM micrographs of C. procera synthesized AgNPs revealed size in range of 6-15 nm and nanoparticles were rounded to subspherical in shape and L. camara synthesized AgNP revealed size in range of 20-40 nm and nanoparticles were of angular to oval in shape.

8. Acaricidal effect of biofabricated silver nanoparticles using Calatropis procera and Lantana camara leaf extract on Rhipicephalus microplus ticks of cattle

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9. A study on heat tolerance of lactating Sahiwal cattle in semi-arid climate of India

The present experiment was aimed to assess critical THI and recommend suitable THI based on elucidation of physiological, hemato-biochemical, metabolic, and endocrine responses along with dynamics of expression of stress and immunity marker genes and productive performance in lactating *Sahiwal* cattle. Total sixty lactating *Sahiwal* cattle in 2nd or 3rd parity, weighing 300-400 kg, age 3-4 years, maintained at Livestock Farm Complex, yielding 1500-2500 Kg during last lactation were selected. Meteorological variables and daily milk

yield were recorded from one week prior to first sampling to one week after last sampling. Physiological parameters were recorded two days prior and two days after every blood and milk sampling day. Milk and blood samples were collected in afternoon on each fortnight from February to August 2021. Pearson's correlation between eight THI models and studied parameters was calculated and parameters exhibiting high coefficient of correlation (>0.6) at significance ($P \leq 0.01$), were utilized to identify best THI model. One way ANOVA was performed to determine significant differences among different parameters at different fortnights and best THI model. Segmented regression analysis was performed to determine critical THI with respect to different parameters. THI1 (NRC, 1971) was found to be best suitable THI model. On basis of each fortnight as well as with increasing THI, meteorological variables indicated that February was cooler, May was hot-dry while July was hot-humid. RR and PR were lowest at first fortnight of February (THI: 58.27), increased and were highest in second half of July (85.09) and second fortnight of June (THI: 80.61), respectively. RT was minimum at THI of 84.95 (second fortnight of August) and maximum at THI of 80.61 (second fortnight of June) and differed significantly ($P < 0.05$). No significant ($P < 0.05$) changes were observed in TEC, PCV, Neutrophil (%), Lymphocyte (%), Neutrophil to Lymphocyte Ratio, Monocyte (%), Urea, Creatinine, MDA and milk yield. Hb was highest during second half of May whereas, MCV and MCH were highest at IX fortnight and lowest at XIII fortnight and differed significantly ($P < 0.05$) while MCHC decreased suddenly in second half of June. Platelet count was highest during first half of February, reducing slowly till first half of July reaching its lowest value. The pattern of change in ANC is similar to TLC and ALC with only change that peak of ANC was observed at a THI of 75.76 rather than 73.91 as in TLC and ALC. Eosinophil (%) initially decreased from THI 58.27 (February) to THI 70.66 (March), thereafter increased suddenly at THI of 71.85. Total Protein was highest during second fortnight of May at THI 75.76 and first fortnight of June (THI 79.59) and lowest at second fortnight of August (THI: 84.95). Triglyceride exhibited lowest value during first fortnight of March (THI 70.66) consistently increasing reaching highest value on first fortnight of August (THI: 82.67). Plasma AST exhibited decrease from second fortnight of February (THI: 65.06) to second fortnight of April (THI: 74.30).

Plasma ALT exhibited lowest value at second fortnight of May (THI: 75.76) and highest value at first fortnight of August (THI: 82.67). Plasma LDH exhibited highest value during first fortnight of March (THI: 70.66) and lowest value during first fortnight of July (THI: 86.84), the two varying significantly ($P < 0.05$). GPx and ROS were lowest during first fortnight of February (THI: 58.27) while SOD was lowest during second fortnight of February (THI: 65.06), increasing thereafter, with SOD reaching its peak value by May (THI: 75.76), GPx by first fortnight June (THI: 79.59) and ROS by first fortnight of July (THI: 86.84). Plasma Cortisol concentration was recorded lowest at beginning of February (THI: 58.27) increased steadily till second fortnight of June reaching its highest value (THI: 80.61), two extremes differing significantly ($P < 0.05$). Relative gene expression of *HSP70* and its protein product followed same pattern exhibiting an inconsistent decrease from February (THI: 65.06) to April (THI: 74.30) to reach its lowest concentration followed by a constant increase from May to be highest at second fortnight of June (THI: 80.61). Relative gene expression of *HSP90* and its protein concentration reduced initially till second fortnight of March and reached its lowest point, increasing subsequently to reach its highest concentration at second fortnight of May after which it declined consistently till August. Relative expression of *TNFA* and its protein as well as relative expression of *IL10* gene was lowest during February (THI: 58.27) followed by a consistently increasing trend reaching its highest value at first fortnight of June (THI: 79.59). Fat (%) decreased nearly consistently from February (THI: 58.27) till June (THI: 80.61) and thereafter increased till August. Solid not fat (%) and lactose (%) exhibited a significant ($P < 0.05$) decline from THI 58.27 (February) to THI 71.85 (March). Milk pH was recorded highest at first fortnight of February (THI: 58.27) and lowest at first fortnight of July (THI: 86.84), both differing significantly ($P < 0.05$). Somatic cell count (SCC, $10^3/\text{mL}$) exhibited an increase as the THI increased with greater effect at THI higher than 79.59. The break point exhibited by SegReg linear regression for different studied parameters varied between 72.12 and 85.06. The mean critical THI of five parameters which exhibited maximum correlation with THI was found to be 82.84 while, mean critical THI in respect all the parameters studied was 79.54. As per mean critical THI in respect to all parameters studied it can be suggested that a THI less than 79.54 is suitable for lactating *Sahiwal* cattle of semi-arid climate of India.

Ph.D

College of Biotechnology

1. Studies on isolation, characterization and differentiation of Caprine bone marrow derived Mesenchymal Stem cell

The study was conducted with the objectives of (i) isolation, purification and enrichment of bone marrow mesenchymal stem cells (BMMSCs) (ii) characterization of BMMSCs (iii) effect of serum concentrations and mitogens on BMMSCs proliferation and (iv) differentiation of BMMSCs. The BMMSCs were isolated from bone marrow of 1-2 years healthy goats. Following the isolation, the BMMSCs were suspended in DMEM supplemented with FBS (15%), antimycotics-antibiotic (100IU/ml). NEAA ($5\mu/\text{mL}$). low glucose, L-glutamine (2mM) and gentamicin (5mg/100ml) and incubated at 37°C in humidified atmosphere with 5% CO_2 . The non-adherent cells were removed in every 48-72 h and media was changed in order to propagate the BMMSCs. The cells were enriched up to 10 passages where they attained maximum proliferation rate in passage 3 and lowest in passage 10. The BMMSCs were characterised by morphological features, ALP staining, MACS ($\text{CD}73^+$, $\text{CD}90^+$, $\text{CD}105^+$, $\text{CD}271^+$, and $\text{CD}34^+$), FACS ($\text{CD}29^+$, $\text{CD}54^+$, $\text{CD}45^-$ and $\text{CD}31^+$), immuno-cytochemistry (Oct4 FITC and CD 271 PE) and molecular characterisation against $\text{CD}73^+$, $\text{CD}90^+$, $\text{CD}271^+$. In differential serum treatment, the 20% FBS containing media attained maximum cell number at the end of the experiment with lowest PDT and high CFU assay. However, in 5% FBS containing media the cells failed to propagate optimally. Moreover, the expression of stress related genes in lower conc. of FBS was higher whereas pro-inflammatory genes were minimally expressed in 20% FBS. In melatonin experiment, com. of 100nM was found to be more optimal for BMMSCs which was evident from growth curve analysis, PDT and CFU assay. There was highest expression of interferon γ , IL 6, IL 10, IL 1 β , TLR 3 and 6 in 1000 nM conc. in exclusion to this, the BMMSCs were differentiated into osteocytes, chondrocytes and adipocytes which were confirmed by Alizarin red staining, Alcian blue staining and Oil red O staining respectively. Moreover, they were trans-differentiated into neural like cells, oocyte like cells and cardiomyocytes which were confirmed by cresyl violet staining and molecular marker expression. We had studied efficacy of different coating agents towards cell attachment and proliferation rate in which it was



observed that fibronectin coating had highest number of cells at the end of the experiment (day 6) when compared with vitronectin, laminin, ACF, collagen IV and lectin. In conclusion, the BMMSCs obtained from goat bone marrow can be propagated and cultured *in vitro* and under suitable environment can be differentiated and trans-differentiated in to a varied number of cell types. Moreover, to obtain higher cell number which is needed in transplantation/clinical studies they can be cultured in fibronectin as a surface coating agent.

2. To study on effect of addition of L-Glutamine on HSP70 expression and redox status of cryopreserved goat semen

The study was conducted with the objectives of (i) isolation, purification and enrichment of bone marrow mesenchymal stem cells (BMMSCs) (ii) characterization of BMMSCs (iii) effect of serum concentrations and mitogens on BMMSCs proliferation and (iv) differentiation of BMMSCs. The BMMSCs were isolated from bone marrow of 1-2 years healthy goats. Following the isolation, the BMMSCs were suspended in DMEM supplemented with FBS (15%), antimycotics-antibiotic (100IU/ml). NEAA (5 μ /mL). low glucose, L-glutamine (2mM) and gentamicin (5mg/100ml) and incubated at 37°C in humidified atmosphere with 5% CO₂. The non-adherent cells were removed in every 48-72 h and media was changed in order to propagate the BMMSCs. The cells were enriched up to 10 passages where they attained maximum proliferation rate in passage 3 and lowest in passage 10. The BMMSCs were characterised by morphological features, ALP staining, MACS (CD73⁺, CD90⁺, CD105⁺, CD271⁺, and CD34⁺), FACS (CD29⁺, CD54⁺, CD45⁻ and CD31⁻), immunocytochemistry (Oct4 FITC and CD 271 PE) and molecular characterisation against CD 73⁺, CD 90⁺, CD 271⁺. In differential serum treatment, the 20% FBS containing media attained maximum cell number at the end of the experiment with lowest PDT and high CFU assay. However, in 5% FBS containing media the cells failed to propagate optimally. Moreover, the expression of stress related genes in lower conc. of FBS was higher whereas pro-inflammatory genes were minimally expressed in 20% FBS. In melatonin experiment, com. of 100nM was found to be more optimal for BMMSCs which was evident from growth curve analysis, PDT and CFU assay. There was highest expression of interferon γ , IL 6, IL 10, IL 1 β , TLR 3 and 6 in 1000nM conc. in exclusion to this, the BMMSCs

were differentiated into osteocytes, chondrocytes and adipocytes which were confirmed by Alizarin red staining, Alcian blue staining and Oil red O staining respectively. Moreover, they were trans-differentiated into neural like cells, oocyte like cells and cardiomyocytes which were confirmed by cresyl violet staining and molecular marker expression. We had studied efficacy of different coating agents towards cell attachment and proliferation rate in which it was observed that fibronectin coating had highest number of cells at the end of the experiment (day 6) when compared with vitronectin, laminin, ACF, collagen IV and lectin. In conclusion, the BMMSCs obtained from goat bone marrow can be propagated and cultured *in vitro* and under suitable environment can be differentiated and trans-differentiated in to a varied number of cell types. Moreover, to obtain higher cell number which is needed in transplantation/clinical studies they can be cultured in fibronectin as a surface coating agent.

M.V.Sc.

College of Veterinary Science and Animal Husbandry

1. Gross anatomical, histological and histochemical studies on the tongue of Prenatal Goat (*Capra hircus*)

The gross anatomical, histological and histochemical studies were conducted on the tongue of 18 healthy goat embryos/ foeti of either sex at different stages of gestation. The embryos/ foeti were divided into three groups *viz.* Group I (below 50 days gestation), Group II (50-100 days of gestation) and Group III (100 days of gestation to fullterm) comprising of 6 foeti in each group. Three distinct parts *viz* cranial apex, middle body and caudal root were identified from 43 days onwards. Median sulcus of the tongue became evident from 45 days of gestation. Welldeveloped lingual papillae were encountered on the developing tongue of goat at various stages of gestation *viz* fungiform (69 days), filiform (99 days), circumvallate (99 days), conical (127 days) and lenticular papillae (127days) of gestation. Distinct Torus lingue and lingual fossa were observed at 99 days of foetal age. The growth of the tongue was fastest in the mid prenatal period followed by late prenatal period. The weight of the tongue was recorded highest in the third group as compared to second and first group. The growth in terms of the length was the fastest in comparison to width and thickness of the tongue. The thickness and width of the tongue were recorded highest at the root

of the tongue as compare to tip and body. Microscopically the primordium of the tongue was noticed at 38 days of gestation and consisted of two distinct lateral swellings covered by epithelium. The epithelium was two, three and seventeen layered at 38, 46 and 145 days of gestation respectively. Below the epithelium mesenchymal cells contains differentiating myocytes, differentiating leucocytes and numerous blood vessels were present. Microscopically the fungiform, conical, lenticular, circumvallate and filiform papillae were identified first time at 59, 69, 69, 80 and 99 days of gestation respectively. Differentiation of connective tissue fibers *viz* reticular, collagen and elastic fibers were noticed at 43, 69 and 99 days of gestation respectively. The lingual glands and Von-Ebner's glands were observed at 75 and 99 days of gestation on the ventral and dorsal surface of tongue, respectively. The lingual muscle contributed highest percentage of parenchyma followed by lamina propria and epithelium. All the micrometrical parameters were significantly increased as age advanced. Histochemical studies revealed that the basal and superficial layers of epithelium, propria submucosa, and lingual intrinsic muscle showed mild to moderate reaction for PAS and bound lipid in group I but could not show any reaction for AMP. From this study it can be concluded that the organogenesis and histogenesis of tongue was almost completed in prenatal life. The activity of acid mucopolysaccharides in the gland indicate the functional activity of the organ but still required time for the process of keratinization of organ and the complete development of taste buds in papillae were yet to be completed.

2. Effect of natural antioxidants on quality attributes of ghee prepared from Sahiwal, Cross breed and Murrah buffalo milk

The present study was conducted to evaluate the effect of natural antioxidants on quality attributes of ghee prepared from Sahiwal, Cross breed and Murrah buffalo milk. First experiment was carried out to assess physico-chemical properties of different milch animals. Various physico-chemical properties showed significant ($P<0.05$) difference between Murrah buffalo, Sahiwal and Cross breed milk. In second experiment, aqueous and ethanolic extract of three natural antioxidants *viz*. Tulsi, Lemon grass and Curry leaves were evaluated for their antioxidant potential where ethanolic extract of all three natural antioxidants were selected on the basis of total phenolic compounds and radical scavenging activity. In third experiment, total cost

formulation for per liter of Sahiwal, Cross breed and Murrah buffalo ghee from creamery butter method was found Rs. 755.2, 738.02, 725.88/- respectively and butter creamery method was selected as more cost effective method than traditional method. Fourth experiment was carried out to compare quality characteristics of Sahiwal, Cross breed and Murrah buffalo ghee prepared by creamery butter method. Various physico-chemical properties and sensory attributes showed significant ($P<0.05$) difference among the treatments. In fifth experiment, suitable concentrations of natural antioxidants' extracts in ghee were assessed under three sub experiments. Sahiwal, Cross breed and Murrah buffalo ghee were incorporated with ethanolic extracts of three natural antioxidants *viz*. Tulsi leaves, Curry leaves and Lemon grass leaves at 0.2, 0.4 and 0.6% level respectively under three different sub experiments. The scores of various sensory attributes including total scores decreased significantly ($P<0.05$) at 0.6% of Curry leaves and Tulsi leaves extract, whereas Lemon grass leaves extract incorporated ghee showed no significant difference upto 0.6% level in Sahiwal, Cross breed and Murrah buffalo ghee. Therefore, 0.4% of Curry leaves extract, 0.4% Tulsi leaves extract and 0.6% Lemon grass extract were selected as the best treatments in Sahiwal, Cross breed as well as Murrah buffalo ghee. These selected treatments were compared with their respective control for physico-chemical properties, where no significant difference was observed for any parameter. In sixth experiment, control ghee and selected treatments for Sahiwal ghee, Cross breed ghee and Murrah Buffalo ghee were stored at $25\pm 2^\circ\text{C}$ for 30 days and evaluated for peroxide values, FFA values and sensory properties at every 10 days interval. Whereas in seventh experiment, all control ghee and selected treatments were again stored at $80\pm 2^\circ\text{C}$ for 20 days separately for accelerated oxidation to assess the antioxidant properties of natural antioxidants extract at 10 days interval. PV was 0 in freshly prepared samples, whereas FFA values showed no significant difference between control and treatments at $25\pm 2^\circ\text{C}$ as well as at $80\pm 2^\circ\text{C}$. Control had significantly ($P<0.05$) higher PV and FFA values than treatments with further storage in Sahiwal, Cross breed as well as Murrah buffalo ghee. Among the treatments, overall PV and FFA treatment means were observed in Lemon grass leaves extract followed by Tulsi leaves and then Curry leaves extract incorporated ghee at $25\pm 2^\circ\text{C}$ as well as at $80\pm 2^\circ\text{C}$. The peroxide and FFA values of control as well as treatments



increased significantly ($P<0.05$) with progression of storage period except for FFA values of antioxidants extracts incorporated Sahiwal ghee. There was no significant difference in sensory scores between control and treatments throughout the storage period which was carried out only at $25\pm 2^{\circ}\text{C}$ for 30 days. It was concluded that Creamy butter method was more cost effective for ghee preparation. The cost of formulation for Murrah buffalo ghee was lowest followed by Cross breed ghee than Sahiwal ghee. Again well acceptable ghee was prepared with incorporation of 0.4% Tulsi leaves extract, 0.4% Curry leaves extract and 0.6% Lemon grass ethanolic extract. These ghee samples were stored atleast for one month at $25\pm 2^{\circ}\text{C}$ without any significant change in sensory scores, whereas peroxide and free fatty acid values remained within prescribed AGMARK limits. Among the ghee samples stored at $80\pm 2^{\circ}\text{C}$ for accelerated oxidation, curry leaves extract showed highest antioxidant properties followed by Tulsi leaves and lemon grass in Sahiwal, Cross breed as well as Murrah buffalo ghee.

3. Utilization of poultry byproducts for development of cost effective pet food

The present investigation was carried out to utilize poultry byproducts for development of cost effective pet food. First experiment was conducted to standardize the processing technology for preparation of pet food where baking in hot air oven at 150°C for 20-25 minutes was found optimum. The formulation of pet food was optimized with incorporation of chicken meat powder at 30, 40 and 50% level. The values of physico-chemical properties increased significantly ($P<0.05$) with increased level of chicken meat powder except pH values. Hardness, chewiness, resilience and lightness values decreased significantly ($P<0.05$) whereas redness values increased significantly ($P<0.05$) in treatments. General appearance, colour, odour, meat flavour intensity and overall acceptability scores were significantly ($P<0.05$) higher at 50% chicken meat powder level. Therefore, pet food prepared by 50 % chicken meat powder was selected and used as control in next experiment. Second experiment was conducted to develop cost effective pet food with incorporation of poultry byproducts (head, intestine and feet) powder at 30, 40 and 50% levels. pH values and ash content increased significantly ($P<0.05$) whereas baking yield, moisture, protein, fat content and water activity values decreased significantly ($P<0.05$) with

increased level of poultry byproducts powder in pet food. Hardness, cohesiveness, gumminess, chewiness and redness values increased significantly ($P<0.05$) whereas lightness and yellowness values decreased significantly ($P<0.05$) in treatments. There was no significant difference was observed in overall acceptability scores, hence pet food prepared with 50% poultry byproducts powder was selected and used as control in next experiment. Third experiment was conducted to improve fiber content in pet food with incorporation of fiber rich vegetables viz. carrot powder and french beans powder separately at 5.0, 10.0 and 15.0% level by replacing freshly grated cruciferous vegetables. For carrot powder, pH, baking yield, moisture, ash content and water activity values increased significantly ($P<0.05$) whereas protein and fat content decreased significantly ($P<0.05$) with increased level of carrot powder. Hardness, springiness, cohesiveness and redness values decreased significantly ($P<0.05$) whereas gumminess, chewiness, lightness and yellowness increased significantly ($P<0.05$) in treatments. Poultry byproducts incorporated pet food with 10% carrot powder was found optimum as per palatability test. For French beans powder, baking yield, moisture, ash content and water activity values increased significantly ($P<0.05$) whereas protein and fat content decreased significantly ($P<0.05$) with increased level of french beans powder. Hardness, cohesiveness, lightness and yellowness values decreased significantly ($P<0.05$) whereas gumminess, chewiness and redness values increased significantly ($P<0.05$) in treatments. Sensory scores decreased significantly ($P<0.05$), but there was no significant difference in overall acceptability scores between 5% and 10% level. Therefore, poultry byproducts incorporated pet food with 10% french beans powder was found optimum. The selected treatments were further compared with control for different quality characteristics and finally poultry byproducts incorporated pet food with 10% carrot powder was selected as the best treatment and used as control in next experiment. In fourth experiment, poultry byproducts incorporated fiber fortified pet food was further incorporated with different binders viz. ragi flour and boiled potato mash separately at 5.0, 10.0 and 15.0% level by replacing rice flour in formulation. For ragi flour as well as boiled potato mash, there was no significant difference in pH values and fat content, whereas baking yield, moisture, protein, ash content and water activity values increased significantly ($P<0.05$) in



treatments. There was significant ($P<0.05$) difference in many textural and colour parameters in different binders incorporated pet food. There was no significant difference upto 10% of ragi flour as well as 10% boiled potato mash in pet food for sensory scores and these were selected as the best treatments. Ragi flour incorporated pet food showed higher amount of omega- fatty acids and PUFA than control and other treatments on fatty acids profile analysis. In fifth experiment, the selected treatments, along with poultry byproducts powder incorporated pet food and control (chicken meat powder incorporated pet food) were stored at ambient room temperature ($25\pm 1^\circ\text{C}$) and evaluated for their storage stability at every 15 days interval for 60 days. Overall highest treatment mean for pH values were observed in $\text{BP3}>\text{RG2}=\text{PO2}>\text{M3}$, whereas for TBARS, FFA values and total plate count, overall highest treatment means were observed in $\text{BP3}>\text{M3}>\text{PO2}>\text{RG2}$. Highest treatment mean for yeast and mould count were observed in $\text{M3}>\text{BP3}>\text{PO2}>\text{RG2}$. There was no *Coliform* and *Salmonella* count throughout the storage period in any product. The values of pH, TBARS, FFA values and microbiological count of control and treatments increased significantly ($P<0.05$) whereas scores of sensory attributes decreased significantly ($P<0.05$) with progression of storage period. RG2 had higher oxidation stability and lower microbiological count along with significantly ($P<0.05$) higher overall acceptability scores than M3 and other treatments till the end of the storage. The cost of production for poultry byproducts incorporated fiber fortified pet food with 10% ragi flour and 10% boiled potato mash was Rs 191.10/kg and Rs 193.23/kg respectively which was lesser than control pet food (Rs.366.31kg). Therefore, it was concluded that cost effective pet food was developed by incorporating 50% poultry byproducts powder, 10% carrot powder and 10% ragi flour with appropriate nutritive values as per AAFCO (2008) and NRC (2006).

4. Development of functional chicken nuggets coated with Aloe vera gel containing natural antioxidant

The present study was undertaken to develop low-fat functional chicken nuggets with high dietary fiber content. To further enhance the shelf life of functional nuggets, the nuggets were coated with aloe vera-based edible coating containing caraway essential oil (EO). Preliminary trials were conducted to standardize chicken nuggets ingredients with 10% of fat and processing techniques. Whey protein concentrate (WPC) was incorporated in 0.5%, 1.0%,

1.5% and 2% of nuggets formulation. The rheological study of meat emulsion through apparent viscosity, shown highly significant ($P<0.01$) decrease with increasing shear rates. With increasing concentration of WPC, the protein, moisture, cooking yield, emulsion stability and water holding capacity increased significantly ($P<0.05$), whereas, pH decreased non significantly ($P>0.05$) with non-significant ($P>0.05$) increase in ash content. Texture profile analysis and sensory scores were significantly ($P<0.05$) affected with the incorporation of WPC. The sensory score was decreasing with increase in WPC and based on sensory evaluation functional chicken nuggets incorporated with 1.5% of WPC was found optimum. Best variant with 1.5% of WPC was incorporated with *Moringa oleifera* (MO) roots powder at various levels 0.5%, 1%, 1.5% & 2.0% for dietary fiber inclusion in developed functional chicken nuggets. The apparent viscosity values for meat emulsion with increasing concentration of MO root powder shown highly significant ($P<0.01$) decrease with increasing shear rates. Emulsion stability, cooking yield, water holding capacity, moisture content, protein content, fiber and ash content was significantly ($P<0.05$) increased, however, pH showed significant ($P<0.05$) decrease with increasing *Moringa oleifera* content in nuggets. Hardness and gumminess showed highly significant ($P<0.01$) increase. Based on sensory evaluation, nuggets having 1.5 % MO root powder was selected. For the purpose to extend the shelf life of functional chicken nuggets aloe vera coating blend was optimized with different concentrations 0.5, 1% and 1.5% of carrageenan. Moisture content, ash content was increased ($P<0.05$) significantly in coated nuggets with increasing concentration of carrageenan. Based on rheological study & sensory evaluation coating blend containing 1% of carrageenan, 40% aloe vera pulp & 10% glycerol was selected. Dynamic oscillatory measurement of gel showed gelling property. Caraway essential oil (EO) was incorporated in the coating blend of aloe vera-based coating at 0.5, 1% and 1.5% levels. Functional chicken nuggets coated with coating containing caraway essential were stored for 15 days at refrigeration temperature ($4\pm 2^\circ\text{C}$) for observing the stability of chicken nuggets. The pH, FFA and TBA value of treatments was significantly ($P<0.05$) lower than control. The treated products showed significantly ($P<0.05$) higher DPPH value. The total plate count, psychrophilic count, yeast and mold count were significantly ($P<0.05$) lower in



treatments than control, whereas, coliform were not detected throughout the storage period. All the textural profile & sensory parameters were significantly ($P < 0.05$) affected during 15 days storage except saltiness. The treated samples were well acceptable during whole period of storage; however, the control group was most perishable during storage. Reduction in overall acceptability with storage time was higher in control than nuggets coated with 0.5%, 1% and 1.5% (EO). The retail cost of coated functional chicken nuggets was estimated to be R 357.

5. Molecular insight into wound healing efficacy of mangiferin in immunocompromised rat model

Wound healing is a complex phenomenon with three distinctive yet overlapping phases i.e. Inflammatory, proliferative and remodeling phases. Present study was conducted to unravel the molecular insights of Mangiferin in immunocompromised excisional rat model. Firstly, immunocompromised state was established following hydrocortisone injection @80 mg/kg body weight through intra muscular route and determining the immunocompromised state with neutrophilia, lymphocytopenia and reduced splenic weight in adult male rats weighing 200-250 grams. Then, 120 animals were randomly and equally divided into five groups i.e. group I served as Healthy control, group II served as Immunocompromised control, group III served as Immunocompromised group treated with silver sulphadiazine and group IV and V served as Immunocompromised group treated with 2.5 % Mangiferin and Immunocompromised group treated with 5 % Mangiferin, respectively. Study was conducted for a period of 28 days. Six animals were humanely sacrificed at weekly interval till day 28th of study. Wound healing efficacy and molecular cascading of pharmacodynamics of Mangiferin was determined following gross studies including digital photography, wound area measurement and per cent wound contraction and biochemical indices viz. hydroxyproline, DNA content, total protein and LPO assay. Further, histopathological examination of skin by H & E staining and Masson Trichome staining was also done to elucidate the microscopic changes. H & E staining of splenic tissue was also done. Molecular dynamics was studied following expression of vascular endothelial growth factor (VEGF) by immunohistochemistry and expression profiling of genes i.e. IL1 β , TNF α and COX-2 genes by RT-q PCR. Data mined from the study revealed significant ($P \leq 0.05$) reduction in wound area

measurement and significant ($P \leq 0.05$) increase in wound contraction (%) following Mangiferin administration in immunocompromised rats. Hydroxyproline, DNA and total protein showed significant ($P \leq 0.05$) increase in skin tissues of Mangiferin treated immunocompromised rats as compared to immunocompromised control and silver sulphadiazine treated animals. Whereas, LPO assay revealed significant ($P \leq 0.05$) reduction in terms of MDA production in Mangiferin treated animals as compared to immunocompromised control and silver sulphadiazine treated immunocompromised animals. Histopathological studies of skin tissues and masson Trichome staining revealed restoration of epithelial lining, presence of sebaceous gland and hair follicle development and organized collagen deposition advocating grade III of healing in 2.5 % Mangiferin treated immunocompromised animals as compared to group II and III. Mangiferin treatment showed higher expression and strong signal intensity of VEGF. Expression profiling IL1 β and TNF α showed significant ($P \leq 0.05$) upregulation on day 7 in 2.5 % Mangiferin treatment group as compared to immunocompromised control and silver sulphadiazine treated immunocompromised group. Expression profiling of COX-2 revealed significant ($P \leq 0.05$) down regulation in Mangiferin treatment group as compared to other groups i.e. group II and III. It is concluded from our study that Mangiferin facilitated wound healing through improved wound closure, organized deposition of collagen deposition and granulation matrix formation. Our study also suggested wound healing potential of Mangiferin in immunocompromised excisional rat model via molecular cascading through transient upregulation of alarm cytokines i.e. IL1 β and TNF α thereby promoting the secretion of VEGF and also via down regulation of inflammatory genes i.e. COX-2 and free radical scavenging activity through reduced LPO level. Thus, 2.5 % Mangiferin could be useful as an alternate to the available wound healing agents in immunocompromised patients.

6. Studies on cartap toxicity in male rats and its amelioration by α -tocopherol

Present study was undertaken to evaluate the ameliorative effect of α -tocopherol (100 mg/kg) against cartap (16.25 mg/kg and 32.5 mg/kg) induced toxicity following 28 days oral exposure in adult male Wistar rats. Cartap exposure did not produce any clinical signs of toxicity in rats at both

the doses. Weekly Average body weight gain was significantly reduced following cartap (32.5 mg/kg). Both absolute and relative organ weights did not differ significantly between different treatment groups. Hematological parameters did not differ significantly in any of the treatment groups. Plasma Glucose, Total Cholesterol, Triglycerides, AST, ALT, BUN levels were found to be markedly increased in cartap alone treatment groups. Plasma calcium levels showed irregular but non-significant change in response to cartap doses. α -tocopherol co-treatment with cartap produced non-significant decrease in the plasma levels of Glucose, AST and ALT but the levels of Total Cholesterol Triglycerides and Calcium were found to be significantly decreased in both the co-treated groups. BUN levels remained unaffected following α -tocopherol co-treatment. Plasma Total Protein, Albumin, Globulin, LDL, HDL, Bilirubin and Creatinine levels showed non-significant change following exposure to cartap at both the doses. A significant decrease in Total Protein and increase in MDA levels was observed in testes and liver at both the doses of cartap. CAT, SOD, and GST activities were reduced markedly in liver and testes of cartap alone treatment groups. GSH levels showed non-significant change in testes but significant reduction in liver at cartap dose of 32.5 mg/kg. Following co-treatment with α -tocopherol Total protein levels were significantly increased in testes and liver but MDA level was decreased in Liver only. Rest of the oxidative stress parameters showed non-significant changes. Testicular ACP, LDH and GGT levels were significantly increased at cartap dose of 32.5 mg/kg but non-significant change was observed in SDH level. Moderate decrease in ACP, LDH and GGT levels was observed in co-treated groups. Plasma testosterone levels were significantly reduced in cartap alone treatment groups. Non-significant change in plasma testosterone levels was observed in both co-treated groups. Gross examination of organs revealed swelling and congestion in lungs of cartap alone treatment groups. A visible decrease in severity of gross changes in lungs was observed in cartap and α -tocopherol co-treated groups. Histopathological examination revealed mostly degeneration and congestion in lungs, liver, kidneys spleen, heart, testes and trachea in cartap alone treatment groups. α -tocopherol co-treatment revealed a visible decrease in severity of pathological changes in both co-treated groups. Significant upregulation of testicular HSP-70 gene was observed at both the doses of cartap. Sperm

concentration, % live spermatozoa and % HOS+ve spermatozoa were found to be significantly reduced in cartap dose of 32.5 mg/kg. A marked increase in % live and % HOS+ve spermatozoa was observed following co-treatment with α -tocopherol in both co-treated groups. The present study showed that α -tocopherol was able to suppress some of the negative effects of cartap exposure to a certain degree but could not produce complete amelioration in most of the studied parameters. Based on the above results, cartap seem to exert toxic effects on lungs, liver, kidney, spleen, heart and male reproductive system and α -tocopherol possesses moderate restorative potential against Cartap toxicity.

7. Evaluation of therapeutic potential of *Moringa oleifera* leaves on subclinical mastitis in goats

Sub clinical mastitis (SCM) is one of the important constraint in animal husbandry sector throughout the globe especially in growing countries like India. Goat, the poor man's cow usually reared for milk and meat in every climatic condition in India. Now-a-days rearing of goat for milk has been increasing as goat milk is wholesome, easily digestible, nutritious and medicinal properties. SCM is a multi etiological disease and involves in alteration of several factors. Therefore, the present situation demands a newer approach of therapy. *Moringa oleifera* possess potent antimicrobial, antibacterial, anti-inflammatory and anti-oxidant properties. Hence, the present study was designed to evaluate occurrence of SCM in goat as well as to evaluate therapeutic efficacy of *Moringa oleifera* leaves. For this study, a total of 217 lactating goats were screened for SCM by California mastitis test (CMT) and somatic cell count (SCC). Out of 217, 50 goats (23.04%) positive for SCM by CMT and 56 (25.81%) goats by SCC. Quarter wise incidence was highest in right quarter 21.86 % than left quarter 18.60 %. Jakhrana and Black Bengal breed showed highest and lowest incidence, respectively. The incidence showed an increasing trend as age of goat increases. The highest incidence was observed in 4th and more lactation (25.92 %), followed by 3rd lactation (19.23 %) and lowest in 2nd lactation (16.66 %). Similarly, more incidence was observed in late lactation than mid and early lactation. The season wise incidence of SCM revealed highest in winter than summer season. A total of 18 goats (36 quarters) found positive for SCM were randomly divided into three groups viz., oral group (10mg/kg), oral group (50mg/kg) and topical group (10mg/kg) with six animals each for



therapeutic study. Six goats (12 quarters) were considered apparently healthy control group. In the present study, the mean SCC and pH of milk of SCM affected goats increased significantly as that of healthy control goats. On contrary, fat% and solid not fat (SNF) decreased significantly. *Moringa oleifera* significantly reduced the SCC and pH of milk as well as significantly increased the fat and SNF% of milk administered through both the route. The complete blood count picture revealed leucocytosis, neutrophilia and lymphocytosis in SCM goats and *Moringa oleifera* successfully decreased the above parameters administered through either of the route. It is concluded that *Moringa oleifera* was found effective against SCM as evidenced by restoration of SCC and other milk parameters. It is also found effective against SCM when administered through either of the routes i.e., oral and topical, but oral administration is more effective than topical.

8. Evaluation of therapeutic effects of chewable fluralaner against canine sarcoptic mange

Sarcoptic mange is considered an emerging or re-emerging infectious ectoparasitic disease threatening human as well as animal health. Most of the conventional medicines recommended for the management of mites induced dermatitis are highly unsafe for both animals and the owners. Therefore, the present study aimed to evaluate the therapeutic effects of fluralaner against sarcoptic mange in the dog, and untoward effects of fluralaner in dogs, if any. Microscopically *Sarcoptes scabiei* mite detected dogs (N=09) having the presence of pinnal-pedal scratch reflex and clinical manifestations of sarcoptic mange were treated with fluralaner chewable tablet @ 25- 56 mg/kg body weight orally once and were reviewed on day 21 post-therapy for clinical and parasitological recovery. Another six healthy dogs were kept in control. Marked alterations in the hemato-biochemical panels were observed in dogs with sarcoptic mange as compared to healthy dogs. On day 21 post-therapy none of the treated dogs (N=6) was found to have the presence of *S. scabiei* mite and/or its developing stages on microscopic examination. The complete parasitological cure was observed in all dogs on day 21 of chewable fluralaner administration. A total of 83.6 % improvement in the SCLS of fluralaner-treated dogs was found on day 21 post-therapy. Except for ALT, all studies of haemato-biochemical panels improved toward normalcy on day 21 post-therapy. Therefore, it can be concluded that

Sarcoptes scabiei mite infection confers a major dent in the health of infested dogs. A single oral dose of fluralaner is sufficient and safe enough to kill *Sarcoptes* mites and bring a clinical improvement in diseased dogs. Further, studies in large no of dogs with sarcoptic mange are needed to corroborate the findings of the presents study.

9. Evaluation of therapeutic potential of *Dalbergia sissoo* and *Punica granatum* on calf diarrhoea

In present investigation total 100 Caves Haryana and Sahiwal breed age of up to one month were screened for diarrhoea, based on observation of clinical symptoms of diarrhoea in calves. Clinical symptom were Faecal consistency, Dehydration status and sucking reflex. Out of which total 42 caves selected for study out of 42, 12 were healthy and 30 were diarrhoeic. Firstly zinc, copper and immunoglobulin G status were determine in healthy and diarrhoeic calves of Haryana and Sahiwal breed. On study found that zinc and immunoglobulin G level lower and Cu level higher in diarrhoeic calves than healthy calves. In diarrhoeic calves of Sahiwal breed therapeutic potential of *Dalbergia sissoo* and *Punica granatum* was evaluated. After shed drying of leaves of *Dalbergia sissoo* and peel of *Punica granatum* powder was prepared. The diarrhoeic calves were divided in four treatment group T1, T2, T3, T4 and one group was healthy control group (Hc). Powder was supplemented at dose rate of 50gm bid for five day's. In addition to powder Ringer lactate fluid @ of 25 ml/kg iv along with antiinflammatory and multivitamin. The therapeutic efficacy of above therapeutic regimens was evaluated on the basis clinical recovery (days of recovery) and improvement in the altered values of the clinical score, hemato-biochemical alterations and electrolyte values towards normalcy (as par to the values in healthy control calves) on day 6th after treatment. Clinical observations and blood sampling will be done on the day of occurrence of diarrhoea and on day 6th post treatment. Clinical signs viz. general condition, rectal temperature, heart rate, respiration rate, consistency of faeces, depression, dehydration etc. was recorded. Vital parameter like heart rate, rectal temperature, respiration rate were elevated in diarrhoea. Blood samples was collected on day 0 and day 6th, from jugular vein in clean glass tubes for hemato-biochemical alterations before treatment. Complete blood count was done by hematology analyzer. The haematological attributes included Haemoglobin (Hb) concentration, packed

cell volume (PCV), total erythrocyte count (TEC), total leukocyte count (TLC) and Erythrocyte Indices. Haemoglobin (Hb) concentration, packed cell volume (PCV), total erythrocyte count (TEC), total leukocyte count (TLC) were significantly higher in diarrhoeic calves than healthy calves. A total of 5 ml blood was collected from each animal in a sterilized glass at each of the specified intervals for serum biochemistry. Blood was allowed to coagulate by keeping the tubes in slants and serum was separated by spinning at 3000 rpm for 10 minutes. Biochemical parameter sodium, potassium, chloride, total protein, albumin, globulin and glucose level and cytokine (IL10, TNF α , INF γ) were determined. Potassium, Total protein, albumin was significantly higher and sodium, chloride, glucose level, globulin were significantly lower in diarrhoeic calves than healthy calves. Cytokine IL 10 was significantly lower and TNF α , INF γ was significantly higher in diarrhoeic calves than healthy calves. Therapeutic regimen adopted in the treatment of acute diarrhoeic calves under groups T4 in which *Dalbergia sissoo* and *Punica granatum* powder was given found to be most efficacious as evident by the improvement in clinical score in terms of rehydration, improved faecal consistency, depression score and improved haemato-biochemical alteration.

10. Molecular characterization and antimicrobial resistance profile of *Staphylococcus aureus* and *Escherichia coli* isolated from subclinical mastitis in dairy animals

Mastitis is one of the important diseases affecting the dairy industry across the globe, Subclinical mastitis being underrated and often go unnoticed. It is not only economically important to the farmers but also has public health significance associated with potential zoonotic risk and dissemination of livestock-acquired multi-drug resistant organisms. It is therefore important to detect the cases of subclinical mastitis as early as possible to reduce the economic loss. In the present study, screening of the animals was done on the basis of CMT and SCC and the samples positive for the same followed further bacteriological as well as molecular examination. The prevalence of the subclinical mastitis in and Mathura region came to be 7.82% (n=167) detected by CMT and 3.27% (n=70) by somatic cell count. Two most important etiological agents responsible for causing SCM, i.e. *Staphylococcus aureus* and *E.coli*. were studied and their prevalence was 34.28 % (24/70) and 10 % (7/70), respectively. Various bacteriological,

biochemical and molecular detection was performed for the isolation and identification of the individual bacteria. 24 (42.85 %) isolates confirmed for the presence of *23SrRNA* gene of *S. aureus* and 11(19.64 %) isolates positive for *mec A* gene indicating the presence of MRSA. Two (28.57 %) isolates confirmed for the presence of TEM gene for *E. coli* detected for the presence of ESBL genes. The presence of *mec C* gene as well as other ESBL genes such as *bla-SHV*, *OXA*, *CTX-M* were not found. List of drugs were used for the detection of antimicrobial susceptibility test and the percentage of resistance found for *Staphylococcus* spp., for chloramphenicol, gentamicin, ampicillin, oxacillin, ertapenem, cefoxitin, ceftriaxone and tetracycline were 7.14%, 3.57%, 19.64%, 30.35%, 1.78%, 19.64%, 14.28%, 10.71%, respectively while for *E. coli*. isolates, the percentage resistance for chloramphenicol, enrofloxacin, ertapenem and ceftriaxone were 71.42%, 57%, 71.42% and 57%, respectively. Complete resistance was shown for gentamicin, ampicillin and cefoxitin while for oxacillin and tetracycline isolates were found susceptible. The current study determines the prevalence of subclinical mastitis in Braj region. There is the lacuna in terms of documentations available in this area and thus regular monitoring and screening of the animals is to be done for effective use of antimicrobial agents and strategies to control the development of antimicrobial resistance.

11. Molecular characterization of carbapenem-nonsusceptible Enterobacterial isolates of animal origin

Carbapenem-resistant confers resistance to most of the β -lactam antibiotics including penicillin, cephalosporin, and carbapenem, hence responsible for the rise of multidrug-resistant strains. Several different mechanisms are involved in the development of carba-resistance which includes, porin channel, efflux pump, and production of carbapenemase. Although these mechanisms are already characterized in human strains there is a lack of a comprehensive understanding of the inherent mechanisms in strains of animal origin, where carbapenems are rarely being used. Hence the present study was undertaken to elucidate the molecular mechanism of in carbapenem-resistant bacterial strains isolated from animal's sources. The CRE isolates were identified and characterized by morphological, cultural, and biochemical tests. Conventional tests like carba-NP and carbapenemase inhibition assay (CIA) were used to detect the production of carbapenemase production

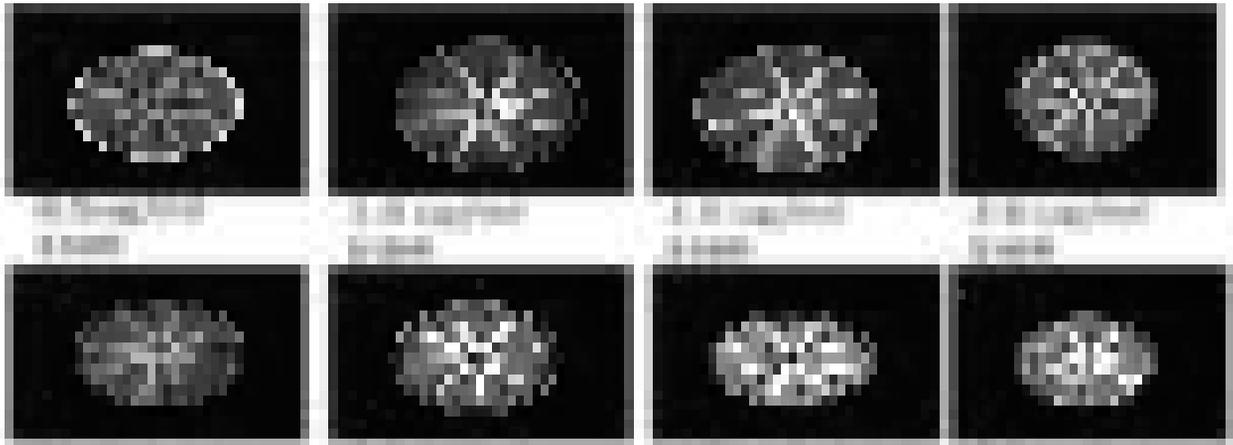


Figure 1: Agar diffusion tests for antibiotic sensitivity of various bacterial strains. The images show zones of inhibition for different antibiotics, indicating varying degrees of sensitivity among the isolates.

in these isolates. MICIMP was calculated for all the isolates. The efficiency of the efflux pump to effectively efflux carbapenem resistance was evaluated by three independent tests viz. CCCP-IMP/ETP disc synergy test, MIC broth microdilution method, and EtBr cartwheel test. Further, the presence of different carbapenem-resistant genes was confirmed by PCR and gene sequencing. The transcriptional response of various OMP gene and efflux pump genes were evaluated by Q-PCR. Carba-NP and CIA tests could successfully detect 12 and 10 carbapenemase producers respectively with high sensitivity and specificity. Out of 12 isolates that were producing carbapenemase as observed by carbaNP test, among them bla IMP was detected in 7, blaVIM was detected in 4, blaOXA-48 in 3, whereas in 2 isolates PCR experiment could not fetch any amplification although they were Carba-NP test positive. The sequence analysis of bla VIM, bla IMP and bla Oxa-48 revealed the presence of VIM-2, IMP-8 and Oxa-181 variants. Out of 18 non-susceptible isolates, 5 isolates were found to have the role of active efflux pump mediated carbapenem non-susceptibility. In this study, a strong correlation between imipenem resistance and *acrA* and *acrB* overexpression was observed in all the Enterobacteriaceae isolates. Further, it was observed that imipenem stress decreased *ompF* and *ompC* expression in a majority of isolates. Additionally, the transcription of *ompK35* was insistently increased in *Klebsiella* isolates with a corresponding decrease in the transcriptional level of *ompK36* under carbapenem stress conditions. A corresponding rise

in *mexB* efflux pump was noted in *Pseudomonas* while there was a decrease in *oprD* porin. The study established the involvement of multiple mechanisms in the development of carbapenem resistance. Porins (like *OmpF* and *OmpC*) and *AcrAB* efflux pump is a relevant antibiotic resistance determinant in the bacterial pathogen, has an important role in developing resistance against the carbapenem group of antibiotics apart from carbapenemase production.

12. Effect of nickel supplementation on growth performance of heifers fed urea based diet

This study was conducted to evaluate the effect of nickel (Ni) supplementation on feed intake, nutrient utilization, growth performance, haematology, enzymatic activity, antioxidant status and plasma minerals in growing Sahiwal heifers. Eighteen growing Sahiwal heifers were randomly allocated into three groups having six heifers in each group and fed for 90 days. Control group were fed on basal diet without nickel and urea whereas, animals in treatment group-1 was supplemented concentrate with urea (3%) without Ni and treatment group-2 animals were supplemented with nickel @5ppm and concentrate containing urea (3%). The nutrient requirements of Sahiwal heifers were met by feeding concentrate mixture, berseem and wheat straw as per NRC (2001) guideline. Experimental heifers were monitored daily for DM intake (DMI) and fortnightly for body weight change. At the end of the study, a digestion trial of 7 days was conducted to study the effect of Ni supplementation on nutrients utilization. Blood samples were collected at 0, 30, 60



and 90 days post-Ni supplementation and analyzed for haematological attributes, biomarker of energy, lipid and protein metabolism, biomarker of liver and kidney function, biomarker of antioxidant status and plasma mineral levels. Adding 5.0 ppm Ni to the diet of growing heifers had no effect on DMI, body weight gain, FCR, FCE in heifer fed urea based diet. No significant difference ($P>0.05$) was found between the three treatments for blood haemoglobin (Hb) and haematocrit value (PCV) concentrations. Dietary supplementation of Ni did not ($P>0.05$) exert any effect on biomarkers of lipid and protein metabolism i.e. plasma triacylglycerols, cholesterol, plasma total protein, plasma albumin and plasma globulin remains similar in all groups. The plasma glucose level was found significantly higher ($P<0.05$) in nickel supplemented group. The digestibility of DM, CP and ADF was significantly higher ($P<0.05$) in nickel supplemented heifers fed urea based diet. Even though the plasma level of AST was higher ($P<0.05$) in 5.0 ppm Ni supplemented group but values for all studied biomarkers of liver functions i.e. aspartate aminotransferase (AST), alanine aminotransferase (ALT), alanine phosphatase (ALP) and bilirubin were reported within normal physiological range. No significant differences ($P>0.05$) of Ni supplementation of 5.0 ppm level were observed on biomarkers of kidney function i.e. plasma creatinine and PUN. The activity of glutathione peroxidase (GSH-Px) and catalase (CAT) had no effect of nickel supplementation whereas, superoxide dismutase (SOD) and FRAP was found lowest in 5.0 ppm Ni supplemented group. Ni supplementation showed no interaction ($P>0.05$) with Ca, P, Cu and Fe which is evidenced from similar plasma levels of these minerals in all three groups. Finally, it concluded that dietary supplementation of Ni at 5 ppm improved digestion and nutrient utilization (protein & ADF) in urea based diet.

13. Amelioration of insulin resistance in dairy animals by dint of nutritional strategies

This study was conducted to determine the effect of dietary chromium (Cr) supplementation on the performance, insulin sensitivity, blood metabolite pattern shift and health status of Haryana calf during transition phase. A total of 24 Haryana calves were randomly allocated into four groups having six calves in each group and fed for a period of 90 days. Experimental calves either received a basal diet devoid of supplemental Cr (Cr0.0 group) or were supplemented with 0.05 mg (Cr0.05 group), 0.10 mg

(Cr0.10 group) and 0.15 mg (Cr0.15 group) of Cr/kg BW^{0.75} as Cr- picolinate. Experimental calves were monitored fortnightly for body weight change. At the end of the study, a metabolic trial of 7 days was conducted to study the effect of Cr supplementation on nutrients utilization and mineral metabolism. The blood samples were collected at -7, 0, 7,14, 21,28, 35, 42, 49, 56 and 63 min in postglucose infusion during intra venous glucose tolerance test (IVGTT) while at -2, 2, 5, 10, 20, 30, 45, 60, 90, 120, 180 and 240 min post-glucose drenching during oral glucose tolerance test (OGTT). Blood metabolites pattern shift in transition calves were assessed by the collection of blood at 0, 30, 60, 70, 80, 84, 86, 87, 88, 89, 90, 95 and 100 days post-Cr supplementation. The monthly blood samples were collected for the determination of biomarkers of energy and lipid metabolism, antioxidant status, immune response, endocrine variables and plasma mineral levels. Fortnight body condition score (BCS), occurrence and duration of the diarrhoea, pneumonia occurrence, joint and navel ill and calf mortality parameters were used to access the health status of experimental calves in different groups. Dietary Cr supplementation did not exert any significant ($P>0.05$) effect on the growth performance and nutrients digestibility. However, Cr supplementation exert positive effect ($P<0.05$) with calcium (Ca), phosphorus (P), zinc (Zn), copper (Cu), iron (Fe), magnesium (Mg), nickel (Ni) and boron (B). Insulin resistance exists in all the experimental calves during transition phase. Even though, Cr supplementation did not exert any effect on plasma insulin concentration but its supplementation improved insulin sensitivity which was evidenced from better glucose kinetics and higher plasma level of insulin receptor substrate-1 (IRS-1) and non-esterified fatty acids (NEFA) in Cr supplemented calves during IVGTT. However, plasma glucose and insulin showed a non-significant effect ($P>0.05$) of treatment while plasma IRS-1 showed significant effect ($P<0.05$). The monthly plasma glucose was lower ($P<0.05$) effect on superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx) activity and total antioxidant status (TAS). Accordingly, addition of the Cr in the diet of Haryana calves did not exerts any impact on monthly plasma total immunoglobulin (TIg) and white blood cell (WBC) count. The monthly plasma level of IGF-1 was higher ($P<0.05$) on BCS while the diarrhoea occurrence and duration of the diarrhea was lower in Cr supplemented calves. The results of this study revealed that dietary Cr supplementation reduced



lactose intolerance and improved health status of transition Harijana calves by improving insulin resistance. Furthermore, Cr supplementation is very helpful in the transformation of pre-ruminant calf into adult ruminants by favouring dynamics of the nutrient shift.

14. Effect of different sources of selenium supplementation on performance of bucks

The present study was designed to evaluate the effect of dietary supplementation of different sources of Se on growth performance, nutrient utilization, seminal attributes, haemato-biochemicals, antioxidant, mineral and hormonal profile of bucks. For this study, 24 experimental bucks were selected and equally divided into four groups (n=6) on body weight basis. The animals in control group were fed on basal diet i.e., concentrate mixture, gram straw and corn silage as per ICAR (2013) feeding standard whereas, the groups T1, T2 and T3 were fed basal diet along with supplementation of inorganic Se (Sodium selenite), organic Se (Se-Yeast) and Se nano particles at level of 0.3mg/kg DM offered respectively. The experimental feeding was done for 90 days and a digestion trial of seven days was conducted to appraise the nutrient utilization. Blood sample were collected at day 0 followed by monthly interval. Semen from each buck in a group was collected and pooled, a total of six pooled ejaculates from each group were evaluated at start and end of experimental feeding. The results revealed dietary supplementation of Se from either source have no significant ($P<0.05$) effect on BW, ADG, FCR, feed intake and digestibility of nutrients. Plasma globulins and total protein concentration were significantly ($P<0.05$) higher in Se supplemented groups. However, all other haemato- biochemical parameters monitored were under normal physiological range. Significant ($P<0.05$) increase in plasma SOD and GSH-Px activity with concomitant decrease in ROS and LPO levels was found in treatment groups. However, on comparing the source of Se supplementation, nano Se seems to be more effective in enhancing antioxidant status. Plasma Se concentration significantly ($P<0.05$) increased with Se supplementation irrespective of source, however, nano Se exhibited highest plasma Se concentration. The assay of IgG, Testosterone and LH significantly ($P<0.05$) increased in treatment groups with highest concentration in nano Se group. Semen analysis showed significant ($P<0.05$) improvement in progressive motility, viability,

Acrosomal integrity, ROS, membrane fluidity, intracellular Ca levels, and HOST values in treatment groups compared to control with best results in T3 group. So, it can be concluded that incorporation of different Se sources (inorganic, organic and nano) at 0.3 ppm level in diet increased plasma Se concentration, improved antioxidant, immunity, seminal attributes and reproductive hormones status. Moreover, nano Se seems to be more effective in improving fertility through enhancement of seminal attributes, antioxidant and Se status in bucks.

15. Effect of Boron supplementation on performance and bone health markers of heifers

The biological importance of effects of dietary boron and calcium interaction on health and production of farm animals and cattle are minutely known. Present study was conducted to see the effect of boron supplementation on growth performance, nutrient utilization, blood biochemical parameters, immune and antioxidant response, selective minerals plasma concentration and bone health markers in Harijana heifers. Twenty-four Harijana heifers were distributed into four groups with six animals each in a 2x2 factorial design such as, normal-Ca diet and low-Ca diet fed without or with 200 ppm boron. In present study, control (C1) group was not supplemented with any extra amount of boron other than present in the basal diet, T1 group was supplemented with normal calcium diet along with boron (boric acid) @ 200 ppm, while C2 group is supplemented with low calcium (30% less than normal calcium) and T2 group were supplemented with boron @ 200 ppm with low calcium diet. Basal diet offered to experimental groups containing 50% concentrate, 35% wheat straw and 15% green fodder. Body weight and dry matter intake were recorded fortnightly. Overall body weight, DMI (kg/day), DMI (kg/100kgBW), TDN intake (g/kg $W^{0.75}$) and DCP intake (g/kg $W^{0.75}$) found similar over time in treatment as well as control group. Nutrient digestibility and digestible nutrient intake were not impacted by supplementation of boron either with normal calcium diet or with low calcium level diet. ADG, metabolic body weight gain were similar in all groups. FCR and FCE were not significantly different between treatment and control group. Haematological parameters like blood haemoglobin concentration and PCV values were not effected in different treatment groups. Overall plasma glucose, triacylglycerol and cholesterol concentration improves with the trial duration and found significantly



different at end of trial. Plasma total protein, plasma albumin, BUN, ALT, AST, bilirubin and creatinine were found similar in all treatment and control group though ALP concentration was improving. plasma SOD concentration was found higher in boron with normal calcium supplemented group than control and other groups but not differs significantly. FRAP concentration increase within all groups over the time, and were higher in T1 group than the control (C1) and lowest in low calcium fed group. Total plasma immunoglobulin concentration was found improve as the time of experiment advances i.e. found highest at the 90th day of experiment. Plasma levels of bovine alkaline phosphatase (BALP) improves with the trial duration but variations were not reflected. Over all plasma osteocalcin (OCN) concentration is significantly differ among the control and treatment groups as the OCN concentration was higher in the group supplemented with 200 ppm boron either with normal calcium or with low calcium diet, while in only low calcium supplemented group were found lower than control group. plasma concentrations (ng/ml) of tartrate resistant acid phosphatase (TRAP) concentration were decreasing with trial duration. Plasma boron and calcium in present study were significantly ($P < 0.05$) affected in T1, C2 and T2 experimental groups. Plasma phosphorus, magnesium, and copper concentration remained unaltered due to dietary treatments. Plasma zinc concentration was more in T1 treatment groups as compare to control and other group. It may concluded that boron supplementation at 200 ppm improved calcium utilization and bone health status on both normal calcium or low calcium level.

16. Effect of dietary supplementation of oregano and thyme oil on the performance of turkey poult

The present study was conducted to assess the effect of dietary supplementation of oregano and thyme oil on the performance of turkey poult. Day old turkey poult ($n=144$), were divided into four treatment groups, having three replicates of 12 birds each. The study was conducted in turkey poult during 0-8 weeks of age. Poult were fed T1 basal diet, T2- basal diet supplemented with oregano oil @ 1% diet, T3 – basal diet supplemented with thyme oil @ 1g/kg diet, T4- basal diet supplemented with oregano oil @ 1% and thyme oil @ 1g/kg diet. Weekly body weight was significantly higher in poult of T1 and T3 than poult of T4 during 1st ($P < 0.05$), 2nd ($P < 0.01$), 3rd week ($P < 0.01$),

4th ($P < 0.05$), 5th ($P < 0.01$), 6th ($P < 0.01$), 7th ($P < 0.01$) and 8th ($P < 0.01$) week of age. Further, weekly body weight was apparently higher in T1 poult as compared to poult of other treatment groups from 1st to 3rd week of age. Thereafter, the weekly body weight was apparently higher in T3 as compared to other treatment groups. Weekly body weight gain was significantly higher in T1 and T3 than T4 during 2nd ($P < 0.01$) and 7th ($P < 0.01$) week of age. Phase wise body weight gain was significantly higher in T1 and T3 than T4 during 0 to 4 weeks ($P < 0.05$), 4 to 8 weeks ($P < 0.05$) and 0 to 8 weeks ($P < 0.01$) of age. Further, phase wise body weight gain was apparently higher in T3 as compared to other treatment groups during 0-4 weeks, 4-8 weeks and 0-8 weeks of age. Weekly feed intake was significantly higher ($P < 0.05$) in poult of T1, T2 and T3 than T4 poult at 2nd and 8th week of age. Phase wise feed intake was significantly higher in the poult of T1 and T3 than T4 during 0-4 weeks ($P < 0.01$) and 0 to 8 weeks ($P < 0.05$) of age. Weekly FCR was significantly better ($P < 0.05$) in T1, T3 and T4 than T2 at 2nd week of age. At 3rd week of age, FCR of poult of T2, T3 and T4 were significantly better ($P < 0.01$) than T1. At 7th week of age, FCR of poult of T1, T2 and T3 were significantly better ($P < 0.05$) than T4. There was no significant difference observed in the humoral immune response (response to 1% GRBC HA titre) among the different treatment groups. T2, T3 and T4 poult had significantly higher ($P < 0.01$) foot web index compared to T1 poult. T2 group poult had significantly higher ($P < 0.05$) concentration of serum IgG as compared to other treatment groups. Further, the concentration of serum IgG and IgM of all the oil supplemented groups were apparently higher than the control group. No significant difference was observed in plasma uric acid, AST, ALP, SOD and LPO values. T4 poult had significantly higher ($P < 0.05$) total plasma protein than T1, T2 and T3. T2 and T3 poult had significantly higher ($P < 0.05$) plasma ALT as compared to T4 poult. T3 and T4 poult had significantly higher ($P < 0.05$) plasma cholesterol as compared to T1 poult. Further, T2 and T3 poult had significantly higher ($P < 0.01$) plasma HDL values than T1 and T4. There was no significant difference in development of digestive organs, lymphoid organs, yield of giblet and cut up parts and carcass quality traits among the different treatment groups. T2 poult had significantly higher ($P < 0.05$) ready to cook yield% than T1. No significant difference was observed in the chemical composition of breast and thigh meat. T2 and T3 poult had significantly higher ($P < 0.05$) deposition



of Mg in breast muscle as compared to T1. Further all the oil supplemented groups had apparently higher deposition of Mg in breast meat. Monounsaturated fatty acid was significantly higher ($P<0.01$) in T1 as compared to other treatment groups. Polyunsaturated fatty acid was significantly higher ($P<0.01$) in all the oil fed groups as compared to the control group. Thus, it may be concluded that thyme oil @ 1g/kg of diet may be supplemented to elicit growth performance, immunity, percent ready to cook yield, Mg deposition in breast meat cut and PUFA in meat of turkey poult.

17. Comparative evaluation of thiopental and Propofol as induction agent in dogs

The present study was conducted in 36 healthy dogs of six breed-specific groups to evaluate the intraocular ultrasonographic biometry, colour Doppler ultrasound assessment of the long posterior ciliary artery and further clinical application of these were performed in 64 clinical cases of ocular affections presented at TVCC between August, 2020 and July, 2021. Parameters measured in B-scan sonogram through transcorneal approach were aqueous chamber depth (ACD), lens thickness (LT), vitreous chamber depth (VCD), Optical disc length (OCD), axial globe length (AGL) and Doppler measurements such as pulsatility index (PI), resistivity index (RI), peak systole velocity (PSV) and end-diastole velocity (EDV) with microconvex transducer (having frequency range from 2.5-7.5 MHz) transducer at 3-7 cm scanning depth. The Mean \pm SE values of ultrasonographic biometry parameters were non-significantly ($p\geq 0.05$) different between the left and right eyes of the individual breed. The result of the present study revealed that large breeds of dogs have higher values of ultrasonographic biometry parameters than small breeds while the values of velocimetric indices of the long posterior ciliary artery donot depend upon the size of the breed of dog. The Mean \pm SE values of pulsatility index (PI), resistivity index (RI), peak systole velocity (PSV) and end-diastole velocity

(EDV) in the left eye, right eye and average of left eyes and right eyes in animals of group I-VI was non-significantly different ($p\geq 0.05$). Total 16 ocular affections in 64 dogs belonging to 11 different breeds were diagnosed and managed by therapeutic or surgical procedures as per the need of the conditions. Conditions like conjunctivitis, blepharitis, hyphema, tumour (T.V.T), corneal ulcers and corneal opacity were managed through medical treatment. For the management of cherry eye conditions, Morgan's pocket technique was found to be supercilious. Vision restoration was achieved through extracapsular extraction of the lens method in case of cataracts. In severe chronic corneal injury enucleation is a better method of management. Rhytidectomy was performed for the management of entropion due to excess facial folds.

18. Observations on upper gastrointestinal endoscopy in clinical cases of dog

Endoscopic evaluation of esophagus and stomach was carried out in referred cases of eighteen dogs belonging to different breeds (German Shepherd (5), Non-descript/Mongrel (4), Labrador (5), Indian Spitz (1), Dalmatian (1), Golden Retriever (1) and Rottweiler (1) and age groups (2 month to 12 year) presented to the Teaching Veterinary Clinical Complex (TVCC), DUVASU, Mathura (U.P.) with clinical sign of persistent vomiting, regurgitation, inappetance, anorexia which were not responding to any symptomatic treatment or history of accidental ingestion of any foreign body. Gender wise, 10 dogs were male and 8 dogs were female. Body weight of dogs range from 4.1 kg to 28 kg. Diagnosis was made on the basis of clinical symptoms, haemato-biochemical, blood gas and electrolyte, radiographic, ultrasonographic, endoscopic and histopathological evaluation and appropriate medical/surgical management was done as per the requirement. The prominent clinical signs observed were chronic vomiting, regurgitation, anorexia and inappetance. Endoscopic diagnosis revealed 8 cases



Blood pressure measurements



HDC-Lyte plus ABG



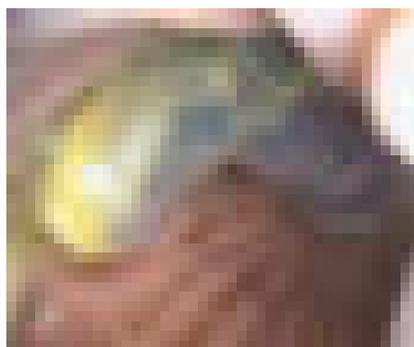
Electrocardiography



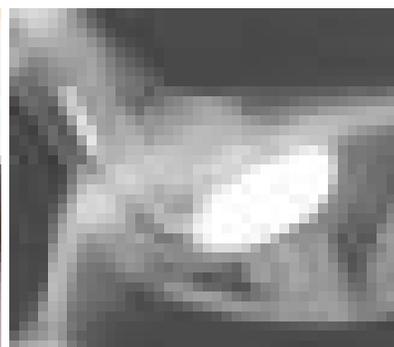
Multi Parameter Monitor



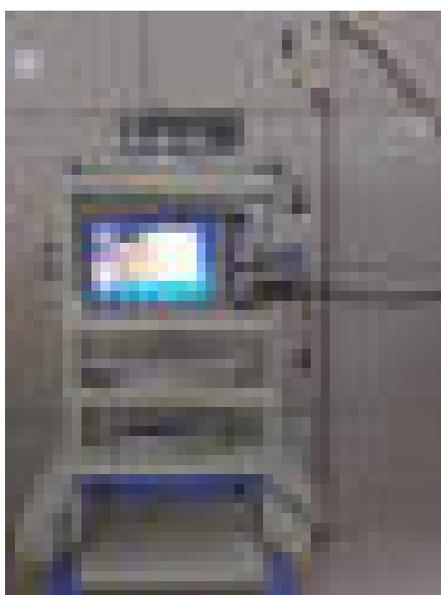
Sonogram showing acoustic shadowing of foreign body in the stomach.



Endoscopic image of foreign body i.e. plastic nipple inside which present a whitish material, along with bile.



Lateral thoracic contrast radiograph showing dilated thoracic esophagus.



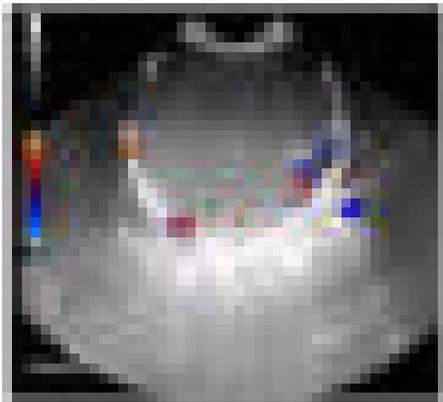
Video-endoscope unit (Karl Storz veterinary video-endoscope tele pack vet X LED RP 100)

of gastric ulcer, 6 cases of gastritis, 9 cases of esophagitis, 5 cases of megaesophagus, 3 cases of foreign body, 1 case of cervical esophageal ulcer and 1 case of spirocercosis. On the basis of endoscopy esophageal lesions were classified in 18 cases which include hyperemia in 4 cases, discoloration in 2 cases, friability in 3 cases, hemorrhage in 3 cases, erosion/ulcer in 3 cases, contents like mucus/bile/food in 11 cases, dilatation in 5 cases, LES lesion in 7 cases (out of 16 cases), others lesion/finding in 9 cases. Endoscope was not able to pass into cardia in 4 cases. On the basis of endoscopy gastroscopic lesions were classified in 14 cases which include hyperemia in 4 cases, hemorrhage in 2 cases, erosion/ulcer in 8 cases, content like mucus/bile/food in 12 cases, others lesion/finding in 5 cases. Edema/discoloration /friability was not found in any cases.

Endoscopic guided biopsy sample was taken from stomach in 3 cases which revealed gastritis while in one case biopsy was taken from esophagus which revealed suppurative esophagitis. Exploration of abdomen in four cases was done. Out of this one case was diagnosed with lymphoma which was confirmed by FNAC, one case was diagnosed with suppurative lymphadenitis and arteriosclerosis which was confirmed by histopathological examination, one case was diagnosed with ileus along with pseudo obstruction at ileocolic and caecocolic junction and one case was diagnosed with intestinal foreign body. Radiographic (plain and contrast), ultrasonographic finding complemented the endoscopic examination to reach the final diagnosis. Out of 18 dogs included in the study complete recovery was there in nine cases. Megaesophagus was diagnosed in 5 cases out of which four cases showed reduction in frequency of regurgitation while in one case owner consented euthanasia was done. No follow could be obtained of 3 cases, one case reported to have died after 2 months. In the present study endoscopy proved better and effective modality in diagnosing lesions of mucosa of esophagus and stomach than plain and contrast radiography and ultrasonography.

19. Study on surgico - chemo - therapeutic management of mammary tumour in dogs

Present study on surgico-chemo-therapeutic management of mammary tumours in dogs was carried in 18 cases of canine mammary tumours. The data pertaining to age, breed, sex, general condition of the animal, duration of the clinical signs, rate of growth, borders, recurrence, size of neoplasm, number of glands involved, location of neoplasm, consistency of neoplasm, attachment to skin or body wall, nipple deformities, discharge from teats, mated



Ultrasonogram of tumour mass of Labrador dog aged 8.5 years showing well defined border, homogenous hyperechoic echotexture and colour Doppler shows vascularisation with peripheral flow pattern

at first heat, neonatal deaths, time since last heat were collected as a part of general clinical examination. The physiological (PR, RT and RR) and haemato-biochemical (Hb, DLC, BUN and creatinine) parameters were recorded during the period of study. All the 18 animals were grouped into three groups viz., Group C, Group A and Group S as per treatment modalities. In Group S animals undergone surgery alone (simple mastectomy, enblock dissection and lumpectomy), in Group A animals after surgery undergone to adjuvant chemotherapy with combination of doxorubicin @ 25mg/m² IV and cyclophosphamide @ 30 mg/m², and 3 doses of this treatment at 10 days interval and in group C animals undergone chemotherapy alone. Lateral thoracic radiography was performed to evaluate the distant pulmonary metastasis. Ultrasonograph of all the cases was done to determine the echogenicity of tumour mass. Histopathological evaluation revealed majority of the tumours to be malignant. Combination of doxorubicin and cyclophosphamide was found to be effective as adjuvant therapy in treatment of mammary tumour and this combination increased the longevity and survival of animals.

20. Ultrasonographic biometry and color Doppler assessment of eyes in dogs

The present study was conducted in 36 healthy dogs of six breed-specific groups to evaluate the intraocular ultrasonographic biometry, colour Doppler ultrasound assessment of the long posterior ciliary artery and further clinical application of these were performed in 64 clinical cases of ocular affections presented at TVCC between August, 2020 and July, 2021. Parameters measured in B-scan

sonogram through transcorneal approach were aqueous chamber depth (ACD), lens thickness (LT), vitreous chamber depth (VCD), Optical disc length (OCD), axial globe length (AGL) and Doppler measurements such as pulsatility index (PI), resistivity index (RI), peak systole velocity (PSV) and end-diastole velocity (EDV) with microconvex transducer (having frequency range from 2.5-7.5 MHz) transducer at 3-7 cm scanning depth. The Mean±SE values of ultrasonographic biometry parameters were non-significantly ($p \geq 0.05$) different between the left and right eyes of the individual breed. The result of the present study revealed that large breeds of dogs have higher values of ultrasonographic biometry parameters than small breeds while the values of velocimetric indices of the long posterior ciliary artery do not depend upon the size of the breed of dog. The Mean±SE values of pulsatility index (PI), resistivity index (RI), peak systole velocity (PSV) and end-diastole velocity (EDV) in the left eye, right eye and average of left eyes and right eyes in animals of group I-VI was non-significantly different ($p \geq 0.05$). Total 16 ocular affections in 64 dogs belonging to 11 different breeds were diagnosed and managed by therapeutic or surgical procedures as per the need of the conditions. Conditions like conjunctivitis, blepharitis, hyphema, tumour (T.V.T), corneal ulcers and corneal opacity were managed through medical treatment. For the management of cherry eye conditions, Morgan's pocket technique was found to be supercilious. Vision restoration was achieved through extracapsular extraction of the lens method in case of cataracts. In severe chronic corneal injury enucleation is a better method of management. Rhytidectomy was performed for the management of entropion due to excess facial folds.

21. Studies on ultrasonography of the eye in Sahiwal Calves

The present study was undertaken to standardize the procedure for ultrasonography of the eye and study the echo-pattern of intraocular structures in Sahiwal calves. This study was divided into two parts. Part I of the study was conducted on 21 apparently healthy Sahiwal calves of either sex, divided into three groups of seven animals each namely, Group I comprising animals of 0 to 4 months of age, Group II comprising animals of above 4 up to 8 months of age and Group III comprising animals of above 8 up to 12 months of age. Part II of the study was conducted on cattle calves which were presented to the TVCC DUVASU, Mathura during the period of study with

ocular ailments. Trans-corneal ocular ultrasound was performed in all animals in standing position with minimal restraint, without the use of any sedative or general anaesthesia or topical anaesthetic agent, after applying sterile coupling gel and a 5 to 9 MHz microconvex transducer was used. Aqueous chamber depth (ACD), lens thickness (LT), vitreous chamber depth (VCD), sclero-retinal rim thickness (SRRT), axial globe length (AGL) and intra ocular pressure (IOP) were measured. The mean ACD of right eye was 0.23 ± 0.01 cm, 0.23 ± 0.01 cm and 0.32 ± 0.02 cm in group I, II and III, respectively. The mean LT of was 0.86 ± 0.01 cm, 0.93 ± 0.01 cm and 0.97 ± 0.01 cm in group I, II and III, respectively. The mean VCD was 1.23 ± 0.02 cm, 1.25 ± 0.02 cm and 1.36 ± 0.03 cm in group I, II and III, respectively. The mean SRRT was 0.22 ± 0.00 cm, 0.27 ± 0.01 cm and 0.28 ± 0.02 cm in group I, II and III, respectively. The average AGL was 2.61 ± 0.04 cm, 2.73 ± 0.04 cm and 2.99 ± 0.03 cm in group I, II and III, respectively. The mean ACD of the left eye was 0.26 ± 0.02 cm, 0.27 ± 0.01 cm and 0.32 ± 0.01 cm in group I, II and III, respectively. The average LT was 0.83 ± 0.00 cm, 0.89 ± 0.01 cm and 0.96 ± 0.01 cm in group I, II and III, respectively. The mean VCD was 1.28 ± 0.02 cm, 1.29 ± 0.01 cm and 1.37 ± 0.031 cm in group I, II and III respectively. The mean SRRT was 0.22 ± 0.00 cm, 0.27 ± 0.01 cm and 0.27 ± 0.01 cm in the group I, II and III, respectively. The mean value of AGL of was 2.62 ± 0.05 cm, 2.79 ± 0.02 cm and 2.99 ± 0.03 cm in group I, II and III, respectively. The difference in the mean values of ACD, LT, VCD, SRRT and AGL between the right and left eyes were non-significant in the calves of all the groups. The mean IOP of the right eye was 23.42 ± 2.12 mm Hg, 22.14 ± 0.70 mm Hg and 26.14 ± 1.75 mm Hg in group I, II and III, respectively. Total mean IOP of the right eye was 23.90 ± 0.97 mm Hg. The mean IOP of the left eye of the calves was 23.14 ± 0.88 mm Hg, 24.42 ± 1.83 mm Hg and 26.28 ± 2.41 mm Hg in group I, II and III, respectively. Total mean IOP of left eye was 24.61 ± 1.04 mm Hg. The mean IOP were found to be non-significant ($p \geq 0.05$) among all the age groups. A prospective study of ocular affections in cattle calves was carried out. Five types of ocular affections were diagnosed in 19 calves of which corneal affections 6 cases (31.57%) which includes corneal opacity (10.52%), corneal ulcer (10.52%), iris prolapse (5.26%), pigmentary keratitis (5.26%), lenticular affections - congenital cataract 2 cases (10.52%), dermoid 5 cases (26.31%), eye ball affections 3 (15.78%) and congenital blindness 3 cases (15.78%) were recorded.



Fig: Intra ocular pressure of eyes measured using icare tonovet plus.



Fig: Intra ocular structures showing on ocular ultrasonography.

22. Studies on effect of resveratrol on cryopreservation of Haryana bull spermatozoa

The present study was designed to determine the effect of resveratrol as an additive in tris-egg yolk-based extender in Haryana bull semen opted for cryopreservation. The study evaluated physico-morphological properties (individual progressive motility, viability, HOS response, acrosomal integrity, sperm kinematic of spermatozoa) at pre-freeze and post-thaw stage. *In vitro* fertility test (BCMPT) and oxidative stress was also evaluated at post-thaw stage. Thirty two ejaculates collected from four Haryana bull were divided into four aliquots. Aliquot diluted in egg yolk tris glycerol (EYTG), Group I: control (without addition of resveratrol), Group II: treated with 0.5 mM resveratrol, Group III: treated with 1.0 mM resveratrol, Group IV: treated with 2.0 mM resveratrol spermatozoa. Semen evaluated at pre-freeze and post-thaw stage showed supplementation of 0.5 mM resveratrol in semen significantly ($p < 0.05$) increased individual progressive motility %, viability %, acrosomal integrity %, HOS response % and kinematic parameters in both stages.



At post thaw stage, supplementation of 0.5 mM resveratrol significantly ($p < 0.05$) increase distance travelled by vanguard spermatozoa and reduced oxidative stress to protect sub cellular components of Hariana bull spermatozoa. It was recommended the resveratrol @ 0.5 mM can be added as additive in semen extender for better post-thaw sperm recovery.

23. Studies on effect of parity on postpartum follicular dynamics of Hariana cows

The present study examined ovarian changes preceding the resumption of the ovarian cycle in postpartum dairy cows with different parities. In postpartum primiparous ($n = 5$), and multiparous ($n = 5$) Hariana cows, ovarian ultrasonographic observations starting at day 7 after calving were performed every other day till 50 days post partum. To evaluate the energy status during postpartum, blood samples were collected 1 week before parturition and at 1st, 2nd, 3rd, 4th, 5th, 6th, 7th weeks after parturition for the analysis of non-esterified fatty acid (NEFA) and beta-Hydroxyl Butyrate (BHB). The days to first ovulation after calving in primiparous cows (45.33 ± 4.10 days) were significantly higher ($p < 0.05$) than those in multiparous cows (31.33 ± 4.35 days). There was no influence of parity on follicle number on day 8 post partum, days from parturition to detection of first dominant follicle, growth rate of ovulatory dominant follicle, growth rate of regressing dominant follicle, max size of corpus luteum after first ovulation, inter ovulatory interval (IOI) during postpartum period. Similarly no influence of parity on prepartum and postpartum changes in plasma BHBA and NEFA were observed throughout the study. The present study demonstrated a negative relationship between parity and number of days from calving to first ovulation in Hariana cows.

24. Studies on effect of carnitine on cryo-preservation of hariana bull spermatozoa

The present study was designed to determine the effect of carnitine (CAR) as an additive in tris-egg yolk-based extender in Hariana bull semen opted for cryopreservation. The study evaluated physico-morphological properties (individual progressive motility, viability, HOS response, acrosomal integrity), sperm motion and kinematic parameters using CASA, sperm functional attributes using Flow-cytometry, capacitation status using CTC assay, after equilibration and thawing. Thirty-two ejaculates were collected from four Hariana bulls and were divided into four aliquots. Aliquot diluted in egg yolk tris glycerol (EYTG), Group I: control (without carnitine), Group II: treated with 2.5 mM CAR, Group III: treated with 5 mM CAR, Group IV: treated with 10 mM CAR/ 100×10^6 spermatozoa. Semen evaluated after equilibration and post-thaw stage showed supplementation of 5 mM CAR in semen significantly ($p < 0.05$) increased sperm viability, intact acrosome, intact membrane, and significantly decreased B- and AR- pattern spermatozoa. 5mM CAR and 2.5 mM CAR significantly ($p < 0.05$) increased motion and kinematic parameters in both stages of freezing-thawing. Supplementation of 5mM CAR and 2.5 mM CAR significantly ($p < 0.05$) decreased oxidative stress and 5 mM CAR protected sub cellular components of Hariana bull spermatozoa. The findings of the present study suggested the cryoprotective effects of carnitine on bull spermatozoa both at cellular and subcellular level by lowering free radicals and its associated oxidative stress. It was recommended that; carnitine can be added as an additive in semen extender at 5mM concentration to achieve better post thaw sperm functional dynamics.



EXTENSION

1. DIRECTORATE OF EXTENSION

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

S. No.	Theme of Training	Duration	Number of Trainees	Beneficiaries
1.	Pashupalan Evam Pashu Prabhandhan Ke Vaigyanik Siddhant-I	29 th Nov-03 rd Dec, 2021	40	Farmers
2.	Pashupalan Evam Pashu Prabhandhan Ke Vaigyanik Siddhant-II	03 rd -07 th Feb, 2022	35	Farmers

B. Visits of Farmers/Students/Officials

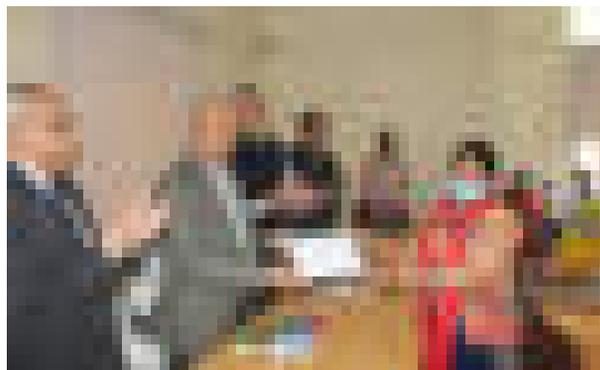
S. No.	Date of Visit	Number & Address of Farmer	Sponsoring Agency	Remarks
1.	08.09.2021	02 Members from NIRPHAD NGO	NIRPHAD & Purvanchal Gramin Vikas Sewa Samiti, Mathura	Provide information about organization of training
2.	04.10.2021	45 Farmers under the leadership of Mr. L N Sharma from Dausa (Rajasthan)	ATMA	Visit of Dairy farm and PGC, Distribution of literature to the farmers about the animal husbandry practices and delivered the lecture on Heifer management & Health management of Dairy Animals.
3.	05.10.2021	20 Farmers under the leadership of Dr. Ravinder Kumar & Dr. Kamal Kant, Haridwar, (Uttarakhand)	Agricultural Department, Uttarakhand	Provides hands on training, information and literature about dairy and goat farming. Visit of PGC, Goat unit and Dairy.
4.	27.10.2021	35 Farmers from, Fatehpur, Kanpur (Uttar Pradesh)	Pragya Gramothhan Sewa samiti	Provides basic information about the Dairy farming, loan and layout of ideal dairy farm with literature
5.	26.11.2021	24 Farmers under the leadership of Dr. Shiv Lal Singh from Kanpur (Uttar Pradesh)	Arpit Gramin Vikas Samiti,	Visit of Dairy farm and PGC, Distribution of literature to the farmers about the animal husbandry practices and delivered the lecture on care & management of Dairy Animals.
6.	12.12.2021	45 Farmers under the leadership of Mr. Dinesh Tiwari from Shahjahanpur (Uttar Pradesh)	Bhawana Sewa Sansthan	Visit of Dairy farm and PGC, Distribution of literature to the farmers about the animal husbandry practices and delivered the lecture on Milking management of Dairy Animals, Health management of Dairy Animals.



7.	15.12.2021	60 Farmers under the leadership of Dr. N P Singh from Nuh (Haryana)	Sehgal Foundation	Visit of Dairy farm and PGC, Distribution of literature to the farmers about the animal husbandry practices and delivered the lecture on Scientific management of Dairy Animals.
8.	18.12.2021	43 Farmers from District Sikar (Rajasthan)	ATMA	Visit of Dairy farm and PGC, Distribution of literature to the farmers about the animal husbandry practices and delivered the lecture on Milking management of Dairy Animals.
9.	21.12.2021	50 Farmers under the leadership of Mr. Awadesh Kumar from Dist. Hamirpur (Uttar Pradesh)	ATMA	Visit of Dairy farm and PGC, Distribution of literature to the farmers about the animal husbandry practices and delivered the lecture on care and management of Dairy Animals.
10.	31.01.2022	32 Farmers under the leadership of Shri Rakesh Pandey, from Shahjahanpur (Uttar Pradesh)	Saraswati Educational Society	Provides hands on training, information and literature about dairy and goat farming. Visit of PGC, Goat unit and Dairy.
11.	24.01.2022	30 Farmers under the leadership of Harendra Kumar from Jalaun (Uttar Pradesh)	Manav Vikash Samaj Sewa Samiti	Provides hands on training, information and literature about dairy and goat farming. Visit of PGC, Goat unit and Dairy.
12	16.02.2022	36 Farmers under the leadership of Shri Ashutosh Singh (Chhata)	Sehgal Foundation, Nuh (Haryana)	Visit of Dairy farm and PGC, Distribution of literature to the farmers about the animal husbandry practices and Visit of Goat Unit
13	17.02.2022	38 Farmers under the leadership of Shri Ashutosh Singh (Chhata)	Sehgal Foundation, Nuh (Haryana)	
14.	11.03.2022	40 Farmers under the leadership of Shri Dinesh Tiwari from Lucknow	Bhawna Sewa Sansthan,	Visit of Dairy farm and PGC, Distribution of literature to the farmers about the animal husbandry practices



Farmers' visit under interstate visit sponsored by ATMA



NABARD sponsored three days training on Goat Rearing



Celebration of World Disability Day

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 also provides 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.

i) Exposure visit of students

S.No.	Organization/institution Name	Date	Number	
			Male	Female
1.	Jawaharlal Nehru Krishi Vishwa Vidyalaya, College of Agriculture, Kundeshwar, Tikangarh (M.P)	25 th March 2021	31	12
2..	College of Agriculture, Rani Lakshmi Bai Central Agriculture University (M.P)	31 March 2021	17	14

ii) Exposure visit of farmers

S.No.	Department/Agency	Date	Number	
			Male	Female
1.	Om Goura Sewa Sansthan Goverdhan, Maath	03-01-2022	45	-
2.	Om Goura Sewa Sansthan Goverdhan, Maath	04-01-2021	24	-
3.	Om Goura Sewa Sansthan Goverdhan Kosi, Maath, Farah	05-01-2022	23	-
4.	Animal Husbandry Department, Hathbaudh (Chhattisgarh)	30-03-2022	48	-



Trainings organized

S. No.	Training Title	Number of participant	Duration and Place
1.	Multi Purpose Artificial Insemination Technician in Rural India (MAITRI)	30	23 rd Nov. - 22 th Dec., 2021
2.	Multi Purpose Artificial Insemination Technician in Rural India (MAITRI)	30	07 th Oct. – 06 th Nov., 2021
3.	Three days training programme for livestock owners of Uttarakhand under ATMA scheme	40	04 th -06 th Oct., 2021
4.	Scientific dairy management training of women sponsored by National commission for women	25	05 th -07 th Jan., 2022

Training Manual

S.No.	Title of Manual	Year	Author/Editors
1.	Multi Purpose Artificial Insemination Technician in Rural India(MATRI) Health and AI management in animal DUVASU publication no. 230	2021	Dr. Pankaj Kumar Shukla, Dr. Sanjeev Kumar Singh, Dr. Amit Singh and Dr.Rashmi
2.	Scientific Dairy Management sponsored by National commission for women DUVASU publication no. 244	2022	Dr. Pankaj Kumar Shukla, Dr. Sanjeev Kumar Singh, Dr. Amit Singh and Dr.Rashmi
3.	Scientific principles of Animal Husbandry	2021	Sarvajeet Yadav, Amit Singh and D. N. Singh
4.	Modern dairy farm practices for optimizing health and production	2021	Anuj kumar, Muneendra Kumar, D N Singh and Amit Singh

3. OTHER EXTENSION ACTIVITIES ORGANISED BY VARIOUS DEPARTMENTS OF COLLEGE OF VETERINARY SCIENCE AND ANIMAL HUSBANDRY

Extension trainings organized by different departments

No.	S. Theme of Training	Duration	No. of Trainees	Beneficiaries	Department
1.	Training on “Application of diagnostic imaging technology and management of surgical conditions in animals” was organized under All India Network Programme on Diagnostic Imaging and Management of Surgical Conditions in Animals (AINP-DIMSCA)	13 th -18 th Dec., 2021	10	Veterinary officers	Department of Veterinary Surgery and Radiology
2.	Public Awareness - डेरी पशुओं का उत्पादकता में वृद्धि हेतु साइलेज प्रबंधन	27 th Sept.2021	38	Rural Youth	Department of Animal Nutrition
3.	Public Awareness- पशु आहार में साइलेज की भूमिका	29 th Sept.2021	46		



4.	Public Awareness- साइलेज भारतीय परिस्थितियों में हरे चारे के संरक्षण की विधि	30 th Sept.2021	45	Rural youth	Department of Animal Nutrition		
5.	Three-days training on पशु आहार व्यवसाय: संभावनाएं एवं चुनौतियाँ	11 th -12 th Nov., 2021	20				
6.	Three-days training on ग्रामीण युवाओं के स्वावलम्बन हेतु पशु आहार उद्योग से जुड़े आयाम	16 th -18 th Nov., 2021	22				
7.	One-day Workshop on साइलेज: पशु पालकों को आय में वृद्धि का सरल माध्यम	01 st Dec., 2021	65				
8.	One-day Workshop on साइलेज प्रबंधन	04 th Dec., 2021	66				
9.	Three-days training on “Entrepreneurship avenues in feed processing sector”	06 th -08 th Dec., 2021	16				
10.	One-day Workshop on पशु आहार उत्पादन इकाई	28 th Dec., 2021	76				
11.	One-day Workshop on फीड प्रसंस्करण सम्बन्धी व्यवसाय	29 th Dec., 2021	65				
12.	Enterpreneurship training under RKVY funded project on “Grameen yuvaon ke swarozgar hetu Pashu aahar udyog- Ek Naveen vikalp”	20 th -22 nd Mar., 2021					
13.	Training programme on “ Control of subclinical parasitism in dairy	06 th -08 th Sep., 2021	10			Veterinary Officers	Department of Parasitology
14.	animals” under RKVY funded project	09 th -11 th Sep., 2021	10				
15.	Training programme on “Strategic control of subclinical parasitism for better animal health and enhanced productivity in U.P.”.	28 th -30 th Dec., 2021	200	Animal Owners			
16.	Training on Artificial Insemination - Chattisgarh	05 th – 10 th April, 2021	20	Veterinary Officers	Department of Veterinary Physiology		
17.	Training on Artificial Insemination - Haryana	19 th -24 th July, 2021	30				
18.	Training on Artificial Insemination - Uttar Pradesh	08 th -13 th Nov., 2021	20				
19.	Training on Artificial Insemination - Madhya Pradesh	14 th -19 th Dec., 2021	10				
20.	National Training on “Hands on training on Molecular Techniques Sponsored under ICAR (Schedule Caste Sub plan)”	22 nd - 28 th Mrach, 2022	15	Rural youth	Department of Veterinary Pharmacology and Toxicology		



Hands on Training Programme on Ethno-Veterinary Medicine



Hands on training on Molecular Techniques Sponsored under ICAR (Schedule Caste Sub plan)



4. EXTENSION TRAINING LECTURES/PUBLICATION

by the Faculty of various departments of College of Veterinary Science and Animal Husbandry

S.N.	Title of the lecture	Authors	Published in
1.	भारतीय गाय की मुख्य नस्लें	Dr. Vijay Kumar, Dr. S.P. Singh and Dr. Avneesh Kumar	Pashudhan Patrika, DUVASU, 2021
2.	डेयरी पशुओं में गर्भ की शीघ्र पहचान का महत्व एवं उसकी विधियाँ	डा. संजय कुमार मिश्रा, डा. अम्बिका शर्मा एवं डा. अतुल सकसैना	ई-पशुपालन अंक 4 संस्करण 2, अप्रैल 2021
3.	पशुओं के उपचार के लिए विभिन्न औषधियाँ बनाने की विधि तथा उनका उपयोग	डा. संजय कुमार मिश्रा एवं डा. अम्बिका शर्मा	
4.	गाय भैंस के नवजात बच्चों के अतिसार (काफ स्कॉर) का प्रबन्धन	डा. संजय कुमार मिश्रा एवं डा. अम्बिका शर्मा	
5.	गर्मी एवं बरसात के मौसम में पशुओं में होने वाले पशु रोग एवं उनसे बचाव	डा. संजय कुमार मिश्रा एवं डा. अम्बिका शर्मा	
6.	Veterinarians Response to COVID-19 Crisis	Dr. Ambika Sharma, Dr. Ashish Kumar, Dr. P Sharma and Dr. S. K. Mishra	E-Pashupalan, April 2021
7.	पशुधन से समृद्धि की ओर	डा. दीप नारायण सिंह	ई-पशुपालन अंक 4 संस्करण 2, (2021) 65-69
8.	पशु परिवहन एवं पशु कल्याण	डा. ममता, डा. रजनीश सिरोही, डा. दीपनारायण सिंह एवं डा. यजुवेन्द्र सिंह	पशुपालन मित्र (2021) 1(2) 3-7
9.	पशुओं के खुर की उचित देखभाल एवं प्रबन्धन	डा. अजय कुमार, डा. दीप नारायण सिंह एवं डा. ममता	पशुधन पत्रिका (2021) पंचदश अंक द्वितीय संस्करण।
10.	भारतीय दुधारू गौवंश एवं प्रमुख विशेषताएँ	डा. दीप नारायण सिंह एवं डा. संजय कुमार मिश्रा	ई-पशुपालन, मई 2021
11.	बकरी आजीविका एक सुरक्षित स्रोत	डा. ममता, डा. रजनीश सिरोही एवं डा. दीपनारायण सिंह	ई-पशुपालन, (2021) 1(1) 10-13
12.	Role of A1 A2 attribute in marketing management of goat milk	Prof. Deepak Sharma	MAITRI (Multi-Purpose AI technician in Rural India) Training programme from 07 th Oct. – 06 th Nov., 2021 and 23 rd Nov. - 22 th Dec., 2021
13.	Descriptive Illustration of different breeds of cow along with their conservation status, production and reproduction parameters		
14.	Importance of conservation of indigenous bovine germplasm		
15.	Breeding Strategies for improvement and conservation of bovine germplasm		



16.	Role of artificial insemination in genetic up-gradation and advantages and limitations of natural service vs artificial insemination	Prof. Deepak Sharma	MAITRI (Multi-Purpose AI technician in Rural India) Training programme from 07 th Oct. – 06 th Nov., 2021 and 23 rd Nov. - 22 th Dec.,2021
17.	Descriptive Illustration of different breeds of buffalo along with their conservation status, production and reproduction parameters	Dr. S. P. Singh	
18.	Conservation and development of indigenous breeds through Selective Breeding		
19.	Breeding Policy of Uttar Pradesh for Cattle and Buffalo		
20.	Cross Breeding Vs Selective Breeding: Their role in genetic improvement of Dairy Animals	Dr. Avneesh Kumar	
21.	Current Strength of Animal Husbandry Infrastructure and prospects of enforcement of breeding policy in Uttar Pradesh		
22.	Management of commonly affected poisons and toxins in dairy animals	Dr. Amit Shukla	
23.	Splenocyte culture to assess the immune-modulatory profile of phytoconstituents		
24.	Elucidation of Phytobiomolecules to ascertain their potential in regenerative therapy		
25.	An overview of the extraction methods used for isolation of phytoconstituents	Dr. Soumen Choudhury	
26.	Use of reverse transcriptase polymerase chain reaction (RT-PCR) in phytotherapy research		
27.	Exploratory studies on isolated tissue preparations to undermine the functional pharmacodynamics of phyto-biomolecules		
28.	Quantitative analysis of mRNA expression by RT-qPCR and its use in biomedical research		
29.	Principle of SDS-PAGE and Western blot techniques for evaluation of targeted protein expression		
30.	Use of AAS in estimation of macro and micro minerals in biomedical research using phyto-biochemicals	Dr. Atul Prakash	
31.	Production, processing and packaging of clean & hygienic milk	Dr. Meena Goswami	
32.	Vaccination schedule of bovine animals	Dr. Udit Jain	
33.	Cause and management of infertility in animals, importance of artificial insemination	Dr. Jitendra Kumar Agrawal, Dr. Vikas Sachan, Dr. Anuj Kumar and Prof. Atul Saxena	
34.	Role of clean and hygienic milk production in control of Mastitis	Dr. Parul	



35.	Subclinical parasitism: an overview	Prof. Daya Shankar and Dr. Jitendra Tiwari	Training programmes under RKVY Funded research project “Strategic Control of Subclinical Parasitism for Better Animal Health and Enhanced Productivity in Uttar Pradesh” from 06 th - 08 th Sept., 2022 and 09 th -11 th Sept., 2022
38.	Application of molecular tools in parasitology	Dr. Jitendra Tiwari and Dr. Vikrant Sudan	
39.	Tick control strategies in dairy animals		
40.	General guidelines for sustainable control of subclinical parasitism in animals	Dr. Ashok Kumar and Prof. Daya shanker	
41.	Diagnosis of endoparasites through conventional methods	Dr. Vikrant Sudan and Dr. Jitendra Tiwari	
42.	Demonstration of vectors and vector borne diseases	Dr. Amit Kumar Jaiswal, Dr. Pradeep Kumar and Prof. Daya Shanker	
43.	पशुओं के प्रमुख पशुजन्य रोग एवं बचाव के तरीके	Dr. Udit Jain	5 days Online training on “Scientific principal of management in animal husbandry” by Directorate of Extension, DUVASU, Mathura from 29 th Nov to 3 rd Dec., 2021 and 03 rd - 07 th Feb., 2022
44.	दूध के विभिन्न उत्पाद बनाने की वैज्ञानिक विधियाँ	Dr. Meena Goswami	
45.	दूध की गुणवत्ता की जाँच एवं नकली दूध की पहचान की विधियाँ	Dr. Sanjay Kumar Bharti	
46.	Metabolic and production diseases of dairy animals and its prevention and control	Dr. Parul	
47.	Important zoonotic diseases of animals and its prevention and control		
48.	Age Estimation in Domestic Animals	Dr. Abhinov Verma, Dr. Shri Prakash Singh, Prof. Ajay Prakash, Prof. Archana Patahk and Prof. M. M. Farooqui	e-pashupalan, Volume 2, Issue 11 (2021) Pages: 74-79
49.	दूध की गुणवत्ता की जाँच एवं नकली दूध की पहचान की विधियाँ	Dr. Meena Goswami	Women training sponsored by National Commission for Women from 05 th - 07 th January, 2022
50.	दूध उत्पादों का विपणन एवं सरकारी योजनाएँ	Dr. Sanjay Kumar Bharti	
51.	सामिश भोजन के गुण संवर्धन हेतु विविध पाक विधियाँ	डा. संजय कुमार भारती, डा. विकास पाठक, डा. अनिता, डा. मीना गोस्वामी	पशुधन पत्रिका (2021) जुलाई पृष्ठ 11
52.	पशुओं के प्रमुख विषाणुजनित रोग एवं उनका टीकाकरण	डा.रूचि तिवारी	Training under Unnat Dairy Palan Scheme, DUVASU, 5th January, 2022
53.	An update on biomarkers and sensors for monitoring real time data on poultry health and welfare	Dr. Alok Kumar Chaudhary, Dr. Sanju Kumari, Dr. Pradeep Kumar and Dr. Ruchi Tiwari	Poultry Technology, (2022) 16(2): 98
54.	Epigenetic Effects in Poultry: Concepts and Way Forward	Dr. P. R. Jadhav, Dr. A. Bhattacharyya and Prof. P.K.Shukla	Poultry Planner (2021) : 22-24



55.	टर्की पालन: एक लाभदायक व्यवसाय	Dr. A. Bhattacharyya and Prof. P.K.Shukla	Pashupalak Nirdeshika Published by Deptt. of A.H., 2021) : 6-8
56.	जापानी मस्तिष्क ज्वर - एक पशुजन्य रोग	Dr. Parul, Dr. Udit Jain and Dr. Barkha Sharma	Pashudhan Patrika (2021) DUVASU, Mathura
57.	बकरी पालन में कृत्रिम गर्भाधान तकनीक का महत्त्व	डा. अवनीश कुमार सिंह एवं डा. विकास सचान	पशुपालन मित्र (2021)1(3):11-12
58.	डेयरी पशुओं में सिस्टिक ओवेरियन डिजनरेशन	डा. संजय कुमार मिश्रा, डा. विकास सचान, डा. जितेन्द्र अग्रवाल, डा. अनुज कुमार एवं डा. अतुल सक्सैना	ई-पशुपालन (2021) 4(2), 54-57
59.	शीत ऋतु/सर्दियों में गर्भित पशुओं का प्रबंधन	डा. संजय कुमार मिश्रा, डा. अनुज कुमार एवं डा. विकास सचान	ई-पशुपालन (2021) 12(2), 1-2
60.	पशुओं के गर्भित न होने का प्रमुख कारण है: एंडोमेट्राइटिस	डा. संजय कुमार मिश्रा, डा. जितेन्द्र अग्रवाल, डा. विकास सचान एवं डा. अतुल सक्सैना	पशुधन प्रकाश पत्रिका 2021 12: 117-119
61.	गाय एवं भैंस में मद/गर्मी से सम्बंधित प्रजनन समस्याएँ एवं निवारण	डा. विकास सचान, डा. संजय कुमार मिश्रा एवं डा. अवनीश कुमार सिंह	पशुपालन मित्र (2022) 2(1): 8-9
62.	गाय और भैंस में मस्रानित गर्भ की पहचान एवं उपचार	डा. संजय कुमार मिश्रा, डा. अनुज कुमार, डा. जितेन्द्र अग्रवाल एवं डा. अतुल सक्सैना	ई-पशुपालन (2021) 3(2), 8-9
63.	पशुओं में ब्याने के समय और उसके तुरंत बाद की सावधानियाँ	डा. संजय कुमार मिश्रा, डा. जितेन्द्र अग्रवाल डा. विकास सचान एवं डा. अतुल सक्सैना	ई-पशुपालन (2021) 3(2), 8-9
64.	भारत में प्रजनन हेतु साड़ों की स्थिति एवं उनका प्रबंधन	डा. विकास सचान	पशुधन प्रकाश पत्रिका 2021 11:50-52
65.	डेयरी पशुओं में कम समय के गर्भ की पहचान की विधियाँ	डा. आशुतोष बसेरा, डा. जितेन्द्र अग्रवाल एवं डा. अतुल सक्सैना	पशुधन प्रकाश पत्रिका 2021 12



Exposure Visits of Dignitaries, Veterinary Officers, Students and Farmers

S. No.	Date	Exposure visit of farmers, students, Veterinary Officers, Dignitaries
1.	07.04.21	Dr. C. M. Kulshreshtha (Retired Professor & Head - C.V.Sc. & A.H.) along with Dr. S. V. Singh (Prof. & Head - GLA University, Mathura), visited the Department of Poultry Science.
2.	16.06.21	Dr. G. Goyal (Asst. Prof. - Department of Poultry Science, C.V.Sc. & A.H., NDVSU, Jabalpur, M. P.) along with 3 persons visited the Department of Poultry Science.
3.	16.06.21	Dr. V. Raj Kumar (Principal Scientist- CIRG, Makhdoom, Farah) and Dr. Khushyal Singh (Senior Scientist-CIRG, Makhdoom, Farah) along with 4 persons visited the Department of Poultry Science.
4.	16.09.21	Dr. S. B. Bakshi; Dr. Subhasis Batabyal and Dr. D. Madhuri as inspectors of VCI visited the Department of Poultry Science.
5.	18.09.21	Forty (40) nos. of female farmers of Agriculture Skill Development Programme organized by Animal Husbandry Department Nalanda district (Bihar) along with Mr. Ranjan Kumar (BTM) and Mr. B. Kumar (ATM), visited the Department of Poultry Science.
6.	23.11.21	Dr. Simmi Tomar (Principal Scientist), Central Avian Research Institute, Izatnagar UP visited Department of Poultry Science.
7.	24.11.21	Dr. K. Ravi (Ex-Director CPDO-NR) along with 2 persons visited Department of Poultry Science.
8.	29.11.21	Dr. S. K. Sheetal (Assistant Professor-VOG), Bihar Veterinary College, BASU, Patna (Bihar) visited Department of Poultry Science.
9.	30.11.21	Dr. A. K. Das (Professor-VSR), College of Veterinary and Animal Sciences, GBPUA&T, Pantnagar (Uttarakhand) visited Department of Poultry Science.
10.	23.12.21	Mr. A. K. Singh (Deputy Director Agriculture, Mathura) visited Department of Poultry Science and appraised the activities of DUVASU Poultry Farm.
11.	23.12.21	Dr. H. N. Singh (Former Dean, C.V.Sc. & A.H., NDUAT, Ayodhya) and Mr. S. K. Mishra (Managing Director-Smart Grid Pvt. Ltd. Ahmedabad, Gujarat) along with one staff visited Department of Poultry Science.
12.	24.12.21	Dr. Archana Pathak (HOD-Veterinary anatomy cum Coordinator-MAK, DUVASU, Mathura) and four numbers of female Assistant Professor of various departments of the University along with 42 female participants of Mahila Adhyayan Kendra (MAK) visited the Department of Poultry Science in the month of 24/12/21 and saw the activities of DUVASU Poultry Farm.
13.	31.01.22	Mr. Bipin Kumar (H. J. S. Apar Jila Evam Satra Nyayadhish, Mathura) along with his family members (6 numbers) visited Department of Poultry Science and appraised the activities of DUVASU Poultry Farm.
14.	07.02.22	Er. Chinmoy Ghosh (AGM - NBCC India Ltd. on behalf of Rani Lakshmi Bai Central Agricultural University) along with his colleague visited Department of Poultry Science and appraised the activities of DUVASU Poultry Farm.
15.	30.03.22	Dr. B. L. Banerjee (VAS- Baloda Bazar, Chhattisgarh) along with his one colleague and 15 farmers visited Department of Poultry Science and appraised the activities of DUVASU Poultry Farm.



5. KRISHI VIGYAN KENDRA

1. Training Programmes

Clientele	No. of Courses	Male	Female	Total participants
Farmers & farm women	79	1758	312	2070
Rural youths	16	243	101	344
Extension functionaries	11	272	60	332
Total	106	2273	473	2746

2. Frontline demonstrations:

To showcase the potential of various varieties and other proven technologies, frontline demonstrations on farmers field were conducted. The detail of demonstrations conducted is given below.

Enterprise	No. of Farmers	Area (ha)	Units/Animals
Oilseeds	205	87.2	-
Pulses	130	50	-
Cereals	612	461	-
Vegetables	20	8	-
Other crops (Berseem)	55	4	-
Total	1022	610.2	-
Other enterprises	25	-	-
Total	25	-	-
Grand Total	1047	610.2	-

3. Technology Assessment & Refinement (On Farm Testing)

Category	No. of Technology Assessed & Refined	No. of Trials	No. of Farmers
Technology Assessed			
Crops	11	52	52
Livestock	1	4	4
Total	12	56	56

4. Extension Programmes

Category	No. of Programmes	Total Participants
Extension activities	112	6864
Other extension activities	3	7031
Total	115	13895

5. Mobile Advisory Services

Name of KVK	Message Type	Crop	Weather	Awareness	Total
	Text only	20	2	4	26
	Total Messages	20	2	4	26
	Total farmers Benefitted	550	-	-	550

6. Seed & Planting Material Production

	Quintal/Number	Value Rs.	Distributed to No. of farmers
Seed (q)	676 q.	28.00 Lac Approx	Supply to IARI, New Delhi
Planting material (No.)	39300	2750	200
Bio-Products (kg)	2850	7250	27

7. Soil, water & plant Analysis

	Samples	No. of Beneficiaries	Value Rs.
Soil	1015	544	7105.00
Water	49	36	0
Total	1064	580	7105

6. MAHILAADYAYAN KENDRA

For the women empowerment and socio-economic upliftment of rural women various programmes were conducted by the Mahila Adyayan Kendra, DUVASU Mathura during the year 2021-22. In July, 2021 rural women were sensitized about the various laws beneficial to stop the crime against women. A medical camp was organized in village to monitor the health status of women and girls. During the month of August 2021, one day awareness camp was organized against the social evils of the society. Women were also informed about the various schemes run by Panchayati Raj Department. In the month of September, 2021 an awareness programme was organized on the importance of girl child education and one Day Workshop was organized on

the role of proper Nutrition for the growth and development of women. In October 2021 an awareness programme was organized to highlights the tips for the care of physical and mental health of elderly women and girls. On the occasion of Children's Day, one day workshop was organized in the month of November 2021. In December 2021, an awareness camp was organized for the girl students to educate them on the sources of energy and how to save them. For elderly women, lectures were delivered by the subject matter specialists on the importance of organic farming and vermicompost. A visit of goat Farm, rooster Farm and earthworm (vermicompost) unit of DUVASU was organized for rural women to make them ware about these units to make them self-reliance.





UNIVERSITY FARMS

A. LIVESTOCK FARM COMPLEX (LFC)

At LFC Mathura, the total numbers of animals on 31.03.2022 were 659. It included Haryana cattle (237), Crossbred cattle (54), Sahiwal cattle (264), Murrah buffalo (68), Nili Rvai buffalo (03) and Teaser bull (03). During 2021-22, total milk production at the farm was 1,91,386.50 liters, out of which, the production of cow milk was 1,49,890.50 liters, buffalo milk was 41,496.00 liters. The animals are being used for research work of M.V.Sc. & Ph.D students of the University. During the financial year 2021-22 the revenue generated at LFC was Rs. 62,93,135-00 (sixty two lac ninety three

thousand one hundred thirty five only). Out of which Rs. 62,22,260-00 (sixty two lac twenty two thousand two hundred sixty) was generated through the sale of milk coupons, Rs. 3,000-00 (three thousand only) through the sale of dung/fertilizer and Rs. 67,875-00 (sixty seven eight hundred seventy five only) 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 of during 2021-22.

Sl.	Poultry stocks	Quantity (nos.)
1.	Japanese quails	860
2.	Chabro birds	1471
3.	Other Chicken birds (nos,) viz. Black Rock (4); White Rock (14); CHD Broiler (16); Red Cornish (12); Dehlem Red (15); Barred Rock (8); PB Broiler (4); PB-1 Layer (6); Punjab Brown (8) and CHD Black (25)	112
4.	Guinea fowl birds	33
5.	Turkey birds	194
6.	Emu	1
7.	Kadaknath bird	79
8.	Aseel bird	30
9.	Naked Neck bird	13
10	Layer birds	167
11	Cockerels	10
	Grand Total	2,970

During FY 2021-22, the farm generated a revenue of Rs. 9, 06, 265.00/- (nine lac six thousand two hundred sixty five) from sale of different birds and eggs. Additionally, a sum of Rs. 7, 21, 490.00/- (seven lac twenty one thousand four hundred ninety

and 4, 17, 521.00/- (four lac seventeen thousand five hundred twenty one) 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 overall production of Rabi crops 2021-22 (451 Acre of land) during FY- 2021-22

S. No.	Name of Crop	Variety	Area (in Acre)	Production (in Quintal)	Production Program	Utilization	Income (Approximate in lacs)
1	Mustard	RH-725	196	421.00	Commercial Production	Sold at Farm	26.18
2	Barley	NB-2	105	606.75		Supplied to LFC Dairy farm & Goat farm, DUVASU, Mathura	15.16
3	Wheat	DBW-187	150	2082.93	Seed Production	supplied to NSC Agra	42.72
4	Bhusa (Wheat and Barley)	-	-	805.00	Fodder production	Supplied to LFC Dairy farm & MKD Dairy farm, DUVASU, Mathura	9.66
Total			451.00	3915.68	-	-	93.72

- A revenue of Rs 26.18 lacs was generated by the sale of mustard at the rate of Rs. 6220.00/quintal.
- 606.75 quintal of Barley (jau) produced at madhurikund farm was supplied to LFC and Goat farm and also preserved as seed for the next year at store of LFC. The estimated cost of barley was approximately 15.16 lacs.
- 2082.93 quintal of wheat seed produced at

Madhurikund farm was supplied to NSC, Agra. The estimated cost of the same was 42.72 lacs.

- 805.00 quintal of Wheat bran produced at farm was supplied to LFC and Goat farm. The estimated cost of wheat bran was 9.66 lacs.

Thus the total revenue generated during financial year 2021-22 at Madhurikund farm was 93.72 lacs.



HUMAN RESOURCE DEVELOPMENT

National E- Quiz Competition on 'Comparative Osteology, Arthrology and Myology of Domestic Animals' on Celebration of 105th Birth Anniversary of Pandit Deen Dayal Upadhyaya

A National E- Quiz Competition on Comparative Osteology, Arthrology and Myology of Domestic Animals on Celebration of 105th Birth Anniversary of Pandit Deen Dayal Upadhyaya was organized by Department of Veterinary Anatomy, College of Veterinary Science & Animal Husbandry, DUVASU, Mathura on 25th September, 2021 under NAHEP. The competition was open for the undergraduate and postgraduate students of Veterinary Science. In this competition, 1280 participants registered from different parts of the country. Out of which 916 participants successfully submitted their response within time frame of 30 minutes. Shri Aruneshwaran E L of VCRI, Nammakal scored 49/50 and attained first rank. Three students, Shri Venkatesh Dwalikar (VCH Bangalore), Prothoma Kalidaha (WBUAFS, Kolkata) and Rittik De (WBUAFS, Kolkata) scored 48/50 and achieved second rank. The third rank was scored by eleven students named Srinath RD (Veterinary College Bangalore), Hema (Sri Venkateswara Veterinary University), Kaustubh Sarvate (Veterinary college Mhow), Thomas Joseph (Madras Veterinary College), Siddharth Singh (Madras Veterinary College), Talupuru SaiUrmila (C.V.Sc, S.V.V.U, Tirupati), VakaHarideep (C.V.Sc, S.V.V.U, Tirupati), Karnam Mohan Sujana (C.V.Sc, S.V.V.U, Tirupati), Suraj Dhankar (COVAS, SVPDAT, Meerut), Kavisha Gangwar (DUVASU, Mathura) and Dinesh kumar. J (VCRI, Namakkal) and their score was 47/50.

National E-Quiz on 'Animal Biochemistry'

On the auspicious occasion of Teacher's Day on 5th September 2021, Department of Veterinary Biochemistry, College of Veterinary Science and Animal Husbandry, DUVASU, Mathura has organized a National level e-Quiz competition on "Animal Biochemistry" under flagship of National Agriculture Higher Education Project (NAHEP) of the University. Hundred and twenty six students have participated in the competition from all over the country. The level and standard of the questions of the quiz was well admired and appreciated by all the participants of the quiz.

Two Days Workshop on 'Intellectual Property Protection'

Department of Veterinary Biochemistry, College of Veterinary Science and Animal Husbandry, DUVASU, Mathura organized a Two days' online workshop on "Intellectual Property Protection" on 20th & 21st November 2021 under National Agriculture Higher Education Project (NAHEP) of the University. The guest speaker for the workshop was Dr. Bharti Jain, Advocate and Patent agent, New Delhi. The talk of Dr Jain was exceptionally motivational and immensely useful for the students and young faculty and scientists. The workshop as a whole was well appreciated by most of the participants.

Hands on Training on 'Analytical and Molecular Techniques to Decipher the Role of Phyto-biomolecules in Veterinary Therapeutics'

Hands on Training on "Analytical and Molecular Techniques to Decipher the Role of Phyto-biomolecules in Veterinary Therapeutics" was organized w.e.f. 18th – 27th October, 2021 under



Training on 'Analytical and molecular techniques to decipher the role of phyto-biomolecules in veterinary therapeutics'

SCSP of ICAR All India Network Programme on Ethno-Veterinary Medicine.

21 Days Online ICAR Sponsored Winter School on 'Processing and Quality Evaluation of Functional Foods of Animal Origin'

Department of Livestock products technology organized 21 days online ICAR Sponsored Winter School on "Processing and quality evaluation of functional foods of animal origin" from 18th January-07th February, 2022 was organized by Department of Livestock Products Technology, DUVASU Mathura. Total 28 participants participated from different states of the country including academicians and researchers from colleges and universities as well as KVKs and from ICAR system. Various esteemed speakers from different prestigious Institutes shared their crucial work and innovative ideas related to development and processing of functional foods of animal origin.

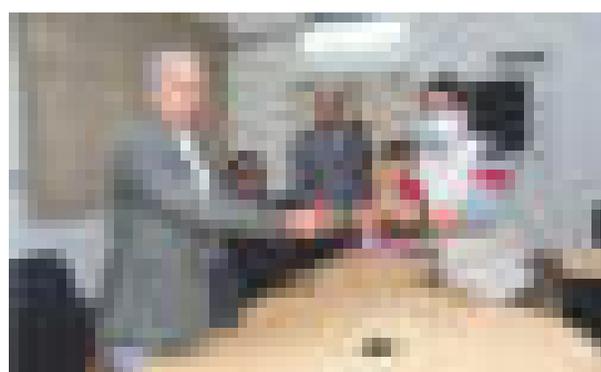
Training Program on 'Advances in Diagnosis and Management of Surgical Conditions in Animals' Under AINP-DIMSCA

Department of Veterinary Surgery and Radiology, DUVASU, Mathura conducted a six-day short training on "Advances in Diagnosis and Management of Surgical Conditions in Animals" under AINP-DIMSCA for Practicing Field Veterinarians from 13th-18th December, 2021. The training was attended by ten veterinary officers of the Animal Husbandry Department of U.P. Government.

Out of ten, three were from Mathura, two from Aligarh, one from Baghpat, one from Firozabad, one from Lucknow, one from Shravasti, and one from Hathras. This training had eight lectures and eight hands-on training sessions. 7 lectures were delivered by the faculty of DUVASU, Mathura while 1 lecture and hands on training on Direct Digital Radiography was delivered by Dr. Iliye Raja, Deputy Director, Veterinary Services, Wildlife SOS, India. A visit to Elephant and Bear rescue centres to update the information on wild animals particularly hospital set-up, physical and chemical immobilization, diagnosis and treatment of common diseases, was also organized. Lectures on Diagnostic imaging (X-rays, CR, DDR, USG, Endoscopyetc), Anaesthetic protocols, reproductive emergencies, surgeries under field condition, ECG, interpretation of haematological and biochemical parameters were delivered by faculty members of surgery, medicine, gynecology and pathology. Post-mortem examination and drafting of PM report, management of urolithiasis, teat instrumentation, orthopaedic and ophthalmology were also introduced into the training programme based on trainee's requirements.

Online National E-Quiz Competition on World Zoonoses Day

Online National e-quiz competition on World Zoonoses Day was organized by Department of Veterinary Public Health on 6th July, 2021. In this quiz, 227 students participated out of which 156 students have qualified the quiz competition.



Training on 'Advances in diagnosis and management of surgical conditions in animals' under AINP-DIMSCA



Faculty Development Training on 'Applications of OMICS Tools and Techniques for Veterinary Science using NGS data'

A five days training programme was organized under faculty development programme of IDP, NAHEP on “Applications of OMICS Tools and Techniques for Veterinary Science using NGS data” by DUVASU, Mathura from July 6th to 10th, 2021. The ICAR-IASRI, New Delhi was the resource institute. Dr. Anil Rai, Head, Dr. Dinesh Kumar, Dr U.B. Angadi (Principal scientists), Dr. Sarika and Dr. M. A. Iqbal (Senior scientists) were the resource persons from the resource institute. The main aim to organize this training was to cater the need of biotechnological research of the country. This programme was especially customized with contents of state-of art in linking use of genomics data animal sciences. The participants were educated about various approaches for genomic data analysis in veterinary sciences and acquainted with various software packages and computational tools used in genomics. Twenty one participants have participated from the different departments of College of Veterinary Science and Animal Husbandry, DUVASU, Mathura.

Workshop on 'Intellectual Property Rights (IPR) Patents and Design Process'

The workshop was Jointly Organized by College of Veterinary Science & Animal Husbandry, DUVASU, Mathura along with Rajiv Gandhi National Institute for Intellectual Property Management (RGNIIPM), Nagpur on "Intellectual Property Rights (IPR) Patents and Design Process", which has been established by the Government of India as the Centre of Excellence for Intellectual Property Right (IPR) training under the Ministry of Commerce & Industry and is engaged in conducting training programmes under the National Intellectual Property Awareness Mission (NIPAM), National IPR Policy 2016, DIPP, Government of India.

The main purpose of the workshop was to sensitize about the faculty and research scholar about Intellectual Property Right (IPR). Intellectual Property Right plays a key role in gaining advantages position to promote economic growth of our nation. India enjoys a large asset of R&D personnel and infrastructural facilities. Scientists and policy makers need more information, orientation and facilities for protecting the products of intellectual prowess of Indian Scientists. The Workshop covered the topics like Introduction and need of Intellectual Property Rights (IPRs), Copyright and Trademark Management, Guidelines and procedure of Patent filing in the country.

102 participants registered for the workshop, out of which 87 participants (Faculty/teaching associates/Research Scholar) from College of Veterinary Science & Animal Husbandry, DUVASU, Mathura, Bihar Veterinary College, Veterinary College, Guwahati attended the workshop.

Feedback responses from the participants showed that the topic was broadly covered on all aspects of IPR in an easy way. Majority of the participants were of the opinion that speaker was knowledgeable; delivery of presentation was good with nice slides and well organized presentation. Almost all the participants were highly satisfied with the workshop and gained basic understanding about the IPR. Adequate time was provided for questions & discussion, and clearing doubts. The workshop ended with vote of thanks to the speaker, its organization as well as to the participants.

National Symposium on 'Physiological Interventions for Augmentation of Sustainable Animal Production'

Department of Veterinary Physiology, College of Veterinary Science and A.H., DUVASU, Mathura organized the 3rd Annual conference of APA and National symposium on “Physiological interventions for Augmentation of Sustainable Animal





Production” on 24th and 25th September 2021 in hybrid mode. In the inaugural session of the conference, Prof. A K Shrivastava, Member ASRB, New Delhi was the Chief Guest, Dr. N.K. Lohiya, Secretary NASI was the Guest of honour and Prof. G.K. Singh, Vice Chancellor DUVASU, Presided over the function. The Valedictory function of the conference was chaired by Prof. G.K. Singh, Hon'ble Vice Chancellor DUVASU, Mathura. Dr. R.C. Agrawal, DDG (Education) ICAR was the Chief Guest and the former DDG (AS) ICAR and the former Vice Chancellor, DUVASU Prof. K.M.L. Pathak were the Guests of Honour. Later in the evening of 24th September, 2021, Prof. N.C. Gautam, Hon'ble Vice Chancellor M.G. Garamodaya Vishwavidhyalaya, Chitrakoot and Prof. J.P. Sharma, Hon'ble Vice Chancellor SKUAST, Jammu and Kashmir also joined the function.

Training Programme for Veterinary Officers Under RKVY Project on 'Strategic Control of Subclinical Parasitism for Better Animal Health and Enhanced Productivity in U.P.'

Department of Parasitology organised Two trainings of three days for ten Veterinary Officers of U.P. under RKVY sponsored project on “Strategic control of subclinical parasitism for better animal health and enhanced productivity in U.P.” from 06th - 08th September 2021 and 09th -11th September 2021. The training was organised on the topic “Control of subclinical parasitism in dairy animals” considering the burning problem of sub-clinical parasitism at field level. The training included both theoretical and hands-on practical exposure of latest techniques for diagnosis and control of parasitic diseases. Expert lectures and practical exposure to other subjects like Medicine, Gynaecology, Nutrition and LPM was also included in the training programme for the benefit of trainees. All the theoretical and practical lectures were provided to the trainees in the form of compendium for their reference purposes. In the valedictory functions of the training, Prof. G.K. Singh, Vice-Chancellor, DUVASU and other senior officers of the University provided certificates to the trainees. All the participants in their feedback appreciated the efforts of the organizing committee and were pleased to get the updated knowledge during the training programme. Under these training programmes Training Manual for Field Veterinary Officers on the topic “Control of subclinical parasitism in dairy animals” was also provided to the participants.

Field Demonstration of Acaricidal Activities of

Neem and Nirgundi Decoctions

Under the NIF sponsored project on “Evaluation and popularization of indigenous acaricidal medication against tick infestation in regions of Uttar Pradesh” In-vitro efficacy trials of neem and Nirgundi leaf extracts were conducted and field demonstration of acaricidal activities of Neem and Nirgundi decoctions were conducted in Twenty villages of Raya (23-25 September 2021), Farah (28-30 September 2021), Nand Gaon (11-13 September 2021) and Chhata (16, 22 and 23 October 2021) blocks of Mathura district. Under this programme animal owners aware about the life cycle of ticks and method of indigenous control of tick infestation on cattle and buffalo. Method of preparation of decoction and application on the animals was demonstrated to the animal owners on first day of visit to the area and effect of this preparation was shown to them in the subsequent visits.

Training programme for Animal owners under RKVY Project

Department of Parasitology organised Three trainings of one day each for Animal Owners of *Bharou garh*, *Vanse* and *Bhijari* villages of Raya block of Mathura on 28th -30th December 2021 under RKVY sponsored project on “Strategic control of subclinical parasitism for better animal health and enhanced productivity in U.P.”. The training was organised for animal owners for making them aware about the sustainable control of subclinical parasitism in dairy animals. Harms caused by the parasites and effective control of parasitic diseases were discussed with the animal owners. During these training programmes, kits consisting of anti parasitic drugs and mineral mixture were distributed to 200 animal owners. In the training programmes animal owners were also make aware on other aspects of the animal health by the experts from Animal Nutrition, LPM, Medicine, Gynaecology and Obstetrics Departments of the University.

Dr. C.M. Singh Birth Centenary Year Celebrations cum International Webinar on Advances of Veterinary Sciences during Platinum Jubilee Year of India's Independence

Uttar Pradesh Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go-Anusandhan Sansthan (DUVASU), Mathura was privileged to host Dr C.M. Singh Birth Centenary Year Celebrations (30-11-2021 to 30-11-2022) cum International Webinar on Advances of Veterinary Sciences during Platinum Jubilee Year of Indian



Independence (1947-2022) on 30th November 2021 with an earnest attempt to explore novel and interesting areas in the field of veterinary sciences, the common thread which connects all of us.

With a hope that the international webinar will draw attention of the participants and the scientific community will be benefitted with innovative ideas with geared up advances in veterinary science, strengthening the scientific impact with firmly reinforcing its societal and global relevance.

The webinar started with Saraswati Vandana followed by University song by the students of College of Veterinary Science & Animal Husbandry. This was followed by a warm welcome of a galaxy of eminent learned personalities, the delegates and participants by the Organizing Secretary of the webinar Professor P.K. Shukla, Dean, Veterinary Science. Dr. R. Somvanshi, Hony. Secretary, CMSET, Bareilly apprised the participants about the life and contributions of Dr. C.M. Singh, The Doyen of Veterinary profession. This was followed by a lecture “*padh chinha ek karmyogi ke*” by Dr. Satyendra Singh, Chintan International Trust, Bereford Drive, London, younger son of Dr. C.M. Singh, a social worker promoting health and sustainable development among disadvantaged and vulnerable populations in India and other developing countries restoring the environmental heritage. The opening remark of the webinar was delivered by Dr. B.N.Tripathi, DDG, Animal Science, Chairman, Birth Centenary Celebrations committee. The 9th Dr. C.M.Singh memorial lecture on glorious Saga of Indian Livestock Development-vital for food and nutrition security will be presented by Professor A.K.Srivastava, Member, ASRB, New Delhi. The Organizing Secretary of the webinar, Professor P.K.Shukla, introduced and felicitated Professor A.K.Srivastava, Member, ASRB with citation reading to the participants. This was followed by Award ceremony. Professor G.K.Singh was conferred Dr. C.M. Singh Samman and Late Dr. J.N. Dwivedi was conferred Dr. C.M. Singh Salihotra Samman. The citations for these were read by Dr. R.Somvanshi, Hony. Secretary, CMSET, Bareilly.

Dr. M.L. Mehrotra was conferred Dr. C.M. Singh Salihotra Samman and for this Professor P.K.Shukla read the citation. Shri R.K.Nagpal was conferred Dr. C.M. Singh-Dr. R.D. Sharma award. *All India Dr. C.M.Singh Birth Centenary Year Essay writing competition* prizes were awarded to veterinary science students. Dr. Kavisha Gangwar, MVSc Scholar, DUVASU, Mathura stood first, Dr Megha Sharma, PhD Scholar, IVRI, Bareilly stood second, Neha Singh, BVSc & AH 2nd Year, DUVASU, Mathura stood third in hindi version. Rohit Singh, BVSc & AH 3rd Year, FVAS, BHU, Mirzapur stood first, Dr Amol Patil, PhD Scholar, IVRI, Bareilly stood second, Dr Panna Lal Panwar, PhD Scholar, CVSc & AH, NDUVS, Mhow stood third in English version. Professor G.K.Singh, Vice-Chancellor, DUVASU, Mathura delivered the presidential address. The inaugural session of the webinar ended with vote of thanks by Professor P.K.Shukla, Dean, Veterinary Science. The afternoon technical session of the webinar was chaired by Founder Vice-Chancellor, Professor S.K.Garg. Shri Tarun Shridhar, IAS (Retd.), Former Secretary, DAHDF, Govt. of India, Administrative Member, Kolkata Branch of CAT, Kolkata, West Bengal delivered his lecture on the topic “Anti-microbial Resistance and climate change: Veterinary science should dispel the myths”. Lecture on “Emerging trans boundary animal diseases in India” was delivered by Dr. M.S. Oberoi, International Animal health expert, Formerly FAO of the UN Sub-Regional ECTAD Manager & Regional Coordinator and Dean, College of Veterinary Science, PAU, Ludhiana, Punjab. Dr. Krishna K.Singh, Consultant Surgeon, Specialist in Upper Gastrointestinal and minimally Invasive Surgery, University Hospitals Sussex, Brighton, Regional Specialty Professional Adviser, Royal College of Surgeons, England delivered a lecture on “Patient centered and evolution of minimally invasive cancer surgery. The session ended with concluding remarks from the chair and a brief note by Dr. J. M. Kataria, Co-Chairman of the session and vote of thanks. The co-organizing secretaries for the webinar were Dr. Amit Singh, Dr. Muneendra Kumar and Dr. Ambika Sharma, DUVASU, Mathura



Professor G.K.Singh, Vice-Chancellor, DUVASU, Mathura delivered the presidential address



PARTICIPATION OF FACULTY MEMBERS IN INTERNATIONAL AND NATIONAL WEBINAR / CONFERENCES / SYMPOSIA

S. No.	Name of the faculty member	Title of the event	Date
A. International			
	Dr. D. N. Singh	International webinar on “Opportunities in Value addition to Meat” organized by Sathya Zero grazing with the support of NAHEP.	13 th Jun., 2021
	Dr. D. N. Singh	International webinar on “Impact of Oxidative stress on male and female Reproduction” organized by ICAR-National Dairy Research Institute (NDRI), Karnal, Haryana	1 st Jul., 2021
	Prof. Vikas Pathak Dr. Udit Jain Dr. Meena Goswami Dr. Sanjay K. Bharti	3 days International Symposium on Holistic Approaches to the Meat food quality & safety in continuum from Farm to Fork” organized by Dept. of LPT, SVPUAT, Meerut	25 th -27 th Nov., 2021
	Dr. Neeraj Kr Gangwar Dr. Shyama N. Prabhu Dr. Renu Singh	Online International symposium on ‘Advances in Veterinary Pathology for Diagnosis and Control of Emerging and Re-emerging Diseases of Livestock, Wild Animals and Poultry’, organised at RAJUVAS, Bikaner, Rajasthan	17 th -19 th Dec., 2021
	Prof. Ajay Prakash Prof. M M Farooqui Dr. ShriPrakash Singh Dr. AbhinovVerma Dr. Brijesh Yadav Dr. Dilip K. Swain	International webinar on “Impact of oxidative stress on male and female reproduction” organized by IDP under NAHEP, NDRI, Karnal	1 st Jul., 2021
	Prof. M M Farooqui	International webinar on “COVID 19: where we do go from here to deal Zoonoses” organized by CDSRZ, Department of Medicine, PGIVR, Jaipur , Rajasthan	6 th Jul., 2021
	Prof. Archana Pathak Prof. Ajay Prakash Dr. Varsha Gupta Dr. ShriPrakash Singh Dr. AbhinovVerma	XXXV Annual convention of Indian Association of Veterinary Anatomist and International Symposium on “Modern concept in Anatomy: New era tools in health and diseases”, organized by Department of veterinary Anatomy, College of Veterinary Science, LUVAS, Hisar, Haryana.	10 th - 12 th Mar., 2022
B. National			
	Dr. Avinash Kumar	Webinar on “Phytogenic feed additives for improving protein efficiency in dairy cattle” conducted by Virbac Animal Health India Pvt. Ltd (India)	12 th May., 2021
	Dr. Rajneesh Sirohi	National webinar “Food Fishes from India Nutritional Highlights & Live Feed Culture for ornamental Fishes” held at Marsco Aqua Clinics-Aqua one Centre.	29 th May., 2021



Dr. D. N. Singh	National webinar on “Ecosystem Restoration for Environmental Sustainability” organized by School of Environmental Sciences, JNU, Alumni Association, JNU and BRICS	4 th Jun., 2021
Dr. D. N. Singh	National webinar on “Zoonotic Potential of Parasitic Diseases of Dog and Cat Origin” organized by Bihar Veterinary College, Bihar Animal Sciences University, Patna with the support of NAHEP	5 th Jun., 2021
	National webinar on “Role of e-NAM and FPOs in Improving Farmers Income” organized by Sri Kiran Narendra Agriculture University, Jobner (Rajasthan)	
Dr. D. N. Singh	One day national webinar on “Safe Food Today for a Healthy Tomorrow” organized by Mumbai Veterinary College, Parel, MAFSU, Maharashtra with the support of NAHEP	7 th Jun., 2021
Dr. Avinash Kumar	National Webinar on “Systematic Approaches for Achieving Health Benefits of Medicinal Plants”, organized by Society for Promotion of farm and Companion Animals, Bihar Animal Sciences University, Patna	16 th Jun., 2021
Dr. Ajay Kumar	National webinar “Frontier Areas in Livestock Production Management and Value Added Dairy Products” held at College of Agriculture Jhilai-Niwai, Tonk, Sri Karan Narendra Agriculture University, Jobner, Rajasthan	16 th Jun., 2021
Dr. Shri Prakash Singh Dr. Abhinav Verma	E-Symposium on “Sustainable buffalo production through integration of reproduction, nutrition, health and knowledge dissemination” jointly organized by ISBD and ICAR-CIRB.	07 th Jul., 2021
Dr. D. N. Singh	E-symposium on “Sustainable Buffalo Production through Integration of Reproduction, Nutrition, Health and Knowledge Dissemination” organized by India Society for Buffalo Development-ICAR	7 th Jul., 2021
Dr. D. N. Singh	National webinar on “One health Approach for Controlling Zoonoses” organized by ICAR-National Research Centre on Camel (NRCC), Bikaner, Rajasthan	6 th Jul., 2021
Dr. Amitav Bhattacharyya	Working Group Meeting at PSS Central Institute of Vocational Education, Bhopal	12 th – 16 th Jul., 2021
Prof. Vikas Pathak	17 th Meeting of Scientific Panel on Meat and Meat Products including Poultry organized by FSSAI	29 th Jul., 2021
Shri. Rakesh Goel	One-day WEBINAR on “Role of Agriculture in Therapeutic Healing” Organized by ICAR-Directorate of Rapeseed-Mustard Research, Bharatpur, Rajasthan	31 st Jul., 2021
Shri. Rakesh Goel	One-day webinar on “Metabolomics and Human health” Organized by ICAR-Directorate of Rapeseed-Mustard Research, Bharatpur, Rajasthan	02 Aug., 2021



Prof. Archana Pathak Dr. Varsha Gupta Dr. ShriPrakash Singh Dr. AbhinovVerma	One day National Webinar On “The Role of Circadian Clock in Maintaining Cardiac Functions: A Molecular Overview” organized by Department of Veterinary Anatomy, College of Veterinary Science & Animal Husbandry, Rewa .	10 th Aug., 2021
Shri. Rakesh Goel	One-day webinar on “Tools and strategies for Quality Improvement in Rapeseed mustard” Organized by ICAR-Directorate of Rapeseed-Mustard Research, Bharatpur, Rajasthan	11 th Aug.,2021
Dr. Avneesh Kumar	One week national training program on Statistical Tool in Research and Data Analysis organized by Department of Animal Genetics and breeding, College of veterinary sciences, Parbhani, Maharashtra, India	9 th -14 th Aug.,2021
Dr. Avinash Kumar	Webinar on “Let Us Listen From Our Veterinary Covid Warriors” conducted by World Veterinary Poultry Association (India)	16 th Aug.,2021
Dr. Amitav Bhattacharyya	7th Asian Council of Science Editors (ACSE) Annual Conference	21 st Aug., 2021
Dr. Vijay Kumar	National Webinar on “Recent Advances in Animal Genetics for Improving Poultry Productivity” organized by ICAR-RCER, Patna	28 th Aug., 2021
Dr. D. N. Singh	National webinar on “Scientific Goat Farming: From the livelihood to Financial Security for the Farmers” organized by ICAR Research Complex for Eastern Region, Patna	18 th Sep., 2021
Dr. Alok Kumar Chaudhary	An Insight into Innovative Approaches in Global Clinical Research and Clinical Trials” 9th International Conference on Clinical Trials 2021 Organized by Editors- Journal of Clinical Trials, Journal of Clinical Research & Bioethics	17 th -18 th Sep., 2021
Dr. D. N. Singh	National webinar on “Environmental Health & Safety” organized by Mumbai Veterinary College, Parel and ICAR-NAHEP-CAAST Project	29 th Oct., 2021
	Exporter Conclave organized by APEDA at Agra Trade Center, Agra	
Prof. Archana Pathak Prof. Rashmi Singh Dr. Barkha Sharma Dr. Meena Goswami	SHAKTI 2021, 1st Lady Vet Wing of Indian Veterinary Association Conference held at State Animal Husbandry Training Institute, Vaishali Nagar, Bhopal	13 th -14 th Nov., 2021
Prof. Vikas Pathak	18 th Meeting of Scientific Panel on Meat and Meat Products including Poultry organized by FSSAI	2 nd Dec.,2021
Dr. Brijesh Yadav	National symposium on “Scientific interventions to address challenges for sustainable buffalo production”- GADVASU, Ludhiana	10 th -11 th Dec.,2021
Dr. Vijay Pandey	National Webinar on “Cowpathy and human health” organized by College of Animal Biotechnology, GADVASU, Ludhiana, in collaboration with Society for Immunology and Immunopathology (SIIP)	15 th & 16 th Dec., 2021



Prof. Archana Pathak Dr. Varsha Gupta Dr. ShriPrakash Singh Dr. AbhinovVerma	2nd National Web Conference on ‘Advances in Teaching and Research in Veterinary Anatomy in India’ organized by NTR College of Veterinary Science, Gannavaram - Vijayawada	16 th - 18 th Dec. 2021,
Dr. JitendraAgrawal	International symposium on “Novel knowledge innovative practice and research in theriogenology in online mode organized by CVAS Kerala Veterinary and Animal Science University	27 th -29 th Dec., 2021
Dr. Deepak Sharma Dr. S. P. Singh Dr. Vijay Kumar Dr. Avneesh Kumar Shri Rakesh Goel	One day interactive session for faculty & students on User Awareness session on national Digital Library of India (NDLI) organized by University Library, DUVASU, Mathura	2 nd Feb., 2022
Dr. D. N. Singh	National webinar on “Enterpreneurship Development on Backyard & Commercial Poultry for Economic Development in Odhisa” Organized by College of Veterinary Science and Animal Husbandry, OUAT, Bhubaneshwar	16 th Feb., 2022
Prof. Arun Kumar Madan Dr. Brijesh Yadav Dr. Dilip K. Swain Dr. Rajneesh Sirohi	XXX Annual Conference and National Symposium on- “Shifting basic physiological paradigm towards clinico-therapeutic innovative interventions for improvement in livestock health and production (SAPICON 2022 NAGPUR)	17 th -19 th Feb.,2022
Prof. Vikas Pathak	19th Meeting of Scientific Panel on Meat and Meat Products including Poultry organized by FSSAI	23 rd Mar.,2022

- Drs. M.M. Farooqui, Ajay Prakash, Vikas Pathak, Archana Pathak, Arun Kumar Madan, Dr. Brijesh Yadav, Vijay Pandey, Ambika Sharma, Pawanjeet Singh, Rajneesh Sirohi, Varsha Gupta, Dilip K. Swain, Neeraj Gangwar, Deepak Sharma, S. P. Singh, Meena Goswami Awasthi, Amit Singh, Yajuvendra Singh, D. N. Singh, Abhinov Verma, Vijay Kumar, Rashmi, Avneesh Kumar, Mamta, Ajay Kumar and Rakesh Goel participated in Dr. CM Singh Birth Centenary Celebrations and International Webinar on Advances of Veterinary Sciences during Platinum Jubilee Year of India's Independence (1947-2022) jointly organized by College of Veterinary Science and Animal Husbandry, DUVASU, Mathura and Dr. CM Singh Endowment Trust Bareilly on 30th Nov, 2021.
- Drs. Sarvajeet Yadav, Arun Kumar Madan, Brijesh Yadav, Mukul Anand, Dilip K Swain, Rajneesh Sirohi, Varsha Gupta, ShriPrakash Singh, Yajuvendra Singh, Deep Narayan Singh, Mamta participated in 3rd Annual conference of APA and National symposium on “Physiological interventions for the augmentation of sustainable animal production” held at DUVASU, Mathura held on 24th-25th Sept., 2021.



PARTICIPATION OF FACULTY MEMBERS IN TRAININGS / WORKSHOPS

College of Veterinary Science & Animal Husbandry

S. No.	Name of the faculty member	Title of the event	Date
1.	Dr. Parul	Online training on 'chemical residue analysis" in Veterinary Science' organized by ICAR-NAHEP-CAAST, Mumbai Veterinary College Parel, MAFSU, Nagpur	4 th -6 th May., 2021
		One week international e-training on 'Gene cloning: Advances and Application in Veterinary Science' organized by ICAR-NAHEP-CAAST, Mumbai Veterinary College Parel, MAFSU, Nagpur	31 st May- 4 th Jun., 2021
2.	Dr. Brijesh Yadav Dr. Vinod K. Singh	Two days training program for nominees of CPCSEA	15-16 th Jun., 2021
3.	Dr. D. N. Singh	Promotion of FPO in livestock Sector: Opportunities and Challenges" organized by MANAGE, Hyderabad (online)	15 th -17 th Jun., 2021
4.	Dr. Meena G. Awasthi Dr. Sanjay Kr Bharti Dr. Alok Kr Chaudhary Dr. Atul Prakash Dr. Amit Shukla Dr. Parul Dr. Yajuvendra Singh Dr. D. N. Singh	Massive Open Online Course (MOOC) on "Theoretical Foundations of Educational Technology" organized by ICAR, NAARM, Hyderabad, Telangana	1 st -30 th Jun., 2021
5.	Dr. Ajay Kumar Dr. D. N. Singh	International Workshop on "Scientific Writing" organized under Institute Development Plan of National Agricultural Higher Education Project (IDP-NAHEP) held at ICAR-National Dairy Research Institute Karnal, Haryana	23 rd - 24 th Jun., 2021
6.	Dr. Varsha Gupta Dr. Shri Prakash Singh Dr. Abhinov Verma	15 DAYS online training cum workshop on "Application of veterinary anatomy in context of innovative techniques" organized by Department of Veterinary Anatomy & Histology, College of Veterinary Science and Animal Husbandry, Mhow	12 th -26 th Jul., 2021
7.	Dr. Rashmi	Online training program on Value addition of milk and meat : A push to entrepreneurship at SAU-GADVASU, Ludhiana and MANAGE, Hyderabad	2 nd -5 th Aug., 2021
8.	Dr. Avneesh Kumar	One week national training program on Statistical Tool in Research and Data Analysis organized by Department of Animal Genetics and breeding, College of Veterinary Sciences, Parbhani, Maharashtra, India	9 th -14 th Aug., 2021
9.	Dr. Deepak Sharma Dr. Ruchi Tiwari	Training on "Application of Intellectual property rights for different aspects of Animal genetic resources in India organized at NDVSU, Jabalpur, MP	10 th -20 th Sep., 2021

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	Dr. S. P. Singh Dr. Vijay Kumar Dr. Avneesh Kumar Shri Rakesh Goel		
10.	Dr. D. N. Singh	International workshop on “Advance Statistical Data Analysis Using SPSS”, organized by Science Tech Institute, Lucknow, Uttar Pradesh	21 st -27 th Sep., 2021
11.	Dr. Ruchi Tiwari	7 days online Training on “Lab animals in Bio-Medical Research” by Department of Animal Genetics, COVAS, Parbhani	21 st -27 th Sep., 2021
12.	Dr. D. N. Singh	Wildlife Conservation & Management at College of Forestry, Dr. Panjab Rao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra (online)	2 nd - 6 th Oct., 2021
13.	Dr. Archana Pathak Dr. Varsha Gupta Dr. ShriPrakash Singh Dr. Abhinov Verma	Online training on ‘Applications of anatomy for clinical practice and forensics’ organized by department of Veterinary Anatomy & Histology, College of Veterinary Science and Animal Husbandry Anjora, Durg.	5 th -12 th Oct., 2021
14.	Dr. Vinod K. Singh	21-days Online International Training cum Orientation Programme entitled “Immunology– A Tool for Disease Management” organized by Department of Veterinary Microbiology, College of Veterinary Science & Animal Husbandry, Mhow (M.P.)	11 th -31 st Oct., 2021
15.	Dr. Jitendra Agrawal	Online training cum orientation program on “Physiological and biotechnological intervention for the improvement of production, reproduction and health status in animals” organized by Nanaji Deshmukh Veterinary Science University, Jabalpur (M.P.)	16 th Nov-6 th Dec., 2021
16.	Dr. Ambika Sharma	Two days online workshop on Intellectual Property Protection organized by DUVASU, Mathura	20 th -21 st Nov., 2021
17.	Dr. Vijay Pandey	Three Days e-Certificate Training Course on “Aerodrome wildlife hazard management” organized by Centre for Studies on Wildlife Management & Health (sub-Centre), organised by College of Veterinary & Animal Science, Navania, Udaipur	23 rd -25 th Dec., 2021
18.	Dr. Muneendra Kumar, Dr. Soumen Choudhury Dr. Amit Shukla Dr. Gulshan Kumar Dr. P.N. Panigrahi	Digital Teaching Techniques, MOOC conducted by NAARM	01 st -31 st Dec., 2021
19.	Dr. Jitendra Tiwari	ICAR Sponsored Winter School on Intervention for paradigm shift from conventional to modern approach in goat farming: A novel insight for Doubling Farmer’s income organized by DUVASU, Mathura	11 th -31 st Jan., 2022
20.	Dr. Vinod K. Singh Dr. Parul Dr. Ajay Kumar	ICAR Sponsored 21 days winter school on “Processing and quality evaluation of functional foods of animal origin” organized by Department of LPT, CoVSc & AH, DUVASU, Mathura	18 th Jan-7 th Feb., 2022



21.	Dr. Udit Jain	3 weeks e-short course on “Municipal (Urban) Public Health Veterinarian” organized by Department of Veterinary Public Health & Epidemiology, COVSc & AH, Mhow (M.P.)	7 th – 27 th Feb., 2022
22.		10 days Online short course in “Pathogenomics and Molecular advances in zoonoses detection” organized by Centre for Zoonoses, Department of Veterinary Public Health & Epidemiology, Nagpur Veterinary College, MAFSU, Nagpur	16 th -25 th Feb., 2022
23.	Dr. Udit Jain Dr. Parul	International workshop (Online mode) on “Antimicrobial resistance (AMR) in Food borne pathogens: Safety concern organized by Division of Veterinary Public Health, ICAR-IVRI, Izzatnagar	14 th -16 th Mar., 2022
24.	Dr. Varsha Gupta Dr. Shri Prakash Singh	Veterinary Anatomy on Multidisciplinary Mindscape, Directorate of Entrepreneurship Academic Staff college. KUVAS, Kerala	16 th Feb – 1 st Mar., 2022

- Drs. Rashmi Singh, Deepak Sharma, Vijay Kumar, Ruchi Tiwari, Vinod K. Singh, Rajneesh Sirohi, Yajuvendra Singh, D.N. Singh, Mamta, Avneesh Kumar, Arvind K. Tripathi, Alok K. Chaudhary, Barkha Sharma, Udit Jain, Jitendra Tiwari, Mukul Anand, Ambika Sharma, Meena Goswami, Soumen Choudhury, Amit K. Jaiswal, Vikrant Sudan, Parul, Shyama N. Prabhu, Avinash Kumar, Pradeep Kumar, Shalini Vaswani, Satyendra Pal Singh and Jitendra Agrawal participated in International Workshop on “Scientific Writing” organized under Institutional Development Plan of National Agricultural Higher Education Project (IDP-NAHEP) held at ICAR-National Dairy Research Institute Karnal, Haryana on 23rd-24th Jun., 2021.
- Drs. Amit K. Jaiswal, Pradeep Kumar, Avneesh Kumar, Ajay Pratap Singh, Ambika Sharma, Vijay Pandey, Vinod K. Singh, Udit Jain, Parul, Rajneesh Sirohi, Yajuvendra Singh, D. N. Singh, Mamta and Ajay Kumar participated in Awareness/ Training programme under National Intellectual Property Awareness Mission on 24th January 2022.
- Drs. M. M. Farooqui, Vikas Pathak, Archana Pathak, Vinod Kumar, Deepak Sharma, S. P. Singh, Vijay Kumar, Shri Rakesh Goel, Drs. Avneesh Kumar, Muneendra Kumar, Raju Kushwaha, Shalini Vaswani, Avinash Kumar, Ambika Sharma, Vijay Pandey, Meena Goswami, Sanjay K. Bharti, Ajay Prakash, Varsha Gupta and Abhinov Verma participated in Interactive Session for Faculty & Students on “User Awareness Sessions on National Library of India (NDLI) organized by DUVASU, Mathura on 2nd Feb., 2022

College of Biotechnology

S. No.	Name of the Teaching Associate	Title of the event	Date
1.	Ms. Parul Singh Ms. Shweta Sharma	Training for Spirulina cultivation project in ManjulSpirulinaSamwardhansansthan, Jaipur	25 th – 27 th Mar., 2022
2.	Ms. Uma Sharma	5 days Online Faculty Development Programme on "Research Methodology" organised by Babu Sunder Singh Institute of Technology and Management, Lucknow	7 th -11 th Feb., 2022



DIGNITARIES VISITED

S.No.	Name of Dignitaries
1.	Shrimati Anandiben Patel (Hon'ble Governor of Uttar Pradesh)
2.	Shri Rupala Parshottam K. (Union Minister of Fisheries, Animal Husbandry & Dairying)
3.	Shri Giriraj Singh, (Hon'ble Union Minister for Rural Development & Panchayati Raj)
4.	Shri Laxminarayan Chaudhary (Hon'ble Minister of Dairy Development, Animal Husbandry, Fisheries, Uttar Pradesh)
5.	Ranvendra Singh (Hon'ble Minister of the food and civil supplies, Uttar Pradesh)
6.	Shri Ashok Desai (OSD, Hon'ble Governor, Uttar Pradesh)
7.	Shri Sudhir Garg, (IAS, Principal Secretary, Department of Dairy Development, Department of Fisheries, Animal Husbandry Department, U.P.)
8.	Prof. A.K. Shrivastava (Member (AS) ASRB, New Delhi; Former Director & Vice chancellor NDRI, Karnal)
9.	Dr. V.K. Saxena (ADG (AP&B), ICAR, New Delhi)
10.	Dr. Inderjeet Singh (Hon'ble Vice Chancellor, GADVASU, Ludhiana, Punjab)
11.	Dr. A.P. Singh (Ex. Vice Chancellor, DUVASU, Mathura)
12.	Dr. A.K. Das (Principal Scientist, ICAR-CIRC, Meerut)
13.	Dr. H.N. Singh (Ex. Dean, Veterinary College, Mathura)





STUDENTS' WELFARE

Webinars organized

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

Sessions for Students with Industry and Academia under Institutional Development Plan (IDP)- National Agricultural Higher Education Project of the University.

1.	2 nd July, 2021	Rearing pigs for nutritional security	Dr. Keshab Barman Principal Scientist, ICAR-NRC on Pig, Guwahati
2.	5 th July, 2021	Commercial fodder production	Dr. Himanshu Awasthi Managing Director, Prajiv Farm Solutions
3.	9 th July, 2021	Carrier opportunities for budding veterinarians	Dr. Saurabh Shekhar Managing Director-South Asia Nutreco
4.	12 th July, 2021	“Role of Dogs in National Security”	Dr. Sandeep Gupta Officer Commanding National Training centre for Dogs, BSF Academy, Tekanpur, Gwalior-475005 (M.P)
5.	16 th July, 2021	Emerging Technologies Reshaping Clinical Microbiology Laboratory	Dr. Yashpal Singh Malik Dean, College of Biotechnology, GADVASU
6.	19 th July, 2021	Recent advances in poultry nutrition	Dr. A.K Panda Principal Scientist (Animal Nutrition)ICAR-CIVVA, Bhubaneswar (Odisha)
7.	26 th July, 2021	Export Potential of buffalo meat in the midst of COVID-19	Dr. S.P. Fonglan General Manager, Allansons
8.	30 th July, 2021	An Overview of Medical Devices Development and Life cycle Management unexplored career opportunities for veterinarians	Dr. Vasbhav Pachade Senior Toxicologist, Medtronic Engineering and Innovation Centre, Hyderabad.
9.	06 th Aug, 2021	Communication skill for success	Prof. Birendra Kumar 1. Former Dean, College of Agribusiness Management Pantnagar 2. Former Director Residential Instruction-cum-Dean PGS Bihar Agriculture University, Sabour 3. Visiting Professor at Alernaya University (Now Harmaya University), Ethiopia
10.	13 th Aug, 2021	Goat Production for Entrepreneurship Development	Mr. Sanjeev Kumar Founder Advisor for the Goat trust of India
11.	28 th Dec, 2021	Transforming dreams into reality	Dr. Farhat Umar, Motivational Speaker Former, Consultant, Ministry of Agriculture & Farmer's welfare, Government of India



National Cadet Corps

During 2021-2022, 40 and 22 cadets appeared in 'B' and 'C' certificate examination respectively. Five cadets of NCC participated in online mode camp Ek Bharat Shreshtha Bharat (EBSB) held from 23-08-2021 to 31-08-2021. Capt. (Dr.) Rajneesh Sirohi actively engaged himself and participated in an online mode camp Ek Bharat Shreshtha Bharat (EBSB) held from 25-11-2021 to 30-11-2021. During the period under report, 42 cadets and Capt. (Dr.) Rajneesh Sirohi participated in CATC-44 camp held from 02-02-2022 to 08-02-2022. NCC cadets gave Guard of Honour and NCC horse-rider cadets escorted as pilot under the leadership of Dr. Rajneesh Sirohi to Hon'ble Governor of Uttar Pradesh, Smt. Anandi Ben Patelji on 21st February 2022 on the occasion of 11th 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 Independence Day 2021 and Republic Day 2022. University organized a blood donation camp on 24th March 2022 at Kisan Bhawan auditorium in which NCC cadets donated 60 Units of blood at District Blood Bank centre, Mathura.

Annual Sports meet

The 19th Annual sports meet 2021-22 of this

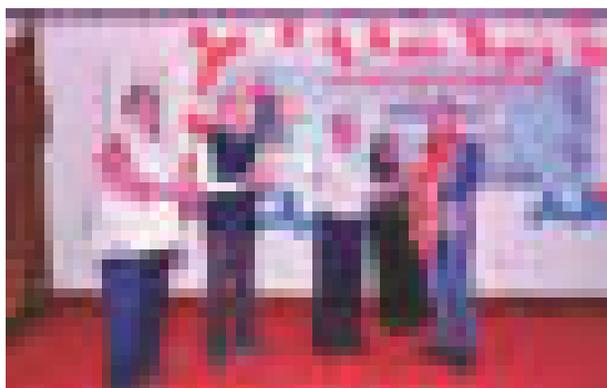
university was held on 29-30 March 2022. The event was inaugurated by Prof. (Dr.) G.K. Singh, Vice-Chancellor by unfurling of University Flag. The meet was declared open by Hon'ble Vice-Chancellor after the march-past, salutation and sports oath. Doves were released as a token of peace and freedom. A number of sports events were organized in which students from different programmes participated. Mr. Shekhar Rana, 2nd Year, B.Sc (Biotechnology) and Miss Kriti Singh, 1st Year, B.Sc (Industrial Microbiology) College of Biotechnology, DUVASU, Mathura were adjudged as the best male and female athletes of the year. The closing ceremony was held on 30th March, 2022.

Scholarships received by students

The University is disbursing scholarship to the meritorious under graduate and post graduate students of college of Veterinary Science and Animal Husbandry. The scholarships offered by the ICAR, New Delhi and Department of Social Welfare, Govt. of U.P. are also facilitated by the university. During the year 2021-22 an amount of Rs. 2,18,000/- was disbursed to 11 meritorious students. 23 Students received National Talent Scholarship (NTS) of ICAR. The university also forwarded 355 applications for the award of scholarship offered by the Department of Social Welfare, Govt. of U.P..



Annual Sports Meet 2021-22



Diploma Welcome party “ABHINANDAN-2022”

Welcome party “ABHINANDAN-2022” was organised by second year Diploma students to welcome freshly admitted students on 07-03-2022 at Kisan Bhawan Auditorium. Dr. G.K. Singh Hon'ble Vice- Chancellor was the chief guest of the occasion. Mr. Gopesh Tiwari (DLE) and Ms. Chanchal Devi (DLE) were chosen as Mr. FRESHER and Ms. FRESHER 2022 respectively.

College of Biotechnology- Fresher's programme

The College of Biotechnology is unequivocally promoting their students in different fields including their studies, sports and many extra curricular activities. The college conducted Fresher's programme on 28th, Mar 2022, to welcome the students of Batch 2021-2023, Kirti Singh and Tushar Bandhu were felicitated as Miss Fresher & Mr. Fresher respectively, by Hon'ble Vice Chancellor of University and Dean College of Biotechnology.

DUVASU Premier League-2021

A mini format of DUVASU Premier League-2021 was organized this year from November 21, 2021 to December 12, 2021. A total of six teams of students of Veterinary College, Biotechnology College, Diploma Institute and staff of the University have participated in the tournament with great fervor and zeal. All the teams played knock-out matches with each other and the final match of DPL-2021 was played between teams of Final Year BVSc and 4th Year BVSc on December 12, 2021. Team 4th Professional BVSc won the DPL-2021 trophy by beating the team Final BVSc in a thrilling final match. The prizes to the winners, runner up teams and players of the tournament were distributed by Prof. PK Shukla, Dean College of Veterinary Science, and Prof. Daya Shankar, President Games and Sports. Mr Rahul Sharma, and Mr. Ravindra Kumawat, students of 4th Professional BVSc were adjudged Best Batsman and Best Bowler of the tournament, respectively. Dr. Vijay Pandey, Cricket



Counselor and Mr. J.N. Pal, PTI of the University, coordinated successful organization of the first ever DPL-2021 of DUVASU, Mathura.

DUVASU Open Badminton Championship-2021

On huge demand of the students and staff, DUVASU Open Badminton Championship has been initiated from this year. The DBL-2021 was played from December 15, 2021 to December 21, 2021 in the indoor Badminton court at University Gymnasium. A total of eight teams of students of Veterinary College, Biotechnology College, Diploma Institute and staff of the University have participated in the tournament with immense zeal and passion. The winner and runner-up of the men doubles were 4th Year BVSc team and Staff team, respectively. Mr. Shivendra Kumar, student of 4th Year BVSc have won the final match of the men singles by beating Mr Rohan, student of College of Biotechnology. The prizes to the winners of the tournament were distributed by Prof PK Shukla (Registrar), Mr Sushil Kumar (Finance Officer), Prof Daya Shankar (President Games and Sports) and Dr. MM Farooqui (SPO), Dr. Sarvajeet Yadav (Estate Officer) of the University. Dr. Vijay Pandey (Associate Professor, Biochemistry), Dr. Dilip Kumar Swain (Assistant Professor, Physiology) and Mr. J.N. Pal, PTI of the University, coordinated in successful organization of the DUVASU Open Badminton Championship-2021.





OTHER HIGHLIGHTS AND ACTIVITIES

Independence Day

The 75th Independence was celebrated with great enthusiasm and respect by the senior officers, faculty members, staff and students of the University. The celebration started with hoisting of national flag by Professor (Dr.) G.K. Singh Hon'ble Vice-Chancellor DUVASU and 'Chief Guest' of the occasion followed by floral tributes to the 'Father of the Nation' Mahatma Gandhi. The chief guest addressed the gathering about the importance of 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.



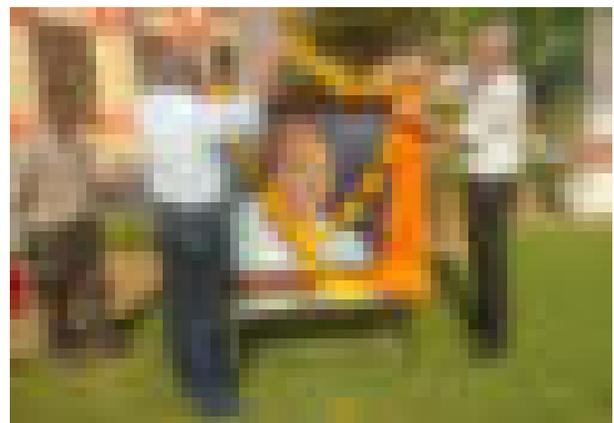
Entrance Examination

The University successfully conducted entrance examinations for the admission in different academic programmes. Prelim examination of Pre Veterinary Test (PVT) was conducted on 29th August 2021 at eleven different centres of Uttar Pradesh viz; Prayagraj, Kanpur, Lucknow, Mathura and Bareilly

districts. Total 4424 candidates applied for the examination, out of which 970 candidates cleared the examination for the next phase of competition. The PVT mains was conducted at two centres of Mathura in which total 736 candidates qualified for the entrance in B.V.Sc. & A.H. course. The postgraduate entrance examination (PGET) for the entrance in post graduate courses of the University was conducted on 10th October, 2021. The PDET examination for the admission in diploma courses of Institute of Para-veterinary Science of the University was conducted on 19th September 2021, in which out of 464 candidates, 349 have qualified the examination. University also conducted PGET for admission in MVSc and PhD program. 236 candidates applied for MVSc and 18 for PhD, out of which 166 candidates appeared for MVSc and five for PhD. 119 and 03 candidates were selected for MVSc and PhD respectively.

Gandhi Jayanti

The University celebrated Mahatma Gandhi's 152nd Birth Anniversary on 2nd Oct, 2021. All the officers, teachers, students & staff attended the event. Professor (Dr.) G.K. Singh Hon'ble Vice-Chancellor DUVASU was 'Chief Guest' of the occasion. The unveiling of the portrait of Gandhiji was done followed by offering of floral tribute.



World Egg Day

The World Egg Day was commemorated at DUVASU, Mathura on 08th October, 2021. To celebrate this event a Speech competition for the students on "Egg as a source of Nutrients in New Normal in India" was organized by the Department of Poultry Science, College of Veterinary Science and A.H, DUVASU, Mathura. Faculty and students



Blood Donation Camp

A Blood donation camp was organized on 26th March 2022 in kisan bhawan in the premises of University in collaboration with 1 U.P. R& V SQN, NCC, Mathura and Maharishi Dayanand District Hospital, Mathura in which 60 collection of Blood were done by student and staff of the University.

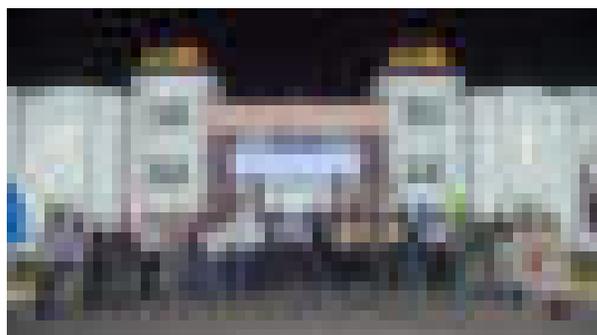
of the College of Veterinary Science witnessed the programme. First, second, third and consolation prizes were awarded to the winners of the competition. Dr. Amitav Bhattacharya, Assistant Professor designed and organised the programme along with his departmental colleagues.

Pt. Deen Dayal Upadhyaya Jayanti

105th birth anniversary of Pandit Deen Dayal Upadhyaya ji was celebrated by the University on 25th September, 2021. Floral tribute was paid to Pandit Deen Dayal Upadhyaya Ji by Prof. G. K. Singh, Vice-Chancellor, Dr. P. K. Shukla, Dean, COVSc & AH and other dignitaries of the University along with faculty members and other staff of the University.

Republic day

The University celebrated 73rd Republic day on the auspicious morning of 26th January 2022. Student, staff and faculty members filled with a feeling of patriotism and dedication gathered in the main ground. A Guard of Honour was presented by 1 U.P. 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.



Ambedkar jayanti

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



DUVASU Mathura organized an awareness programme on Agriculture Education Day – 2021

DUVASU Mathura celebrated the Agriculture Education Day on 3rd December 2021 in collaboration with Diksha Pupil's Academy, Mathura to create awareness and expose school students to different fields of agriculture and allied sciences including Veterinary Science so that they get motivated towards choosing their professional career after schooling in such courses or opt for entrepreneurship in future. Prof. P.K. Shukla, Dean, College of Veterinary Science & Animal Husbandry emphasized that majority of Nation's population is dependent on farming and they rely on animals as their primary source of income. Hence, youth population of the country should be educated and sensitized towards enhancing agriculture as it is the backbone of the nation. A speech competition on the topic "Importance of agriculture education in our country" and a drawing competition on the theme "Clean Environment Green Environment" was organised.

Around 50 students actively participated in both the competitions and the winners were awarded with certificates and prizes.

Dog show

A Dog show was organized in University Play ground by National Training Centre for Dogs, Border Security Force, Tekanpur, Gwalior, M.P on 10th November, 2021 in which Professor (Dr.) G.K. Singh Hon'ble Vice-Chancellor was 'Chief Guest' of this occasion.



Basant panchami

Saraswati poojan was done on Basant Panchimi on 5th Feb., 2022 at University Library. Saraswati Poojan was performed by Professor G.K. Singh, Vice-chancellor and Professor P.K. Shukla, Registrar/ Dean with family. It was attended by large number of faculty members, non teaching staff and students of the University. On this occasion Professor Singh recommended to all the members to maximum use of Library facilities for up grading of their academics and general performance.

Orientation programme for BVSc & AH First Professional students-2021

College of Veterinary Science & Animal Husbandry, DUVASU, Mathura organized an orientation programme on 9th November 2021 for the newly admitted students of Bachelor of Veterinary Science and Animal husbandry at NAHEP building of the University. Prof. P.K. Shukla, Dean, College





of Veterinary Science & Animal Husbandry addressed and motivated the students for choosing Veterinary Science as their profession. Hon'ble Vice-Chancellor Prof. G.K. Singh addressed the newly admitted students and encouraged them to succeed in their future endeavors. Students were exposed to curriculum of the University through the lecture by faculty members.

20th Foundation Day Celebration

Unlike the previous year, the University campus was populated with its students when it celebrated its 20th Foundation Day on the 25th of October, 2021. The first event of the celebrations was a workshop in two consecutive sessions. The morning session was centered on “understanding mind” and was meant for the faculty members which was inaugurated by Prof. (Dr.) Pankaj Kumar Shukla, Dean, College of Veterinary Science and Animal Husbandry. The Principal Investigator of the National Agricultural Higher education Project, Dr. Atul Saxena, presented



a brief of activities. The key speaker was Shri Arun Naik, National Director, Auroyouth, Sri Aurobindo Society from Noida, U.P.. The session ended with a mind relaxation drill by Smt. Aneeta Bansal, Member of Management Committee, Sri Aurobindo Society, Noida, U.P.. The afternoon session was “Understanding Myself,” a sensitization program for students. This session included discussions on “Deepening Our Personality” and “Improving Concentration and Focus” and the key speaker was Smt. Aneeta Bansal.

In the afternoon, the beneficiaries belonging to scheduled caste from different villages of the district, identified by the Animal Husbandry Department, Mathura, were distributed First Aid Kits and packets of mineral mixture, in a programme chaired by Hon'ble Vice-Chancellor Prof. G.K. Singh, in the presence of Prof. P.K. Shukla, Dean, Veterinary Science and the representative officers of the Animal Husbandry Department. This benefit was extended by the Department of Surgery and Radiology under AINPDIMSCA (ICAR).

In the evening, an exhibition, “Artsy Carnival” was inaugurated by the Hon'ble Vice-Chancellor in which creative talent of the students in fine arts, clay sculpting, photography etc were displayed. The artistic creations of students namely, Sonam, Chanchal, Ravi and several others were greatly appreciated by one and all. Exhibition was followed by a cultural programme 'Spandan'.

The Hon'ble Vice-Chancellor and the Dean, unveiled the second edition of the students' magazine, “The Mirror/दर्पण”.



Convocation ceremony

10th convocation of DUVASU, Mathura was held on 21st February 2022 in the University auditorium. Convocation function was presided over by the Hon'ble Governor of Uttar Pradesh and Chancellor of DUVASU Smt. Anandiben Patel. Dr. R.C. Agrawal, National Director, NAHEP was the chief guest of the occasion and Dr. A.P. Singh, Former Vice-chancellor of DUVASU, Mathura was the guest of honour of the occasion. As per the tradition, the proceedings of convocation commenced with lighting of lamp, Saraswati Vandana followed by University song and National anthem. The convocation was declared "open" by the Hon'ble Governor of Uttar Pradesh. Hon'ble Vice Chancellor presented the University progress report and Hon'ble

chancellor conferred degrees to the students of respective streams. 64 students were conferred BVSC & AH degree, 30 students were awarded MVSc degrees and 09 students were conferred PhD degrees. 24 students were conferred with BSc Biotechnology and 03 students were conferred with PhD Biotechnology degrees. 14 students were awarded medals in various categories for their academic excellence and extra-curricular activities. Hon'ble Chancellor, DUVASU blessed and congratulated the degree recipients and medal holders.

International Yoga Day

DUVASU celebrated International yoga Day on 21st June 2021 in the University ground.





AWARDS AND HONOUR/ACHIEVEMENTS

S. No.	Name	Name of award	Event	Date
1.	Prof. Vikas Pathak	Vice-President	Indian Meat Science Association (IMSA)	2021-22
2.		Best Teacher Award	Indian Meat Science Association at IMSACON-X conference and International symposium at Sardar Vallabhbhai Patel University of Agriculture and Technology. (SVPUAT), Meerut. U.P.	25 th Nov., 2021
3.		Lead lecture	Functionality improvement in meat and meat products". Indian Meat Science Association at IMSACON-X conference and International symposium at Sardar Vallabhbhai Patel University of Agriculture and Technology. (SVPUAT), Meerut. U.P.	25 th -27 th Nov., 2021
4.		Lead speaker	"Regulations governing National and International trade of foods of animal origin in India". XXVI Annual Convention of Indian Society of Veterinary Immunology and Biotechnology organized by Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana	4 th -5 th Feb., 2022
5.	Prof. Archana Pathak	Chief executive editor	Indian Journal of Veterinary Anatomy	2021
6.	Prof. Rashmi Singh	Outside Expert Member	DBT-IBSC, ICAR-CIRG, Makhdoom	2022
7.		Nodal Officer	Covid-19 Testing Laboratory, DUVASU, Mathura	2021-22
8.	Dr. Meena Goswami Awasthi	Executive Member	Indian Meat Science Association (IMSA)	2021-22
9.	Dr. Sanjay Kumar Bharti	Reviewer excellence award	Agricultural research communication centre, Asian Journal of Dairy and Food Research, Karnal	2021
10.		First prize for research work presentation	Research Conclave and International summit for packaging industry on "Packaging the growth driver" by FSSAI and Indian Institute of Packaging, an autonomous body under the aegis of Ministry of Commerce and Industry, Government of India	16 th March, 2022



11.	Prof. Vikas Pathak, Dr. Meena Goswami, Dr. Sanjay Kumar Bharti	Best oral presentation award	Fatty acid profile of paneer prepared from different milch animals” at National Webinar on "Cowpathy and Human Health" organized by College of Biotechnology, GADVASU, Ludhiana	15 th -16 th Dec., 2021
12.	Dr. Varsha Gupta, Prof. M. M. Farooqui, Dr. Mukul Anand, Prof. Ajay Prakash, Prof. Archana Pathak	Dr. G. Rajeshwar Rao Memorial Award and Medal for Applied Anatomy including Biomechanics	XXXV Annual convention of Indian Association of Veterinary Anatomist and International Symposium on “Modern concept in Anatomy: New era tools in health and diseases”, organized by Department of Veterinary Anatomy, College of Veterinary Science, LUVAS, Hisar, Haryana	10 th to 12 th Mar., 2022.
13.	Dr. Varsha Gupta	Associate Editor	Indian Journal of Veterinary Anatomy	2021
14.	Dr. Abhinov Verma	Reviewer Excellence Award	The Haryana Veterinarian	2021
15.		Review Board Member	IRC Scientific and Technical Committee and Editorial Review Board on Animal and Veterinary Sciences-2021 in WASET (World Academy of Science, Engineering and Technologies)	2021
16.	Dr. Shri Prakash	Padamshree Dr. B. V. Rao Poultry Entrepreneurs Global Icon Award	Pashudhan Praharee	2021
17.		Zonal Representative (North zone)	Indian Association of Veterinary Anatomist	2021
18.		Member of Editorial Board	Livestock Research International (LRI)	2021
19.	Dr. Amit Vishen Dr. Varsha Gupta Prof. M M farooqui Prof. Archana Pathak Prof. Ajay Prakash Dr. Shri Prakash	Second prize in Best poster presentation award	III Annual National Conference of Animal Physiologists Association and National Symposium on “Physiological interventions for the augmentation of sustainable animal production” organized online by the Department of Veterinary Physiology, College of Veterinary Science and Animal Husbandry, DUVASU, Mathura	24 th -25 th Sept., 2021
20.	Dr. Amit Shukla	Best Educationist Award	Global Education Forum & Awards	2021
21.	Dr. Barkha Sharma	Distinguished Scientist Award	International Multidisciplinary Research Foundation (IMRF), Andhra Pradesh, India	2021
22.	Dr. Amitav Bhattacharyya	NAVS Membership	National Academy of Veterinary Science, New Delhi	23 rd Sept., 2021
23.	Dr. Shanker K. Singh			



24.	Dr. Vinod Kumar Singh	Member Nominee	CPCSEA, Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India	2021
25.		Registration sponsorship from Science Alert, Deira, Dubai, UAE	Under the Science Alert Capacity Building Program. to participate in Asian Council of Science Editors Annual Conference (ACSE-21)	2021
26.		Assistant Guest Editor	Indian Journal of Comparative Microbiology, Immunology & Infectious Diseases (IJCMID) special issue on “Emerging, Zoonotic and Transboundary Diseases”	July-December, 2021
27.	Dr. Ruchi Tiwari	Highly Cited Researchers (HCR) 2021 Award	Highly Cited Researchers (HCR) 2021 List (Clarivate TM)] Released by Clarivate TM (Clarivate Analytics, Thomson Reuters, Web of Science)	2021
28.	Dr. Alok Kumar Chaudhary, Dr. Ruchi Tiwari, Dr. Vinod Kumar Singh, Dr. Mukesh Kumar Srivastava, Dr. Manu Jaiswal, Dr. Sanju Kumari	Third Best oral presentation award	Clinical investigation of ascites in puppy and their need-based therapeutic management along with blood transfusion	2022
29.	Dr. Neeraj Kumar Gangwar	Zonal Secretary North zone	IAVP Society, India	2019-2022
30.		Co-chairman	4 th Central Zonal Conference of IAVP & National Symposium-2021 on “Live stock diseases and their Impact on sustainable production” organized by COVSc&AH., Rewa, NDVSU, MP	05 th -06 th Oct., 2021
31.		Appreciation certificate	Contribution in Veterinary Pathology Congress-2021 and International symposium (online mode) on “Advances in Veterinary Pathology for Diagnosis and Control of Emerging and Re-emerging diseases of livestock, wild animals and Poultry” organized by RAJUVAS, Bikaner	2021
32.	Dr. Ambika Sharma	Winner-article writing contest	World Veterinary Day-2021 Article writing contest on the theme "Veterinarian response to the Covid-19 crisis"	2021
33.	Dr. Muneendra Kumar	Rapporteur	Dr. C. M. Singh Birth Centenary Year Celebrations cum National webinar jointly organized by COVSc & AH, Kamdhenu University,	30 th Nov., 2021
34.	Dr. Ambika Sharma			



35.	Dr. Muneendra Kumar	Scroll of Honour	Sardarkrushinagar, Gujarat & Dr. C.M. Singh Endowment Trust, Bareilly	
36.	Dr. Amit Singh			
37.	Dr. D. N. Singh	Certificate of Recognition for the article "Veterinarian Response to the COVID-19 Crisis"	World Veterinary Day	24 th Apr., 2021
38.		Dr. V. Kurien Award of Excellence-2021	National level Essay Competition on the occasion of world milk day	01 st Jun., 2021
39.		Awadesh Kumar Singh Memorial Award-2021	National Level Essay writing Competition on "Summer Stress Management"	20 th Jun., 2021
40.		Ram Singh Memorial National Animal Welfare Award	All India article writing competition on topic "Application of Veterinary Ayurveda & Homeopathy in the treatment & control of Mastitis in Dairy cattle"	29 th Jul., 2021
41.		Dr. B. V. Rao Poultry Professional National Excellence Award 2021	Recognition of outstanding Professional work & Significant Contribution for the advancement of Poultry Sector	08 th Oct., 2021
42.		Reviewer Excellence Award by Asian Journal of Dairy and Food Research (ARCC Journals)	Significant & Outstanding contribution to the journal and review the article	19 th Feb., 2022
43.	Dr. Dilip Kumar Swain	Letter of appreciation and recognition	Editorial Board Member- 01 (Animal Reproduction Science, Elsevier/ Science Direct) Distinguished Reviewer (Only International Journals with impact factor) Andrologia, Theriogenology, Cell Transplantation, Journal of Applied Animal Research, Animal Reproduction Science, Asian Pacific Journal of Reproduction, Theriogenology, Animals, Human Fertility	2021-22
44.		Best Poster Award	XXX Annual Conference and National Symposium on- "Shifting basic physiological paradigm towards clinico-therapeutic innovative interventions for improvement in livestock health and production (SAPICON 2022 NAGPUR)	17 th -19 th Feb., 2022
45.	Dr. Brijesh Yadav	Dr. D.N. Mullick Mid-carrier Award		



46.		Letter of appreciation and recognition	Reviewer of 1. The International Journal of Biometeorology, 2. Asian Research Journal of Gynaecology and Obstetrics 3. Journal of Animal Physiology and Animal Nutrition, 4. Theriogenology	2021-22
47.		Zonal Secretary (North)	Animal Physiologists Association (APA)	2021-22
48.		Executive Member	Indian Society for Buffalo Development	2021-22
49.		Collaborator	Dr. Md. Morshedur Rahman, Professor, Department of Dairy and Poultry Science, Bangbandhu Sheikh Mujibur Rahaman, Agriculture University, Bangladesh for research collaboration in the area of Climate Change.	2021-22
50.		CPCSEA Nominee	CPCSEA, Ministry of Fisheries, Animal Husbandry and Dairying, GOI	2021-22
51.		CPCSEA nominee	Jawahar Lal Nehru Medical College, AMU, Aligarh and Uttar Pradesh Institute of Medical Sciences, Saifai, Etawah, UP.	2021-22
52.	Dr. Shubha Singh, Dr. Meena Goswami Awasthi, Prof. Vikas Pathak	Best research article award	Journal of Meat Science of IMSA	2021
53.	Dr. Sanjay Singh, Prof. Vikas Pathak, Dr. Meena Goswami Awasthi	Best Poster Award	IMSACON-X Conference and International Symposium at Sardar Vallabhbhai Patel University of Agriculture and Technology. (SVPUAT), Meerut. U.P.	25 th -27 th Nov., 2021
54.	Dr. Anita M. Chappalwar, Prof. Vikas Pathak, Dr. Meena Goswami Awasthi, Dr. Sanjay Kumar Bharti			



RESEARCH PUBLICATIONS

1. Arti, Gupta, V., Farooqui, M.M., Prakash, A., Verma, A. and Pathak, A. (2021). Macroscopic anatomy of prenatal goat tongue. *Indian Journal of Veterinary Anatomy*. 33 (2): 81-84.
2. Baghel, M., Sharma, D., Singh, S. P., Tiwari, M., and Kumar, A. (2022). Single nucleotide polymorphisms in MBL1 gene of cattle and their association with milk production traits and somatic cell score. *Indian Journal of Animal Sciences*. 92 (2): 208–214.
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11. Farooqui, M.M., Sharma, C.P., Singh, S.P. Prakash, A., Pathak, A., Gupta. V. (2021). Prenatal development of leydig cells in nondescript male goats. *Indian Journal of Small Ruminants*. 27 (2):223-228.
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ESTATE

New constructions/Renovation and repair works done by estate of the University during 2021-22.

S. No.	Details of work	Total sanctioned amount (in lacs)	Status of work
1.	False sealing in two classrooms of University IDP building.	005.49	Work completed
2.	a. Construction of Buck mother farm. b. Cryocan filling room and semen straw dispatch and distribution center. c. Developed bio-security measures in existing building (Including boundary wall)	132.00	Work in progress
3.	Repair and renovation of old farm manager house and converted it into Training and lodging-boarding center situated at LFC of University.	021.36	Work completed
4.	Repair and renovation of toilet and bathroom in six rooms of International guest house which included change of toilet seats, exhaust fan, shower, geyser and correction of drainage system. The window glass, mesh and switch boards of rooms were also changed.	003.28	Work completed
5.	Repair and renovation of Vice chancellor's office	009.71	Work completed
6.	a. Tile work on the wall and fitting of kota stone in the milk processing plant of goat farm located at LFC of University. b. Construction of brick road for the animals and workers near automatic milk plant	007.85	Work completed
7.	Renovation work in the ten residences located near Gautam hostel	057.46	Work in progress
8.	Fitting of brick tiles at LFC of University	011.26	Work completed
9.	Construction of floor and fitting of railings and gate between the space of shed 3 and 4 at LFC	017.59	Work in progress
10.	Renovation work at first floor of the Department of Veterinary Medicine.	017.54	Work completed
11.	Repair and renovation work in the University library	022.38	Work in progress
12.	Tiling, change of windows and false sealing work in two laboratories of department of Veterinary gynecology and obstetrics	007.44	Work completed
13.	Construction of boundary wall and railing etc around calorimetric chamber of Environmental lab of Physiology department.	006.37	Work in progress
14.	Installation of 250 KVA transformer in front of medicinal plants garden of main Veterinary University campus.	044.27	Work completed

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15.	Construction of main gate, high boundary wall, water harvesting system at ETT lab located at LFC of University.	017.78	Work in progress
16.	Renovation work of residence no. 02/02 situated at LFC OF University.	012.70	90% work is competed
17.	Renovation of two toilets located at first floor of IDP building	009.92	Work completed
18.	False sealing and renovation work in room number 15, 22, 24 at ground floor and 30, 31 and 35 at first floor of IDP building.	006.09	Work completed
19.	Painting and renovation of wooden railings of stair cases of ground and first floor of IDP building, POP with White wash and renovation and painting of doors.	025.33	Work completed
20.	Change of windows of rooms of 1,2, 3 to 22 and windows on both sides of stair cases of IDP building.	015.79	Work completed
21.	Putrefied tiling work and granite flooring in the corridor and room no. 30 and 31 of incubation center of IDP building.	011.05	Work completed
22.	Renovation and alteration of ARIS cell of University into seminar hall.	008.60	Work completed
23.	Renovation and repair work in the VIP suit of guest house of the University	009.15	Work completed
24.	Renovation and repair work of damaged building situated in front of the office of poultry farm at LFC of University	017.84	Work completed
25.	Construction of parking shed near Institute of Para veterinary Science at new campus of University	016.02	Work completed
26.	Repair work of old building of Esate office located at old campus.	024.46	Work in progress
27.	Construction of drainage system in D-type houses and LAQ houses.	005.30	Work completed
28.	Fencing of boundary wall with round sharp edges wire constructed near Administartive building of the university and Tantura Village.	014.39	Work in progress
29.	Renovation and repair work in the building of transport office	012.97	Work in progress



FINANCIAL STATUS

FINANCIAL STATUS

(in lacs)

Budget Source	Salary	Contingency	Total
State Government	4878.57	1755.00 0323.50	6957.07
ICAR Development		0090.00	0169.11
Library strengthening		0010.00	
SCSP Subplan		0050.00	
Internship		0011.52	
NTS		0007.59	
KVK	0163.00	0008.30	0257.30
7 th CPC Arrear	0086.00		
Other projects			
IDP (NAHEP)		0792.25	0827.79
FMD		0004.00	
EVM		0006.43	
AICRP		0011.09	
DMISCA		0012.00	
JRF		0002.02	
RKVY		0175.00	0175.00
University Receipt		0500.00	0500.00
Grand Total			8886.27

RIGHT TO INFORMATION ACT

In compliance of the order of Govt. of Uttar Pradesh and provision of RTI Act, 2005, PIO received 49 applications out of which 28 applications were cleared and 21 are under consideration.



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

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

