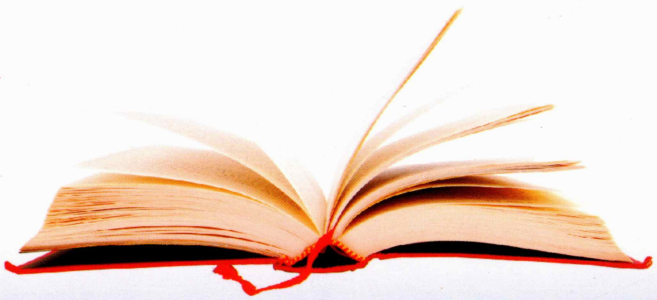
# दुवासु

# वार्षिक प्रतिवेदन

2010-2011



DUVASU

# ANNUAL REPORT

2010-2011


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

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

# DIGNITARIES VISITED



H.E. Sh. B.L. Joshi, the Chancellor & Governor U.P. leaving the Convocation Pandal



Dr. S. Ayyappan, Hon'ble Secretary DARE, GOI & DG ICAR planting a sapling



Dr. S. Ayyappan Hon'ble Secretary DARE, & DG ICAR, Dr. Arvind Kumar DDG (Edn) and Dr. K.M.L. Pathak DDG (AS) ICAR



Sh. Jayant Chaudhary, MP along with Sh. Pardeep Mathura local MLA in DUVASU Kisan Mela



Dr. S. Ayyappan Hon'ble Secretary DARE, & DG ICAR at KVK Farm



Dr. C. Devkumar ADG (EPD) ICAR in Teaching Veterinary Clinical Complex

दुवासु

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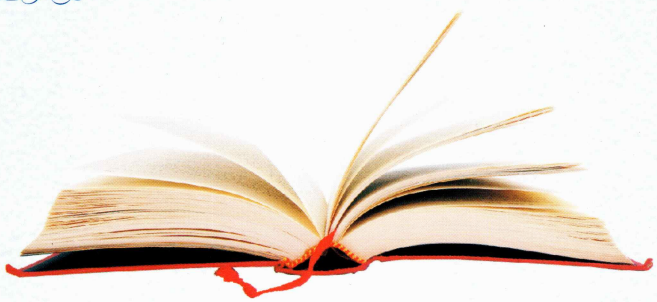

# DUVASU ANNUAL REPORT 2010-2011

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DUVASU ANNUAL REPORT 2010-2011
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# Foreword



Government of Uttar Pradesh established U.P. Pandit Deen Dayal Upadhayaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go Anusandhan Sansthan (DUVASU), Mathura with the mandate of providing quality education and extension services in the field of Animal and Veterinary Sciences in the year 2001. During the last ten years, under the dynamic leadership of Vice-Chancellors, University has made tremendous efforts and has been successful in developing facilities for catering to the requirements of students, faculty, farmers and society at large. This has been possible with active support of Govt. of UP and liberal financial assistance from Indian Council of Agricultural Research, New Delhi.

Progress report of an institution gives an opportunity to assess the developments and achievables vis-à-vis targets in specified period of time. We have decided to publish the progress report annually, however, during 2010 University published the Progress Report for the years 2007-2010. Thus it is a matter of great pleasure that the annual report of 2010-2011 is being published by the University. The University has endeavored for improvement in academic environment and maintenance of discipline for effective teaching-learning process. With the cooperation of students, teachers, employees and alumni of the University we have been able to achieve the mandated objectives. With the start of College of Biotechnology, University has taken first nascent step towards mandate in true spirit. Salient achievements of the last year include organization of Convocation, an international conference, a pre-conference work shop, appointment of faculty in Veterinary College, infrastructural developments with the grants received under strengthening and development grant, modernization of farms, experiential learning programme, outreach programme and library development from ICAR. The MoU with CIRG, Makhdoom for maximal utilization of laboratory facilities, has augmented our capabilities. Completion of gymnasium has provided much needed respite to employees and students of the University. With the handing over of PG hostel, the students will be provided better amenities.

Without the financial support of Indian Council of Agricultural Research, New Delhi, no development would have been possible and for these sincere thanks are due to Dr. S. Ayappan, Secretary DARE, Govt. of India and Director General ICAR, Dr. Arvind Kumar, DDG (Education), Dr. K.M.L. Pathak, DDG (Animal Sciences), Dr. C. Devkumar, ADG (Education) and Dr. Gaya Prasad, ADG (Animal Health) and other officers of ICAR for their kind support. Increase in budget allocation by Govt. of U.P. in view of the increase in faculty strength is thankfully acknowledged. Prof. Satish K. Garg, Dean, College of Veterinary Sciences and Animal Husbandry, Chief Editor, Dr. Jitender Kumar, Associate Professor, Physiology, Editor, Dr. R. P. Pandey, Professor and Head, Surgery, Dr. Vijay Pandey, Assistant Professor, Biochemistry and the staff deserve a special appreciation for the efforts they have put in for bringing out the annual report of the University.

(A. P. Singh)

# प्राक्कथन



वर्ष 2001 में पशुचिकित्सा एवं पशुपालन के क्षेत्र में उच्च गुणवत्ता पूर्ण शिक्षण प्रदान करने एवं शोध व प्रसार कार्यों को गति प्रदान करने के उद्देश्य के साथ उत्तर प्रदेश सरकार द्वारा उ.प्र. पं. दीनदयाल उपाध्याय पशुचिकित्सा विज्ञान विश्वविद्यालय एवं गो अनुसंधान संस्थान की स्थापना की गई। विगत 10 वर्षों में अलग-अलग कुलपतियों के कार्यकाल में उनके गतिमान दिशानिर्देशन के फलस्वरूप विश्वविद्यालय ने महत्वपूर्ण प्रगति की और छात्रों, शिक्षकों, पशुपालकों व समाज के लिए पर्याप्त आवश्यक सुविधायें व संसाधन जुटाये गये। यह सब प्रदेश शासन के सहयोग व भारतीय कृषि अनुसंधान परिषद् से प्रदत्त वित्तीय सहायता द्वारा ही संभव हो सका।

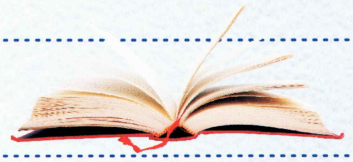
किसी भी संस्था का प्रगति प्रतिवेदन तैयार करने का समय हमें यह अवसर प्रदान करता है कि पूर्व निर्धारित लक्ष्यों के सापेक्ष हम अपनी अर्जित उपलब्धियों का मूल्यांकन कर सकें। पूर्व में प्रगति प्रतिवेदन का वार्षिक प्रकाशन किया जाना निशिचित किया गया था किन्तु वर्ष 2010 में प्रकाशित प्रतिवेदन में वर्ष 2007 से 2010 तक के विवरण को समाहित किया गया। अत: नि:संदेह यह हर्ष का विषय है कि वर्ष 2011 का वार्षिक प्रतिवेदन विश्वविद्यालय द्वारा प्रकाशित किया जा रहा है जो प्रगति प्रतिवेदन के वार्षिक प्रकाशन की दिशा में एक कदम है। विगत वर्ष इस बात के विशेष प्रयास किये गये कि विश्वविद्यालय प्रांगण में अनुशासन हो और पठन-पाठन के लिए आवश्यक श्रेष्ठ शैक्षिक वातावरण बन सके और परिणामस्वरूप छात्रों, शिक्षकों, कर्मचारियों व अधिकारियों के समन्यवयित सहयोग से विश्वविद्यालय अपने पूर्व निर्धारित उद्देश्यों की प्राप्ति की ओर अग्रसर हो सका है।

बॉयोटेक्नालॉजी महाविद्यालय की स्थापना के साथ ही विश्वविद्यालय द्वारा अपने निर्धारित स्वरूप की प्राप्ति की दिशा में वास्तविक अर्थ में पहला कदम उठाया गया है। द्वितीय दीक्षांत समारोह, एक अन्तर-राष्ट्रीय वैज्ञानिक अधिवेशन, एक कार्यशाला का आयोजन, पशुचिकित्सा संकाय में शिक्षकों की नियुक्ति तथा भारतीय कृषि अनुसंधान परिषद से प्राप्त सुदृढ़ीकरण व विकास, प्रक्षेत्रों के नवीनीकरण, कार्य अनुभव द्वारा प्रशिक्षण, 'आउटरीच प्रोग्राम' व पुस्तकालय विकास मदों में प्राप्त वित्तीय सहायता से किया गया ढ़ांचागत विकास विगत वर्ष की महत्वपूर्ण उपलब्धियां हैं। केन्द्रीय बकरी अनुसंधान संस्थान के साथ किये गये 'मैमोरेन्डम ऑफ अन्डरस्टेंडिंग' के रूप में द्विपक्षीय कार्य समझौते के फलस्वरूप हमारी शोध परक क्षमता में और भी वृद्धि हो गई है। रिपोर्ट अवधि में ही कर्मचारियों व छात्रों के लिये बहुपयोगी जिमनेजियम का बहुप्रतीक्षित कार्य पूरा हुआ और स्नातकोत्तर छात्रावास का हस्तांतरण हुआ।

कोई भी विकास कार्य भारतीय कृषि अनुसंधान परिषद से प्राप्त वित्तीय सहायता के अभाव में पूर्ण नहीं हो सकता था। इसके लिये हम विशेष रूप में भारत सरकार के कृषि शोध व शिक्षा विभाग के सचिव तथा भारतीय कृषि अनुसंधान परिषद के महानिदेशक डा. एस. अय्यपन, उप महानिदेशक शिक्षा डा. अरविंद कुमार, उप महानिदेशक पशुविज्ञान डा. के. एम. एल. पाठक, सहायक महानिदेशक शिक्षा डा. देव कुमार, सहायक महानिदेशक पशु स्वास्थ्य डा. गया प्रसाद तथा परिषद् के अन्य अधिकारियों के अत्यंत आभारी हैं। प्रदेश सरकार के प्रति भी हम आभार प्रकट करते हैं कि विश्वविद्यालय में संकाय सदस्यों की संख्या बढ़ने के साथ ही समानुपातिक रूप से हमारा बजट आबंटन भी बढ़ाया गया। इस वार्षिक प्रतिवेदन को इसके वर्तमान स्वरूप में प्रकाशित करने हेतु लिपि प्रस्तुत करने में पशुचिकित्सा संकाय के अधिष्ठाता व प्रधान संपादक डा. सतीश कुमार गर्ग, फिजियोलॉजी विभाग के सह आचार्य व संपादक डा. जीतेन्द्र कुमार, सर्जरी विभाग के आचार्य एवं विभागाध्यक्ष डा. आर. पी. पाण्डेय व बायोकेमिस्ट्री विभाग के सहा. आचार्य डा. विजय पाण्डेय का विशेष योगदान रहा है। विश्वविद्यालय के उन सभी कर्मचारियों के प्रयासों की भी सराहना की जाती है जिनका इस वार्षिक प्रतिवेदन के प्रकाशन में सहयोग रहा है, वे सभी धन्यवाद के पात्र हैं।

(ए. पी. सिंह)

# Executive Summary



Uttar Pradesh Pandit Deen Dayal Upadhyaya Pashu-Chikitsa Vigyan Vishwavidyalaya Evam Go Anusandhan Sansthan Mathura was established on 25.10.2001 by Govt. of UP with the erstwhile UP College of Veterinary Science & A.H., Mathura as its main constituent College to promote livestock production and productivity and address animal health through integrated teaching, research and extension programmes. University has one Krishi Vigyan Kendra at Mathura and has proposed to ICAR and State Govt. for transfer for four more KVKs from the adjoining districts of Mathura to this University. University has 782.34 acres land at Mathura and around 1400 acres at Madhurikund, about 20 km from the main campus. College of Biotechnology was started during 2010-2011 in the newly constructed building of the college with some core faculty members from Veterinary College and guest and visiting faculty from the nearby Institutions. As envisaged in Act of the University, three other constituent Colleges, namely- College of Fisheries, College of Livestock Products Technology and College of Animal Industry and Business Management are likely to start in near future.

During the period under report (2010-11), one meeting of Executive Council and nine meetings of Academic Council were held.

**Teaching:**

- College of Veterinary Science and Animal Husbandry admitted 76, 21 and 03 students in BVSc & AH, MVSc and PhD degree programmes and 69, 30 and 5 students completed their respective degrees during the year under report.
- Interns were imparted hands-on training in Clinical and Preventive Medicine, Surgery, Gynecology, cattle and buffalo production, sheep and goat management, poultry science, semen technology, biologicals production, zoo medicine, and farm management.
- Seventeen students of BVSc & AH were awarded Junior Research Fellowship by ICAR while three students qualified the Combined Entrance Examination of JNU Biotechnology programme.
- 5th year B.V.Sc. & A.H. students were sent on All India Educational Tour and visited Bombay Veterinary College, Fisheries Institute at Goa, Veterinary Colleges at Bangalore, Thrissur, Chennai and Hyderabad and other places of educational importance.
- College of Biotechnology was started in the newly constructed building during the academic session 2010-2011 with an intake of seven students.
- Kothari Teaching Veterinary Clinical Complex (TVCC) is a multi specialty Veterinary Clinics for hands-on training to students and clinical services to farmers and animal owners. The TVCC has well equipped operation theatres for small and large animals, radiology unit having 500 mA and 100 mA X-Ray machines, 9 inch C-arm image intensifier, electrically-operated hydraulic large animal operation table, facilities for inhalation anaesthesia, endoscope, laproscope, digital X-ray, ultrasonography, pulse-oxymeter, electrocardiograph and solid-state surgical diathermy unit and well equipped ICU.
- TVCC is receiving referred and serious cases not only from Mathura but from other districts of UP and adjoining states of Delhi, Rajasthan, Haryana and Madhya Pradesh including pets of BSF and NSG.
- Imaging of the interior of sick animals using ultrasonography, digital radiography and minimally invasive diagnostic endoscopy facilities has proved to be boon for livestock and pet-owners. Management of long bones fractures by "closed inter-locking nailing" technique in pets and large animals is a very common practice and during the year many cases were handled with 100% success.

- Clinical diagnostic laboratory in TVCC for teaching to students is well equipped for haematological and biochemical examination, urine analysis, faecal examination, skin scrapings not only for diagnosis of diseases in animals but also for hands on training of students in diagnostic procedures.
- TVCC successfully handled 6736 cases and the receipt for the year was Rs. 232850.00.
- For specialized veterinary care and hands on training of students in rural set-up, ambulatory clinical services were arranged on routine and regular basis to nearby places like of *Raman Reti, Vrindaban* and *Sonai* under the supervision of teachers of clinical departments.
- Emergency clinical services were also provided during non-working hours. Shri Jayant Chaudhary, Member of Parliament, Mathura, was kind enough to sanction an animal ambulance fitted with hydraulic-lift platform from MP local area development scheme for transportation of sick-animals from the door-step of farmers to University hospital for treatment. An intensive care unit equipped with life saving gadgets is also available in TVCC for critical care of ailing pets.
- During this period 38 manuals, 3 books and book chapters, 27 research papers were published in different National and International journals of repute and more than 90 research papers were presented in National and International Conferences apart from several lead and invited lectures by the teachers.
- University library has sitting space for 120 persons with CD ROM, internet, online database and xerox facility for readers and visitors. During the year, more than four hundred books were added in the library. University has created abundant facilities for e-learning which is a rich library resource of technical information for students and staff. Large number of journals are also available online.
- Agricultural Research Information System (ARIS) Cell and Local Area Network (LAN) facilities provide rapid and fast access to latest scientific developments to the faculty members and students. Internet accessibility in the ARIS cell has been upgraded by availing the broad-band facility and rail-net connectivity.

## Organization of Conferences, Seminar and Workshops:

- University organized several training, conferences and scientific meets.
- IV International Conference of "Laboratory Animal Scientists Association (India)" on "Challenges ahead" was organized on February 17-18, 2011 with more than 100 scientists from various parts of country including resource persons and participants from USA and UK.
- Two days pre-conference workshop on "Canine Echocardiography and Telemetry" was organized with 24 participants on February 15-16, 2011 for imparting hands on training on Echocardiography, ECG and telemetry.
- A National Seminar sponsored by UPDASP on "Cattle breed improvement through improved frozen semen technology in Uttar Pradesh" was organized on Dec. 22-23, 2010 for enhancing technical knowhow of field veterinarian working Department of State Animal Husbandry.

## Sports and Extracurricular activities:

- Annual Sports Meet 2011 of the University was inaugurated by Prof. A.P. Singh, Hon'ble Vice Chancellor of the University on 10th March, 2011 while Shri Shyam Sunder Sharma, Chairman Praklan Samiti (U.P.) and former Minister of Higher Education (U.P.) was the Chief Guest on closing ceremony on 11th March, 2010.
- Thirteen students of College of Veterinary Sciences & A.H. Mathura participated in All India inter Veterinary College Table Tennis, Badminton and Quiz Competition organized by Gobind Ballabh Pant University of Agriculture & Technology, Pant Nagar (U.S.) Uttarakhand from March 23rd to 25th, 2011.
- Students of BVSc & AH participated in 9th kisan mela organized by IVRI, Izatnagar, Bareily from 1-3 November 2010 brought laurels to the University in casting of cattle (1st & 3rd position) and in age determination competitions (2nd position).

- Fresher's day for I[st] year B.V.Sc. & A.H. students admitted during 2010-11 was organized on 15[th] Sept., 2010.
- Zydus Pharmaceuticals organized Zydus All India Drawing and Painting Competition 2010 and the winning students were awarded with certificates and cash prizes of Rs 1500, 1000 and 500 for their I[st], II[nd], and III[rd] place, respectively.
- In the 'B' and 'C' certificate examination of NCC, 44 and 15 cadets appeared and all the cadets qualified in both the examinations. NCC cadets also piloted and escorted H.E., the Chancellor of University and Governor of U.P., Shri B.L. Joshi during his arrival for the second convocation of University. University cadets also participated in four Combined Annual Training camps and one Army Attachment Camp during the year.

## Research:

- Details of major research activities and achievements under different extra-mural research projects and those of postgraduate research are detailed in the report. During the year under report, five outside funded research projects, four from ICAR and one from private firm, were in operation.
- In the four projects ongoing under Rashtriya Krishi Vikas Yojana, additional sum of Rs. 155 lacs was received by the University with which infrastruvtural facilities were strengthened for research.
- The quality of research conducted received recognition in form of ICAR Jawahar Lal Nehru Award for best PhD thesis during the year, VII Ram Lal Agrawal National Award, Best oral presentation award and best poster presentation awards bestowed upon the teachers and students of University.

## Extension:

- Extension activities of the University are undertaken through Department of Veterinary and Animal Husbandry Extension Education and Krishi Vigyan Kendra Mathura. Apart from this, disease diagnosis services through different departments and clinical services through Teaching Veterinary Clinical Complex of Veterinary College and Ambulatory Clinical services to certain villages and gaushalas are the routine extension services for welfare of livestock owners.
- Several training programmes were organized for paravets, livestock extension officers and veterinary officers on "Animal Health and Breed Improvement", "Recent Advances in diseases Diagnosis, Treatment, Control and Eradication of Livestock Diseases" and Infertility Management of Dairy Animals.
- 3210 farmers and farmwomen were trained through 189 training courses organized on campus while 212 in off-campus trainings from which 3795 farmers and farmwomen were benefited.
- Forty one training programmes were organized benefiting 1566 rural youth in various techniques of seed production nursery raising, vermin-culture and composting, dairying, stitching and knitting, embroidery, fruit and vegetable preservation, goat rearing, value addition etc.
- 183 front-line demonstrations covering an area of 59.2 hactare were conducted on various crops to show the productivity potential of new technology on farmers' field.
- Twelve field days on demonstration or OFT site to show the practical and economical feasibility of newly generated technologies and / or varieties at farmers door steps were organized.
- University also participated in Kisan Melas for disseminating new technology to farmers and livestock owners through display of new research materials, leaflets, folders, posters, charts, audio-visual means at Indian Veterinary Research Institute, Izatnagar, U.P from 01[st] – 3[rd] November 2010 and received Third Position in stall presentation.
- University organized Kisan Mela on 5[th] March 2011 where more than 1500 farmers participated.
- Animal health-cum-welfare camp was organized in village Karav (Raya) on 26.02.11 and the team of doctors and final year students treated more than 60 animals.

- University utilized print and electronic media to regularly reach out to the farmers and animal owners and brought out technical bulletin, leaflets, folders etc.
- An annual magazine "Braj Mein Krishi Evam Pashupalan" and "Braj Mein Phal Phool Evam Masale Ki Kheti" and "Pashudhan Patrika" in simple Hindi were also printed. These magazines were distributed / made available free of cost to the farmers. Scientists of the University are regularly on AIR programmes as well as provide telephonic consultancy.

## Agriculture Farm (Madhuri Kund Farm):

- At the 1396 acres agricultural farm at Madhuri Kund, 790 acres of land was under fodder seed and commercial crops production. Seed was produced for National Seed Corporation, UP Seed Corporation and Directorate of Rapeseed Mustard Research, Bharatpur.
- Farm is an important asset of the University and also source of economic resource generation. During the period under report, total production at the farm was about 20% more compared to the production during 2009-10.

## District Dairy Demonstration Farm:

- Almost all buildings of dairy farm of University were extensively renovated with the financial support from ICAR. About 300 cattle and buffaloes are being reared at the dairy farm. The total milk production at the farm during 2010-11 was 1, 30, 499 liters compared to that of 94,051 litres during 2009-10. Apart from the milk production, dairy farm animals were used for teaching and research purposes on different aspects of the animal health, production and reproduction. At the 110 acres of attached agriculture farm of dairy farm, 12,472.43 quintals green fodder and 253.35 quintals grains was produced. The cash revenue generated from the farm was Rs. 30.50 lacs compared to that of Rs. 15.06 lacs during 2009-10.

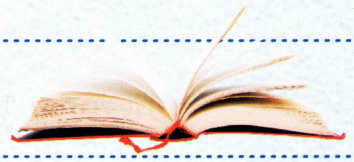
## Poultry Farm:

- Two Entrepreneurial training programmes on broilers rearing under "earn while you learn" programme were organized wherein final year students were trained in poultry production and management. In these programmes students earned a profit of Rs. 1349/- and Rs. 1847/-. per student Six batches of 3753 day old broilers chicks were also procured and reared at different time intervals and the farm earned a profit of Rs. 30942/- under revolving fund scheme of the department.

## Finance and Budget:

- During the years under report, State Govt. provided a total budget of Rs. 27.55 lacs and 927.60 lacs under the Plan and Non-plan schemes, respectively while Indian Council of Agricultural Research, New Delhi provided the financial assistance of Rs. 981.63 lacs. In addition, University also received a sum of Rs. 155.00 lacs in the ongoing RKVY projects.

# कार्यकारी सारांश



पूर्वकालिक उ.प्र. पशुचिकित्सा विज्ञान महाविद्यालय मथुरा को मुख्य प्रांगण बनाते हुए 25 अक्टूबर 2001 को उ.प्र. सरकार द्वारा पशु उत्पादन और उत्पादकता व पशुचिकित्सा के प्रदेश में विकास के लिए समेकित प्रशिक्षण शोध व प्रसार को गति प्रदान करने हेतु उ.प्र. पंडित दीन दयाल उपाध्याय पशु चिकित्सा विज्ञान विश्वविद्यालय एवं गो-अनुसंधान संस्थान, की स्थापना की गई। इस विश्वविद्यालय के पास भारतीय कृषि अनुसंधान परिषद् द्वारा पूर्णत: वित्त पोषित एक कृषि विज्ञान केन्द्र उपलब्ध है। मथुरा के सीमावर्ती जनपदों में स्थित चार अन्य कृषि विज्ञान केन्द्रों का स्थानान्तरण किया जाना प्रस्तावित है। विश्वविद्यालय के पास 782.34 एकड़ भूमि मथुरा प्रांगण पर तथा लगभग 20 किलोमीटर दूर स्थित माधुरीकुण्ड प्रक्षेत्र पर 1400 एकड़ भूमि उपलब्ध है। शिक्षण सत्र 2010-11 में विश्वविद्यालय द्वारा बॉयोटेकनालॉजी महाविद्यालय की स्थापना इसके नवनिर्मित भवन में पशुचिकित्सा विज्ञान महाविद्यालय के कुछ शिक्षकों को कोर फेकल्टी के रूप में चिन्हित करते हुये व निकटस्थ संस्थानों से शिक्षक आमंत्रित कर की गयी। विश्वविद्यालय के अधिनियमों में निहित पशु उत्पादन महाविद्यालय, मतस्य महाविद्यालय व पशु औद्योगीकी एवं व्यवसायिक प्रबन्धक महाविद्यालय का भी निकट भविष्य में प्रारम्भ किया जाना प्रस्तावित है।

रिपोर्ट की अवधि (2010-11) में विश्वविद्यालय कार्य परिषद की दो बैठक तथा विश्वविद्यालय विद्या परिषद की 9 बैठकें सम्पन्न हुईं ।

## शिक्षण

- पशुचिकित्सा विज्ञान महाविद्यालय में बी0वी0एस0सी एण्ड ए0एच0, एम0वी0एस0सी व पी0एच0डी0 में क्रमश: 76, 21 व 3 छात्र भर्ती किये गये व पूर्व में भर्ती 69, 30 व 5 छात्रों ने क्रमश: उपरोक्त उपाधियाँ प्राप्त की।
- इन्टर्नशिप के छात्रों को कार्यदक्षता प्रदान करने हेतु औषधि विज्ञान, शल्य क्रिया विज्ञान, गोवंश व महिष वंश उत्पादन, भेड व बकरी प्रबन्धन, कुक्कुट उत्पादन, वीर्य संरक्षण तकनीकी, जैव उत्पादन उत्पादन तकनीकी, वन्य प्राणि औषधि विज्ञान तथा प्रक्षेत्र प्रबंधन में प्रशिक्षित किया गया।
- 17 स्नातक छात्रों को भारतीय कृषि अनुसंधान परिषद् का जूनियर रिसर्च स्कालरशिप व 3 छात्रों को जवाहर लाल नेहरू विश्वविद्यालय, दिल्ली के जैव प्रोद्योगिकी प्रवेश परीक्षा में छात्रवृति प्राप्त हुई।
- पंचम प्रोफेशनल बी0वी0एस0सी0 स्नातक कार्यक्रम के छात्रों ने शैक्षणिक भ्रमण कार्यक्रम के अर्न्तगत बाम्बे वेटरिनरी कालेज, गोआ में फिशरी इंस्टीट्यूट, पशु चिकित्सा महाविद्यालय बंग्लौर, त्रिचूर,चेन्ई और हैदराबाद का भ्रमण किया।
- सत्र 2010-2011 में बायोटेक्नालॉजी महाविद्यालय के पाठ्यक्रम में सात छात्रों के प्रवेश के साथ शिक्षण कार्य नवीन भवन में प्रारम्भ हुआ।
- कोठारी शैक्षणिक पशुचिकित्सालय (टी0वी0सी0सी0) जो कि एक बहुआयॉमी व विशिष्ठ पशु चिकित्सा केन्द्र है, में छात्रों को प्रशिक्षण प्रदान किया गया। इस चिकित्सालय में छोटे एवं बड़े पशुओं के शल्य क्रिया कक्ष, विकिरण इकाई जिसमें 500 एम0ए व सौ एम0ए0 एक्सरे मशीनें, 9 इंच का सी0ऑर्म इमेज इन्टेनसिव फायर, बिजली से चलनें वाला बड़े पशुओं हेतु शल्य, Ultra sound, digital X-ray, ECG, Diathermy, Pulse Oxymeter से पूर्ण सुसजिज्त संघन चिकित्सा कक्ष उपलब्ध है।
- टी0वी0सी0सी0 में न केवल मथुरा व उत्तर प्रदेश के अन्य जनपदों से बल्कि दिल्ली राजस्थान, हरियाणा व मध्य प्रदेश के निकटस्थ जनपदों से भी पशु चिकित्सा हेतु संदर्भित किये जाते हैं जिसमें सीमा सुरक्षा बल व राष्ट्रीय सुरक्षा गार्ड के स्वॉन भी सम्मिलित हैं।

- अल्ट्रासाण्उड डिजीटल एक्सरे व इनडोस्कोपी जैसे निदान की सुविधायें पशुपालकों के लिए एक वरदान की तरह हैं। छोटे व बड़े पशुओं में बड़ी हडिड्यों को सी0आई0एल0एन0 प्रक्रिया द्वारा 100 प्रतिशत सफलता पूर्वक उपचार किया गया है।
- चिकित्सालय स्थित निदान प्रयोगशाला, रक्त व मल मूत्र तथा त्वचा के विस्तृत प्रशिक्षण के लिए पूर्णत: सक्षम है। जहाँ छात्रों को प्रशिक्षित किया जाता है।
- टी0वी0सी0सी0 में रिपोर्ट अवधि में कुल 6736 पशुओं का उपचार किया गया तथा रू0 232850.00 की आय हुई।
- छात्रों को वास्तविक ग्रामीण स्थितियों में प्रशिक्षित करने के लिए क्लिनिक्स विभागों के शिक्षकों की देखरेख में नियति रूप से रमण रेती, वृन्दावन व सोनई में सचल पशु चिकित्सा कार्य चलाया गया।
- नियमित कार्य अवधि के उपरान्त आकस्मिक पशु चिकित्सा सेवाओं की सुविधा भी उपलब्ध कराई गयी। माननीय सांसद मथुरा श्री जयन्त चौधरी द्वारा सांसद निधि से एक हाड्रोलिक लिफट प्लेटफार्म से सुसज्जित संचल पशुचिकित्सा एम्बुलेंस उपलब्ध कराई गई। जिसकी सहायता से रोगी पशुओं कों पशुपालक के द्वार से विश्वविद्यालय स्थित पशु चिकित्सालय तक लाना सहज हो गया है । चिकित्सालय में जीवन-रक्षक उपकरणों से सुसज्जित छोटे पालतु पशुओं के लिए सघन चिकित्सा इकाई भी उपलब्ध है।
- रिपोर्ट अवधि में शिक्षकों द्वारा 38-मैन्युल, 3-पुस्तकें व पुस्तकों के अनुक्षेद लिखे गये व 27 शोध पत्र विभिन्न राष्ट्रीय व अन्तराष्ट्रीय शोघ पत्रिकाओं में प्रकाशित हुये। इसके अतिरिक्त 90 से अधिक शोध पत्र विभिन्न वैज्ञानिक गोष्ठियॉं में पढ़े गये व अनेकों मुख्य व आमंत्रित व्याख्यान शिक्षकों द्वारा दिये गये।
- विश्वविद्यालय पुस्तकालय में 120 व्यक्तीयों के बैठ कर अध्ध्यन करने हेतु सुविधा है तथा यह पुस्तकालय सीडी रोम, इन्टरनेट, आन लाइन डाटा बेस व जीराक्स आदि की सुविधाओं एवं सुसज्ज्ति है। रिपोर्ट अवधि मे पुस्तकालय में 400 से अधिक पुस्तकें और उपलब्ध कराई गयी। विश्वविद्यालय में इन्टरनेट के माध्यम से शिक्षण के संसाधन भी सृजित किये गये।
- शिक्षकों और छात्रों को देश-विदेश में हो रही वैज्ञानिक प्रगति के क्षेत्र में त्वरित जानकारी उपलब्ध कराने हेतु विश्वविद्यालय में ऐरिस प्रकोष्ठ है व लोकल एरिया नेटवक्र से विभागों को जोड़ा हुआ है। इन्टरनेट को सुलभ व त्वरित पहुँच बनाने के लिए उपलब्ध सुविधा को उच्चीकृत कर ब्राड बेंड व रेल-नेट के माध्यम से इन्टरनेट सुविधा उपलब्ध कराई गई।

## गोष्ठी, सेमिनार व कार्यशालाओं का आयोजन

- रिपोर्ट अवधि में विश्वविद्यालय में अनेकों प्रशिक्षण कार्यक्रम, गोष्ठीयाँ व कार्यशालायें आयोजित की गयी।
- लेबोरेटरी एनीमल सांइटिसट एसोसिऐशन (इण्डिया) की चतुर्थ अन्तर्राष्ट्रीय कान्फ्रेस का आयोजन 17-18 फरवरी 2011 में 'भविष्य की चुनौतियॉं' विषय पर आयोजित किया गया जिसमें 100 से अधिक वैज्ञानिकों ने भाग लिया जिसमें इग्लैण्ड व अमेरिका से आये हुये विशेषज्ञ व प्रतिभागी शामिल रहे ।
- इस कॉन्फ्रेस से पूर्व एक दो दिवसीय कान्फ्रेस-पूर्व-कार्यशाला दिनांक 15-16 फरवरी 2011 को "Canine Echocardiography and Telemetry" विषय पर 24 प्रशिक्षार्थियों के साथ कार्यशाला आयोजित की गयी।
- यू0पी0 डास्प से वित्त पोषित "Cattle breed improvement through improved frozen semen technology in Uttar Pradesh" विषय पर दो दिवसीय सेमिनार का आयोजन दिनांक 22-23 दिसम्बर 2010 को किया गया जिसमें प्रदेश के पशुपालन विभाग के पशुचिकित्सा अधिकारियों ने भाग लिया।

## खेल-कूद व शिक्षेकेत्तर गति विधियाँ

- विश्वविद्यालय के वार्षिक क्रीड़ा प्रतियोगिता 2011 का आयोजन विश्वविद्यालय द्वारा किया गया जिसका उदघाटन माननीय कुलपति प्रो ए0पी0 सिंह द्वारा 10 मार्च को किया गया व 11 मार्च को समापन समारोह के मुख्य अतिथि प्रदेश की प्राक्लन समिति के अध्यक्ष व पूर्व उच्च शिक्षा मन्त्री (प्रदेश सरकार) माननीय श्री श्याम सुन्दर शर्मा जी रहे।

- 23-25 मार्च 2011 में पन्त नगर कृषि विश्वविद्यालय द्वारा आयोजित अखिल भारतीय अन्तर-पशुचिकित्सा विज्ञान महाविद्यालय टेबिल टेनिस, बैटमिन्टन व क्यूज प्रतियोगिता में इस विश्वविद्यालय के 13 छात्रों ने भाग लिया।
- पशुचिकित्सा स्नातक कार्यक्रम के छात्रों ने आई0वी0आर0आई0 इज्जतनगर के 9 वें किसान मेलें में 1-3 नवम्बर 2010 में भाग लिया व विभिन्न प्रतियोगितओं में प्रथम व द्वितीय स्थान प्राप्त किया।
- 2010-2011 में प्रथम वर्ष में भर्ती हुए स्नातक छात्रों का स्वागत दिवस 15 सितम्बर 2010 को मनाया गया।
- Zydus Pharmaceuticals द्वारा आयोजित Zydus अखिल भारतीय चित्र कला प्रतियोगिता 2010 में प्रथम, द्वितीय व तृतीय स्थान पर रहे छात्रों की क्रमशः रू0 1500.00, 1000.00, व 500.00 का नगद पुरस्कार व प्रमापत्र प्रदान किये गये।
- एन0सी0सी0 के बी व सी श्रेणी के प्रमाण पत्र हेतु विश्वविद्यालय के 44 व 15 कैडेट ने परीक्षा दी व शत प्रतिशत सफलता प्राप्त की। विश्वविद्यालय के एन0सी0सी0 छात्रों द्वारा विश्वविद्यालय के कुलाधिपति व प्रदेश के महामहीम राज्यपाल श्री बी.एल. जोशी के दीक्षान्त समारोह के आगमन पर उनकी आगवानी की।

## शोध

- रिपोर्ट में बाहय वित्त पोषित परियोजनाओं तथा स्नातकोत्तर शोध परियोजनाओं में हुई गतिविधियों व उपलबधियों का विवरण समाहित है। रिपोर्ट काल में आई0सी0ए0आर0 से वित्त पोषित चार व प्राईवेट संस्था से वित्त पोषित 1 परियोजना विश्व विद्यालय में कार्यरत्त रही।
- राष्ट्रीय कृषि विकास योजना के अंतर्गत परिचालित चार परियोजनाओं में विश्वविद्यालय को 155 लाख रू0 प्राप्त हुए जिससे शोध कार्यो के लिए ढाचागत सुविधाओं को सुदृढ किया गया।
- विश्वविद्यालय में हुए गुणवत्तापूर्ण शोध कार्यो के लिए रिपोर्ट अवधि में आई0सी0ए0आर0 से जवाहर लाल नेहरू पुरस्कार व 7वॉ रामलाल अग्रवाल राष्ट्रीय पुरस्कार प्राप्त हुआ। इसके अतिरिक्त विभिन्न सेमिनार व गोष्ठियों में प्रस्तुत शोध पत्रों को सर्वश्रेष्ठ मौखिक प्रस्तुतीकरण व सर्वश्रेष्ठ पोस्टर प्रस्तुतीकरण पुरस्कार प्राप्त हुये।

## प्रसार

- विश्वविद्यालय प्रसार गतिविधियाँ कृषि विज्ञान केन्द्र व पशु चिकित्सा व पशुपालन प्रसार विभाग द्वारा सामुहिक रूप से चलाई जाती हैं। इसके अतिरिक्त पशु रोग निदान व पशु चिकित्सा सेवायें टी0वी0सी0सी0 व एम्बुलेट्री इकाई द्वारा पशु पालको व ग्रामीणजनों तक पहुचाई जाती है।
- पैरावेट, पशुधन प्रसार अधिकारी व पशुचिकित्सा अधिकारियों के लाभार्थ "Animal Health and Breed improvement", "Recent advances in disease diagnosis, treatment, control and eradication of livestock diseases" एवं "Infertility management of dairy animals" पर प्रशिक्षण आयोजित की गया।
- 3210 पुरूष व महिला कृषकों व पशुपालकों को प्रागंण पर आयोजत 189 प्रशिक्षण कार्यक्रमों में प्रशिक्षित किया गया। जबकि प्रागंण से बाहर आयोजित 212 प्रशिक्षणों में 3795 कृषक व पशुपालक प्रशिक्षित होकर लाभन्वित हुए।
- ग्रामीण युवकों के लाभार्थ बीज उत्पादन, नर्सरी, पशु उत्पाद गुणवत्ता वर्धन व केंचुआ खाद उत्पादन आदि विषयों में 1566 युवाओं को प्रशिक्षित किया गया।
- कृषि प्रक्षेत्र पर नवीन तकनीकी अपनाये जाने से होने वाले उत्पादन वृद्धि के प्रभाव के प्रदर्शन हेतु 183 फ्रन्ट लाइन डेमोस्ट्रेशन कुल 59.2 हेक्टेयर प्रक्षेत्र पर आयोजित किये गये।
- नवसृजित तकनीकी व्यवहारिक व आर्थिक उपयोगिता दर्शाने हेतु 12 क्षेत्र दिन आयोजित किये गये।
- नवीन तकनीक कों कृषकों में प्रसार प्रचार हेतु विश्वविद्यालय द्वारा 1-3 नवम्बर 2010 में आई0वी0आर0आई0 में आयोजित किसान मेला में भाग लिया गया, जहाँ नवीन शोध के पर्चे, फोल्डर, दृष्टिश्रव्य माध्यमों से कृषकों के मध्य प्रदर्शन किया गया।

इस हेतु विश्वविद्यालय के स्टॉल को तृतीय पुरस्कार प्राप्त हुआ।

- विश्वविद्यालय ने दिनांक 5 मार्च 2011 को किसान मेले का आयोजन किया जिसमें 1500 से अधिक कृषकों ने भाग लिया।
- पशु स्वास्थ शिविर का आयोजन भी विश्वविद्यालय द्वारा किया गया जिसमें शिक्षकों व छात्रों द्वारा 60 से अधिक पशुओ की चिकित्सा एव निदान किया गया।
- विश्वविद्यालय द्वारा प्रिंट व इलेक्ट्रानिक मीडिया के माध्यम से कृषकों तक पहुँचाने का सार्थक प्रयास किया गया।
- विश्वविद्यालय द्वारा कृषकों व पशुपालकों के लाभार्थ सरल हिन्दी में 'बृज में कृषि एवं पशुपालको', 'बृज में फल, फूल एवं मसाले की खेती' तथा 'पशुधन पत्रिका' का प्रकाशन किया गया जिन्हें निशुल्क वितरित किया गया। विश्वविद्यालय के शिक्षकों द्वारा आकाशवाणी व दूरभाष के माध्यम से भी कृषकों व पशुपालकों को सुझाव प्रदान किये गये।

## कृषि प्रक्षेत्र (माधुरी कुंड प्रक्षेत्र)

- माधुरी कुंड प्रक्षेत्र की कुल 1396 एकड़ भूमि में से 790 एकड़ भूमि को चारा व नगद फसल के उत्पादन में प्रयुक्त किया गया। प्रक्षेत्र पर उत्पादित बीज को राष्ट्रीय बीज निगम व उ.प्र. बीज निगम व डायरेक्टरेट ऑफ मसर्टड रिसर्च, भरतपुर द्वारा क्रय किया जाता है।
- रिपोर्ट अवधि में वर्ष 2009-10 की तुलना में उत्पादकता में 20 प्रतिशत से अधिक की वृद्धि दर्ज की गई।

## जिला दुग्धशाला प्रदर्शन प्रक्षेत्र

- भारतीय कृषि अनुसंधान परिषद से प्राप्त वित्तीय सहायता से विश्वविद्यालय के डेयरी फार्म के लगभग सभी भवनों का बृहद्ध नवीनीकरण कराया गया। वर्तमान में प्रक्षेत्र पर लगभग 300 गाय व भैंसे रखी गयी है।
- वर्ष 2009-10 के 94051 लीटर दूध की तुलना में वर्ष 2010-11 में दुग्ध उत्पादन बढकर 130499 लीटर रिकार्ड किया गया।
- दुग्ध उत्पादन के अतिरिक्त प्रक्षेत्र के पशुओं का पशु स्वास्थ्य, प्रजनन व उत्पादन सम्बन्धी शोध व शिक्षण में उपयोग किया गया।
- दुग्धशाला प्रक्षेत्र के साथ सम्बद्ध 110 एकड़ कृषि प्रक्षेत्र पर रिपोर्ट अवधि में 12472.43 कुन्टल हरा चारा व 253.35 कुन्टल दाना उत्पादित किया गया।
- वर्ष 2009-10 में प्रक्षेत्र से हुई कुल प्राप्ति रू0 15.06 लाख थी जो वर्ष 2010-11 में बढ़कर 30.50 लाख हो गई।

## कुक्कुट प्रक्षेत्र

"Earn while you learn" कार्यक्रम के अन्तर्गत अन्तिम वर्ष के स्नातक छात्रों के लिए दो व्यवसायिक प्रशिक्षण कार्य्रक्रम आयोजित हुये जिसमें छात्रों ने कुक्कुट उत्पादन व प्रबंधन में प्रशिक्षिण प्राप्त किया। छात्रों ने इस प्रशिक्षण से क्रमशः रू0 1349.00 व रू0 1847.00 लाभ अर्जित किया । विभाग द्वारा चलाये जा रहे रिवालविग फंड योजना में भी रू0 30942.00 का लाभ अर्जित किया गया।

## वित्त व बजट

रिपोर्ट अवधि में प्रदेश सरकार से विश्वविद्यालय को कुल 27.55 लाख व 927.60 लाख क्रमशः योजनामद व योजनेत्तर मद में प्राप्त हुए। भारतीय कृषि अनुसंधान परिषद से विश्वविद्यालय को 981.63 लाख की वित्तीय सहायता प्राप्त हुई। इसके अतिरिक्त राष्ट्रीय कृषि विकास योजना के अंतर्गत स्वीकृत व पूर्व से परिचालित परियोजनाओं में विश्वविद्यालय को रू0 155.00 लाख की स्वीकृति भी प्राप्त हुई।

## 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 motivate them to adopt animal husbandry, poultry, fishery and related vocations as an engine of economic growth and social empowerment ;
- Social empowerment of women to become "knowledgeable stake holders" and giving them economic identity;
- Interface Industry and stakeholders in the newer perspectives of open global market; and
- Ensure enhanced production from rural and urban livestock through effective disease surveillance and diagnosis, health care and vaccination programmes.
- Empower rural youth for self-employment adopting integrated farming practices.

## MANDATE

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

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

## CHALLENGES

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

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

Challenges enumerated above have to be faced through concerted efforts of University Academia with full support of the Government of U.P. And ICAR.

## 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, Teaching 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 and upcoming faculties;
- Encourage faculty members to garner more financial assistance from outside agencies through externally funded research projects and support atleast one University funded research project in each department to give impetus to research;
- As per University Act, to obtain state support for generating trained and competent human resource in fisheries, biotechnology, livestock products technologies and industry and business management through designated colleges/faculties; and
- To augment University financial resource and refurbish infrastructure.

# I. 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 27 of 2001 on 25.10.2001 by Govt. of U.P. with the erstwhile U.P. College of Veterinary Science & AH, Mathura as its main constituent College with all its moveable and immovable assets. University is having 782.34 acres prime land in Mathura, which includes all the buildings of Veterinary College, residential complex, hostels, Dairy Farm, Poultry Farm and agriculture land and another agriculture farm of around 1400 acres at Madhurikund, about 25 Km from the main campus.

After establishment of the University in 2001, initially the University offices were located in the Administrative block of Veterinary College, however, after inauguration of the Administrative Block of University by His Excellency Shri T.V. Rajeshwar, Hon'ble Chancellor and Governor of U.P. on February 24, 2009, all the central offices of University were shifted to new campus. The employees and teachers have occupied the newly constructed houses in new campus. The newly constructed College of Biotechnology building was inaugurated by John George, Advisor DBT, Ministry of Science and Technology, Government of India in the august presence of Prof. M.L. Madan, the Hon'ble Vice Chancellor, Dr. Lal Krishna, ADG (Animal Health) ICAR, New Delhi and other officers of the University on September 25, 2009.

The Act of University envisages opening of four more colleges, namely - College of Biotechnology, College of Fisheries, College of Livestock Products Technology and College of Animal Industries and Business Management. However, these colleges could not be started in spite of the best efforts of University due to financial constraints and non-sanction of any teaching or other positions by the Govt. During 2009, Government permitted the University to start College of Biotechnology under self-finance scheme. Accordingly, the University started 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.

# II. 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.

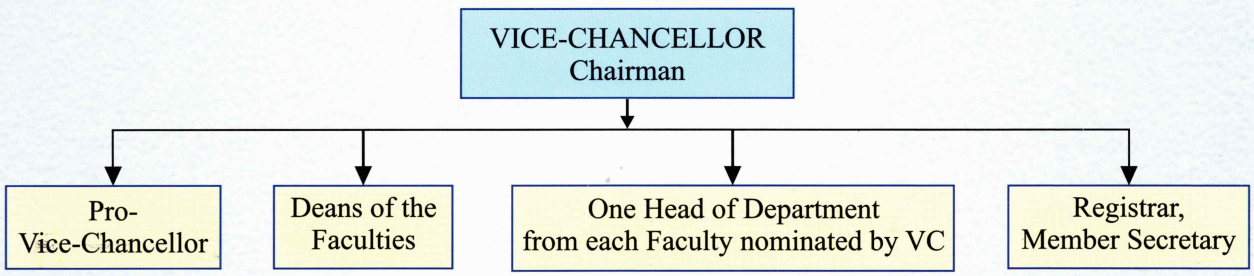
# A. AUTHORITIES OF THE UNIVERSITY :

## 1. Executive Council

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

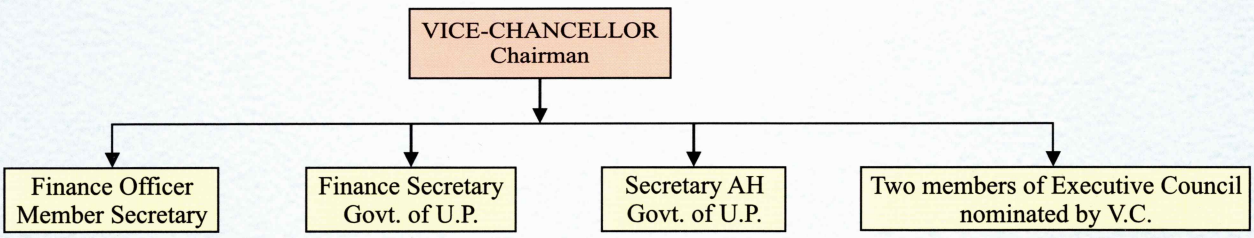
## 2. Academic Council

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



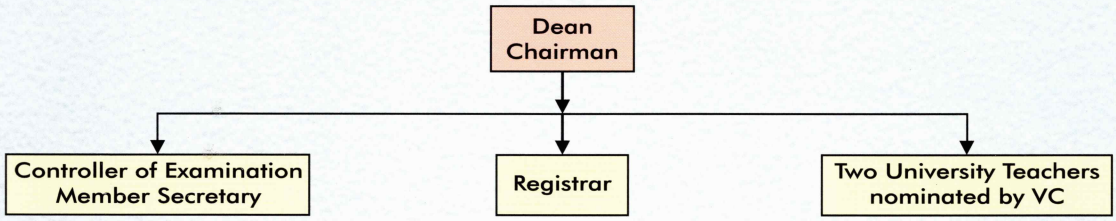

## 3. Finance Committee

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




## 4. Examination Committee

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

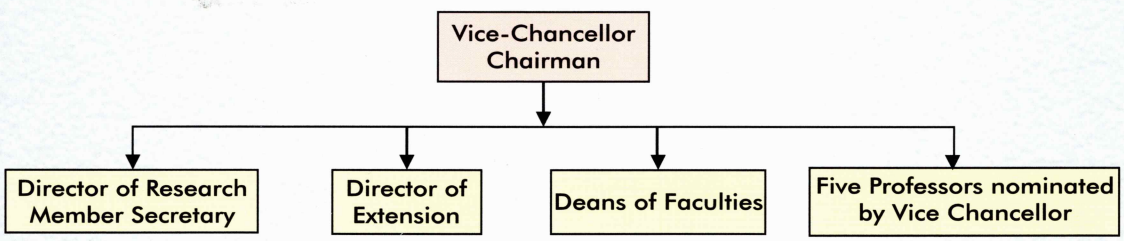



## 5. Board of Faculty

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.

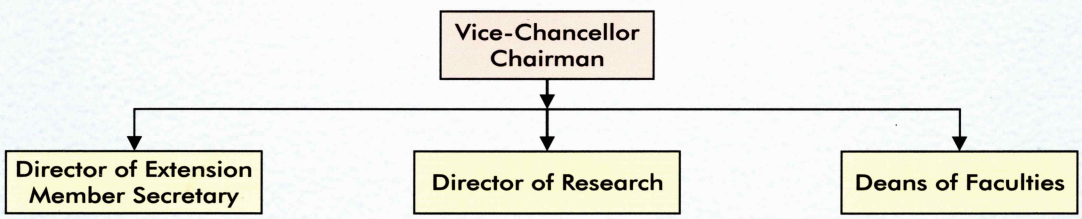
## 6. Research Advisory Committee

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 :



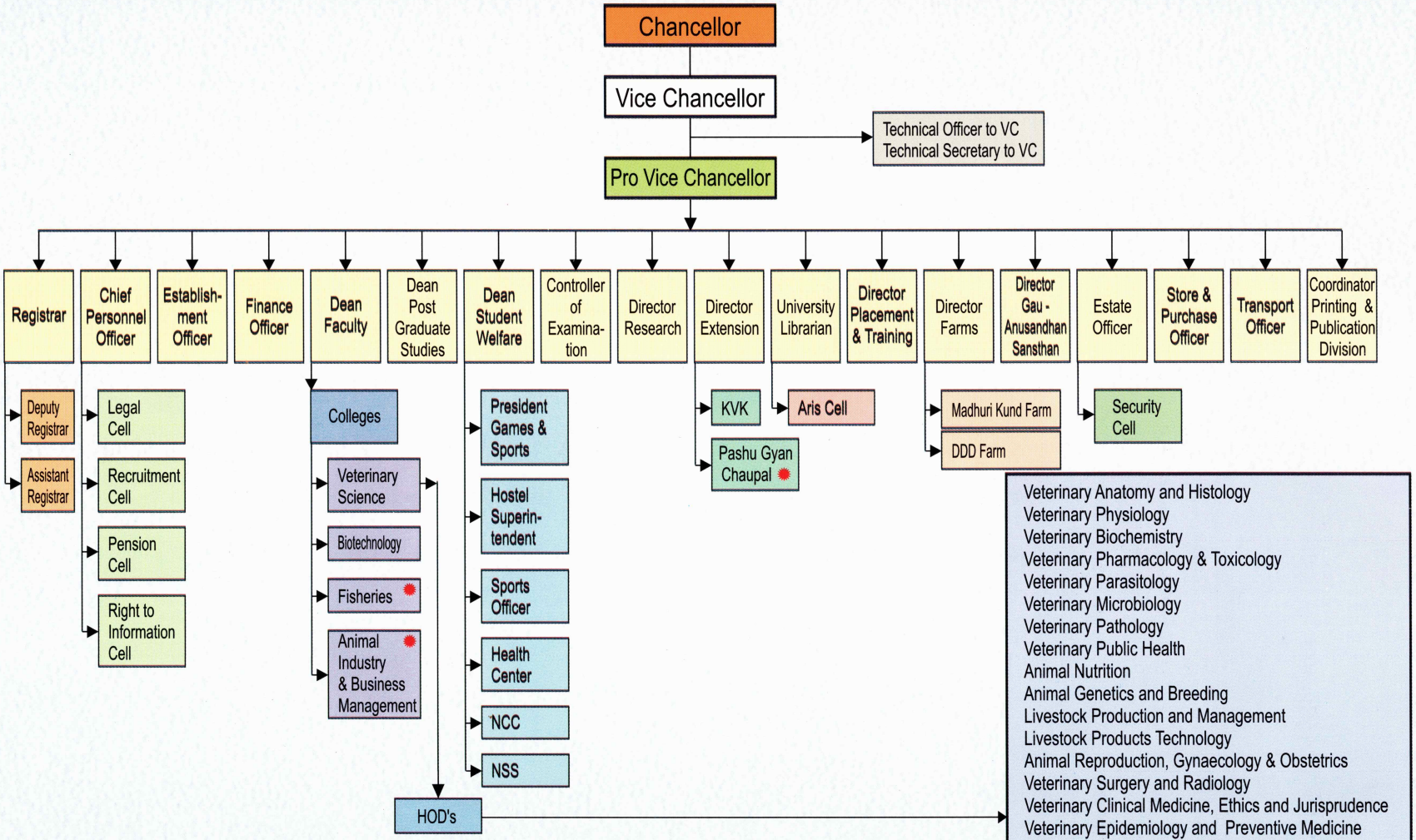

## 7. Extension Advisory Committee

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 Vishwavidyalya Evam Go-Anusandhan Sansthan (DUVASU), Mathura



## B. ORGANIZATIONAL MEETINGS FROM APRIL 2010 TO MARCH 2011

| S.No. | Authority | Meetings No. | Date | Venue |
|---|---|---|---|---|
| 1 | Academic Council | 27th | 19.04.2010 | DUVASU, Mathura |
| | | 28th | 25.06.2010 | |
| | | 29th | 14.09.2010 | |
| | | 30th | 01.10.2010 | |
| | | 31th | 23.10.2010 | |
| | | 32th | 10.01.2011 | |
| | | 33th | 28.02.2011 | |
| 2 | Executive Council | 17th | 05.07.2010 | UPCAR, Lucknow |
| | | 18th | 22.11.2010 | |

## C. OFFICERS OF THE UNIVERSITY (2010-2011)

| | | |
|---|---|---|
| 1 | Chancellor | His Excellency Sr. B.L. Joshi, Governor of Uttar Pradesh |
| 2 | Vice Chacellor | Prof. A.P. Singh (08-02-2010- continuing) |
| 3 | Registrar | Dr. Sharad Kumar Yadav (officiating w.e.f. 23-11-2009-continuing) |
| 4 | Finance Officer | Sh. Sushil K. Yadav (w.e.f. 28-08-2009-continuing) |
| 5 | Dean Veterinary College | Prof. Satish K. Garg (w.e.f. 30-06-2009-continuing) |
| 6 | Controller of Examination | Dr. R.P. Pandey (officiating w.e.f. 02-12-2009-continuing) |
| 7 | Dean P.G.S | Dr. A.K. Srivastava (officiating w.e.f 01-12-2009-continuing) |
| 8 | Dean Students Welfare | Dr. M.M. Farooqui (officiating w.e.f. 01-12-2005-continuing) |
| 9 | Director of Research | Dr. Atul Saxena (officiating w.e.f. 24-11-2009-continuing) |
| 10 | Director of Extension | Dr. Sarvajeet Yadav (officiating w.e.f. 24-11-2009-continuing) |
| 11 | University Librarian | Dr. Bharat Singh (officiating w.e.f. 08-09-2008-continuing) |

# III. Teaching

## A. TEACHING ACTIVITIES

### 1. Teaching Institutes

Presently there are two faculties in the University; College of Veterinary Science and Animal Husbandry and College of Biotechnology. Three other colleges are likely to start in the coming years in a phased manner.

#### College of Veterinary Science and Animal Husbandry

It is one of the premier Veterinary Colleges of India. The College caters to the need of trained manpower for the State of U.P. as well as other states by carrying out teaching, research and extension education programme pertaining to livestock production and health. College has 19 well established departments and offers the following programme of study :-

(i) B.V.Sc. & A.H. (5 years degree programme as per Veterinary Council of India)

(ii) M.V.Sc. (4 semesters, as per Indian Council of Agricultural Research)

(iii) Ph.D. (6 semesters, as per Indian Council of Agricultural Research)

All the Departments are having well qualified faculty members and good laboratory facilities. College has a Central Instrumentation Laboratory equipped with state of the art instruments, equipments and research gadgets. The TVCC of the College is a dynamic and vibrant unit equipped with all necessary state of art diagnostic and treatment instruments and equipments. These facilities are used for providing "hands on training" to the under-graduate and post-graduate students of veterinary faculty.



#### College of Biotechnology

College of Biotechnology was started from the academic session 2010–11 to impart post graduate degree in Biotechnology and to generate human resource; to develop genetic based clinical research technology and to develop / augment bioinformatics technology.

M.Sc. degree programme is of 4 semesters duration and admissions were made based on the merit in Entrance test conducted by the University.



The College is located in a huge, beautiful, and modern building. Different laboratories in the College are well equipped and are being further strengthened with latest state of the art instruments. The University has also signed a M:O.U. with Central Institute for Research on Goats (CIRG) Makhdoom, Farah, to further augment teaching and research for P.G. students of the College.

University envisages of starting Ph.D. and undergraduate teaching programmes in Biotechnology in near future.

## 2. Admissions and turn out of students during 2010-11

**College of Veterinary Science and Animal Husbandry**

| Degree Programme | | Students admitted | | | Students turn out | | |
|---|---|---|---|---|---|---|---|
| | Capacity | Boys | Girls | Total | Boys | Girls | Total |
| BVSc & AH | 78 | 62 | 14 | 76 | 56 | 13 | 69 |
| MVSc | 21 | 17 | 04 | 21 | 24 | 06 | 30 |
| PhD | 03 | 02 | 01 | 03 | 04 | 01 | 05 |
| Total | 102 | 81 | 19 | 100 | 84 | 20 | 104 |

**College of Biotechnology**

| Degree Programme | | Students admitted | | | Students turn out | | |
|---|---|---|---|---|---|---|---|
| | Capacity | Boys | Girls | Total | Boys | Girls | Total |
| MSc/MVSc | 25 | 01 | 06 | 07 | 00 | 00 | 00 |

## 3. Academic attainments of students

Large number of students of College of Veterinary Science and Animal Husbandry excelled in national level competitive examinations. During the year, seventeen students qualified the Junior Research Fellowship examination conducted by ICAR, New Delhi. Besides this, three students also qualified Combined Entrance Examination of JNU Biotechnology Programme. Hon'ble Vice-Chancellor and Dean of Veterinary College not only congratulated the awardees for bringing laurels to the Institution but also congratulated the faculty members for counseling and coaching to students for ICAR-JRF examination 2010.

## 4. Academic Research

During the year, seven students submitted their Ph.D. and twenty nine their MVSc theses which were accepted by the University for Award of respective degrees.

## DOCTORATE OF PHILOSOPHY IN VETERINARY SCIENCES

| S.No. | Title of the Thesis | Name of the Student | Name of the Guide | Co-Guide | Department |
|---|---|---|---|---|---|
| 1. | Studies on carrier stage of *Theileria annulata* in bovines with special reference to evaluation of chemotherapy and immunotharapy | Nidhi Singh | Dr. S.D. Sharma | Dr. Hemant Mehta | Medicine |
| 2. | Studies on cellular structures of pasteurella as candidate immunogens for preparation of vaccine against *Haemorrhagic septicemia* | Salauddin Qureshi | Dr. A.K. Bhatia | Dr. Sharad Yadav | Microbiology and Immunology |
| 3. | Studies on the anti-bacterial and anti-viral effect of the leaves of *Ocimum sanctum* and *Argemone mexicana* with reference to immuno-modulatory effect | Punit Varshney | Dr. A.K. Bhatia | Dr. Sharad Yadav | Microbiology and Immunology |
| 4. | Comparative pathology of experimentally-induced pasteurellosis in chickens and quails | Rajul Saxena | Dr. A.K. Srivastava | | Pathology |
| 5. | Pathology of paratuberculosis in goat in reference to vaccine strategy | Aswini K. Singh | Dr. A.K. Srivastava | | Pathology |
| 6. | Comparative pharmacokinetics and interaction studies of ofloxacin and meloxicam in yaks and cattle | Fakar-uddin Ali Ahmed | Dr. S.K. Garg | | Pharma-cology and Toxicology |
| 7. | Detection and identification of *Clostridium perfringens* in foods | Ranvijay Singh | Dr. Basanti Bisht | | Public Health |

## MASTER OF VETERINARY SCIENCES

| S.No. | Title of the Thesis | Name of the Student | Name of the Guide | Co-Guide | Department |
|---|---|---|---|---|---|
| 1. | Genetic evaluation of frieswal sires on the basis of early growth and production performance of their progeny | Satbir Singh Dagur | Dr. K. C. Sharma | | Animal Genetics and Breeding |
| 2. | A study on comparative protein profile in the pre-ovulatory follicles vis a vis serum of buffalo during different stages of estrus cycle | Dilip Kumar Baitha | Dr. Rajesh Nigam | | Biochemistry |

| S.No. | Title of the Thesis | Name of the Student | Name of the | Co-Guide | Department |
|---|---|---|---|---|---|
| 3. | Prophylactic and therapeutic effect of Johne's disease vaccine in cattle | Abhishek Kumar Srivastava | Dr. Sharad Yadav | | Epidemiology & Preventive Medicine |
| 4. | Development of sanwich ELISA for the detection of infectious bovine rhinotracheitis (IBR) virus | Shanaz Bashir | Dr. Sharad Yadav | | Epidemiology & Preventive Medicine |
| 5. | Some studies on coliform diarrhoea in cow and bufalo calves with speacial reference to antibiotic sensitivity | Subhash Malik | Dr. S.D.Sharma | Dr. Manoj Gupta | Medicine |
| 6. | Studies on clinico-therapeutic and diagnostic aspect of renal failure in dogs | Ramakant | Dr. H.P. Lal | Dr. Mukesh Kumar Srivastava | Medicine |
| 7. | Studies on gastroentritis, its therapeutic management with probiotics and role of campylobacter in dogs | Rajesh Kumar | Dr. H.P. Lal | Dr. Amit Kumar Verma | Medicine |
| 8. | Studies on bacterial mastitis with seasonal variations and susceptibility of causative organisms against antibiotics and herbal extracts in bovines | Sumit Vashney | Dr. Basanti Bisht | Dr. M. K. Gupta | Microbiology and Immunology |
| 9. | Comparative screening of medicinal plants for their antimicrobial and immune-modulatory activities. | Arvind Sharma | Dr. Sharad Yadav | | Microbiology and Immunology |
| 10. | Studies on induction of estrus and fertility with controlled internal drug release (CIDR) device and other hormonal combination in bufalo heifers | Atul Kumar Verma | Dr. Atul Saxena | | Obstetrics and Gynecology |
| 11. | Studies on comparison of fertility in different ovulation synchronization protocols for fixed time insemination in anoestrus | Brijesh Kumar | Dr. Atul Saxena | | Obstetrics and Gynecology |
| 12. | Studies on induction of estrus and fertility in anestrus buffaloes using progesterone releasing intravginal device and other hormonal combinations | Ram Shyam Singh | Dr. Atul Saxena | | Obstetrics and Gynecology |
| 13. | *Datura stramonium* seed toxicity in rats-a clinicopathological and pathomorphological study | Santosh K. Verma | Dr. A.K. Srivastava | | Pathology |

| S.No. | Title of the Thesis | Name of the Student | Name of the | Co-Guide | Department |
|---|---|---|---|---|---|
| 14. | Studies on disposition kinetics of levofloxacin in buffalo calves | Ram Raghuvendra Singh | Dr. Satish K.Garg | | Pharma-cology and Toxicology |
| 15. | Toxicity study of binary mixture of arsenic and deltamethrin and the ameliorative effects of aqueous extracts *Moringa oleifera* leaves and *Withania somnifera* roots in male wistar rats | Sunil Kumar | Dr. Satish K.Garg | | Pharma-cology and Toxicology |
| 16. | Pharmacological studies on nitric oxide pathway and its signaling mechanism(s) in buffalo myometrium | Suchendra Singh Sikarwar | Dr. Satish K.Garg | Dr. Atul Prakash | Pharma-cology and Toxicology |
| 17. | Pharmacological characterization of ATP-dependent potassium channels and signaling pathways of terbutaline and forskolin induced myometrium relaxation in pregnant buffaloes | Suresh Kumar | Dr. Satish K.Garg | | Pharma-cology and Toxicology |
| 18. | Disposition kinetic studies of levofloxacin in cattle calves | Arvind Kumar | Dr. Anu Rahal | Dr. Satish K. Garg | Pharma-cology and Toxicology |
| 19. | Studies on seminal attributes and antioxidative parameters in cryopreserved semen of Barbari bucks after supplementation of zinc and selenium | Tribhuwan Kumar | Dr. Sarvajeet Yadav | | Physiology |
| 20. | A study on effects of ageing and season on cryopreservability of Barbari buck semen | Arvind Kumar | Dr. Sarvajeet Yadav | | Physiology |
| 21. | Studies on semen quality, antioxidative enzymes in semen and reproductive hormones of Barbari bucks after dietary supplementation of zinc and selenium | Pankaj Kumar | Dr. Sarvajeet Yadav | | Physiology |
| 22. | Effect of dietary supplementation of zinc and selenium on haemato-biochemical profile and antioxidative enzymes on Barbari goats | Agresh Singh Yadav | Dr. Jitendra Kumar | | Physiology |

| S.No. | Title of the Thesis | Name of the Student | Name of the | Co-Guide | Department |
|---|---|---|---|---|---|
| 23. | Studies on propofol, midazolam and their combination for clinical anaesthesia in dogs | J.P. Kushwaha | Dr. Bharat Singh | | Surgery and Radiology |
| 24. | Radiographic and ultrasonographic studies on liver, spleen, kidneys and urinary bladder in common breeds of dogs | Md. Nadeem | Dr. Bharat Singh | | Surgery and Radiology |
| 25. | Studies on halothane anaesthesia in propofol, xylazine, midazolam premedicated and propofol-induced dogs. | Tejveer Singh | Dr. Bharat Singh | Dr. Vivak Malik | Surgery and Radiology |
| 26. | Studies on laparoscopic sterilization techniques in bitches | Kuldeep Singh Gautam | Dr. R. P. Pandey | | Surgery and Radiology |
| 27. | Studies on diagnosis and treatment of otitis in dogs | Puja Jain | Dr. R. P. Pandey | | Surgery and Radiology |
| 28. | Prevalence of *Clostridium perfringens* in foods in Braj region | Ankur Priyadarshi | Dr. Basanti Bist | | Veterinary Public Health |
| 29. | Prevalence of B*aillus cereus* in different foods of Mathura and Vrindavan and its antibiogram studies | Soniya Gupta | Dr. Basanti Bist | | Veterinary Public Health |

## 5. Hands on training of interns

Students of BVSc & AH after completing their teaching of four and half years were exposed to different working environments during internship programme of six months. For better clinical exposure, the students were put on round the clock duty in Veterinary Clinics and also dairy farm of the University. In addition, the students were also trained on different aspects of livestock production and management including poultry and small animals. Each batch of the internship students was on attachment at Biological Products Section. Lucknow, Kanpur Zoo and at National Animal Welfare institute, Ballabhgarh for handling, care and management of small animals including animal welfare issues. During this period, different pharmaceutical companies visited the University for interaction with Interns and acquainted the interns with different pharmaceutical formulations available in the market and their uses in animal production and treatment.



## 6. Scholarships

Several students of the University received financial assistance from different state and central agencies and also University in the form of merit scholarships and stipend.

| S.No. | Name of the Scholarship | B.V.Sc. | M.V.Sc. |
|---|---|---|---|
| 1. | National Talent Scholarship | 3 | - |
| 2. | Poor Boys Scholarship for General Category | 27 | 6 |
| 3. | State scholarship for students of Other Backward Classes | 108 | 27 |
| 4. | State scholarship to students from SC/ST categories | 31 | 2 |

## 7. Educational Tours

Students of 5th year B.V.Sc. & A.H. went on All India Educational Tour (13-30 Dec., 2010) and visited Bombay Veterinary College, Veterinary College Bangalore, Trissur, Chennai, Hyderabad and Fisheries Institute at Goa. The tour was not only an excursion programme but also enabled students to know about the facilities available and recent developments in these institutes. Dr. Gulshan Kumar and Dr. Pratibha Sachan accompanied the students in this tour.

# B. STUDENTS WELFARE ACTIVITIES AND AMENITIES

## 1. National Cadet Corps

In the NCC 'B' certificate examination conducted in February, 2011, 44 cadets appeared in the examination, out of which 5 cadets passed the examination with 'AEE' grade, 25 cadets with 'BEE' grade and 14 cadets with 'CEE' grade. All the 15 cadtes who appeared in 'C' certificate examination during February, 2011 also qualified the said examination.



NCC cadets made their appearances in celebration of the National festivals by piloting the Hon'ble Vice-Chancellor's vehicle on horseback from Hon'ble Vice-chancellor's residence to the programme ground and also escorted the Hon'ble Vice-chancellor during unfurling of National flag and saluting the National flag on the occasions.



The NCC cadets also piloted and escorted H.E., the Chancellor of the University and Governor of UP Shri B.L. Joshi during his arrival at the convocation ground.

The cadets attended the following camps as a part of their NCC activity:-

| S. No. | Camp | Location | From | To |
|---|---|---|---|---|
| 1. | CATC-37 | 10 UP BN NCC at Mathura | 22.08.10 | 31.08.10 |
| 2. | CATC- 39 | 10 UP BN NCC at Mathura | 15.09.10 | 24.09.10 |
| 3. | Army attachment camp | RVC Center, Meerut | 25.10.10 | 08.11.10 |
| 4. | CATC – 46 | 11 UP BN NCC at Mathura | 19.11.10 | 28.11.10 |
| 5. | CATC – 48 | 10 UP BN NCC at Rall | 10.01.11 | 19.01.11 |

## 2. Sports Facilities and Activities

### Annual Sports Meet of the University-2011:





Annual Sports Meet 2011 of the University was inaugurated by Prof. A.P. Singh, Hon'ble Vice Chancellor of the University on 10th March, 2011. The meet was declared open by Hon'ble Vice Chancellor after the march-past, salutation and sports oath. Doves were released as token of peace and freedom. Dr. Daya Shankar, President Games and Sports, welcomed the Chief Guest, other guests, teachers and students. Majority of the inter-class competitions of in-door and out-door games and sports were completed before the sports day. The remaining atheletic events were completed on 10th and 11th of March, 2011. Mr. Bhoodev Singh, IInd year student and Km Renu Singh of Final year were adjudged the best male and female atheletes of the year, while Mr Tarun Kumar Yadav, Internship student and Miss Neha Gupta, finalyear were adjudged as best performers in male and female categories, respectively in the Annual Cultural Programme. Beside these, under literary events, quiz, debate, essay and extempore competitions were also organized. Mr. Tarun Kumar Yadav was adjudged as best speaker. Slow Cycling and Musical Chair for ladies and "Tug-of-War" between staff And students were special attractions of the meet. The closing ceremony was held on 11th March, 2011. Shri Shyam Sunder Sharma, Chairman Praklan Samiti (U.P.) and former Minister of Higher Education (U.P.) Mathura was the Chief Guest and distributed the prizes and shields to winners. Speaking on the occasion, he emphasized that every day is a challenge and we should accept it on daily basis.







### All India Veterinary College Table Tennis, Badminton and Quiz Competition

Thirteen students of College of Veterinary Sciences & A.H. Mathura participated in this competition organized by Gobind Ballabh Pant University of Agriculture & Technology, Pant Nagar (U.S.) Uttarakhand from March 23 to 25, 2011.

## 3. Extracurricular Activities

### Participation in competition of judging of age and casting of animals

7th Semester students of BVSc & AH participated in the 9th kisan mela organized by IVRI, Izatnagar, Bareily from 1-3 November 2010 and brought laurels to the University in casting of cattle (1st & 3rd position) and in age determination (2nd position). Mr. Dushyant Kumar Sharma, Sushant Singh, Resham Lal, Hari Ram Pal and Sudheer Kumar Yadav won the first prize in casting of cattle while Mr. Rajat Varshney, Dharamprakash Srivastava, Arvind, Saurabh Uttam and Shailendra Kumar Rawat got third prize in casting of cattle. Mr. Arvind, Dharamprakash Srivastava, Rajat Varshney won the second prize in age determination of cattle under the guidance of Dr. Mukesh Bhakat, Assistant Professor of LPM.

## Fresher's day







Students of 1st year B.V.Sc. & A.H. admitted during 2010-11were introduced formally to the faculty members and senior students by 2nd year students, their immediate senior batch, as a mark of tradition on 15th Sept., 2010.

A cultural programme was also organized on this occasion Mr. Hemant and Km. Akanksha were adjudged as Mr and Miss Fresher of batch 2010, respectively. These students were felicitated by Prof. A.P. Singh, Hon'ble Vice Chancellor.







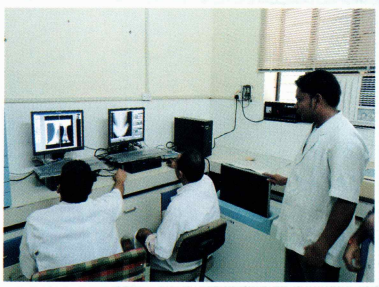


## Zydus All India Drawing and Painting Competition 2010

Mr. Prabhudayal Sharma, Ashish Kumar and Amit Kumar of 3rd year BVSc & AH students excelled in competition organized by Zydus Pharmaceuticals at College level. These students were honoured with certificates and cash prizes of Rs 1500, 1000 and 500, respectively.

# C. CLINICAL ACTIVITIES:

## I. Teaching Veterinary Clinical Complex (TVCC)





Teaching Veterinary Clinical Complex (TVCC), the erstwhile Kothari Veterinary Hospital, is multi-speciality Veterinary Clinics and is the place for hands on training to students while providing clinical services to farmers and animal owners. The TVCC has well-equipped operation theaters for small and large animals, radiology unit having 500 mA and 100 mA X-Ray machines, a 9 inch C-arm image intensifier, electrically operated hydraulic large animal operation table, facilities for inhalation anaesthesia, endoscope, laparoscope, digital X-ray, ultra-sonography, pulse oxymeter, electrocardiograph and solid-state surgical diathermy unit and well equipped ICU. Imaging of the interior of sick animals has received a boost with ultra sonography, digital radiography and minimally invasive diagnostic endoscopy facilities.

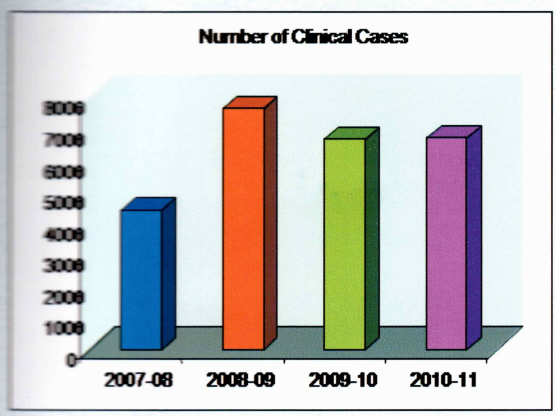
Management of long bones fractures by "closed inter-locking nailing" (CILN) technique in small and large animals is a common practice and during the year many cases were handled with 100% success.

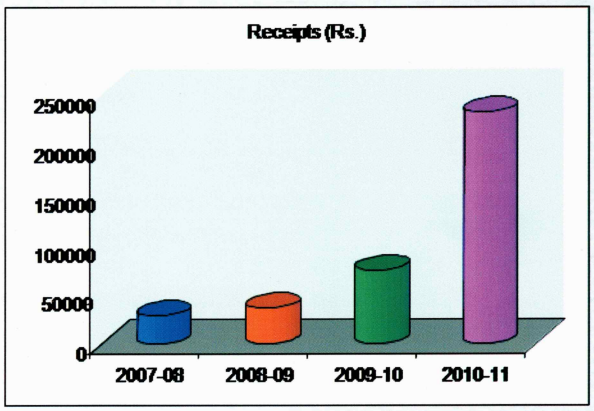
All available facilities are being routinely utilized for instructional training to undergraduate as well as postgraduate students under experiential learning programme. TVCC is an excellent referral polyclinic and receiving referred and serious ailing animals for treatment not only from Mathura but also from other districts of U.P. and adjoining states like Rajasthan, Haryana, Madhya Pradesh including pets of BSF and NSG. The number of clinical cases registered and the revenue generated from the services provided to farmers and animal owners at the TVCC during the year under report and the previous years are shown

below:

| Year | Number of Clinical Cases | Receipts (Rs.) |
|---|---|---|
| 2007-08 | 4414 | 29770.00 |
| 2008-09 | 7661 | 35960.00 |
| 2009-10 | 6680 | 74212.00 |
| **2010-11** | **6736** | **232850.00** |






## 2. Clinical Diagnostic Laboratory



TVCC laboratory is equipped enough for haematological and blood biochemical analysts, faecal examination, urine and skin scrapping analysis etc. and good enough for imparting training in various diagnostic tests to students. The samples requiring microbiological, toxicological and histo-pathological examinations are sent to the concerned departments. The diagnostic laboratory is equipped with semi-auto blood chemistry analyzer, urinometer, flame photometer etc. Students have free access to all these facilities under the guidance of teaching personnels for practical training as well as for extending diagnostic facilities to animal owners.

## 3. Ambulatory Clinics




Realizing that students need to be provided hands-on training in diagnosis and treatment of sick animals under field conditions, ambulatory clinical services are arranged on routine roster basis to rural areas of *Raman Reti, Vrindaban* and *Sonai* under the supervision of teachers of clinical departments. Large number of clinical cases including those for pregnancy diagnosis and treatment of anestrus, repeat breeding etc. were handled by students under supervision of the faculty members.

### 4. Emergency Clinical Services

Emergency clinical services are provided even during non-working and odd hours. Emergency services are manned by undergraduate and postgraduate students under the direct supervision of teachers from the clinical departments including those on on-call duty during late night hours.



### 5. Indoor Facilities

In addition to the routine indoor facility for large animals, an intensive care unit equipped with life saving gadgets is available in TVCC for managing and critical care of ailing pets.

## B. LIBRARY SERVICES

University library has sufficient space for 120 persons and has CD ROM, internet, online database and Xerox facility for readers and visitors. Data entry, bar coding and cataloging of six thousand books, one thousand five hundred journals, one thousand five hundred theses, nine thousand computerized catalogue cards and computerized reader cards have been completed successfully. More than four hundred books and large nuber of other reading materials were added in the library this year. University has created abundant facilities for e-leaming which is a rich library resource and technical information for students and staff. Large numbers of journals are available online through CERA to research scholars and teachers of the University.

## C. ARIS CELL

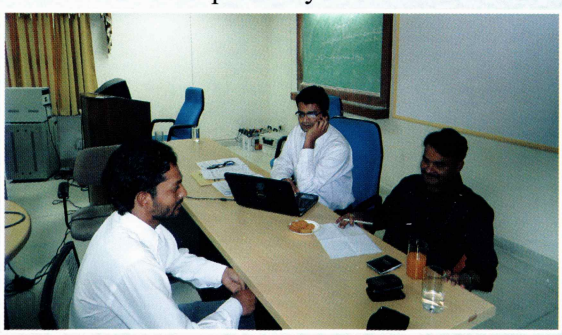
To match with the pace of advancements in scientific world, rapid and free access to internet is required. Agricultural Research Information System (ARIS) Cell and Local Area Network (LAN) facilities are available in the University which provide rapid and fast access to scientific knowledge to the faculty members and students. ARIS cell is being extensively used by faculty members and PG students for surfing and searching the latest scientific developments in the field of their interests. The internet accessability of the ARIS cell was upgraded this year by availing the broad-band facility.



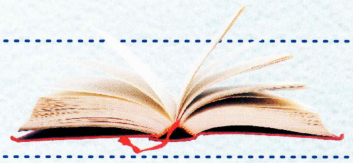
## D. DIRECTORATE OF COUNSELING, TRAINING AND PLACEMENT

The training and placement cell of DUVASU has been working with the objective of providing latest information to the students regarding recent developments in the field of veterinary science and employment opportunities. The directorate is also imparting counseling and coaching to students in communication skills and personality development and ICAR-JRF entrance examination. Phoenix Poultry and Indian Immunologicals Limited conducted campus placement interviews at DUVASU, Mathura on 22nd October 2010 and 12th November 2010, respectively and selected 7 and 6 students respectively.





# IV. Research



During the year under report, following externally funded research projects were operational in the university:

## A) Ongoing externally funded research project

| S.No. | Title of the project | PI | Co-PI | Agency | Sanctioned Budget |
|---|---|---|---|---|---|
| 1. | Outreach programme on zoonotic diseases-VTEC | Dr. Basanti Bist | Dr. Udit Jain | ICAR | 73.04 lacs |
| 2. | Out-reach Programme on Ethnoveterinary Medicine: entitlted "Pharmacological studies and development of a polyherbal formulation for reproductive disorders in animals": | Dr Satish K. Garg | Dr. Rajesh Mandil<br>Dr. Anu Rahal<br>Dr. Atul Prakash | ICAR | 80.00 lacs |
| 3. | Niche area of excellence: Livestock production and augmentation through monitoring and health intervention. | Dr. Sharad Yadav | | | 20 lacs |
| 4. | AICRP on Foot and Mouth Disease | Dr. Sharad Yadav | | ICAR | |
| 5. | Comparative efficacy of supplementation of herbal liver tonic products on growth performance, nutrient utilization and carcass traits in broilers | Dr. Satish K. Garg | Dr. Amitav Bhattacharya | Ayurvet Limited | Rs. 62040 |

## B) Ongoing 'Rashtriya Krishi Vikas Yojana' Projects

| S.No. | Title of the project | PI | Co-PI | Budget |
|---|---|---|---|---|
| 1. | Conservation of Hariana cattle and Bhadawari buffalo through modern technique of AI | Dr. Atul Saxena | Dr Vijay Singh | 50 |
| 2. | Fish seed production unit | Dr. Vikas Pathak | Dr Mukesh Bhakat | 30 |
| 3. | Pashu Gyan Chaupals – for field health production interventions | Dr. Sarvajeet Yadav | Dr Sanjeev K. Singh<br>Dr Amit Singh | 50 |
| 4. | Quality fodder seed production | Dr. S.K. Sharma | Dr. Y.K. Sharma | 25 |

# 1. RESEARCH ACHIEVEMENTS

## Project 1: Studies on the carrier stage of *Theileria annulata* in bovines with special reference to evaluation of chemotherapy and immunotherapy.

In the present study, efficacy of different chemotherapeutic agents namely- diminazine aceturate along with oxytetracycline, buparvaquone, chloroquine and vaccine Rakshavac – T was ascertained in experimental calves infected with *Theileria annulata*. Results indicated that buparvaquone was 100 % effective under experimental conditions. Single dose therapy was highly effective in eliminating the protozoan parasite from blood with breakdown of subclinical stages of theileriosis. Similarily Rakshavac – T vaccine also provided full protection from *Theileria annulata*. The use of Berenil along with Oxytetracycline was found beneficial in controlling the disease and the animals recovered. But in subclinical state of *Theileria annulata,* which needed repetition of the treatment for having negative subclinical stage, chloroquine proved totally ineffective.

## Project 2: Studies on the anti-bacterial and anti-viral effect of the leaves of *Ocimum sanctum* and *Argemone mexicana* with reference to immuno-modulatory effect.

The present study was undertaken to evaluate the antibacterial (*in vitro* and *in vivo*), antiviral (*in vitro and in vivo*) and immunomodulatrory effects of *Ocimum sancum* (OS) and *Argemone mexicana* (AM) plants in chicken model and also studied the effect of these two plants on splenocyte proliferation and IFN-α induction in rat model. OS and AM at dose rate of 250 mg/kg body weight was found non toxic and growth promoter in chickens. The gain in weight recorded was about 74% in OS and 67% in AM fed chickens. Immuno modulating effect of hot aqueous extract (HAE) of OS and AM was studied. Humoral immune response using *S. typhimurium* 'O' antigen was measured by quantitating the serum antibody level by ELISA. There was significant rise in antibody titre of OS and AM fed chickens in comparison to control group. This work indicated that the extract of both plants enhanced the antibody level and acted as a humoral immuno stimulant. Cell-mediate immune response using DNCB as an antigen was conducted to evaluate the effect of extract of these two plants. This test demonstrated 29.89% increase and 34.02 % decrease in skin thickness of OS and AM fed chickens, respectively. This study indicated the T cell suppressive effect of hot aqueous extract of AM and stimulator effect of OS. To study the antibacterial activity of OS and AM, against *S.* typhimurium and *E. coli* (O26), different concentrations (20mg/10mg/5mg/2mg/ disc of OS and AM) of different extracts (hot aqueous, cold aqueous, methanolic and hydromethanolic) of both the plants were used. Results indicated that the antibacterial effect was dose-dependent and methanolic extract of both plants were more effective. Antiviral properties of these extracts against RD and IBD virus were also investigated. *In vitro* study in chicken embryo fibroblast (CEF) cells revealed that 15 mg of HAE of OS and 2.5 mg of AM were found safe to CEF. To determine the *in vitro* antiviral effects these two plants, chicken embryo fibroblast cells were used with challenge dose of RD and IBD viruses and observe the cytopathic effect (CPE) of treated and untreated CEF cells. *In vivo* antiviral property against RD and IBD viruses was assessed on the basis of clinical signs, body weight gain, haematology and gross lesions on visceral organs of fed and unfed groups. Studies revealed immunomodulatory properties of HAE of OS and AM on con-A stimulated rat splenocytes and IFN- α induction. *In vitro* study showed 45.35% increase and 11.68% inhibition in splenocyte proliferation following exposure to OS and AM. In *In vitro* study OS showed 38.12% increase and 14.37% decrease in OS and AM in presence of 250 µg/ml concentration. These findings indicate stimulatory/inhibitory effect of HAE of OS and AM on splenocytes. 84.61% and 27.23% induction and 57.85% and 27.23% inhibition of IFN-α were recorded in *ex vivo* and *in vitro* study respectively. This study demonstrated the antagonistic property of hot aqueous extract of OS and AM.

## Project 3: Comparative pathology of experimentally induced pasteurellosis in chicken and quails.

The study was undertaken to elucidate comparative pathology and pathogenesis of fowl cholera in chicken and quails, caused by *P. multocida* (A: 1) in different groups of the birds. For the study 90 chicken and

90 quails were equally divided in three groups. The different groups were assigned as Group IC, IIC, IIIC for chicken and Group IQ, IIQ, IIIQ for quails, respectively. Out of which the birds of group IC and IQ were vaccinated with 1 ml of laboratory prepared formalin killed alum precipitated improved fowl cholera oil adjuvant vaccine intramuscularly and after 21 days challenged with 1ml of $10^{-6}$ dilution of 18 hours BHI broth culture of *Pasteurella multocida* (Immunized and challenged). The birds of group IIC and IIQ were inoculated with 1ml of $10^{-6}$ dilution of 18 hours BHI broth culture of *Pasteurella multocida* (Non-immunized and challenged). While the birds of group IIIC and IIIQ were kept as negative control and inoculated with sterilized BHI broth (non-immunized and non-challenged). Most of the birds showed acute form of the disease with decreased feed and water consumption, pyrexia, depression, increased respiratory rate, fetid diarrhea and urge of vomition with hock sitting posture along with mucus discharges from nostrils, conjunctivitis, dyspnoea, soiled vent and some degree of lameness. For invasiveness studies of *P. multocida* (A: 1) 9 chicken and 9 quails were used. In all the chicken and quails, the bacterial invasion in the blood was detected, sooner or later after inoculation of *P. multocida*. In 88.88% and 66.66% cases the blood invasion was detected at 6 hours post inoculation in chicken and quails, respectively. However, at 12 hours post inoculation all the birds showed septicemia except one quail which was found positive at 18 hours post inoculation. At 24 hours post inoculation 88.88% chicken and 44.44% quails died and by the 36 hours post inoculation the case fatality rate was 100%. For transmission electron microscopy 3 chicken and 3 quails, inoculated with 1ml of $10^{-6}$ dilution of 18 hours BHI broth culture of *P. multocida* organism was sacrificed at 48 hours of infection and small tissue pieces from liver, lungs and spleen were collected in chilled 3% gluteraldehyde solution and processed for electron microscopy. The observations of the electron microscopical studies were almost similar in both the species of experimental birds but were of milder nature in the quails. The following conclusions were derived from the present research work: 1.The laboratory prepared improved low volume fowl cholera vaccine evoked much better humoral immune response in chicken and quails both. 2. The clinical signs were exhibited by both the species of birds but were severe in chicken as compared to quails. 3. Gross and histopathological lesions were comparatively milder in quails as compared to observed lesions in chickens. 4. The invasion of *P. multocida* in the blood was faster in chicken resulting early septicemia and death as compared to quails. 5. Mortality rate was higher in the chicken as compared with the quail. 6. Demonstration of the presence of cross section of the microorganisms in the parenchymatous cells by TEM, may be a gold standard for explaining pathogenesis and diagnosis of *P. multocida* infection.

## Project 4: Pathology of paratuberculosis in goats in reference to vaccine strategy.

The study was conducted to compare efficacy of laboratory prepared indigenous vaccine and imported commercial vaccine (Gudair) in protecting the MAP infection in goats. For this study 40 goats was divided in to three groups, comprising 10 goats (Sham-immunized) in group I, 15 goats (Indigenous vaccine) in group II and 15 goats (Gudair vaccine) in group III. All the groups were challenged twice with $3X10^9$ MAP Bison type strain S5 on 50 DPV and with $5X10^9$ MAP Bison type strain S5 on 270 DPV. The goats of group II & III gained higher body weight as compared to sham-immunized goats while, there was no significant difference in body weight gain observed in between the vaccinated groups. The studies of cell mediated immunity revealed the impact of both vaccinated and experimental infection by MAP S5 strain on the proliferation of PBMCs. The CMI response (SI value) increased at 30 DPV and showed down regulation from 90 DPV and onwards in vaccinated goats and control goats. The studies on humoral immune response at 180 DPV revealed significantly increase in vaccinated goats and maintained till 450 DPV. Microscopic examination of faecal samples showed at 180 DPV, 5 animals of control group started showing positive results, while at 400 DPV one goat of each vaccinated group was found to shed bacilli. Culture of faecal samples showed growth on HEY medium with mycobactin J confirmed the goats as positive for JD. IS 900 PCR applied in the DNA samples of all goats of each group revealed that at 360 DPV, 100% (4/4), 11.9% (1/9) & 11.9% (1/9) were positive for MAP DNA in animals of group I, II & III, respectively. The control animals at 200 DPV showed emaciation and depletion of body fat and mild to moderate lesions of focal/diffuse thickening of small intestine with or without corrugations specifically at ileocaecal junction characterized by mild to moderate catarrhal enteritis with infiltration of mononuclear cells and epitheloid cells. The remaining goats sacrificed at 450 DPV showed thickening of small intestine in 5 cases each in group II and III with chronic catarrhal enteritis and shortening, thin, atrophied and ballooned villi with infiltration of mononuclear

cells and epitheloid cells, which at places fused to form giant cells. In vaccinated groups there were focal thickening of intestines in 5 cases each at 450 DPV with lesions of chronic catarrhal enteritis adorned with presence of lymphocytic, plasma cells and macrophages with a few epitheloid cells. MLN collected at 200 DPV sacrificed goat revealed presence of edematous fluid and focal infiltration of mononuclear cells with scattered presence of epitheloid cells and few giant cells and on 450 DPV showed mosaic like arrangement of epitheloid cells with presence of multinucleated giant cells. In vaccinated groups, the MLN showed infiltration of MNC and a few epitheloid cells. The study of body score at 200 and 450 DPV on the parameters of body conformation, carcass components fat measurements revealed better marks in vaccinated animals (groups II & III) than control (group I). These parameters in both the vaccinated groups did not differ significantly.

## Project 5: Comparative pharmacokinetics and interaction studies of ofloxacin and meloxicam in yaks and cattle.

Disposition kinetic studies on ofloxacin (7.5mg.kg$^{-1}$) and meloxicam (0.5 mg.kg$^{-1}$) in yaks and cattle were conducted following a single intravenous, intramuscular and subcutaneous administration, while the interaction studies were undertaken after concurrent administration of both these drugs by intravenous and subcutaneous routes. Blood plasma concentrations of ofloxacin and meloxicam were determined using the well validated HPLC assay methods which were found to be linear and reproducible with the correlation coefficient value of >0.99 and the inter-day coefficient of variance of less than 10 per cent and the mean recovery of more than 90 per cent. Plasma concentrations versus time data were subjected to compartmental pharmacokinetic analysis using "PHARMKIT" software.

Pharmacokinetic data of ofloxacin in yaks and cattle following IV administration were described using three-compartment open model, while by two-compartment after IM and SC administration. Plasma meloxicam versus time data following IV administration were best fitted to two-compartment open model in yaks and cattle, while after IM and SC administration in yaks by two-compartment and in cattle one-compartment model, thereby suggesting the species-dependent differences between yaks and cattle.

Following IV administration of ofloxacin in yaks (7.5 mg.kg$^{-1}$), the values for $t_{½á}$, $t_{½â}$, $t_{½ð}$, $Vd_{(area)}$ and $Cl_B$ were 0.14±0.01 h, 1.08±0.03 h, 3.82±0.60 h, 1.29±0.05 L.kg$^{-1}$ and 0.83±0.01 L.h$^{-1}$.kg$^{-1}$, respectively, while after IM administration the values of $t_{1/2Ka}$, $t_{½â}$, $t_{½ð}$, $Vd_{(area)}$ and F were found to be 0.34±0.05 h, 1.82±0.18 h, 31.29±10.50 h, 1.36±0.25 L.kg$^{-1}$ and 97.05±13.45 per cent, respectively. After SC administration of ofloxacin in yaks, the values for $t_{1/2Ka}$, $t_{½â}$, $Vd_{(area)}$ and F were calculated to be 0.31±0.01 h, 1.02±0.14 h, 0.85 ±0.28 L.kg$^{-1}$ and 65.71±0.06 %, respectively; thus suggesting that IM route should be preferred over SC route.

Following IV administration of meloxicam in yaks (0.5 mg.kg$^{-1}$), the values for $t_{½á}$, $t_{½â}$, $Vd_{(area)}$ and $Cl_B$ were found to be 0.21±0.02 h, 4.65±0.40 h, 1.99±0.09 L.kg$^{-1}$ and 0.35±0.02 L.h$^{-1}$.kg$^{-1}$, respectively. After IM administration of meloxicam in yaks, the values of $t_{1/2Ka}$, $t_{½á}$, $t_{½â}$, $Vd_{(area)}$ and F were found to be 0.92±0.11 h, 2.05±0.25 h, 11.10±5.90 h, 1.51 ± 0.18 L.kg$^{-1}$ and 91.20 ±0.20 per cent, respectively; while respective parameters after SC administration in yaks were 1.34±0.04 h, 4.78±0.97 h, 6.14±0.01 h, 2.44 ± 0.53 L.kg$^{-1}$ and 95.13±17.69 per cent, respectively; thus suggesting certain advantages of SC administration over the IM route.

Following IV administration of ofloxacin in cattle (7.5 mg.kg$^{-1}$), the mean values of $t_{½á}$, $t_{½â}$, $t_{½ð}$, $Vd_{(area)}$ and $Cl_B$ were 0.14±0.01 h, 1.10±0.02 h, 14.69±1.63 h, 0.84±0.02 L.kg$^{-1}$ and 0.53±0.02 L.h$^{-1}$.kg$^{-1}$, respectively. After IM administration, the values of $t_{1/2Ka}$, $t_{½á}$, $t_{½â}$, $Vd_{(area)}$ and F were found to be 0.27±0.01 h, 1.98±0.06 h, 26.57±5.03 h, 1.49 ±0.02 L.kg$^{-1}$ and 104.86 ±10.96 per cent respectively, while these PK determinants in cattle after SC administration were found to be 0.33±0.02 h, 1.01±0.15 h, 6.14±1.53 h, 0.94 ±0.10 L.kg$^{-1}$ and 81.32 ±4.56 per cent, respectively. These differential PK determinants suggest superiority of IM route over the SC route. Following IV administration of meloxicam in cattle (0.5mg.kg$^{-1}$), mean values for $t_{½á}$ and $t_{½â}$ were 0.24±0.06 h and 5.04±0.35 h, respectively and $Vd_{(area)}$ and $Cl_B$ were found to be 2.05±0.09 L.kg$^{-1}$ and 0.29±0.01 L.h$^{-1}$.kg$^{-1}$, respectively. Following IM administration, $t_{1/2Ka}$, $t_{½â}$, $Vd_{(area)}$ and F were found to be 0.49±0.03 h, 4.27±0.48 h, 1.06±0.23 L.kg$^{-1}$ and 96.08±5.30 % respectively; while after SC administration 1.32±0.11 h,

5.04±0.23 h, 2.80±0.22 L.kg$^{-1}$ and 101.70±7.17 %, respectively. These results suggest that meloxicam can be administered by either of the routes (IM or SC) with almost similar suitability. Following IV administration of ofloxacin alone or in combination with meloxicam, plasma levels (mean ± SE) were significantly higher in yaks and cattle on concurrent administration compared to ofloxacin alone. Elimination half life ($t_{1/2\beta}$) of ofloxacin was found to be significantly lower in yaks than in cattle thus, suggesting faster elimination from yaks. $Vd_{area}$ value was significantly higher in yaks (1.29 L.Kg$^{-1}$) than in cattle (0.84 L.Kg$^{-1}$) thereby suggesting better penetration of ofloxacin in yaks than cattle.

Following meloxicam administration either alone or meloxicam+ofloxacin concurrently by intravenous route in yaks and cattle, plasma meloxicam levels and majority of the pharmacokinetic variables did not differ significantly between yaks and cattle. Pharmacokinetic determinants of ofloxacin in yaks and cattle following IM administration did not differ significantly from each other. But, elimination half life of meloxicam was significantly lower in yaks thus, indicating faster elimination of the drug from yaks.

Ofloxacin should be administered to both yaks and cattle @ 7.5 mg/kg body weight and repeated at 24 h interval by IV or IM route. The loading and maintenance doses of meloxicam by intravenous administration to yaks were calculated to be 1.05 and 0.88 mg.kg$^{-1}$ body weight, respectively repeated at 12 h interval, while for cattle, the loading and maintenance IV doses were calculated to be 0.97 and 0.79 mg.kg$^{-1}$ body weight, respectively repeated at 12 h interval. For intramuscular administration of meloxicam in yak, the loading dose of 0.50 mg.kg$^{-1}$ and maintenance dose of 0.36 mg.kg$^{-1}$ at 12 h interval and in cattle a loading dose of 0.72 mg.kg$^{-1}$ and maintenance dose of 0.62 mg.kg$^{-1}$ is recommended for administration at 12 h interval.

## Project 6: Detection and identification of *Clostridium perfringes* in foods.

The present study was undertaken to observe the occurrence of *Clostridium perfringens* in various foods, to analyze the efficacy of different media and to develop rapid diagnostic test with particular reference to enterotoxigenic *Clostridium perfringens* and to study the antibiotic sensitivity/resistance of *Clostridium perfringens* isolates from food. The presence of *Clostridium perfringens* was studied in various foods (meat and meat products, milk and milk products, juice and water). The overall occurrence of *Clostridium perfringens* was found to be 57.9% in different foods with the highest prevalence in poultry (94.11%). The meat samples of goat and fried chicken had 58% and 16.66% of *Clostridium perfringens*, respectively. Among the milk samples, srikhand (82.1%) had highest presence of *Clostridium perfringens* followed by icecream (44.44%), raw milk (33.3%) and pasteurized milk (32.1%). Higher presence of *Clostridium perfringens* in meat samples and milk samples indicates the unhygienic and insanitary practices prevailed in the environment leading to cross contamination of samples.

For the isolation and enumeration of *Clostridium perfringens*, four different media were used viz. SPS, TSC, SFP and IMM. IMM showed 100% positivity on the basis of presumptive isolation. Among agar media, SFP and TSC had given more than 90% positivity for *Clostridium perfringens* followed by SPS (83.66%) in poultry samples. The results of selective media in the goat sample showed TSC and SPS to be better than SFP. In the milk sample particularly pasteurized milk and srikhand, SFP was found to be better than SPS in the isolation and identification of *Clostridium perfringens*. Among virulence markers of *Clostridium perfringens*, lecithinase and hemolytic activity were examined. A total of 149 isolates of *Clostridium perfringens* were screened to observe lecithinase activity, out of which 142 (95.6%) were turned to be positive. In meat samples, goat isolates showed higher lecithinase activity (96.6%) than poultry (92.5%). In milk isolates, lecithinase activity displayed by *Clostridium perfringens* was 100%. For hemolytic activity, 139 strains of *Clostridium perfringens* were observed, 130 (93.52%) had shown hemolysis on blood agar plates. The hemolytic activity in poultry isolates of *Clostridium perfringens* was 94.54% and found greater than goat (86.66%). In raw and pasteurized milk and icecream hemolytic activity was 100% while in srikhand it was 88.88%. One hundred thirty food samples were screened by PCR by single step enrichment to detect the presence of enterotoxin gene in *Clostridium perfringens*. Out of the 130 samples, 21(16.15%) samples had enterotoxin gene of *Clostridium perfringens* and out of 60 samples of poultry, only one sample (1.6%) was positive for enterotoxigenic *Clostridium perfringens*. In 30 and 20 samples of goat and srikhand, 8 (26.66%) and 12 (60%) samples were positive for enterotoxigenic *Clostridium perfringens*, respectively. Raw and pasteurized milk and icecream didn't show presence of enterotoxin gene among the samples tested.

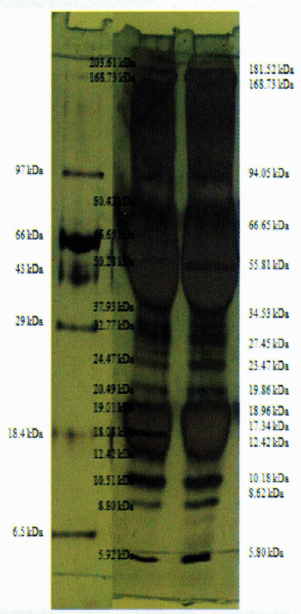
Phylogenetic analysis of sequences of PCR products of *Clostridium perfringens* (16srDNA) by 'DNA Star'computer software programme revealed that *Clostridium perfringens* (G53) showed highest similarity (66.3%) with ATCC, 16sRNA *Clostridium perfringens* followed by genomic DNA (42.9%-Gwalior). The genomic DNA (23.8%-UK) and 16sRNA from canine feces (23.5%-UK) had lower percent of identity with *Clostridium perfringens* (G53). In the phylogenetic study of enterotoxigenic *Clostridium perfringens* (G53 and G60) it was found that similarity with cpe equine- Canada and cpe Europe was 100%.The similarity of cpe (G53 and G60) was found lower with cpe (human-36.9%) and cpe serotype A(31.2% ). Isolates from goat (cpe-G53 and G60) had shown 98.7% identity with each other.

Among the antibiotic tested, amikacin, cephalosporin group (cefuroxime, cephradine, ceftriaxone, ceftazidime and cephoxitim), piperacillin and chloramphenicol were highly sensitive (80-100%) followed by erythromycin and gentamycin which were found to be effective between 40 to 60%. The drugs like tetracycline, penicillin and ampicillin had displayed resistance between 40-70%, while the drugs like co-trimoxazole and cloaxacillin showed resistance from 80 to 90%. The *Clostridium perfringens* isolates were nearly 100% resistant to lincomycin.

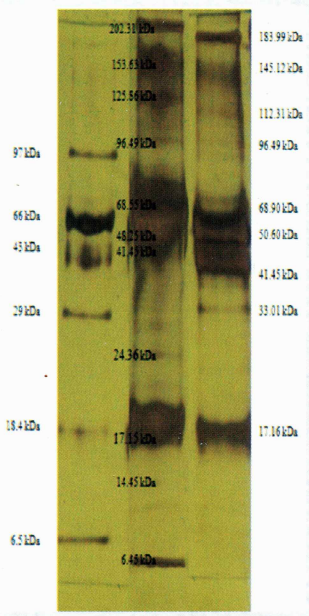
Thus, the overall study disclosed that the occurrence of *Clostridium perfringens* was high in foods particularly the meat samples of poultry and goat and in some milk products particularly icecream and srikhand, which is an alarming signal. The higher prevalence of enterotoxigenic strains of *Clostridium perfringens* in milk product (srikhand) and goat meat samples indicates the unhygienic status of the environment.

## Project 7: A study on comparative protein profile in the pre-ovulatory follicles vis a vis serum of buffalo during different stages of estrus cycle.

To ascertain the comparative protein profile of follicular fluid, granulosa cells and serum of buffaloes at different stages of estrus cycle, ovaries of buffaloes were obtained from local abattoir and ovarian stages (estrus cycle) were determined on the basis of corpus luteum morphology. The follicular fluid was aspirated from the follicles by syringe and the cells were separated by centrifugation at low temperature (4°C) in PBS




Photograph 1: Protein bands obtained on SDS-PAGE of follicular fluid of buffaloes at III and IV ovarian stages.




Photograph 2: Protein bands obtained on SDS-PAGE of granulose cells of buffaloes at III and IV ovarian stages.

Lane- 1 =Standard Molecular Marker, Lane -2= Granulosa cell stage III, Lane -3 = Granulosa cell stage IV

(0.1M pH 7.4). Supernatant follicular fluid was stored for further analysis and the pellets of granulosa cells were suspended in 1ml of PBS and washed by repeated centrifugation. The granulose cells were lysed first with repeated freezing and thawing and then by sonication. The proteins of follicular fluid, isolated granulosa cells of stage III and IV of ovary and serum were analyzed by SDS–PAGE. The electrophoretogram of follicular fluid obtained on silver stained gel revealed fifteen protein bands of molecular masses ranging from 5.92 kDa to 203.61 kDa in both the stages. The proteins of granulose cells of ovarian stage III revealed eleven bands of molecular weight (202.31, 153.63, 125.86, 94.49, 68.55, 48.25, 41.44, 24.36, 17.15, 14.45 and 6.45 kDa) and ovarian stage IV revealed protein bands of molecular weight (183.99, 145.12, 112.31, 96.41, 58.90, 50.68, 50.60, 41.45, 33.01 and 17.16 kDa) on the silver stained gels. The band of molecular weight 24.36kDa, 14.45 kDa and 6.45 kDa were detected only in stage III and were absent in stage IV. The silver stained electrophoretograms of serum of buffaloes at stage III and stage IV showed seven protein bands of similar molecular weight ranging from 10.43 kDa to 190.5 kDa in both the cases. The study could reveal that the three protein bands of molecular weight 6.45 kDa, 14.45 kDa and 24.36 kDa were found missing in granulosa cells of stage IV when compared with that of stage III. However, the findings need to be confirmed by an in vivo study in buffaloes.

## Project 8: Prophylactic and therapeutic effects of Johne's disease vaccine in cattle.

In this study, clinical trial of the first Indian vaccine for JD developed at CIRG, Makhdoom using native Indian Bison Type Strain of *Mycobacterium avium Subsps paratuberculosis* (MAP) was conducted in cattle herd. There was slight improvement in the bodyweight of vaccinated animals as compared to sham vaccinated animals. The mortality rate was also very low in vaccinated group of animals. Protective antibody titres were achieved around 30-60 days post vaccination (dpv) in majority of animals. Significant reduction in fecal shedding of MAPs was observed in vaccinated trials after 6 months of vaccination. Microscopy was found to be more sensitive than PCR may be due to more false positive results. Overall data showed the therapeutic and prophylactic efficacy of JDV in protection from MAO infection by significant increase in cell mediated and humoral immune response.

## Project 9: Development of Sanwich ELISA for the detection of infectious bovine rhinotracheitis (IBR) virus.

In this study, a sandwich ELISA was developed for the detection of BHV-1. IBR virus (source of antigen) was isolated from an aborted fetus. Large scale isolation of BHV-1 was done in MDBK cell line. Polyethylene glycol precipitation (PEG) method was adopted for the concentration of virus from cell culture. Purification of virus was carried out by continuous sucrose gradient ultracentrifugation. Assessment of the purified virus was done by protein assay and evaluation of cytopathic effect in MDBK cell line. Hyperimmune sera (source of antibody) were produced in rabbits and guinea pigs by injecting purified virus. The antibody titer of this serum, as estimated by ELISA test, was found to be 1:3200 and 1:2000 for rabbit and guinea pig, respectively. IgG was extracted from this sera. Reaction conditions were optimized for antibodies and conjugate, choosing as optimal concentrations the 1:20 for rabbit "capture" antisera and 1:10 for guinea pig "detector" antisera, and 1:2000 dilutions for conjugate. In the preliminary ELISA, OD (A490) of >0.15 and a P/N ratio of > 1.30 indicated a positive reaction. OD was found to be >1.5 for purified virus, less than1.2 for culture positive samples and less than 0.2 for negative controls.

## Project 10: Studies on clinico–therapeutic and diagnostic aspects of renal failure in dogs

The study was undertaken for comparative evaluation of the ultrasonography, hematology, serum biochemistry and urinalysis in renal failure in dogs. Therapeutic efficacy of ACE- inhibitors was also evaluated in management of hypertension in cases of renal failure. Dogs exhibiting clinical signs associated with azotemia were screened for presence / absence of renal failure. Serum creatinine values of > 2 mg/dL were considered as marker of renal damage. ACE – inhibitor (Captopril) @ 0.5 to 2.0 mg/dL was found effective in the management of arterial hypertension associated with renal failure.

## Project 11: Studies on gastroenteritis, its therapeutic management with probiotics and role of campylobacter in dogs.

Present study was undertaken on dogs exhibiting symptoms of gastroenteritis at teaching veterinary clinical complex, DUVASU, Mathura. During the period under study, 10 clinical cases were treated by intravenous fluid therapy (DNS and Ringer lactate), ceftriaxone @ 10mg/kg body weight, botropase @ 0.5-1.0ml (total dose),i/m, metoclopromide @0.01-0.2mg/kg body weight i/m, Ranitidine @0.5 mg/ kg body weight i/m, and Multivitamins infusion@ 1ml/10 kg body weight i/m, while another 10 clinical cases were treated with all the previous mentioned drugs along with probiotics (lactic acid bacillus 60 million spores) @120-240 million spores twice a day. The faecal samples were processed for isolation of *Campylobacter* and identified by colony characteristics, gram staining and biochemical tests. All the isolates were examined for their drug-sensitivity pattern. On hematological examination, there was significant difference in the haemoglobin concentration between 0 day and 3rd day in dogs of group 1 and 2. In group 1, the mean value of haemoglobin was 13.47 ± 0.559 g/dl on 3rd day after treatment as compared to 9.68 ± 0.587 g/dl on 0 day while in case of group II dogs, the mean value of haemoglobin was found to be 14.44 ± 0.292 g/dl on 3rd day after treatment as compared to 9.72 ± 0.453 g/dl on 0 day. There was significant increase in TLC values. Out of 100 faecal samples of dogs, *Campylobacter was* isolated from only 51 samples and the incidence was highest in non-descript (73.68%) and the lowest in Pomeranian (25%) dogs. Antibiotic sensitivity test revealed the sensitivity to be amikacin (100%), streptomycin (98.04%), levofloxacin and chloramphenicol (90.19%) and amoxycillin-clavulanic acid (60.79%).

## Project 12: Studies on coliform diarrhoea in cow and buffalo calves with special reference to antibiotic sensitivity.

The study was undertaken to find out the prevalence of *E. coli* diarrhoea in cattle and buffalo calves in districts of north – western Uttar Pradesh. Out of 930 cases recorded, 499 (53.66 %) were of calf diarrhea and 572 (61.50 %) were of buffalo calves, which differed significantly ($P < 0.05$) in comparison to 358 (38.50 %) in cattle calves. Incidence of calf diarrhoea in cattle calves (52.51 %) was almost comparable to that in buffalo calves (54.37 %). Hematological examination revealed significant increase in PCV, TLC, and neutrophils whereas biochemical examination revealed significant elevation in serum chloride level in diarrheic calves. Out of 109 faecal samples collected from diarrheic calves, 41 were found positive for *E. coli*, out of which 13 were found pathogenic based on hemolysin test. On the basis of antibiotic sensitivity test, amikacin (87.80 %), aztreonam (73.17%) and gentamicin (51.21%) were found effective against the isolated enteropathogenic *E. coli*. Other drugs which were found to be less efficacious were kanamycin (39.02 %), cefadroxil (19.51 %) and ciprofloxacin (15.63 %). The isolates were completely resistant to ampicillin, cefdinir, co trimoxazole, cloxacillin, erythromycin, lincomycin, norfloxacin, pefloxacin, penicillin, rifampicin, tetracycline and vancomycin.

## Project 13: Comparative screening of medicinal plants for their antimicrobial and immune-modulatory activities.

The plants; *Ocimum sanctum* (Tulsi), *Adhatoda vasica* (Adosa), *Ricinus communis* (Castor/Arandi), *Calotropis procera* (Madar/ Acona), *Terminalia bellarica* (Beleric myrabolam / Baheda), *Terminalia chebula* (Myrabolam/ Harra), *Phyllanthus niruri* (Bhui Amala), *Moringa olifera* (Horse radish tree/ Sahjan), *Acacia nilotica* (Gum tree/ babul) and *Cinnamomum cassia* (Dalchini) were selected for their scientific validation of their antimicrobial and immunomodulatory effects. Two types of extracts HAE and HME were prepared for study purposes. Antibacterial and antifungal tests were performed with both types of extracts whereas only HAE were used for anti viral and immunomodulatory effects. All the discs of HAE of plants showed anti bacterial effect against *Staphylococcus aureus* except *Calotropis procera* and *Cinnamomum cassia* extracts, although the extent of effect varied plant to plant. The antibacterial effects were dose dependent and size of the zone of inhibition increased with the increase of extract concentration. The disc diffusion test with HME of plants against *Staphylococcus aureus* produced antibacterial effects except the extracts of *Adhatoda vasica, Calotropis procera, Moringa olifera* and *Phyllanthus niruri*. Other plants showed variation in antibacterial effects as *Cinnamomum cassia*, *Ocimum sanctum* and *Ricinus communis* showed no effect.

Moreover, the effects were shown by the higher disc concentrations. Other three plants *Acacia nilotica, Terminalia bellarica* and *Terminalia chebula* showed dose-dependent bacteriostatic effect even at the lower conc. of 1.25 mg /disc. Both HAE and HME of *Calotropis procera* showed no antibacterial activity against *Staphylococcus aureus.* Similar to the findings against *Staphylococcus aureus*, HAE and HME of the plant revealed dose-dependent bacteriostatic effects except the *Adhatoda vasica* and *Calotropis procera* which produced no effect with both HAE and HME against *Escherichia coli*.

Out of ten plants, only four *Acacia nilotica, Cinnamomum cassia, Terminalia chebula* and *Terminalia bellarica* showed anti-fungal activity. *Cinnamomum cassia* revealed effect only with HME. The anti fungal effect was dose-dependent but HME of these plants produced better effect in comparison to HAE. The cumulative effect of these plant extracts against *Candida albicans* at the 1:1 combinations of *Cinnamomum cassia, Terminalia chebula* and *Terminalia bellarica* were attempted but there was no significant effect of these combinations against *Candida albicans.*

*Terminalia bellarica*, *Terminalia chebula*, *Phyllanthus niruri*, *Moringa oleifera* and *Acacia nilotica* did not produce any anti-viral effect as no inhibition of viral cytotoxicity was observed with nontoxic concentrations. Extracts of *Adhatoda vasica, Calotropis procera, Cinnamomum cassia, Ocimum sanctum* and *Ricinus communis* showed variable anti viral effects with inhibition of cell toxicity in the range of 2.13 % to 36.14%. HAE of all plants revealed both proliferation and inhibition of the splenocytes depending on the concentration of plant extracts except the *Terminalia chebula* extract which produced only inhibition of splenocytes even at lower concentration. The proliferation of splenocyte was in dose-dependent manner. The extent of proliferation varied in the range of 2.17% to 63.42%. Thus the lower concentrations of the HAE of plants could be used to improve immune response or to combat micro organisms causing immunosuppression. To find out the effect of HAE of plants on the secretion of IL 10 from spleen cells particularly splenocytes was assessed and variability was recorded which was dose dependent. HAE of *Calotropis procera* upregulated the release of IL 10 from the splenocytes in both the combination with or without Con A. However, the HAE of *Ricinus communis*, *Cinnamomum cassia, Terminalia chebula* and *Acacia nilotica* down regulated the IL 10 release from spleen cells. Thus extracts of plants have both kinds of constituents responsible for up and down regulation and different plant extracts had different effects on bacteria, virus and fungi with variation in immunomodulatory and anti inflammatory responses.

## Project 14: Studies on bacterial mastitis with seasonal variations and susceptibility of causative organisms against antibiotics and herbal extracts in bovines.

In the present study, 485 animals (55 clinical and 430 normal lactating animals) from various dairy farms, field and Kothari Veterinary Hospital, DUVASU, Mathura were selected. Overall incidence of sub-clinical mastitis in animals was found to be 22.09%. In cows it was 26.32%, which was slightly higher in cross-bred (27.27%) compared to local breeds (25.83%). In buffaloes, the incidence was 17.33%. The incidence of sub-clinical mastitis was observed higher at farms (closed herd) than under field conditions. The variations in the incidence of mastitis at different farms may be due to difference in hygienic conditions and managemental practices. Prevalence of sub-clinical mastitis was 23.29% during winter season (Dec- Feb), and it was higher as compared to 20.85% during summer (Mar- Jun). An increase in the incidence of mastitis (clinical + sub-clinical) was recorded with the commencement of subsequent lactations; it reached to maximum at Vth lactation and then declined drastically. The incidence was recorded as 23.21%, 32.76%, 36.36%, 48.65%, 50.68%, and 13.29% in first, second, third, fourth, fifth and above fifth lactations, respectively. During the present study a total 164 bacterial isolates were obtained from 150 milk samples belonging to 150 lactating bovines tested positive for mastitis (95 of sub-clinical and 55 of clinical). Among the bacterial isolates *Staphylococci* (54.2 - 40.85% coagulase positive and 13.41% coagulase negative), *Streptococci* (24.39% - 19.51%; *St. agalactiae* and 4.88% *St. uberis*) along with *E.coli*, 9.76% were isolated. The other organisms isolated included *Klebsiella pneumoniae* (5.49%), *Bacillus subtilis* (1.83%), *Pseudomonas aeruginosa* (3.66%) and *Salmonella* spp. (0.6%). Seasonal prevalence of various bacterial isolates showed a comparatively high prevalence of Coliform (*E.coli* and *Klebsiella)* mastitis; 21.52% in summer, compared to 9.41% in winter. Seasonal variations were also reported with other environmental pathogens viz. *Streptococcus uberis*, 6.33% and 3.53% and *Pseudomonas aeruginosa* 5.06% and 2.35% during summer and in winter, respectively. *In-vitro* antimicrobial sensitivity test revealed that bacterial

isolates were highly sensitive to levofloxacin (90.85%), ciprofloxacin (87.20%) and chloramphenicol (82.32%), moderately sensitive to amoxycillin /clavulanic acid (76.82%), tetracycline (67.07%) and co-trimoxazole (63.41%) and less sensitive to ampicillin / cloxacillin (53.05%). Amikacin, which was used only against gram-negative bacterial isolates, was recorded as highly effective (90.63%), followed by kanamycin (59.38%) and erythromycin (56.25%). While most of gram positive isolates revealed resistance to penicillin and streptomycin, though methicillin was recorded as 51.69% sensitive against *Staphylococci*. Among penicillin-resistant *staphylococci*, penicillinase enzyme was produced by 34.04% of coagulase positive *staphylococci* and 31.25% of coagulase negative *Staphylococci*. In the present study, the hot aquous extract (HAE) of the fruits of *Terminalia chebula*, *Terminalia belerica* and their 1:1 mixture showed significant antibacterial activity (bacteriostatic) against all bacterial isolates, except *Klebsiella* spp. with a consideration of zone of inhibition of 12 mm as minimum for significance . The highest zone of inhibition was recorded as 36 mm by *Terminalia belerica* against *Salmonella* spp. The antibacterial effect showed the positive correlation with the dose of extract and the mixture was not recorded as to having no synergistic or antagonistic effect.

## Project 15: Studies on induction of estrus and fertility with controlled internal drug release (CIDR) device and other hormonal combination in buffalo heifers.

The experiment was designed to compare the three hormonal treatments (synchronization) for their efficacy in resulting pregnancies in buffalo heifers. 44 anoestrus buffalo heifers, aged between 3 year and 3.5 year were exposed to three treatments CIDR (T1, n=14), CIDR + GnRH+$PGF_{2á}$ (T2, n=16) and CIDR+ E V (T3, n=14). All heifers were free from anatomical or reproductive disorders, were clinically healthy and were in average to good body condition (BCS 2.5-3.0). Before start of treatment, heifers were scanned (using sonography) for their ovarian activity (follicular status) and all those which were found to have normal ovaries (presence of small follicles) were considered as cases of anestrus. The T1 group animals were treated with hormone progesterone (CIDR, each implant contain 1.38G progesterone, supplied by M/s DEC International Limited, Hamilton, Newzeland) kept implanted (intravaginally) for 6 days. The T2 group animals were similarly treated as of T1, however, an additional hormone GnRH (20 µg/animal) was injected I/M at the time of implant insertion and injection of PG (Cyclix , 500 µg) on the day of removal of implant. The T3 group animals were treated similar to T1 with additional hormone estradiol (1 mg) injected I/M 24 hr later to implant removal. The animals were inseminated between 48–72 hours using frozen semen (double insemination). Post AI pregnancy diagnosis at 50-55 days revealed 42.85% (6/14), 50% (8/16) and 42.85% (06/14) pregnancies in T1, T2 and T3 groups, respectively. The mean progesterone concentration at the time of AI in pregnant animals were 0.58 ± 0.36 ng/ml, 0.72 ± 0.35 ng/ml and 0.40 ± 0.17 ng/ml in T1, T2 and T3 groups, respectively. But the respective concentration in non- pregnant groups were 1.02 ± 0.33 ng/ml , 1.41 ± 0.34 ng/ml and 1.09 ± 0.41 ng/ml. The mean size of largest follicle at the time of AI in pregnant animals were 11.37 ± 0.24 mm, 12.15 ± 0.37 mm and 11.97 ± 0.32 mm in treatment group T1, T2 and T3 respectively. The respective size in non pregnant animals' was 11.42 ± 0.36 mm, 12.65 ± 1.02 mm and 10.94 ± 0.53 mm.

## Project 16: Studies on comparison of fertility in different ovulation synchronization protocols for fixed time insemination in anoestrus cows.

The experiment was designed to detect the fixed time AI protocol for anestrous cows using different hormonal treatment. 53 parous cows aging between 5 and 11.5 years were exposed to hormonal treatment, namely (I) Ovsynch (T1, n=17) (II) Ovsynch+used CIDR (T2, n=18) (III) EV+P4+used CIDR (T3, n=18). All the cows were free from anatomical or reproductive disorders and were clinically healthy and in average to good body condition (BCS 2.5-3.0). Before start of treatment, cows were scanned (using sonography) for their ovarian activity (follicular status) and all those which were found to have normal ovaries (devoid of a dominant follicle and presence of 2-3 follicles) were considered as cases of anestrus. T1 treatment group animals were treated with Ovsynch ($Gn\text{-}RH^{7}$ – PG – $GnRH^{2}$) protocol as per schedule on day 0, 7 and 9. The T2 group animals were similarly treated as of T1 except that there was insertion of used CIDR (controlled internal drug release, 1.38 G progesterone) in the anterior of vagina of cows from 0 day to $7^{th}$ day of Ovsynch

protocol. The treatment group T3 was similar to T1 except that additional hormone (estradiol valerate; 1 mg and progesterone; 100 mg) was injected at the time of insertion of CIDR and after removal PGF2α (cyclix @ 500 µg) and 24 hr later estradiol valerate (progynon @ 1 mg) was given intramuscularly. In all the treatment groups, fixed time insemination was done 20 hour after the last injection with frozen semen. These treatments resulted in 88.23% (15/17), 55.55% (10/18) and 77.77% (14/18) pregnancies in treatment groups T1, T2 and T3, respectively. The mean progesterone concentration at the time of AI in animals which became pregnant were 1.37±0.34 ng/ml, 0.72±0.34 ng/ml and 1.04±0.39 ng/ml in the treatment groups T1, T2 and T3 where as in non-pregnant groups the concentrations were non-significantly lower 0.15±00.15 ng/ml, 0.49±0.17 ng/ml and 0.61±0.31 ng/ml respectively. The mean size of largest follicle at the time of AI these treatment groups were 13.29±0.21 mm, 14.06±0.07 mm and 13.61±0.17 mm, respectively while the respective size in non pregnant group animals were 13.4±0.80 mm, 12.51±0.37 mm and 11.00±0.58 mm.

## Project 17: Studies on induction of estrus and fertility in anestrus buffaloes using progesterone releasing intravaginal device and other hormonal combinations.

49 parous anestrus buffaloes, aging between 4 and 11.5 years and having a past history of anestrus from 499 to 1131 days were exposed to three hormonal treatments, namely-PRID (progesterone releasing intra-vaginal device) indigenously developed by Central Sheep and Wool Research Institute (CSWRI), Avikanagar, Rajsthan contains 900 mg progesterone, (T1, n=16), PRID + GnRH (T2, n=16) and PRID +PMSG (T3, n=17). All the anestrous buffaloes were free from anatomical or reproductive disorders and clinically healthy with an average to good body condition (BCS 2.5-3.5). These animals were scanned by ultrasound machine for their ovarian activity and all those which were found to have normal ovaries with small follicles were considered as cases of anestrus. The T1 group animals were treated with PRID implant in the anterior vagina for 14 days. T2 group animals were treated similar to T1 with an additional injection of GnRH (Receptal, 20 µg) intramuscularly a day prior to removal of the implant. Treatment of T3 group animals was similar to T1 except intra muscular injection of PMSG on the day of removal of implant (Folligon, 500 IU). Majority of the animals were reported in heat with in 72 to 96 hr of last injection/ removal of implant. Animals were inseminated with frozen semen and second insemination was done after 24 hour of the first insemination. These treatments resulted in 31.25% (5/16), 62.50% (10/16) and 76.47% (13/17) pregnancies in T1, T2 and T3 group, respectively. The mean progesterone concentrations at the time of AI in pregnant animals were 0.38 ± 0.22, 0.42 ± 0.35 and 0.19 ± 0.10 ng/ml in T1, T2 and T3 groups. The respective concentrations in non-pregnant animals were 0.39 ± 0.13, 0.04 ± 0.02 and 0.16 ± 0.12 ng/ml. The size of large follicles at the time of AI were 11.86 ± 1.29 mm, 11.51 ± 0.43 mm and 11.43 ± 0.53 mm in treatment groups T1, T2 and T3 where as the respective values were of 10.47 ± 0.48 mm, 11.83 ± 0.77 and 12.95 ± 0.15 mm in pregnant animals.

## Project 18: Studies on disposition kinetics of levofloxacin in cattle and buffalo calves.

Disposition kinetics of levofloxacin was studied in cattle calves following a single intravenous, intramuscular and subcutaneous administration at a dose rate of 10mg/kg. Plasma concentrations of levofloxacin were determined using the HPLC assay method. This method was very consistent and reproducible with the correlation coefficient value of 0.999; the intra-day and inter-day coefficient of variance was less than 10 per cent and the mean recovery was 86 per cent. Plasma concentrations versus time data were subjected to compartmental pharmacokinetic analysis using the computer software "PHARMKIT".

Following intravenous administration of levofloxacin in cattle calves (10 $mg.kg^{-1}$), mean plasma concentration of the drug at 0.04 h was 24.00±3.67 $\mu g.mL^{-1}$ and the drug could be detected in plasma (0.10±0.02 $\mu g.mL^{-1}$) for up 24 h. The plasma concentrations time data of levofloxacin was best described by two-compartment open model. Based on plasma concentrations of levofloxacin, the mean values for $t_{½á}$ and $t_{½â}$ were 0.05±0.01 h and 2.12±0.21 h, respectively. The values of AUC, $Vd_{(area)}$ and $Cl_B$ were found to be 29.32±1.19 $\mu g.mL^{-1}h$, 1.05±0.10 $L.kg^{-1}$ and 0.34±0.01 $L.h^{-1}.kg^{-1}$, respectively while the ratio of drug concentrations between the tissues and plasma (T/P) was 4.47± 02.09. The overall mean residence time of

levofloxacin was calculated to be 2.87±0.31 h. Following IM administration of levofloxacin (10 mg.kg$^{-1}$), an appreciable and clinically effective concentration of 1.04±0.34 µg.mL$^{-1}$ could be detected in plasma within 0.04 h and the peak plasma concentration of 3.08±0.33 µg.mL$^{-1}$ was observed at 1 h. Levofloxacin was detected in plasma (0.21±0.05 µg.mL$^{-1}$) up to 18 h and the plasma concentration time data of levofloxacin could be best fitted to one-compartment open model with first order absorption rate constant. The mean (±SE) values of $t_{1/2Ka}$, $t_{½â}$, AUC, MAT, MRT and F were found to be 0.51±0.09 h, 2.76±0.36 h, 18.43±2.15 µg.mL$^{-1}$h, 1.85±0.46 h, 4.72±0.72 h and 62.65±5.99 per cent respectively. After SC administration of levofloxacin (10 mg.kg$^{-1}$), clinically satisfactory concentration of 1.18±0.48 µg.mL$^{-1}$ could be detected in plasma within 0.04 h and the peak levofloxacin level of 3.03±0.36 µg.ml$^{-1}$ was observed at 1 h. The drug could be detected in plasma of calves up to 12 h when the level was 0.28±0.07 µg.mL$^{-1}$. Plasma levels versus time data was best fitted to one- compartment open model and the values of $t_{1/2Ka}$, $t_{½â}$, AUC, MAT and MRT were calculated to be 0.75±0.18 h, 2.57±0.29 h, 28.61±6.40 µg.mL$^{-1}$h, 0.59±0.62 h and 3.46±0.39 h. The bioavailability of levofloxacin following subcutaneous administration in cattle calves was found to be almost 100% (97.50±19.66%).

After intravenous administration of levofloxacin in buffalo calves (10 mg.kg$^{-1}$), mean plasma concentration of the drug at 0.04 h was 28.42±2.99 µg.ml$^{-1}$ and it declined to 1.16±0.266 µg.ml$^{-1}$ at 8 hr. The plasma concentrations versus time data of levofloxacin were best described by two-compartment open model. The mean values of $t_{½â}$ and $t_{½â}$ in buffalo calves were 0.19±0.04 h and 3.99±0.30 h, respectively. The values of AUC, $Vd_{(area)}$ and $Cl_B$ were calculated to be 49.67±4.24 µg.ml$^{-1}$h, 1.20±0.12 L.kg$^{-1}$ and 0.21±0.02 L.h$^{-1}$.kg$^{-1}$ respectively while the ratio of drug concentrations between the tissues and central compartment (T/P) was 2.11± 0.26 and the overall mean residence time was calculated to be 4.23±0.34 h. Following IM administration of levofloxacin (10 mg.kg$^{-1}$), an appreciable and clinically effective concentration of 1.60±0.49 µg.ml$^{-1}$ in plasma could be detected within 0.04 h and the peak plasma concentration of 5.77±0.37 µg.ml$^{-1}$ was observed at 1.5 h. Levofloxacin could be detected in plasma (0.66±0.10 µg.ml$^{-1}$) up to 12 h. Plasma levofloxacin concentration time data was best described using one-compartment open model.

The values of $t_{1/2Ka}$, $t_{½Ke}$, AUC, MAT, MRT and F were found to be 0.49±0.08 h, 3.33±0.19 h, 39.35±5.03 µg.ml$^{-1}$h, 1.04±0.40 h, 5.27±0.21 h and 80.04±7.80 per cent respectively. After SC administration of levofloxacin (10 mg.kg$^{-1}$), clinically satisfactory concentration of 0.35±0.10 µg.ml$^{-1}$ could be detected in plasma within 0.04 h and the peak levofloxacin level in plasma (2.80±0.24 µg.ml$^{-1}$) was observed at 1.5 h and the drug could be detected in plasma of buffalo calves up to 12 h when the level was 0.52±0.17 µg.ml$^{-1}$. Plasma concentrations versus time data was best fitted to one-compartment open model and the values of $t_{1/2Ka}$, $t_{½â}$, AUC, MAT and MRT were calculated to be 0.61±0.09 h, 4.22±0.40 h, 23.84±2.14 µg.ml$^{-1}$h, 3.18±0.53 h and 7.41±0.55 h.

The bioavailability of levofloxacin following subcutaneous administration in buffalo calves was found to be almost 50 per cent (49.54±6.22%). After extravascular administration of levofloxacin in buffalo calves, either by IM or SC routes, appreciable and clinically effective plasma concentrations of 1.60±0.49 and 0.35±0.10 µg.ml$^{-1}$ respectively were observed within 0.04 h of drug administration which gradually peaked to 5.77±0.37 and 2.80±0.24 µg.ml$^{-1}$ at 1.5 h. After attainment of peak levels, levofloxacin plasma concentrations in buffalo calves after SC administration at different time intervals 2, 3, 4, 6, 8 and 12, 24 h were significantly higher compared to the corresponding values after IM administration. But values of pharmacokinetic determinants, namely- AUC, AUMC, MRT, MAT and F following SC administration was significantly lower compared to the IM route. Value of elimination half life after SC administration was longer 4.22±0.40 h compared to 3.33±0.19 h after IM administration, however, the difference was not statistically significant. Based on the results of pharmacokinetic studies, it may be inferred of levofloxacin in buffalo calves, and pharmacokinetic: pharmacodynamic predictors of efficacy i.e. AUC/MIC and $C_{max}$: MIC derived from the generated data, that levofloxacin should be administered to buffalo calves at the dose level of 10 mg.kg$^{-1}$ by either of the routes IV, IM, SC and repeated at 24 h intervals, But almost 50% bioavailability of levofloxacin following SC administration does not favour its preferential recommendation over the intramuscular route.

## Project 19: Toxicity study of binary mixture of arsenic and deltamethrin and the ameliorative effects of aqueous extracts *Moringa oleifera* leaves and *Withania somnifera* roots in male Wistar rats.

Present research work was carried out to study toxicity of binary mixture of arsenic and deltamethrin and the ameliorative effects of aqueous extracts *Moringa oleifera* leaves and *Withania somnifera* roots in male Wistar rats, if any. From result of present study it may be inferred that sodium arsenite (@ 40 ppm) in general was more toxic than DLM (@ 1.9 mg/kg). Reduced weight gain in As-treated group (21.32) compared to DLM treated rats (29.40) was reversed both by MOLE or WRE. Both As and DLM alone or their binary mixture did not adversely affect the haematological parameters. Per cent count of lymphocytes was reversed by MOLE and WRE. Hepatic and other tissues damage was more with As than DLM and binary mixture did not have any pronounced effect and MOLE on concurrent treatment with xenobiotics prevented such damage. Both As and DLM resulted in renal damage which was not countered by any treatment. As-induced hypercholesteremia and hyperbilirubinemia were checked by both, MOLE and WRE. WRE was more effective in preventing DLM induced decrease in total proteins and plasma protein levels. Lipid peroxidation and other oxidative stress biomarkers revealed that both As and DLM induced marked to significant accelarations were revesed by both- MOLE and WRE. But AChE activity was not significantly affected by any of the xenobiotics. Absolute and relative weights of organs also revealed protective effect of MOLE and WRE. Hepato-protective effect of MOLE was more pronounced compared to other organs.

## Project 20: Pharmacological studies on nitric oxide pathway and its signaling mechanism(s) in buffalo myometrium.

Present study was undertaken to evaluate the underlying signaling mechanisms involved in nitric oxide mediated relaxant effect on pregnant buffalo myometrium. Pregnant uteri from nondescript buffaloes were collected from local slaughter house in ice cold (4±0.5°C) Ringer locke solution. The myometrial strips were mounted in an organ bath under 2g resting tension. After 2hrs equilibration period myometrial strips exhibited regular pattern of spontaneity. L-arginine produced concentration dependent relaxant effect on myometrial spontaneity ($pD_2$=2.80±0.21; $R_{max}$= 43.63± 4.52%). But pre-incubation of the tissue with L-NAME (3 mM) did not inhibit rather potentiated ($pD_2$=3.7±0.11, $R_{max}$= 87.18 ±4.45) the relaxant effect of L-arginine. Biochemically also L-NAME failed to decrease tissue nitrite level in L-arginine stimulated myometrium. ODQ (10 µM) pretreatment also failed to produce any inhibitory effect on L-arginine-induced tocolysis. While pre-incubation of the myometrial strips with glybenclamide (1 µM) completely reversed the relaxant effect of L-arginine which evidenced that possible involvement of $K_{ATP}$ channels in regulating L-arginine induced tocolytic effect in buffalo myometrium.

## Project 21: Pharmacological characterization of ATP-dependent potassium channels and signaling pathways of terbutaline and forskolins induced myometrium relaxation in pregnant buffaloes.

Main objective of the present pharmacological study was to unravel the presence of KATP channels and possible signaling pathways of terbutaline and forskolin-induced tocolysis of buffalo myometrium particularly to elucidate the involvement of different types of potassium channels and second messengers-cAMP and cGMP. The study was conducted on the uteri of pregnant buffaloes and isometric tension of isolated uterine strips was recorded. Cromakalim produced concentration-dependent inhibitory effect on myometrial spontaneity and the median effective concentration (EC50) of cromakalim along with its 95% confidence limits was $1.56 \times 10^{-7}$ M ($9.47 \times 10^{-8}$ M to $2.68 \times 10^{-7}$ M) and the pD2 value was found to be 6.80. The DRC of cromakalim was shifted rightward and the shift was parallel with decrease in maximal effect, thus suggesting non-competitive antagonism between romakalim and glibenclamide. The pA2 value of glibenclamide was calculated to be 5.17. Therefore, these findings reveal the functional and pharmacological presence of KATP channels which are involved in tocolysis in buffalo myometrium. Pinacidil produced concentration-dependent inhibitory effect on myometrial spontaneity whereas, Glibenclamide (10ìM) significantly reduced the relaxant effect of pinacidil. The DRC of pinacidil was shifted rightward and the shift

was parallel with decrease in maximal effect, thus suggesting non-competitive antagonism between pinacidil and glibenclamide. Therefore, KATP- channels seem to be functionally involved in mediating pinacidil-induced tocolysis in buffalo myometrium. Terbutaline produced concentration-dependent inhibitory effect on myometrial spontaneity and Glibenclamide (10ìM) significantly reduced the relaxant effect of terbutaline. The DRC of terbutaline was shifted rightward and the shift was parallel with decrease maximal effect, thus suggesting non-competitive antagonism between terbutaline and glibenclamide. The pA2 value of glibenclamide against terbutaline was calculated to be 5.22. Therefore, KATP channels seem to be present and functionally involved in mediating terbutaline induced tocolysis in buffalo myometrium. L-NAME did not significantly alter the relaxant effect of terbutaline .Therefore, NO does not seem to modulate $\alpha_2$ agonist-induced myometrial relaxation in buffaloes.

Forskolin produced concentration-dependent inhibitory effect on myometrial spontaneity and Glibenclamide (10ìM) significantly reduced the relaxant effect of forskolin. The DRC of forskolin was significantly shifted in rightward direction with no decrease in maximal effect; thus suggesting the antagonistic effect of glibenclamide against forskolin. Therefore, KATP channels seem to be function- ally involved in mediating forskolin-induced tocolysis in buffalo myometrium. TEA (1mM) significantly potentiated the relaxant effect of forskolin. The DRC of forskolin was shifted leftward suggesting the involvement of BKCa channels in mediating forskolin-induced tocolysis in buffalo myometrium. L-NAME (1mM) significantly potentiated the relaxant effect of forskolin. The DRC of forskolin was shifted leftward and the shift was parallel with no decrease maximal effect, thus suggesting that NOS inhibitors augmented the tocolytic effect of forskolin. Therefore, nitric oxide pathway seems to be involved in mediating forskolin-induced tocolysis in buffalo myometrium. The DRC of forskolin was shifted leftward with no decrease in the maximal effect; thus suggesting the involvement of soluble guanylyl cyclase sGC-pathway in mediating forskolininduced tocolysis in buffalo myometrium.

## Project 22: Screening of indigenous plants for different Pharmacological activities with particular reference to immunomodulation and ameliorative potential of certain plants against metal toxicity in laboratory animals.

Ameliorating potential of *Moringa oleifer*a leaves and *Withania somnifera* against arsenic-and lead-induced toxicity in rats revealed their efficacy against low dose arsenic toxicity in rats, including their potential against oxidative stress. MOLE possesses promising haematopoietic potential including its possible use in thrombocytopenia and anaemia. Pharmacological screening of *Moringa oleifer*a and *Nyctanthes arbortrsiris* flowers extract revealing potent analgesic, antiinflammatory, antipyretic, haemopoietic, hepatoprotecive, hypolipedimic and immmunomodualtion properties and effect mediated through inhibition of COX-2. Further studies on modulation and expression of cytokines involved in the regulation of immune systems are in progress.

## Project 23: Studies on seminal attributes and antioxidative parameters in cryopreserved semen of barbari bucks after supplementation of zinc and selenium.

The study was conducted in Hi-Tech Lab of Department of Physiology and Central Instrumentation Laboratory (CIL) on eight bucks aged between two and four years, weighing 25-35 kg which were reared in experimental sheds of Department of Physiology. All the animals were screened for zinc and selenium level in blood serum 15 days prior to experiment to know the status of zinc and selenium levels in blood. The experimental animals were divided into control and test groups of four animals each. The animals of the control group were not given any supplementation where as test group animals were given supplementation of zinc and selenium in inorganic form with 150 ppm zinc sulfate and 0.50 ppm sodium selenate for 105 days. The day of supplementation was regarded as the 0 day. Zinc and selenium supplementation markedly improved the antioxidative status of cryopreserved sperm which is essential for preventing free radical damage of spermatozoal membrane and nuclear DNA. The improvement in anti oxidant system in terms of the sperm anti oxidant enzymes reduced generation of free radicals along with the scavangring activity of the antioxidant enzymes protected sperm damage from free radicals.

## Project 24: A study on effects of ageing and season on cryopreservability of barbari buck semen.

The study was designed to study the effects of ageing and season on the freezability of semen of the Barbari goats. Eighteen normal, healthy adult Barbari bucks aging between eight months and eight years were reared in the experimental goat sheds of Department of Physiology. Effects of ageing and different seasons were evaluated on cryopreservability of Barbari buck semen. Both ageing and season affect the semen quality. Winter (S2) was found to be unsuitable for both semen collection and semen preservation where as S1 and S3 were found differentially suitable for semen collection and cryopreservation. Adult animals (G2) were found to be best for all the seminal attributes. The G3 showed impaired quality of sperm in terms of DNA damage which in turn lead to poor outcome of sperm survival and poor AI results. G1 should not be used for semen collection and preservation as they were sexually not mature enough to qualify for cryopreservation and long term storage. With ageing, the semen quality detoriated both morphologically as well as internally with respect to the integrity of DNA. Season markedly influenced the features of the sperm quality and photoperiod was found to be the critical regulator of the semen quality in Barbari goats.

## Project 25: Studies on semen quality, antioxidative enzymes in semen and reproductive hormone of barbari bucks after dietary supplementation of zinc and selenium.

The study was conducted in 8 bucks aging between 2-4 years and weighing 25-35 kg. All the animals were screened for zinc and selenium level in blood serum. The experimental animals were divided in control and test groups containing four animals each. Animals of the control group were not given any supplementation whereas test groups were given supplementation of zinc and selenium in inorganic form with 150-ppm zinc sulfate and 0.50-ppm sodium selenate, respectively. Results of the study revealed that zinc and selenium supplementation improved testosterone ($T_3$ and $T_4$) levels required for growth and development of testes, interstitial cells, secretory activity of accessory sex glands, development of secondary sexual characteristics and spermatogenesis. Zinc and selenium supplementation improved antioxidative status of semen which is essential for preventing free radical damage of spermatozoal membrane and nuclear DNA. Thus improvement in hormonal status in serum and antioxidative status in seminal plasma as well as in spermatozoa has helped in improving all seminal parameters as a whole.

## Project 26: Effect of dietary supplememntation of zinc and seleneum on haematological- biochemical profile and antioxidative enzymes in barbari goats.

The study was conducted in 8 bucks aging between 2 and 4 years and weighing 25-35 Kg. All the animals were screened for zinc and selenium level in blood serum 15 days earlier to the experiment to know the status of the zinc and selenium level in the blood. The experimental animals were divided in to control and test group containing four animals each. The animals of the control group were not given any supplementation where as test group were given supplementation of zinc and selenium in inorganic form with 150 ppm zinc sulfate and 0.50 ppm sodium selenate for 105 days. The day of supplementation was regarded as the 0 day. Blood biochemical parameters were evaluated along with the antioxidant enzymes of plasma and RBC. The zinc and selenium supplemented group exhibited a marked improvement in the antioxidative enzymes in the plasma indicating a correlated reduction in the oxidative stress. But there was no significant rise in the haematological parameters was found after treatment.

## Project 27: Studies on propofol, midazolam and their combination for clinical anaesthesia in dogs

The study was conducted on 36 selected clinical cases of dogs of either sex of different breeds and 2 - 8 years of age and weighing 10-25 Kg to study the effects of midazolam and propofol anaesthesia in different combinations on clinicophysiological, haematobiochemical and some haemodynamic parameters. The animals were divided into six groups. In group $T_1$, midazolam, 0.5 mg/Kg b.wt. i.v. was administered in group

$T_2$ Midazolam, 0.5 mg/Kg b.wt. i.v. followed by mixture of propofol, midazolam (1:1 v/v) i.v. till effect was used for induction as well as maintenance of anaesthesia, in group $T_3$ midazolam, 0.5 mg/Kg b.wt. i.v. followed by mixture of propofol, midazolam (1:2 v/v) i.v. till effect used for induction as well as maintenance of anaesthesia. In group $T_4$ propofol alone used i.v. till effect for induction as well as maintenance of anaesthesia, in group $T_5$ induction of anaesthesia with propofol i.v. till effect and maintenance with mixture of propofol and midazolam (1:1 v/v) i.v. was used in incremental doses for maintenance and in group $T_6$ induction of anaesthesia with propofol i.v. till effect and mixture of propofol and midazolam (1:2 v/v) i.v. was used in incremental doses for maintenance. Animals receiving midazolam alone became recumbent in 0.53+ 0.022 min. Midazolam produced moderate degree of tranquilization and mild muscular relaxation with mild analgesia. The duration of peak effect in this group was 14.72+ 0.602 min. A mild degree of salivation during recovery was seen in this group. In the group T2 and T3 time of induction was 0.55+ 0.031 and 0.61+ 0.047 min, respectively while the complete recovery took 26.25+0.539 and 29.01+ 0.592 min, respectively. The mean induction doses of propofol and midazolam required were 3.33+ 0.462 mg/kg b.wt. and 0.33+ 0.041 mg/kg b.wt., respectively in group T2. Whereas, in group T3 required induction doses of propofol and midazolam were 2.20+ 0.381, 0.44+ 0.032 mg /kg b.wt., respectively. In group T4, T5 and T6 induction doses of propofol were 5.50+0.482, 5.42+0.522 and 5.80+0.443 mg/kg b.wt., respectively and time of induction were 0.50+ 0.025, 0.50+0.057 and 0.51+0.028 min respectively. In T5 and T6 groups maintenance was done with mixture of propofol and midazolam on an average dose of 2.62+ 0.213, 0.262+ 0.024 and 1.92+0.152, 0.384+0.022 mg/kg b. wt., respectively. The duration of anaesthesia in T2, T3, T4, T5 and T6 groups of animals were maintained for 19.95+ 0.586, 23.01+ 0.496, 16.25+ 0.025, 18.06+ 0.607 and 21.03+ 0.549 min, respectively. The complete recovery time in T4, T5 and T6 groups were 90.63+0.452 25.42+0.853 and 27.38+0.511 min, respectively. Increase in heart rate was a consistent finding in all the groups at different time intervals after induction of anaesthesia. RT, $SpO_2$, Hb, TLC, and PCV decreased in all the groups after induction of anesthesia and SGPT, SGOT, serum creatinine, serum glucose increased in all the groups. Electrocardiographic changes after attaining anaesthesia represented more intensity. The variation in T-wave, S-T segment depression, biphasic T wave indicative of hypokalaemia. ECG recorded after 24 hr in T2 did not show any noticeable disturbance. It was concluded that midazolam at the dose rate of 0.5 mg/Kg b.wt. i.v. serves as a tranquilizer for short duration of procedure and can be used as an adjunct to local analgesia for minor surgical operations. Midazolam at the 0.5 mg/kg b.wt. for tranquilization and mixture of propofol and midazolam (1:2 v/v) for maintenance was best drug combination for satisfactory/ balanced anaesthesia in dogs, which can easily be practiced in various clinico-surgical procedure for various duration of surgical interventions as has been also recorded in this study without any deleterious effects on any system and organ of the body.

## Project 28: Studies on laparoscopic sterilization techniques in bitches.

The study was planned to evaluate the three agents viz. carbon dioxide, carbon dioxide followed by filtered room air for maintaining the intra-operative laparoflation and filtered room air alone used for laparoflation on the basis of physiological, haemodynamic, haematological alterations and effects of laparoscopic ovariectomy and laparoscopic ovarieo-hysterectomy in bitches in an attempt to find the most suitable and less expensive gaseous agent for laparoflation in bitches and to find a technique for quick laparoscope assisted oophorectomy in pre-pubertal dogs.

In step 1 the number of groups taken were three viz. group A ($CO_2$ alone), group B ($CO_2$ followed by filtered room air) and group C (filtered room air), for the assessment of the hazardous complications associated with laparoflation using these agents. Groups viz. D and E were taken for the standardization of two techniques i.e. Laparoscopic oophorectomy using intracorporeal haemostatic techniques and Laparoscope assisted oophorectomy using extracorporeal haemostatic techniques. In both the groups $CO_2$ gas was used exclusively to create the capnoperitoneum.

Various clinical, physiological, haemodynamic and haematological parameters revealed that the agent used for laparoflation and laparoscopic technique did not pose any deleterious effect on vital functions of body.

$CO_2$, $CO_2$ followed by filtered room air, and filtered room air can be used safely for laparoscopic surgery. However in filtered room air laparoflation, there was slight reduction in visibility and clarity of vision but it can be used for diagnostic laparoscopy and minor laparoscopic surgeries. Insufflation with $CO_2$ and maintenance by filtered air and that with $CO_2$ alone in groups B and C respectively provided better visibility and clarity and therefore can be used for laparoscopic ovario-hysterectomy.

Laparoflation with either of the gaseous agents namely, filtered air and carbon di oxide have no significant adverse physiological, behavioural or clinical effect on the animal. Laparoscopic oophorectomy and ovario-hysterectomy can be performed with minimal time, minimal manipulation and quick post operative ambulation and healing albeit after achieving dexterity by practice. Large no. of animals can be spayed / castrated in short duration of time. Minimum hands are required for the procedures, i.e. one anaesthetist, one assistant and one surgeon. It can be used as an effective measure for animal birth control programme. Extracarporial oophorectomy has considerable advantage over intra-corporial technique with less time consumption but with the additional need of two extra ports to deliver the ovaries. Use of filtered air can cut down cost of procedure in comparison to carbon dioxide in ABC programme in veterinary practice for maintenance of intraoperative laparoflation. Similarly filtered air alone is found suitable for laparoflation for diagnostic laparoscopy.

## Project 29: Studies on diagnosis and treatment of otitis in dogs.

The study was undertaken on 27 dogs presented at the Teaching veterinary clinical complex, College of veterinary science and animal husbandry, Mathura for a period of 6 months from 1st November to 31st April 2010 with any kind of complaint related to ears. Out of all maladies of dogs the overall incidence of otits externa stood at 2.86 percent. The influence of age, breed, sex, living environment of pet, skin coat, shape of ears, frequency of ear canal cleaning, anal sac infection, ectoparasiticide and deworming use on the incidence of otitis externa was also studied. The results of the study revealed that the incidence of ear affection was highest in dogs belonging to the age group of 1-5 years and the least in the age group below 1 year. Male dogs showed greater involvement than females. German shepherds, followed by Spitz, and Labrador retrievers were the most frequently affected breeds. Indoor companion pets were mostly affected as compared to outdoor pets. Long haired dogs were more commonly affected than short haired dogs. Dogs having erected ear was more commonly affected followed by floppy ear, droopy ear and semiprick ear. The dogs in which regular cleaning of ear canal was followed had the least incidence. Anal sac infection was present in 40.74% cases. The dogs suffering from otitis showed physical manifestation such as erythema, crust formation, foul smelling otic discharge, head shaking, scratching of ear pinnae with paws, pain on palpation of auricular cartilage, and ulceration of the inner aspect of external ear canal. The dogs harbouring *Staphylococccus* spp. Infection of ears were presented with foul smelling purulent exudates or brownish color ceruminous discharge, and in case of *Pseudomonas* spp. Infection yellowish to greenish color discharge was presented. Affected dogs were also found with inflammation, head tilted towards the affected site, constant shaking of head, and scratching ear pinnae with paws. In clinical cases of dogs with *Mallasezia* spp. Ear infections, presence of brownish color foul smelling purulent ceruminous exudates in external ear canal was present. On cytological examination of swabs from clinical cases, either Gram-positive/ or Gram-negative organisms were observed. Cells of *Mallasezia* spp. were seen as oval to pea-nut Gram-positive unicellular yeast cells. Radiography helped in assessing the changes in the density, contour and lytic changes in the tympanic bulla, narrowing or obstructed ear canal in chronic-recurrent otitic cases. Video otoscopy was found a non-invasive technique which clearly displayed the structures of the ear canal and tympanic membrane to evaluate the condition of ear like hyperemia, hyperplasia, stenosis and ulceration of the epithelium in the ear canal in otitic cases. Ultrasonography of the Exteranal ear canal with 6.5-8 MHz curvillinear probe after infusion of saline solution as a contrast media into the ear canal may be an accurate, non-invasive, rapid, and widely available method for assessment of ear canal. The first step in the treatment of otitis comprised of clipping of hairs around external ear canal before cleaning and instituting any treatment. In the present investigation normal saline was used as cleaning agent and para-dichlorbenzene as a ceruminolytic agent along with topical/systemic antimicrobial drugs or both. Ear cleansing is considered to be vital for successful treatment of chronic otitis.

## Project 30: Studies on halothane anaesthesia in propofol, xylazine, midazolam premedicated and propofol induced dogs.

This study was undertaken to test the suitability of different preanaesthetics/combination and to study their effects on propofol-halothane anaesthesia in 24 selected clinical cases of dogs. The dogs were divided in to four groups viz. $T_1$, $T_2$, $T_3$ and $T_4$. The animals of $T_1$ group were premedicated with atropine (0.04 mg/kg i.m.) and propofol (2 mg/kg i.v.). In $T_2$ group atropine (0.04 mg/kg i.m.) and xylazine (0.5 mg/kg i.m.) were used as preanaesthetics. In $T_3$ group atropine (0.04 mg/kg i.m.) and midazolam (0.5 mg/kg i.m.) were administered as preanaesthetics. The animals of $T_4$ group were administered with atropine (0.04 mg/kg i.m.) and xylazine (0.25 mg/kg i.m.) + midazolam (0.25 mg/kg i.m.) combination. The drugs were injected simultaneously at different sites. After 15 min of premedication anaesthesia was induced with 1% propofol (i.v., to effect) and maintenance of anaesthesia was done with halothane in 100% oxygen in all groups of animals. Clinical examination revealed that in the animals of $T_3$ group, weak time (12±1.17 min) was significantly higher than in $T_2$ group (10±1.17 min) followed by $T_4$ group (8.5±1.21 min) and $T_1$ group (2±0.52 min), respectively. The value of induction time was highest in $T_3$ group (62.0±5.15 sec) followed by $T_1$ group (57.5±10.21 sec), $T_3$ group (57.5±8.76 sec) and $T_4$ group (52.5±5.27 sec), respectively with no significant difference among the groups. The recovery time in the animals of $T_2$ group (8.5±1.613 min) and $T_3$ group (8.0±1.33 min) was significantly ($P<0.05$) higher than in $T_1$ (5.5±1.21 min) and $T_4$ groups (6.5±1.38 min). The animals of $T_2$ and $T_4$ groups produced better quality sedation and analgesia than that of $T_1$ and $T_3$ groups. The quality of muscular relaxation was excellent in the animals of all groups. The required doses of propofol to achieve induction of anaesthesia in $T_1$, $T_2$, $T_3$ and $T_4$ groups were 4.940±0.318, 4.580±0.467, 4.930±0.371 and 4.310±0.389 mg/kg, respectively, which was significantly ($P<0.05$) lesser in $T_4$ group than in other groups . The anaesthesia could be maintained by setting the vaporizer in the range of 2 - 3.5 in $T_1$ group, 1.2 - 3 in $T_2$ group, 1.8 - 3.2 in $T_3$ group and 1.5 - 3 in $T_4$ group, respectively. Heart rate increased in all groups and remained on higher side throughout the period of observation. Respiratory rate in all groups showed decreasing trend throughout the observation period. Significant ($P<0.05$) decrease in rectal temperature was observed at almost all time intervals in all groups in comparison to base line values. Systolic blood pressure (SBP), diastolic blood pressure (DBP) and mean arterial pressure (MAP) showed highly significant ($P<0.01$) and $SpO_2$ showed less significant ($P<0.05$) decrease on almost all time intervals in all groups in comparison to base line values. Significant decrease in Hb, PCV and TLC was observed in all the groups at almost all time intervals. Significant ($P<0.05$) increase in neutrophils count and significant ($P<0.05$) decrease in lymphocytes count were observed in all the groups throughout the observation period. Significant ($P<0.01$) increase in plasma glucose level was observed in animals of all the groups and did not return to base line at the end the observation period. Plasma creatinine and plasma urea nitrogen were found increased significantly ($P<0.05$) during whole observation period in the all groups of animals. Aspartate amino-transferase (AST) did not show any significant change at any time interval in any group. Plasma sodium and potassium values also did not show any definite trend in any of the groups. Xylazine (0.25 mg/kg i.m.) + midazolam (0.25 mg/kg i.m.) combination was found best in terms of quality of sedation, induction and recovery followed by xylazine (0.5 mg/kg i.m.), midazolam (0.5 mg/kg i.m.) and propofol (2 mg/kg i.v.), respectively, when used as preanaesthetics to propofol-halothane anaesthesia in dogs.

## Project 31: Prevalence of *Clostridium perfringens* in foods in Braj region.

A total of 350 samples comprising 60 chicken meat, 60 buffalo meat, 60 pig meat, 60 goat meat, 50 fish meat, 20 cooked chickens meat, 20 badam-milk and 20 ice-creams were collected from in and around Mathura city and analyzed for *Clostridium perfringens* contamination. The overall occurrence of *Clostridium perfringens* was 48.57% in different food with the highest prevalence in poultry meat (66.67%) followed by buffalo meat (61.67%), fish meat (60%), pig meat (53.33%) and goat meat (48.33%). The meat samples of cooked chicken had 10% of *Clostridium perfringens*. In the milk products samples, badam-milk and ice-cream had no *Clostridium perfringens*. CMM showed higher level of *Clostridium perfringens* during enrichment than other two media (IMM and ATM). The overall occurrence of *Clostridium perfringens* in CMM was 63.33% followed by IMM (60%) and ATM (53.33%) in poultry meat in combination with selective media (TSC). IMM showed 60% positivity on the basis of presumptive isolation. Among agar

media, SFP and TSC had given 55% positivity each for *Clostridium perfringens* followed by SPS (43.33%) in poultry samples.

A total of 102 isolates of *Clostridium perfringens* were screened to observe lecithinase activity, out of which 91(89.2%) were reported to be positive. In meat samples, poultry (95%), goat (90%), buffalo (90%), pig (85%) and fish (85%) isolates showed lecithinase activity. In cooked meat isolates, 100% lecithinase activity was displayed. For hemolytic activity, 77 strains of *Clostridium perfringens* were observed, 65 strains (84.42%) had shown hemolysis on blood agar plates. The hemolytic activity of the isolates of *Clostridium perfringens* of goat (93.33%), pig (86.67%), poultry (86.67%), fish (80%), and buffalo (73.33%) were found. In cooked chicken hemolytic activity was observed to 100%. 25 raw meat samples isolates and 2 cooked meat samples isolates were screened by PCR to detect the presence of alpha toxin (*cpa*) and enterotoxin gene (*cpe*) in *Clostridium perfringens* strains. The result of PCR studies showed a band of 324bp, positive for alpha toxin (*cpa)* gene in 17 samples while negative for enterotoxin (*cpe*) gene. The overall occurrence for alpha toxin (*cpa)* gene was found 77.78 %( 17 out of 27 isolates) in food sample isolates. All the two cooked meat samples showed *cpa* gene. None of the samples found to be positive for enterotoxin gene (*cpe*) among the samples tested.

The antibiotic sensitive/resistant pattern of *Clostridium perfringens* against 16 antibiotics revealed that piperacillin, chloramphenicol, ceftriaxone, and amikacin were highly sensitive (80-100%), followed by cephoxitim, cephradine, cefuroxim sensitive (50-70%). Gentamicin was found to be resistant around 46%. The drugs like penicillin G, tetracycline, erythromycin and ampicillin had displayed resistance between (50-70%), while the drugs like lincomycin, co-trimoxazole, cloaxacillin and ceftazidime showed resistance from 80 to 95%.

### Project 32: Prevalence of *Bacillus cereus* in different foods of Mathura and Vrindavan and its antibiogram studies.

A total of 205 samples of food and food products from Mathura and Vrindavan regions were tested out of which 71 revealed contaminations with *B. cereus* and the per cent positivity was 34.63 %. Highest per cent contamination was found in local shops (39.39%) than in standard shops (26.47%). Of the food products highest percentage of contamination was observed in cooked meat and fried rice (40%) followed by milk products (35.82 %), milk (35.55%), chawmean (33.33%) and raw meat (31.03%). Majority of food and food products had presumptive and confirmatory counts of less than 4.00 CFU/ml or gram in local and standard shops. Sensitivity patterns of 70 isolates against 12 antibiotics were seen. The isolates presented 100% sensitivity to ciprofloxacin, chlorafinicol, doxicyclin and ofloxacin but the sensitivity was only 97.10%, 94.20%, 82.20%, 74.20% and 57.10% for norfloxacin, gentamycin, amikacin, streptomycin and tetracythrine, respectively.

## V. Extension



### A. DEPARTMENT OF VETERINARY AND ANIMAL HUSBANDRY EXTENSION

The department organized training and refresher programmes for delivering information regarding new innovative techniques of animal husbandry practices to farmers and animal husbandry workers. The department also participated in various Kisan Melas in Mathura and Kanpur, focusing on the various achievements of the Veterinary University and disseminating information regarding livestock production. The department was also involved in providing orientation programmes to farmers coming to visit University from Uttar Pradesh, Madhya Pradesh and Rajasthan.

## 1. Training Programmes Organized

Following training programmes were organized by the University during the period for farmers, paravets, livestock extension officers and veterinary officers:

1. Five day training Programme on "Animal Health and Breed Improvement" for Veterinary Officers, Livestock Extension Officers and members of dairy cooperative from 8th to 12th June 2010 under ATMA Programme.
2. Three 10 days training Programmes from 19th to 28th July, 02nd to 11th August and 17th to 26th August 2010 under ASCAD Programme for 20 Veterinary Officer each on "Recent Advances in diseases Diagnosis, Treatment, Control and Eradication of Livestock Diseases".
3. Training for 42 Paravets under UPDASP programme from U.P. State Animal Husbandry Department (September 2010 to December 2010).
4. Progressive farmers from Dehradun were given three days training on "Animal Health and Management" from 07-03-11 to 09-03-11.
5. Six trainings of 5 days on "Infertility Management in Dairy Animals" for field veterinarians from October 2010 to March 2011 under Project Implementation Unit, UPDASP.





## 2. Participation in Kisan Mela/Farmers Fair

The extension department represented the University in Kisan Melas for disseminating new technology to livestock owners through display of new research materials, leaflets, folders, posters, charts, audio-visual means, etc. The department participated in the Kisan Mela at Indian Veterinary Research Institute, Izatnagar, U.P from 1st – 3rd November 2010 to provide information regarding new technology to livestock owner. The Department stall received Third Position in stall presentation in this kisan Mela.





## B. KRISHI VIGYAN KENDRA (KVK)

### 1. Training organized during the period

| Name of the discipline | On Campus | | Off Campus | | Rural Youth | | Extension Functionaries | | Sponsored | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T | P | T | P | T | P | T | P | T | P | T | P |
| Crop Production | 36 | 725 | 36 | 725 | 6 | 535 | 12 | 240 | 38 | 665 | 128 | 2890 |
| Live Stock Production | 18 | 360 | 26 | 520 | 6 | 65 | - | - | - | - | 50 | 945 |
| Home Science | 35 | 291 | 45 | 572 | 5 | 48 | 2 | 80 | - | - | 87 | 991 |
| Plant Protection | 22 | 430 | 16 | 320 | 5 | 510 | 11 | 290 | 38 | 666 | 92 | 2216 |
| Total | 111 | 1806 | 123 | 2182 | 22 | | 25 | 610 | 76 | 1331 | 357 | 7042 |

#### (i) On Campus Training

Short term "On Campus Training" based on the principle of learning by doing and seeing believes for practicing farmers/farm women. 70, 40, 31 and 48 training on Crop Production, Crop Protection, Animal Husbandry/Dairying and Home Science disciplines were respectively conducted by the scientists. These training not only provided an opportunity to participants in raising the productivity of their corps and animals by adoption of latest technical knowhow but also gave practical exposure in scientific manner. Over 3210 farmers and farmwomen were trained through 189 training courses.

#### (ii) Off Campus Training

One day group discussion-cum-off campus Training in Agriculture, Animal Husbandry, Home Science and allied fields to provide on spot solution to various problems were organized by the scientists of KVK with the assistance of teachers of Veterinary College. In all, 212 Off Campus Training benefitting 3795 farmers and farmwomen were organized.

#### (iii) Training for school dropouts & rural youth

Specialized short and long duration vocational courses/trainings in the field of seed production nursery raising, vermiculture and composting, dairying, stitching & knitting, embroidery, fruit and vegetable preservation, roat rearing, value addition etc to generate employment opportunities and livelihood security of school dropouts & rural youth were conducted by the scientists of KVK. This center has organized 41 of training programmes benefitting 1566 of rural youth.

#### (iv) Sponsored Training

Trainings sponsored by the department of agriculture and horticulture under ATMA and Horticulture Mission respectively were also conducted in different modes. More than 7042 farmers have been trained.





### (v) Training to extension personnels

KVK was also entrusted with the responsibility of conducting "In-Service Training" for the workers/field level staff and others of line departments. The KVK has organized 38 such course benefitting 964 extension functionaries.

## 2. Front Line Demonstrations:

With the aim to demonstrate production potential and to generate production data and feedback information of newly released crop varieties and various production and protection technologies on farmer's field under different agro-ecological farming situation, large number of front line demonstrations were conducted under direct supervision of the KVK scientists. The demonstration on each crop was generally conducted on 5 ha land to show/prove the greater impact of technologies generated. The details of front line demonstration conducted on crops are given below.





**Frontline Demonstrations (2010-11)**

| S. No. | Crop | D | A |
|---|---|---|---|
| 1 | Bajra | 16 | 5 |
| 2 | Paddy | 12 | 7.4 |
| 3 | Til | 20 | 5 |
| 4 | Mustard | 46 | 20 |
| 5 | Wheat | 12 | 5 |
| 6 | Barley | 19 | 6.2 |
| 7 | Chilli | - | - |
| 8 | Cauliflower | - | - |
| 9 | Cabbage | 3 | 1.2 |
| 10 | Okra | 3 | 1.2 |
| 11 | Berseem | 24 | 2 |
| 12 | Potato | 3 | 1.2 |
| 13 | HS | - | - |
| 14 | Jawar | 25 | 5.0 |
| | **Total** | **183** | **59.2** |

D = No. of Demonstrations, A = Area in ha.

During the year, 183 demonstrations covering an area of 59.2 hactare were conducted on various crops to showcase the productivity potential of new technology on farmers' field.

Scientists also laid out FLD'on fodder crops using best varities of Sorghum (Poorva Desi), Ankur, Kanchan (Multicut) and Berseem (JHB-1466) to promote fodder production by farmers. The farmers appreciated the potential of these varieties and the demand for seed (fodder) is increased.





## 3. Live Stock Production Activities:

KVK Mathura conducted demonstrations on de-worming and feeding management aspects. Demonstrations on use of mineral mixture after deworming helped in improving milk yield. As a result this technology is gaining popularity and more number of farmers are adding mineral mixture in animal feed. Besides Animal Health and Vaccination camps were also organized.

## 4. Home Science Activities:

Demonstrations for women empowerment and other training activities for them on stitching, knitting, health and hygiene, nutrition, safe storage of grain, drudgery reduction, preservation of fruits and vegetables and other household activities were conducted by KVK.

## 5. Demonstration Unit:

Demonstration units of "Napier and Guinea Grass" to showcase the fodder technology and to meet the requirement during the lean period were established in one acre at DDD Farm. Besides, Vermi-compost and NADEP compost units were also established to promote organic farming and for improvement in soil health. Vermi-compost was also made available to farmers at nominal cost of Rs. 10.00/bag of 2 Kg.

## 6. On-Farm Testing:

To assess and evaluate refinement of technologies generated by research scientists, KVK conducted OFT on cereal, oilseeds, commercial crops, vegetable on farmers fields. OFT's on livestock production and management and on home science aspects were also conducted. Some of the technologies assessed and refined by the scientist were :

1- Weed management in wheat by Clidinofob and Metribuzine.

2- Identifying suitable cultivars of paddy under saline condition.

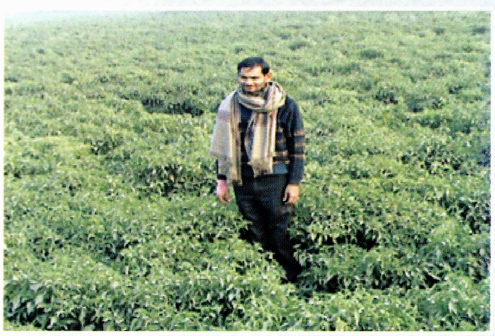
3- Identifying suitable cultivars of barley.

4- Effect of different spraying schedule on control of blight of potato.

5- Effect of different spraying schedule on control of sheath blight.

6- Assessment of best suitable material to store grain at household level.





7- Drudgery reduction through improved farm implements.
8- Mineral supplementation for improving milk production.
9- Assessment of IPM and IDM modules.

## 7. Kisan Mela:



To extend an opportunity of a good deal of knowledge, awareness and experience about the latest scientific advancement in agriculture and allied field with a single window concept, Kisan melas are organized. Kisan mela of 2011 was organized in the University premises on 5th March 2011. Sh. Jayant Chaudhary, Member of Parliament, Mathura and Member of ICAR Governing council inaugurated the kisan mela in the gracious presence of Prof. A. P. Singh, Hon'ble Vice Chancellor of the university. The other dignitaries who participated in Mela were Sri Pradeep Mathur, MLA, Mathura and leader of opposition in State Assembly, Sri Pooran Prakash, MLA, Goverdhan Assembly Segment, Mathura, representative from Zonal Project Directorate, Kanpur Dr. Lakhan Singh along with Dean, COVS and AH Dr. S.K. Garg, various govt., semi -govt. and departments of college put up more than 20 stalls to exhibit their technology use for farmers. In Mela, two magazines published by KVK and newsletter were also released by the Chief Guest and dignitaries. More than 1500 farmers participated in Mela during the reporting period.










## 8. Field days:




Farmers, Scientists and Extension workers interaction/discussion is an important feature the field days. This is an intensive educational activity in which farm experts, extension workers and farmers are involved and they learn from each other. KVK conducted 12 field days on demonstration or OFT site to show the practical and economical feasibility of newly generated technologies and / or varieties at farmers door steps. This activity instilled a level of confidence among farmers as well as in extension workers enlisting the principle of seeing is believing for adoption and spread it horizontally.

# Other Activities

## 1. Pashupalan Diwas:

KVK conducted Animal health-cum-welfare camp in village Karav (Raya) on 26.02.11. The camp was inaugurated by the Hon'ble Vice Chancellor, DUVASU, Mathura and Dean, COVS and AH, Dr. S. K.






Garg was also present on the occasion. A team of doctors and final year students participated in the camp and treated more than 60 animals. Most of them were treated for repeat-breeding which is a major problem in the district.

## 2. Information Services:

For brushing up the knowledge of farmers, extension functionaries and SMS's of line departments, KVK has been regularly bringing out the technical bulletin, leaflets, folders etc. and articles for print media.

## 3. Braj Mein Krishi Evam Pashupalan:

To convert the intellectual input (Knowledge) in to economically rewarding opportunity/ activity, information is considered as the most important input. KVK published its annual magazine "Braj Mein Krishi Evam Pashupalan" in simple Hindi language to cater to the need of rural people. Besides, "Braj Mein Phal Phool Evam Masale Ki Kheti" was also published. These magazines were distributed / made available free of cost to the farmers.

## 4. Print & Electronic Media:

Increasing literacy rate has offered new prospects for use of literature / printed material as a strong medium of receiving farming information at the farmers' doors. Scientists of KVK are using leading dailies of Mathura to extend their scientific information.

## 5. AIR:

Though broadcast on radio is well known and popular medium of extending information. A programme "Phone on line" is widely used by the scientist of KVK where answers to the questions are directly given immediately on Radio. Twenty such programmes were broadcasted during reporting period.

## 6. Telephone Consultancy:

To provide immediate solution of problems, the farmers were free to consult the concerned scientists on office phone or on their personal mobile at any time. Many such phones were received and solutions were offered to the farmers.

## 7. Seed Production Programme on KVK farm:

Seed is one of the important inputs to get higher yields of various crops. Seed replacement rate is around 22 %, which is extremely low. Looking to the shortage of quality seeds, KVK undertook seed production programme on its 42.5 acres instructional-cum-demonstration farm and produced more than 809 qtls of wheat seed during last two years. During the year 2010-11, more than 50% increase in wheat seed production was recorded compared to the year 2009-10. Besides, the farmers in adopted villages were motivated and provided training for producing quality seeds.

## 8. Soil, water and plant analysis labs:

For promoting judicious and balanced use of fertilization in various crops under micro and macro situation, soil water and plant analysis laboratory was established at KVK and made functional.

## 9. Participation:

To keep abreast with the new technologies and to monitor the quality of work performance, the scientist of KVK participated in the following workshops.

| | | | |
|---|---|---|---|
| 1- | Zonal workshop on FLD's & OFT's | - | 2 |
| 2- | State level workshop on KVK's | - | 2 |
| 3- | National level workshops | - | 2 |

In these workshops, the issues related to KVK were discussed, progress report and action plans were presented. In National workshop, only Programme Coordinator, Dr. S. K. Mishra participated.

# VI. University Farms

## A. Madhuri Kund Farm:

1396 acres of land is available at Madhuri Kund farm; out of which only 788 acres is under cultivation. The farm is undertaking fodder seed production progrmmes from National Seed Corporation, UP Seed Corporation, Directorate of Rapeseed Mustard Research, Bharatpur and also under RKVY. During the period under report, following types of fodder and grains were cultivated and produced in the farm.




| S.No. | Season | Name of the crop | Area of cultivation(Acre) | Production(Quintals) |
|---|---|---|---|---|
| 1. | Kharif | Dhan-Pant 12 | 44.38 | 619.40 |
| 2. | | Dhan-Sugandh 4 | 21.81 | 166.03 |
| 3. | | Til | 30.80 | 5.08 |
| 4. | | Jwar-fodder | 7.00 | 1973.50 |
| 5. | | Jwar | 62.00 | — |
| 6. | | Jwar seed | 52.20 | 72.60 |
| 7. | Rabi | Sarson—NSC | 52.98 | 331.08 |
| 8. | | Jau seed | 191.75 | 2857.81 |
| 9. | | Jau-general | 138.00 | 1208.80 |
| 10. | | Wheat-HUN 234 | 52.50 | 723.35 |
| 12. | | Wheat-Pbw 373 | 74.5 | 965.18 |
| 13. | | Wheat-Pbw 373 | 68.00 | 850.60 |
| 14. | | Jaei | 33.80 | 192.98 |
| 15. | | Barseem | 10.00 | 2003.80 |
| 16. | | Tarameera | 75.00 | 86.95 |
| 17. | | Baeseem seed | 38.38 | 41.26 |
| 18. | | Jaei seed | 53.20 | 335.91 |





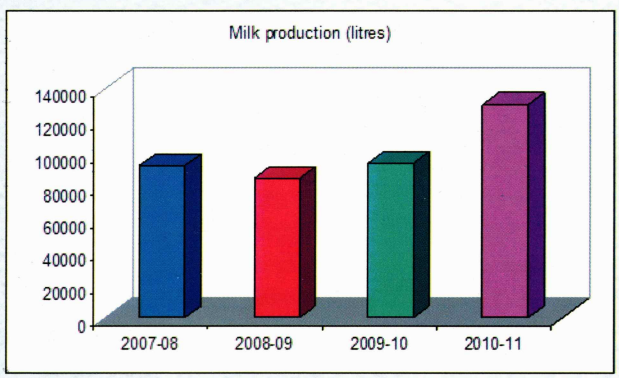
## B. District Demonstration Dairy Farm

Almost all the buildings of dairy farm of the University have been extensively renovated with the financial support from the ICAR under modernization of farms. About 300 cattle (Hariana, Sahiwal, Hariana-cross breed) and buffaloes are being reared at the dairy farm. With the financial grants under Experiential Learning Programme for entrepreneurial training of students in modern dairy farming, sahiwal cows and murrah buffaloes were procured. The total milk production of the farm during 2010-11 was 1, 30, 499 liters during the year compared to that of 94,051 litres during 2009-10. Milk produced at the farm is supplied to students and employees of the University.

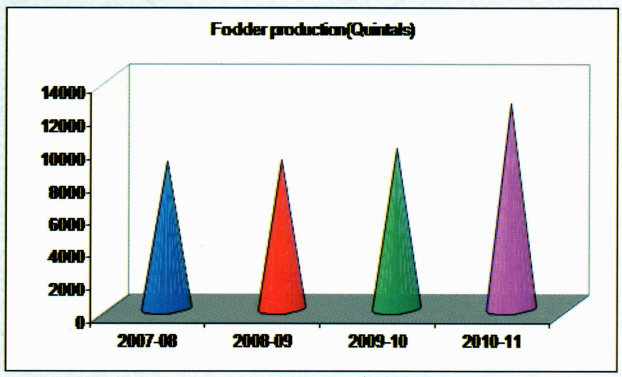


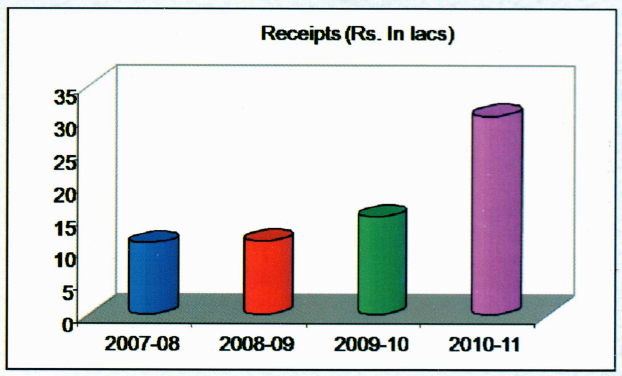
Apart from the milk production, dairy farm animals are being used for teaching and research purposes on different aspects of the animal health, production and reproduction. About 110 acres of attached agricultural land to the DDD farm is used for production of grains and green fodder during different seasons of the year. During the period under report, green fodder and grains production was 12,472.43 quintals and 253.35 quintals, respectively. The revenue generated from the farm was Rs. 30.50 lacs compared to that of Rs. 15.06 lacs during 2009-10.








## C. Poultry farm

College of Veterinary Science and Animal Husbandry is having its own poultry farm in the Department of Poultry Science. On the poultry farm, broiler chickens, quails and turkey layers, cockerels, aseel, kadknath etc. are being reared for teaching and research purposes. Two 'Entrepreneurial training programme on broilers rearing' were organized during April 2010 to March 2011. The first training was held from 15th April 2010 to 22nd May 2010 and the second training was held from 30th July to 23rd August, 2010. Two batches of final year students were also trained in poultry production and management under these training also usually called as "earn while you learn programme". In the first training, the profit generated was Rs. 1349.00 and in the 2nd training the profit generated was Rs. 1847.00 and profit made were distributed equally amongst the participating students. The main objective of these training often called as 'Earn While You Learn' was not only restricted to financial gain of the students but also provided a vista for exploring the logistics of commercial broiler production. All the technical aspects pertaining to purchase of chicks, rearing, feeding, management and sale were done by the students. The scheme not only provided the required knowledge and skill for poultry production but also provided an opportunity to the students to assess the market and study the intricacies of marketing management associated with poultry production.

During the period under report, 6 batches of broilers were reared. The total no of broilers procured was 3753 and the total quantity of feed procured was 95.5 quintal. The total expenses for procuring the chicks and feed was Rs.2, 82,850.00 and the receipts generated through the sale of broilers were Rs. 3, 12,792.00. Thus a profit of Rs. 30942.00 was generated.

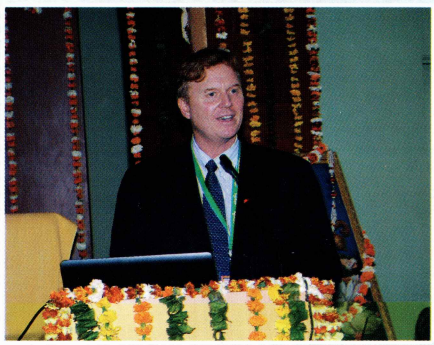




# VII. Human Resource Development

## A. TRAININGS / CONFERENCES / SEMINARS/WORKSHOPS ORGANIZED

### IV International Conference of LASA





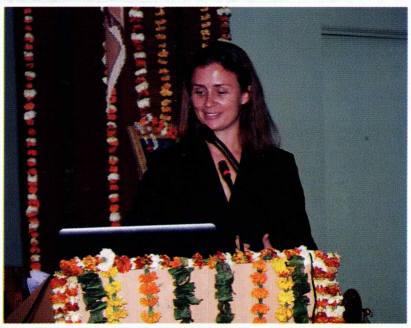
IV[th] International Conference of "Laboratory Animal Scientists Association (India)" on "Challenges ahead" was organized on February 17-18, 2011 by Dr. S. K. Garg, Dean, COVS and AH as Organizing Secretary and Dr. Jitender Kumar as Co-Organizing Secretary and Dr. Rajnish Sirohi as Treasurer. More than 100 scientists from various parts of country including resource persons and participants from USA and UK, scientists working in pharmaceutical industry, SAUs, central institute and associated with laboratory animal research participated in the conference and discussed the recent developments in the field, including ethical issues to minimize animal sufferings during experimentation.

The conference was inaugurated by Prof. A.P. Singh, Hon'le Vice Chancellor of the University and Dr. Robert Dysko, President American Association of Lab Animal Science from University of Michigan was the Guest of Honour. Some of the eminent scientists who attended the conference from abroad were Dr. Steve Niemi, Vice President ACLAM from Harvard Medical School, Dr. Claire Hankenson, University of Pennsylvania, Dr. Jeffery Wyatt from University of Rochestar, Dr. Christopher Cosgrove, Mr. Fronco Mondini, Dr. Graham Tobin, Dr. Sai Tummala, Director Jewish Hospital, Denver, USA.

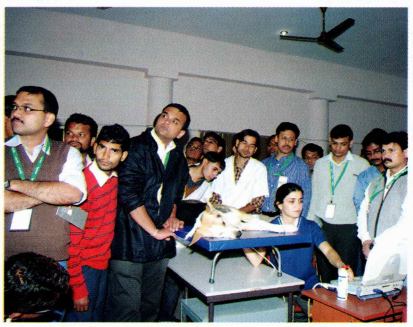


## Pre-conference Workshop on Canine Echocardiography and Telemetry

Twenty four persons participated in two days Pre-conference workshop on "Canine Echocardiography, ECG and Telemetry" on February 15-16, 2011 in which they received hands on training on Echocardiography, ECG and telemetry. The resource persons for workshop were from USA which included Dr. Robert Dysko, Dr. Joyce K. Holt, Dr. Ana Goncalves and Dr. Curtis Michael Klages. Participants in workshop included veterinarians from SAUs, Central Institutes, Pharma Industry and practicing vets from Delhi and Punjab. This pre-conference workshop was accredited by Registry of Approved Continuing Education (RACE), American Association of Veterinary State Boards, USA and carried points for Continuing Veterinary Education program of USA.








## National Seminar on Frozen Semen Technology for Cattle Breeds Improvement

A National Seminar sponsored by Uttar Pradesh Diversified Support Project was organized by Department of Gynecology & Obstetrics, College of Veterinary Science and Animal Husbandry on 'Cattle breed improvement through improved frozen semen technology in Uttar Pradesh' on 22nd and 23rd Dec. 2010 with the objective of enhancement of technical knowhow of U.P field veterinarians working in area of artificial insemination with frozen semen. Dr. Rudra Pratap, Director, Department of Animal Husbandry was the chief guest while Dr. D. Swaroop, Director, CIRG was guest of honour. Seminar was attended by District Nodal Officers of Districts covered under DASP, Chief Veterinary Officers, Deputy Directors of the animal husbandry department. A total of 149 officers of Animal Husbandry department were registered. The eminent speakers were Dr. A. K. Misra, PDC, Meerut, Dr. R.K. Chandolia, HAU, Hisar, Dr. V.K. Arora, Director, CFSP&T, Hessarghatta, Dr. K. Veenu Gopal Naidu, ARGO, Tirupati, Dr. P.K. Singh, NBAGR, Karnal,








Dr. Pawan Singh Semen Freezing Lab CIRB, Hisar, Dr. H.K. Singh, Deputy Registrar, Herd Registration Scheme, Rohtak Dr. Madhumeet Singh, Prof,& Head, ARGO. Palampur and Dr. Atul Saxena Professor & Head Department of Gynaecology & Obstetrics, DUVASU.

## B. Training attained by the faculty members during the period

| Name | Title of the event | Organized by | Date |
|---|---|---|---|
| Dr. Amit Kumar Verma | 21 days Winter school on "Basic techniques in solid phase peptide synthesis and application of synthetic peptides in animal disease diagnosis and research" | Division of animal biotechnology, IVRI, Izatnagar | 22-09-2010 to 12-10-2010 |
| Dr. M. K. Srivastava<br>Dr. Vivak Malik | 21 days National training programme on "Clinical procedures and skill developments in veterinary clinical curriculum" | CAFT in Veterinary Clinical Medicine, Ethics & Jurisprudence, Madras Veterinary College, Chennai. | 24-11-2010 to 14-12-2010 |
| Dr. K. K. Chauhan<br>Dr. V. K. Singh<br>Dr. R. Sirohi | 21 days training on "Data mining techniques for farm animal management" | National Dairy Research Iinstitute, Karnal | 08-12-2010 to 28-12-2010 |
| Dr. Vijay Pandey<br>Dr. D. K. Swain | 21 days National training programme (ICAR) on "Recent techniques of proteome analysis" | Animal biotechnology center, National Dairy Research Institute, Karnal | 10-03-2011 to 30-03-2011 |

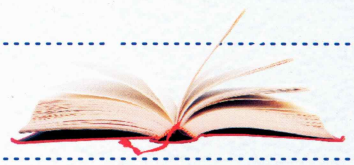
## C. Participation in National Conferences / Symposia / Seminars/ Workshop

| Name | Title of the event | Venue | Date |
|---|---|---|---|
| Dr. Archana Pathak | VII Mid-Annual convention of IAVA and National seminar on "Application of forensic and allied sciences in veterinary anatomy. | Assam Agricultural University, Khanapara, Guwahati, Assam | 29-04- 2010 |
| Dr. Neeraj Kumar Gangwar | Advances in animal cancer research in India. Diagnosis, treatment and clinical Management. | Indian Veterinary Research Institute, Bareilly | 15-06-2010 to 16-06-2010 |
| Dr. Amitav Bhattacharyya | XXVII Annual conference and national symposium of Indian Poultry Science Association. | Madras Veterinary College, Tamilnadu University of Veterinary and Animal Science, Chennai | 16-09-2010 to 18-09-2010 |
| Dr. Vikas Pathak | Workshop on "Road map for the National meat and poultry processing sector" | MFPI, New Delhi | 03-11-2010 |
| Dr. Dilip Kumar Swain | "Biotechnologies for optimization of reproductive efficiency of farm and companion animals to improve global food security and human health" and 26th Annual Convention of ISSAR | College of Veterinary Science, GBPUAT, Pantnagar | 10-11-2010 to 12-11-2010 |
| Dr. Mukesh Bhakat | National Symposium on "Technology management, visioning and upscalling for accelerating livestock production and XVIII Annual convention of Indian society of animal production and management" | Assam Agricultural University, Khanapara, Guwahati, Assam | 11-11-2010 to 13-11-2010 |
| Dr. Jitender Kumar<br>Dr. Brijesh Yadav<br>Dr. Mukul Anand | International conference on "Physiological capacity building in livestock under changing climatic scenario" | Division of Physiology, Indian Veterinary Research Institute, Bareilly | 11-11-2010 to 13-11-2010 |
| Dr. V.P. Singh | IV Convention of Indian meat science association and national symposium on strategies for sustainable meat production for nutritional security and employment generation | Indian Veterinary Research Institute, Izatnagar, Bareilly | 19-11-2010 to 20-11-2010 |
| Dr. R.P. Pandey | 1st review meet on Experiential Learning Programme of ICAR | University of Agricultural Science, Dharwad | 27-11-2010 to 28-11-2010 |

| Name | Title of the event | Venue | Date |
|---|---|---|---|
| Dr. Ajay Prakash<br>Dr. Archana Pathak | XXV Annual Convention of IAVA and National Symposium on Veterinary Anatomy | Rajiv Gandhi College of Veterinary and Animal Sciences, Puducherry | 27-11-2010 to 29-11-2010 |
| Dr. Satish K. Garg | X Annual Conference and National Symposium on recent trends in ethnopharmacology and monitoring of environmental and food toxicants | College of Vetinary Science, MP University of Veterinary and Animal Sciences, Jabalpur | 02-12-2010 to 04-12-2010 |
| Dr. Deepesh Kumar | XXXIV Annual Congress of ISVS and International Symposium "Newer concepts and surgical techniques for farm and companion animal practice" | Rajiv Gandhi College of Veterinary and Animal Sciences, Puducherry. | 08-12-2010 to 10-12-2010 |
| Dr. Satish K. Garg<br>Dr. Atul Prakash | 30th Annual Conference of Society of Toxicology (India) and symposium on strategies for safety study requirements for herbal formulations | Jamia Hamdard University, New Delhi | 09-12-2010 to 11-12-2010 |
| Dr. Dilip Kumar Swain | UGC sponsored National Seminar on "Application of animal and plant biotechnology for human needs" | Banapur, Orissa. | 14-12-2010 to 15-12-2010 |
| Dr. Prabhakar Kumar<br>Dr. Shri Prakash Singh | Vth Convention of Society for Immunology and Immunopathology and National Symposium on Immunobiotechnology | Institute of Biotechnology, GBPUA&T, Patwadnagar, Uttarakhand | 17-12-2010 to 19-12-2010 |
| Dr. Vinod Kumar<br>Dr. Ravindra Kumar | Animal Nutrition Strategies for environmental protection and poverty alleviation. | College of Veterinary Science, OUA&T Bhubaneswer | 17-12-2010 to 19-12-2010 |
| Dr. Jitendra Tiwari<br>Dr. Amit K Jaiswal | 21st National Congress of Veterinary Parasitology on Applications of research in parasitology for end users | Department of Parasitology, Bombay Veterinary College, MAFSU, Mumbai | 05-01-2011 to 07-01-2011 |
| Dr. Udit Jain | Veterinary public health: new horizon for integrating the animal production, food safety and human health | Department of Public Health, Bombay Veterinary College, MAFSU, Mumbai | 28-01-2011 to 29-01-2011 |
| Dr. A. K. Srivastava | National Symposium on "Prevention and management of companion animal diseases vis-à-vis human health" | F.V.Sc. & A.H., SKUAST-J, RS Pura, Jammu | 02-02-2011 to 04-02-2011 |

| Name | Title of the event | Venue | Date |
|---|---|---|---|
| Dr. Vijay Pandey<br>Dr. Amit Verma<br>Dr. Anu Rahal<br>Dr. Barkha Sharma<br>Dr. Amit Kumar | 11th Indian Veterinary Congress & XVIII annual conference of IAAVR & national symposium on "Veterinary science & education on move: critical and needs" | Apollo College of Veterinary Medicine Jaipur | 11-02-2011 to 12-02-2011 |
| Dr. Ambika Shrama<br>Dr. Deepak Sharma<br>Dr. Madhu Tiwari<br>Dr. S.P. Singh | IV$^{th}$ International Conference of Laboratory Animal Scientist's Association (India) on "The challenges ahead" | U.P. Pandit Deen Dayal Upadhyay Pashu-chikitsa Vigyan Vishvidyalya evam Gau Anusandhan Sansthan, Mathura | 17-02-2011 to 18-02-2011 |
| Dr. V. K. Singh | VIII Annual Convention of SOCDAB & National Symposium | Orissa Livestock Resources Development Society (OLRDS), Bhubaneswar | 17-02-2011 to 18-02-2011 |

## VIII. Finance and Budget



(Rupees in Lacs)

| State Government | | ICAR & Other Sources | | University Receipts |
|---|---|---|---|---|
| Plan | 27.55 | Development Grant | 365.00 | 311.70 |
| Non-Plan | 927.60 | Library Strengthening | 5.00 | |
| | | Modernization of farms | 415.00 | |
| | | Experiential Learning Programmes | 196.63 | |
| | | RKVY | 155.00 | |
| Total | 955.15 | | 1136.63 | 311.70 |

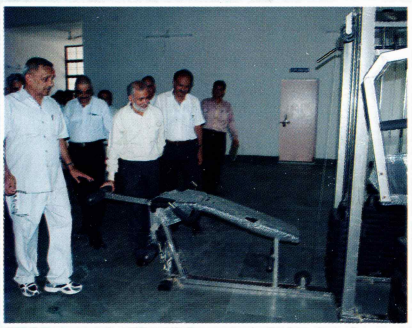
# IX. New Infrastructure added

## Inauguration of University Gymnasium and New PG Hostel

During the period under report, new buildings of University Gymnasium and New PG hostel were built in new campus of the University with the financial assistance from U.P. Govt. These buildings were inaugurated on August 28, 2010 by Dr. S. Ayyapan, Secretary DARE, Government of India and DG, ICAR in the gracious presence of Dr. KML Pathak, DDG (Animal Science), Dr. Arvind Kumar, DDG (Education) ICAR, New Delhi, Dr. A.P. Singh, Hon'ble Vice Chancellor, DUVASU, Mathura and other officers, teachers, students and employees of the University. The Gymnasium has a very large hall having two badminton courts, table for table tennis and workout machines for the students and staff.



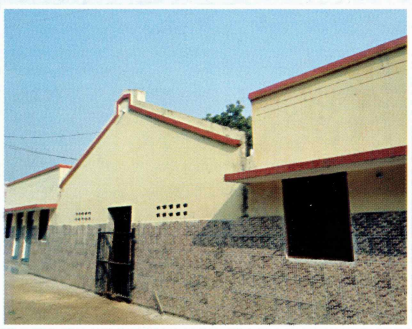


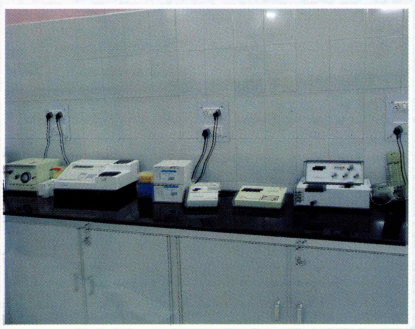




## Renovation of Diagnostic Lab and DDD Farm buildings

The buildings of DDD farm were in much depilated condition and were renovated so as to provide adequate space to farm office. Sheds and paddocks for farm animals were exclusively renovated/ reconstructed with the financial assistance from ICAR under modernization of farms. The diagnostic lab in





the Kothari hospital was established by renovating two large rooms for imparting better hands on training to students in disease diagnosis and also to extend diagnostic facilities for livestock and pet-owners in teaching veterinary clinical complex.

## Semen Freezing Laboratory

A semen freezing lab was constructed at the Instructional Livestock Farm Complex under RKVY project "Conservation of Hariana Cattle and Bhadawari Buffalo through Modern Technique of AI" for evaluation, processing, and storage of semen of Hariyana cattle and Bhadawari Buffalo bulls.





## Infrastructure Being Developed

With the financial assistance of Rupees One Hundred lacs from ICAR, an Educational Museum is under construction in the University the foundation stone of which was laid down by Dr. Arvind Kumar, Deputy Director General (Education), ICAR on 19.05.2010 in the presence of Hon'ble Vice Chancellor Prof. A.P. Singh and other faculty members, staff and students of the University.

To transfer the technology on applied aspect of animal husbandry practices and for providing goods and services to livestock owners and farmers of the state, University received Pashu Gyan Chaupal Project under RKVY programme. The foundation stone for construction of Pashu Gyan Chaupal building costing Rs. Fifty lacs was laid by Dr. C. Devkumar, ADG (EP&D) ICAR, New Delhi on 13.06.2010 in the presence of Hon'ble Vice Chancellor Prof. A.P. Singh with other officers, teachers, staff members and students of the University.






# X. Other Highlights and Activities

## Ambedkar Jayanti:

Ambedkar Jayanti was celebrated by the staff, students, and officers of the University with great enthusiasm in the University on 14th April, 2010. Prof. A.P. Singh Vice-chancellor of the University along with other officers, teachers and employess offered floral tributes to Dr. Bhim Rao Ambedkar.





## World Veterinary Day:

World Veterinary day was celebrated on 24th April 2010. Celebration of the day started with the inauguration of vaccination camp in TVCC by Prof. A. P. Singh, Hon'ble Vice chancellor in the presence of Dean of the College, teachers and students. In the camp, 77 dogs were vaccinated against rabies and 75 dogs were de-wormed and one dog was treated for other diseases. 27 large animals (cows & buffaloes) were examined for pregnancy diagnosis and infertility problems.






## Entrance Examinations:

University conducted the Pre-Veterinary Test (PVT–2010) in two phases - preliminary exam and mains exam. The first phase of examination was conducted on five centers; two at Kanpur and one each at Allahabad, Lucknow, Bareilly and Mathura while the second phase of examination was conducted in Mathura. A total of 2574 candidates were found eligible to appear in preliminary exam out of which 924 qualified for the mains and 751 qualified the mains examination. Admission to BVSc and AH programme were made on the basis of merit in competitive examination after counseling of the candidates under various

categories. Hon'ble Vice-Chancellor appreciated and complemented all the faculty members and staff of the University for successful conducting the PVT 2010.

Admissions to MVSc and PhD degree programmes in Veterinary College were also made on the basis of merit in PGET-2010. Twenty one students were admitted in MVSc and three students in PhD degree programme. Entrance examination for MVSc and MSc Biotechnology Programme-2010 was also conducted and based on the merit list, seven students were admitted to MSc Biotechnology degree programme.

## Independence Day Celebrations :

Independence Day was celebrated with great fervour on 15th Aug., 2010 with hoisting of the National Flag at the University Administrative Buildings by Prof. A.P.Singh, Hon'ble Vice Chancellor. Floral tributes were paid to Father of Nation followed by recitation of patriotic songs and delivery of speeches by students and staff. Saplings were planted in front of department of Anatomy, Pharmacology and main building of Veterinary College. Winners in patriotic song and speech were honoured by first lady of the campus, Mrs. A. P. Singh.











## Orientation programme of new entrants :

Two days orientation programme was organized on 20th and 21st August, 2010 for the first year students of BVSc and AH degree programme. While welcoming the students, Hon'ble Vice Chancellor of the University and Dean of the College wished them best of luck and assured of their safety and comfortable stay on the campus and providing best possible amenities within the means of University. Senior teachers and the officers of University apprised the students about the degree course they had joined, VCI curriculum, Examination and evaluation system, hostels, veterinary college, the University, Mathura city, Rules and Regulations etc. in the orientation programme.

## University foundation day :

Celebrations started on 19th October 2010 by organizing blood donation camp in collaboration with district Red Cross society. Twenty seven units of blood were donated by staff and students of the University. Dr. Ranjan Singh, Farm Manager of DDD Farm, Dr. M. M. Farooqui, Dean Student Welfare also donated blood along with Sunil Sharma, Ajay Singh Rajput, Amit Kumar and other students. On 25th October 2010 Rangoli competition, Cultural night 'Jhankar' were organized for students.
















## Republic Day celebrations :

Republic Day was celebrated on 26th January, 2011 with the hoisting of National Flag by Prof. A.P. Singh, Hon'ble Vice Chancellor. Floral tributes were paid to Father of the Nation followed by recitation of patriotic songs and speeches by students and staff. Speech and patriotic song competition was also organized. Mr. Avnish, Miss Mrinalini and Renu Singh stood first, second and third in speech competition while Neha Gupta and her group and Avnish and his group won the first and second prizes respectively in patriotic song competition. Few of the saplings were also planted in front of the College building.







## Second Convocation of the University:

Second Convocation of the University was held on 28th January, 2011 in the august presence of Shri B. L. Joshi, H.E. the Chancellor of the University, Dr. Panjab Singh, Former Secretary DARE and Director General ICAR, Shri Awadh Pal Singh Yadav, Minister of State for Animal Husbandry and Dairying, Government of UP. Whole of the University campus took a festive look with staff, students and faculty bubbling with enthusiasm and gaiety. The convocation function was held on the spacious ground of University in front of administrative block of Veterinary College.





Dr. Sharad Yadav, Registrar of the University led the academic procession in which members of Executive Council, Academic Council including Heads of Department, H.E. Chancellor of the University, Chief Guest, Hon'ble Minister of Animal Husbandry and Dairying and Vice-chancellor participated. Programme started with "Saraswati Vandana" and "University Song" by University students. Prof. A.P. Singh, Hon'ble Vice Chancellor of the University welcomed H.E. Sh. B. L. Joshi, the Chancellor of the University, Dr. Panjab Singh, Former Secretary DARE and Director General ICAR and the Chief Guest, Sh. Awadh Pal Singh Yadav, Hon'ble Minister of State AH, other guests, invitees, graduates and others who graced the occasion.



Postgraduate degree recipients for PhD and MVSc degrees were presented before the Hon'ble Chancellor for admitting the respective degrees by Dean Postgraduate Studies, Dr. A. K. Srivastava while the graduate degree recipients were presented by Dean Veterinary College, Dr. Satish Kumar Garg for admitting the degree of BVSc & AH. Out of a total of 175 students, 07 students received PhD degree, 47 MVSc and 121 BVSc&AH degrees. On this occasion, 12 medals were also awarded by H. E. the Chancellor of the University, Chief Guest and Vice Chancellor to the deserving candidates for their outstanding scholistic achievements.



The Convocation address was delivered by Dr. Panjab Singh, Former Secretary DARE and Director General ICAR and H.E., Sh. B. L. Joshi, the Chancellor of the University, delivered his presidential speech.

Speaking on the occasion, His Excellency Sh. B. L. Joshi, the Governor of Uttar Pradesh expressed his happiness in presiding over the Second Convocation Function. He urged Veterinary Scientists to devise techniques and packages for small-land holders and landless people.



Dr. Panjab Singh, Chief Guest, while delivering the convocation address highlighted the role of Veterinary University and said "in near future Veterinary Universities are required to play a pivotal role in augmenting the rural and national economy".

Prof. A.P. Singh, Hon'ble Vice Chancellor of the University expressed his gratitude to His Excellency, the Governor and Chancellor of this University for his first visit to this












University and the constant guidance for development of the University. On this occasion, Hon'ble Chancellor, Chief Guest and Guest of Honour were also presented an insignia of the University.

Prof. A.P. Singh, Vice Chancellor highlighted the achievements of University and also the challenges to University and need for infrastructural and human resource support to University.

## MOU with Central Institute for Research on Goats (CIRG):

To augment the teaching and research activities, the University signed M.O.U. with Central Institute for Research on Goats (CIRG) Makhdoom, on February 3, 2011. The MOU was signed by Prof. A.P. Singh Hon'ble Vice-Chancellor, DUVASU and Dr. D. Swaroop, Director, CIRG in the presence of Dr. Satish K. Garg, Dean, Veterinary College, Dr. Kranti Dev, Dean, College of Biotechnology and senior and principal scientists of CIRG. The purpose of MOU was to facilitate the sharing and maximal utilization of state of art lab facilities by students and scientists of both the institutes.




# XI. Awards and Recognitions

- PhD student Dr. Thakur Uttam Singh received Jawahar Lal Nehru Award for the best PhD Thesis research work entitled "Molecular profile of $Na^+$-$K^+$-ATPase μ-1 isoform and its modulation by eicosapentaenoic acid in ovine coronary artery" (Guide Dr. Satish K. Garg).
- MVSc student Dr. M. Jayanthi, Dr. Satish K. Garg and Dr. Rajesh Mandil Department of Pharmacology & Toxicology, DUVASU, Mathura received VII Ram Lal Agrawal National Award for the research work entitled "Evaluation of certain pharmacological activities of *Moringa oleifera* leaves extract with particular reference to immunomodulation".
- Dr. Satish K. Garg, Dean Veterinary College and Dr. Pankaj Shukla, Professor of Poultry Science (Presently Joint Commissioner Poultry, GOI on deputation) were awarded the fellowship of the National Academy of Veterinary Sciences, India (FNAVSc) in its convocation held at NDRI, Karnal (Nov. 2010)
- Dr. Archana Pathak, Associate Professor was honoured as Fellow of Indian Association of Veterinary Anatomists at XXV annual convention of IAVA and National Symposium on Veterinary Anatomy held at Rajiv Gandhi College of Veterinary and Animal Sciences, Puducherry on Nov.27-29, 2010.
- Best oral presentation award for research paper entitled "Effect of replacement of concentrate with mulberry leaves (*Morus indica Var suzanpur*) on nutrient utilization in goats" was bestowed upon Dr. Ravindra Kumar, Animal Nutrition Department during 7th Biennial Conference of ANA from 17-19 Dec. 2010 held in OUAT, Bhubneswar.
- Dr. Vinod Kumar, Assistant Professor, Animal Nutrition received the best poster presentation award on the research paper entitled "Pesticides: Occurrence and Control measures" during 3rd rd Annual Conference on "Recent Advances in Chemical and Environmental Sciences (RACES-2011)", Post-Graduate Department of Biotechnology, Multani Mal Modi College, Patiala.
- Dr. Vikas Pathak was nominated as member of National Meat and Poultry Processing Board Expert Panel.
- The stall installed by Department of Extension of the University in the Kisan Mela at IVRI, Izatnagar from 01st – 03rd November 2010 received Third position in the Kisan mela.

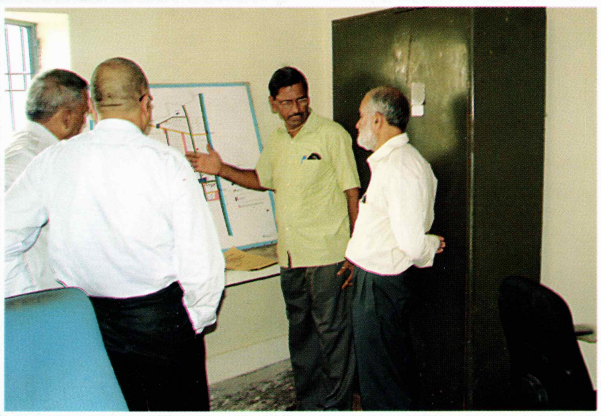


# XII. Visits of Dignitaries to University

| S.N. | Name | Designation |
|---|---|---|
| 1. | Shri. B.L. Joshi | H.E. The Chancellor, and Governor, Uttar Pradesh |
| 2. | Shri. Avadh Pal Singh Yadav | Hon'ble Minister of Animal Husbandry State, Government of U.P. |
| 3. | Dr. Panjab Singh | Former Secretary, DARE, GoI and DG, ICAR, New Delhi |
| 4. | Dr. S. Ayyapan | Secretary DARE, Government of India and DG ICAR, New Delhi |
| 5. | Shri Jayant Chaudhary | Member Parliament, Mathura and Member, ICAR, Governing Council |
| 6. | Dr. Arvind Kumar | DDG (Education), ICAR, New Delhi |
| 7. | Dr. K.M.L. Pathak | DDG (Animal Science), ICAR, New Delhi |
| 8. | Dr. A.K. Srivastava | Vice-Chancellor cum Director, NDRI, Karnal |
| 9. | Dr. C. Dev Kumar | ADG (EP&D), ICAR, New Delhi |
| 10. | Dr. Rudra Pratap Singh | Director, Animal Husbandry, Department, Government of U.P. |
| 11. | Dr. D. Swaroop | Director, CIRG, Makhdoom |









# XIII. Research and other Publications

## A. Paper published in national and international Journals


Bansal GR, Singh VP and Sachan N (2011). Effect of probiotic supplementation on the performance of broilers. *Asian J. Animal Science* 5 (4) 277-284.

Chandra S, Srivastava AK and Kumar S (2010). Pathomorphological and hematological changes in experimentally induced lead toxicity in Rats. *Ind. J. Vet. Pathol*. 34 (2) 162-167.

Dash SK, Tewari A, Kumar Krishna, Goel A and Bhatia AK (2011) Detection of rotavirus from diarrhoeic cow calves in Mathura, India. *Vet. World* 4(12):554-556.

Goel Anjana, Kumar Sandeep, Singh Dilip Kumar and Bhatia AK (2010) Wound healing potential of *Ocimum sanctum* with the induction of Tumor Necrosis Factor –á. *Ind. J. Experimen. Biol.* (48) 402-406.

Goel Anjana, Kumar Sandeep and Bhatia AK (2010), Effect of *Ocimum sanctum* on the development of protective immunity against *Salmonella typhimurium* infection through cytokines. *Asian Pacific J. Trop. Med. Hyg.* 3, 682-686.

Goel Anjana, Singh Dilip Kumar and Bhatia AK (2010) Immunomodulating property of *Ocimum sanctum* by regulating the IL-2 production and its m-RNA expression from splenocytes in rats. *Asian Pacific J. Trop. Med. Hyg* (3) 8-12.

Goel Anjana, Singh Dilip Kumar and Bhatia AK (2010). Effect of *Ocimum sanctum* extract on the induction of IFN- ã & IL-10 cytokines and their m-RNA expression. *J. Immunol. Immunopathol*. 12(1) 45-46.

Goel Anjana, Singh Rashmi, Dash Sandeep, Gupta Deepti, Pillai Ajita, Yadav SK and Bhatia AK (2011) Antiviral activity of few selected indigenous plants against Bovine Herpes Virus-1. *J. Immunol. Immunopathol*. 13(1) 54-55.

Kumar Ashish, Sharma Ambika, Kumar Ashok and Dev Kranti (2010). Cloning and characterization of Goat enteric â- defensin cDNA. *Ind. J. Vety. Res.* 19 (1): 1.

Kumar D, Kumar G, Pandey R P and Singh B (2010). An unusually large corneal dermoid in a buffalo. *Ind. J. Vet. Surg.* 31(1)72.

Kumar D, Pandey RP and Singh B (2010). Haemangiosarcoma of spleen in dog. *Ind. J. Vet. Surg.* 31(1) 69.

Kumar D, Srivastava AK and Kumar S (2010). Arsenic toxicity in experimental guinea pigs: quantitative assay and pathomorphological study. *Ind. J. Vet. Pathol.* **34 (1)** 82-86.

Kumar D, Srivastava AK and Kumar S (2010). Haematobiochemical and immunological studies in arsenic fed guinea pigs. *Ind. J. Vet. Pathol.* 34 (2) 176-179.

Kumar D, Srivastava AK and Kumar S (2010) Arsenic toxicity in experimentally Guinea pigs- quantitative assay and pathomorphological study. *Ind. J. Vet. Path.* 34 (1) 82-86.

Kumar S, Verma SK and Singh PJ (2010). Spindle cell lipoma in buffalo- A case report. *Veterinary Practitioner* 11 (1) 7-8.

Kumar S, Verma SK. and Singh PJ (2010). Multisystem involvement of Hydatid cyst. *Veterinary Practitioner.* 11 (1) 24-25.

Sharma Amita, Sharma KC, Singh VK and Goel Rakesh (2010). Peak yield and its association with various first lactation economic traits in Sahiwal Cattle. *Ind. J. Anim. Prod. Management* 26 (3-4): 191-193.

Sharma Anubhuti, Lami Vijay, Goel Anjana, Sharma Viney & Bhatia AK (2010) Antiviral activity of Cassia fistula against IBR virus. *J. Immunol. Immunopathol.* 12(2), 114-119.

Sharma Indu and Bist B (2010). Antibiotic resistance in *Escherichia coli* isolated from raw goat, pig and poultry meat in Mathura city of northern India, Published in Assam University. *J. Sci. Tech.: Biologic. Env. Sci.* 6(1) 89-92.

Singh Devendra, Chaudhary Soumen, Thakur Uttam Singh, and Garg Satish Kumar (2010). Role of calcium and potassium channels in *Moringa oleifera* flowers extract-induced myometrial contractility in buffalo uterus. *Ind. J. Vet. Res.* 19: 1-12

Singh N, Srivastava AK, Kumar S and Gangwar NK (2010). Diclofenac sodium toxicity in broilers with special reference to renal dysfunction & therapeutic effect of *Boerhaavia diffusa*. *Indian J. Vet. Pathol.* 34 (2) 149-152.

Singh SK, Srivastava AK and Kumar S (2010). Haematological, serobiochemical and immunological studies in diclofenac fed experimental Japanese Quails. *Ind. J. Vet. Pathol.* 34 (2) 153-155.

Singh Thakur Uttam, Kathirvel K, Choudhary S, Garg SK and Mishra SK (2010). Effects of docosahexaenoic acid on sodium pump in ovine coronary artery. *Ind. J. Vet. Pharmac. Toxicol.* 9:38-40.

Singh VP and Sachan N (2011). A survey report on impact of abattoir activities and management on residential neighbourhoods. *Ind. J. Field Veterinarians* 6(3) 39- 41.

Singh VK, Goel Rakesh and Sharma KC (2010). Prediction of body weight on the basis of body measurements under farm and field conditions in native tract of Bhadawari buffaloes. *Ind. J. Anim. Prod. Management* 26 (3-4) 204-206.

Verma AK, Mahima, Pal BC, Yadav SK, Kumar A and Raies M (2010). Phylogenetic relationships between foot-and-mouth disease virus serotype 'A' isolates and vaccine strains, *Online J Vet Res*. 14 (1) 87-95.

Verma Amit K, Malik Raies, Jain Udit, Yadav SK, Mahima and Pal BC (2010). Differentiation of Foot and Mouth Disease infected and vaccinated animals using 3ABC non-structural protein. *Ind. J. Vet. Med.* 30 (2) 84-86.

## B. Practical Manuals published by the Departments

| S.No. | Title of manual | Course No. | Authors |
|---|---|---|---|
| 1. | Laboratory Manual of Osteology, Arthrology & Biomechanics | VAN 111 | Ajay Prakash, MM Farooqui, Varsha Gupta, Prabhakar Kumar, Archana Pathak and Sri Prakash Singh |
| 2. | Laboratory Manual of Myology, Angiology, Neurology and Aesthesiology | VAN 121 | MM Farooqui, Ajay Prakash, Archana Pathak, Prabhakar Kumar, Sri Prakash Singh and Varsha Gupta |
| 3. | Principles of Genetics and Population Genetics | AGB 121 | K.K.Chauhan, K.C. Sharma and H.N. Singh |
| 4. | Principles of Animal Genetics and Population Genetics (New VCI syllabus), | AGB 121 | K.K.Chauhan, Deepak Sharma, Madhu Tiwari and S.P. Singh. |
| 5. | Principles of Animal Breeding (including Avian Breeding) | AGB 211 | K.K.Chauhan, K.C. Sharma and V.K. Singh |
| 6. | Livestock Breeding System | AGB 221 | K.K.Chauhan, K.C. Sharma, V.K. Singh and H.N. Singh |
| 7. | Livestock and Poultry Breeding (New VCI syllabus) | AGB 211 | V.K. Singh and S.P. Singh |
| 8. | Biostatistics and Computer Application (New VCI syllabus) | AGB 111 | Rakesh Goel |
| 9. | Manual for Veterinary Andrology & AI (Revised) | VOG 512 | Atul Saxena, Sanjay Mishra & Vijay Singh |

| S.No. | Title of manual | Course No. | Authors |
|---|---|---|---|
| 10. | Practical Manual of General Veterinary Biochemistry(New VCI syllabus) | VPB 112 | Rajesh Nigam, Pawanjeet Singh, Ambika, Vijay Pandey, |
| 11. | Practical Manual of Veterinary Intermediary Metabolism(New VCI syllabus) | VPB 122 | Vijay Pandey, Rajesh Nigam, Pawanjeet Singh, Ambika |
| 12. | Practical Manual of Clinical Biochemistry (Revised) | VBC 411 | Rajesh Nigam, Pawanjeet Singh, Ambika, Vijay Pandey |
| 13. | Veterinary Laboratory Diagnosis | VLD 421+511 | Ambika and R. Nigam, |
| 14. | Livestock Economics, Marketing and Business Management | AHE 121 | Amit Singh, Sanjeev Kr SinghSusheel Kumar |
| 15. | Extension Techniques in Veterinary Practice and Livestock Production | AHE 411 | Amit Singh, Sanjeev Kr Singh |
| 16. | A Practical manual on Swine/equine/ camel/yak production and management | LPM 311 | M. Bhakat, R. Sirohi and R. Singh. |
| 17. | A Laboratory manual on Wild and Zoo animal health care and management and fish production | LPM 312 | M. Bhakat, R. Sirohi and R.Singh. |
| 18. | Laboratory manual of Laboratory animal/rabbit/fur animal production and management and pet animal care | LPM 313 | R. Sirohi, R. Singh and M. Bhakat |
| 19. | Practical manual on Sheep and goat production and management | LPM 321 | M. Bhakat, R. Sirohi and R.Singh |
| 20. | Practical manual on Avian Production and management | LPM 322 | A. Bhattacharya and M. Bhakat |
| 21. | Practical manual on Cattle and buffalo production and management | LPM 411 | R. Sirohi, M. Bhakat and R. Singh |
| 22. | Laboratory manual for Livestock Production and Management-I (general principles and ruminants) | LPM 111 | R. Singh, R. Sirohi and M. Bhakat |
| 23. | Laboratory manual for Livestock Production and Management-II (Monogastric and laboratory animals) | LPM 122 | R. Sirohi, M. Bhakat and R. Singh |
| 24. | Internship manual of 2010 | | M. Bhakat, A. Saxena and V. Malik |
| 25. | Livestock Farm practices | LPM 221 | M. Bhakat, R. Sirohi and R. Singh |
| 26. | Laboratory Manual of Abattoir Practices and Animal By-products technology | LPT 321 | V. P. Singh |
| 27. | Veterinary Clinical Medicine (General and Systemic Medicine) | VCM 422 | H. P. Lal, Mukesh Srivastava, Ashish Srivastava, Pratibha Sachan |
| 28. | Veterinary Clinical Medicine (Production and Deficiency disease) | VCM 512 | H. P. Lal, Mukesh Srivastava, Ashish Srivastava, Pratibha Sachan |
| 29. | Laboratory manual on General Veterinary Parasitology & Helminthology | VPA 211 | Daya Shanker, Jitendra Tiwari and Amit K Jaiswal |
| 30. | General Surgery and Anaesthesiology | VSR 411 | Gulshan Kumar, Vivak Malik, Bharat Singh |

| S.No. | Title of manual | Course No. | Authors |
|---|---|---|---|
| 31. | Regional and Clinical Surgery I | VSR 422 | R. P. Pandey, Deepesh Kumar, Gulshan Kumar, Prabha Katiyar, Bharat Singh |
| 32. | Regional Surgery II, Lameness & Orthopaedics | VSR 512 | R. P. Pandey, Prabha Katiyar, Deepesh Kumar |
| 33. | Clinical case manual | VSR 422 +512 | Deepesh Kumar, R. P. Pandey, Bharat Singh |
| 34. | Laboratory manual of Radiology | VSR 422 | Prabha Katiyar, Deepesh Kumar, Gulshan Kumar, R.P. Pandey, Bharat Singh |
| 35. | Practical manual on cell biology | BT 101 | D. K. Swain and Vijay Pandey |
| 36. | Principles of Biochemistry | BT 103 | Ambika Sharma |
| 37. | Enzymology and Enzyme Technology | BT 108 | Vijay Pandey, K. D. Singh, D. K. Swain |
| 38. | Practical manual on reproductive biotechnology | BT 207 | D. K. Swain and Vijay Pandey |

## C. Books / Books chapter published :

V.P. Singh and Neelam Sachan. Text book on "Principles of Meat Technlogy". Satish Publishing House, New Delhi.

Vijay Pandey and Neelesh Sharrma (2011). Hypomagnesaemia-in "Production Diseases of Dairy Animals". Neelesh Sharma, N.K. Singh and Goran Bacic. Satish Publishing House, New Delhi.

Sanjeev Kr Singh (2010). Extension Techniques for Livestock Development. New India Publishing Agency, New Delhi.

## D. Abstract presented/ published in different conferences:

Archana, Farooqui MM and Prakash Ajay (2010). Study of centre of ossification in the forelimb of goat (*Capra hircus*). XXV Annual convention of Indian Association of Veterinary Anatomists and National Symposium on "Veterinary anatomy as a vital partner in the improvement of health and production of livestock and birds" held at Rajiv Gandhi College of Veterinary and Animal Sciences, Puducherry from 27th to 29th Nov. 2010.

Archana, Katiyar RS, Sharma DN, Farooqui MM, and Prakash Ajay (2010). Anatomy of prostate gland in one day old Gaddi kid (*Capra hircus*). Paper presented in the VII Mid-Annual convention of IAVA and National Seminar on " Application of Forensic and Allied Sciences in Veterinary Anatomy" held at Assam Agricultural University, Khanapara on 29th Apr. 2010.

Baitha DK, Pandey V, Singh P, Sharma A, Nigam R and Swain DK (2010). SDS-PAGE of granulosa cell proteins of buffalo at different stages of estrus cycle. International Symposium on "Role of biotechnology in conserving biodiversity and livestock development for food security and poverty alleviation" and XVII Annual convention of Indian Society of Veterinary Immunologists & Biotechnologists held from 29th to 31st Dec. 2010 at College of Veterinary & Animal Science, Rajasthan University of Veterinary and Animal Sciences, Bikaner.

Baitha DK, Pandey V, Singh P, Sharma A, Nigam R and Swain DK (2011). SDS- PAGE Characterization of follicular fluid and serum proteins of buffaloes at different stages of estrus cycle. 11th Indian Veterinary Congress and XVIII Annual Conference of IAAVR 7 National Symposium on "Veterinary Science & Education on Move: Critical & Needs" organized at Apollo College of Veterinary Medicine Jaipur, from 11th to 12th Feb. 2011.

Bhattacharyya A, Majumdar S, Bhanja SK, Dash BB and Kadam MM (2010). Maternal dietary manipulation and vaccination on growth performance and immunity of turkey poults. XXVII Annual Conference and National Symposium of Indian Poultry Science Association, Chennai from 16th to 18th Sept. 2010

Bhattacharyya A, Majumdar S, Bhanja SK, Mandal AB and Kadam MM (2010). Effect of maternal dietary manipulation and in ovo injection of nutrients on the growth and immunocompetence of turkey poults. XXVII Annual Conference and National Symposium of Indian Poultry Science Association, Chennai from 16th to 18th Sept. 2010

Brijesh, Srivastava Ramakant, Srivastava Mukesh, Ashish and Sachan Pratibha (2010). Therapeutic management of generalized demodecosis and pyoderma in dogs, during 29th annual convention of ISVM and National symposium on "Recent developments on diagnostics and therapeutics including application of nanotechnology in veterinary medicine" held at Department of Veterinary Medicine, Bombay Veterinary College, MAFSU, Maharashtra from 17th to 19th Feb. 2011.

Chauhan KK, Rout PK and Shukla SN (2011) Genetic parameters for faecal egg counts to gastro-intestinal nematode infections and relationship with live weight in Jamunapari kids, VIII Annual Convention of SOCDAB & National Symposium Organized by Orissa Livestock Resources Development Society (OLRDS), Bhubaneswar, Orissa and NBAGR, from 17th to 18th Feb. 2011.

Chauhan KK, Rout PK, Shukla SN, Das Gopal and Roy R (2010) Susceptibility to natural gastro-intestinal nematode infection during different physiological stages in goat and sheep in the semi-arid tropics, National Symposium on "Conventional and Modern Breeding Technologies for Genetic Improvement of Livestock and Poultry in India" organized by Dept. of Genetics and Animal Breeding, College of Vety. Sc. & Animal Sc., G.B.P.U.A.& T., Pantnagar, Uttarakhand, from 22nd to 23rd Oct. 2010.

Chauhan KK, Sharma Deepak, Tiwari Madhu and Singh SP (2011) Genetic variation on control of resistance to infectious diseases in small ruminants for improving animal productivity, IVth International Conference of Laboratory Animal Scientist's Association (India) on "The Challenges Ahead" jointly organized by DUVASU & LASA (India), DUVASU, Mathura, from 17th to 18th Feb. 2011.

Farooqui MM, Pal Chandra, Archana and Prakash Ajay (2010).Morphogenesis of penis in prenatal goat (*Capra hircus*). Paper presented in the VII Mid-Annual convention of IAVA and National Seminar on "Application of Forensic and Allied Sciences in Veterinary Anatomy. held at Assam Agricultural University, Khanapara on 29th Apr. 2010.

Farooqui MM, Pal C, Archana and Prakash A (2010). Morphogenesis of seminal vesicle in prenatal goat (*Capra hircus*). XXV Annual convention of Indian Association of Veterinary Anatomists and National Symposium on "Veterinary anatomy as a vital partner in the improvement of health and production of livestock and birds" held at Rajiv Gandhi College of Veterinary and Animal Sciences, Puducherry 27th to 29th Nov. 2010.

Gangwar NK, Srivastava AK, and Kumar S (2010). Mixed mammary gland tumour in Bitch. In national animal cancer seminar, IVRI from 15th to 16th June 2010.

Gupta V, Sharma AP, Farooqui MM and Sharma A (2010). Gross biometrical studies on the spleen of goat foetus during prenatal life. Vth Convention of Society for Immunology and Immunopathology and National Symposium on "Immunobiotechnology" held at Institute of Biotechnology, GBPUA&T, Patwadangar from 17th to 19th Dec. 2010.

Gupta AK, Shukla PK and Bhattacharyya A (2010). Effect of supplemental ascorbic acid and herbal vitamin C replacer on the growth performance, biochemical indices and carcass quality traits of broilers exposed to immobilization stress. XXVII Annual Conference and National Symposium of Indian Poultry Science Association, Chennai from 16th to 18th Sept. 2010

Gupta Soniya, Bist Basanti, Jain U, Pandey Preeti and Singh Seema (2011). Antibiograms of Bacillus Cereus isolates from foods of Mathura and Vrindavan. Published in compendium cum Souvenir of National Symposium on "Veterinary public health: New horizon for integrating the animal production, food

safety and human health" organized by Deptt. of Veterinary Public Health, Bombay Veterinary College, Parel, Mumbai from 28th to 29th Jan. 2011.

Jain Udit, Bist Basanti and Lalwani DD (2011). Assessment of bacteriological quality of different drinking water sources of Mathura region. Presented and published in compendium cum Souvenir of National Symposium on "Veterinary public health: New horizon for integrating the animal production, food safety and human health" organized by Deptt. Of Veterinary Public Health, Bombay Veterinary College, Parel, Mumbai from 28th to 29th Jan. 2011.

Jain Udit, Verma Amit, Kumar Pal BC and Yadav SK (2010). PCR based detection of *Mycoplasma bovis* from bovine clinical specimens. International Symposium on role of biotechnology in conserving biodiversity and livestock development for food security and poverty alleviation and XVII annual convention of Indian Society of Veterinary Immunologist and Biotechnologist held at College of Veterinary and Animal Sciences, Rajasthan University of Veterinary and Animal Sciences, Bikaner from 29th to 31st Dec. 2010.

Jaiswal Amit K, Tiwari Jitendra & Shanker Daya (2011). Effect of closantel and ivermectine for the treatment of bovine demodecosis. 21st National Congress of Veterinary Parasitology on "Applications of Research in Parasitology for end users" from 5th to 7th Jan. 2011.

Katiyar P, Kumar D, Kumar G, Malik V, Purohit S, and Pandey RP (2010). Ultrasonographic examination of eye in bovines. XXXIV Annual Congress of Indian Society for Veterinary Surgery and International symposium. Department of Veterinary Surgery & Radiology, Rajiv Gandhi College of Veterinary and Animal Sciences, Puducherry from 8th to 10th Dec. 2010.

Kumar A, Swain DK, Pandey V, Yadav S (2010). Evaluation of sperm acrosomal integrity by FITC-PSA labeling technique. Accepted for oral presentation at 26th Annual Convention of ISSAR held at CVASc., Pantnagar from 10th to 12th Nov. 2010.

Kumar A, Swain DK, Pandey V, Yadav S (2010). Evaluation of Sperm DNA integrity by Comet Assay. Accepted for oral presentation at 26th Annual Convention of ISSAR held at CVASc., Pantnagar from 10th to 12th Nov. 2010.

Kumar A, Swain DK, Yadav S (2010). Effect of ageing on the acrosomal integrity, membrane integrity and DNA integrity of the Barbari Buck semen. XIX SAPI conference held at IVRI, Bareilly (11th to 13th Nov., 2010).

Kumar A, Swain DK, Yadav S (2010). Effect of season on the acrosomal integrity, membrane integrity and DNA integrity of the Barbari Buck semen. Accepted for oral presentation at XIX SAPI conference held at IVRI, Bareilly (11th to 13th Nov., 2010).

Kumar Amit, Verma Amit K, Malik Subash, Srivastava MK, Kumar Rajesh, Mamta (2011). Epidemiological and drug sensitivity studies of calf diarrhoea in reference to *Campylobacter spp.* 29th ISVM convention and National symposium on "Recent development in diagnostics and therauptic including application of nanotechnology in Veterinary Medicine" held at Mumbai Veterinary College, Parel campus, Mumbai, from 17th to 19th Feb. 2011.

Kumar Amit, Verma Amit Kumar, Sharma Arvind and Malik Subhash (2011). Co-occurrence of Multiple drug resistant *Escherichia coli* and *Camylobacter jejuni*: A Threat to Public Health (III-P3). IX Annual Conference of Indian association of Veterinary Public Health Specialist and National Symposium on "Veterinary Public Health: New horizon for integrating the animal production, food safety and human health" at Bombay Veterinary College, Parel, Mumbai, from 28th to 29th Jan. 2011.

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## XIV. Right to Information Act



In compliance of the order of Govt. of U.P. and provision of RTI Act, 2005, PIO is working in the University. During the period, PIO office received 91 applications out of which 50 application were cleared.

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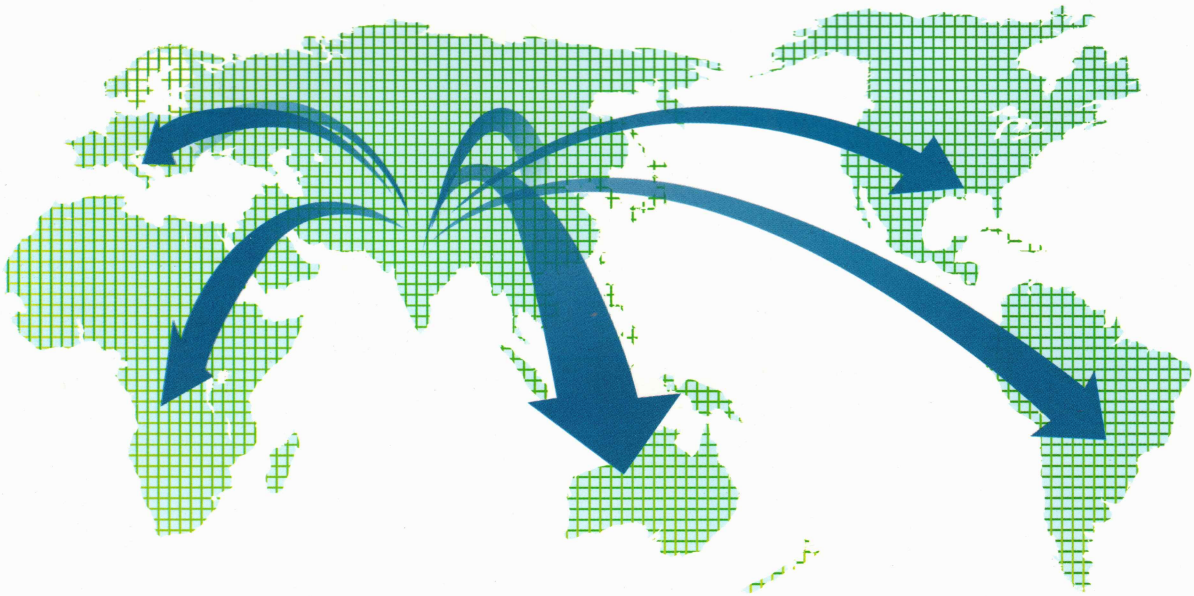


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