

# वार्षिक प्रतिवेदन ANNUAL REPORT 2017-18



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

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

***Editorial Board :***

**Prof. Satish K. Garg**

Dean, College of Veterinary Science & A.H.

**Prof. P.K. Shukla**

Dean, Post Graduate Studies

**Prof. Atul Saxena**

Director, Research

**Prof. Vikas Pathak**

Director, Go Anusandhan Sansthan

**Dr. Sanjay Purohit**

Co-ordinator, Communication Center,

**Dr. Vijay Pandey**

Department of Veterinary Biochemistry

**Dr. Yajuvendra Singh**

Department of Livestock Production and Management

**Dr. Brijesh Yadav**

Department of Veterinary Physiology

**Dr. Ashish Srivastava**

Department of Veterinary Clinical Medicine

***Publication No.***

---

***Design & Printed by:***

**M/s Royal Offset Printers**

A-89/1, Naraina Industrial Area, Phase-I, New Delhi-110028 | Ph.: 9811622258

## FOREWORD

It is a matter of great pleasure to present the Annual Report of DUVASU underlining the main activities of the academic departments, farms, clinics and administrative units during 2017-18. The report gives details of the teaching, research and extension activities and financial statement of the University. The year 2017-18 has been a milestone for the University after its establishment in 2001.

The University welcomed the Hon'ble Chancellor and Governor of Uttar Pradesh, Shri Ram Naik Ji who visited DUVASU, twice. It was a rare opportunity for our University to witness the gracious presence of our Chief Minister, Hon'ble Shri Yogi Aditya Nath Ji also twice in the University campus. The University also welcomed Shri Radha Mohan Singh Ji, Union Agriculture and Farmer Welfare Minister, Smt. Krishna Raj, MoS, Ministry of Agriculture and Farmer Welfare, Chief Minister of Haryana Hon'ble Shri Manohar Lal Khattar Ji and Hon'ble Cabinet Minister, Government of Uttar Pradesh Prof. S. P. Singh Bhagel Ji, Shri Laxmi Narayan Ji and Shri Shrikant Sharma Ji and Smt. Hema Malini Ji, Member of Parliament, Mathura. This has been a great opportunity to the University to welcome such distinguished personalities and project University on the national map. It is worth mentioning that out of the four new proposed colleges in the University, our Chief Minister announced the opening of two Colleges with of B. Tech Dairy Technology and Bachelor in Fisheries Sciences degree programmes.

The Seventh Convocation of the University was presided over by Hon'ble Chancellor and Governor of Uttar Pradesh, Shri Ram Naik Ji, who conferred the degrees to successful Under Graduates, Post Graduates and PhD candidates of various disciplines.

For any University, development of infrastructure is a prerequisite for its progress. Our Chief Minister announced the grant for construction



and repair of the University roads. A state of art University Auditorium is being constructed with the help of grant from Indian Council of Agriculture Research. Several infrastructure development projects of more than Rs. 20 Crores have been sanctioned under Rashtriya Krishi Vikas Yojna (RKVY) by the state government and the sanctioned money is being utilized for developing state of the art laboratories and for equipping the laboratories with latest instruments.

A new boys hostel has been added to the accommodation facility for students and the old hostels have been renovated. University has been emphasizing on restoration of the heritage building of the College of Veterinary Science and Animal Husbandry. Many cleanliness and plantation drives were carried out throughout the year with the help of students, teachers and university staff to make the Campus Clean and Green.

It was a matter of rejoice that Government of Uttar Pradesh in consultation with the University granted “**same work same pay**” for many IV class employees of the University. As one of the most desirable step, the University has successfully implemented the career advancement scheme for teachers by virtue of which every teacher could get their time-bound promotion which was due to them since long. On one hand students brought

laurels to the University by winning many national level competitions and on the other hand, several teachers were adorned with several prestigious awards and academic accomplishments at national and international level. The research papers speak of the quality of research work at any academic institute. More than 100 research articles including those with high impact of NAAS rating more than 8, were published. Directorate of extension along with KVK organized several trainings for the benefit of farmers, field veterinarians and para- veterinary staff besides ICAR sponsored winter schools.

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

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

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

*K.M.L. Pathak*

**(K.M.L. Pathak)**

# CONTENTS

S. No.	TITLE	PAGE No.
1	Foreword	iii
2	Executive Summary	vii
3	कार्यकारी सारांश	xiii
4	Mission, Vision & Mandate	xvii
5	Challenges, University Targets	xviii
6	Introduction	1
7	Organizational Structure	4
8	Teaching	6
9	Research	9
10	Project Report	11
11	Theses abstracts	18
12	Extension	54
13	University Farms	64
14	Human Resource Development	65
15	Dignitaries Visited <del>Duvasu</del>	74
16	Students Welfare	78
17	Other Highlights And Activities	83
18	Awards and Honour/Achievements	89
19	Research Publications	91
20	Estate Organization, Financial Status & Right to Information Act	98



# EXECUTIVE SUMMARY

## TEACHING

- ▶ College of Veterinary Science and Animal Husbandry, College of Biotechnology and Institute of Para Veterinary Sciences are running their regular academic programmes.
- ▶ During 2017-18, College of Veterinary Science and Animal Husbandry admitted 94 students in B.V.Sc. & A.H programme out of which 27.65% were girls. In M.V.Sc. and Ph.D programmes, 31 and 09 students, respectively, were admitted.
- ▶ During the year, 39 Graduate, 32 Postgraduate and 09 Doctorate students completed their degrees from College of Veterinary Science. 42 and 27 students were admitted in Diploma in Veterinary Pharmacy (DVP) and Diploma in Livestock Extension (DLE) programmes, respectively while 48 and 38 students completed their DLP and DLE programmes respectively.
- ▶ During 2017-18, College of Biotechnology admitted 14 students to B.Sc. Biotechnology and 04 students in M.Sc. Biotechnology programmes.
- ▶ Teaching Veterinary Clinical Complex (TVCC) is well equipped with modern facilities which include small and large animal operation theatres, ICU for pets, imaging diagnostic unit, small animal dentistry unit, operating microscope, laproscopic surgery unit, orthopaedic surgery instruments, eye surgery instruments, diathermy, multiparameter monitors, oxygenators, nebulizers and general unit for large and small animals, 13, 533 clinical cases and this number was almost 25% more than that of 2016-17. Out of these, 5524 were large ruminants, 859 small ruminants, 343 equines, 6424 pets and 383 other animals. Total revenue generated during the year was Rs 6, 48, 040.
- ▶ Phacoemulsification with intraocular lens implantation, coloured Doppler, USG machine and flexible laparoscopy were also procured for further strengthening of the facilities in TVCC.
- ▶ The diseases diagnostic laboratory of TVCC is well equipped with semiautomatic blood and biochemical analyzer, urine analyzer and electrolyte machine in addition to other conventional facilities for diagnosis of animal diseases and during 2017-18, 2325 clinical samples were processed in this laboratory generating revenue of Rs 1, 25, 840.. Out of these, 1640 blood samples for CBC, 529 samples for serum biochemical analysis, 139 samples of urine and 17 samples of milk were analysed .
- ▶ During the year under report, **05** clinical camps were organized in Mathura and adjoining districts with the help of gram panchyats and local veterinary officers in which 254 animals were treated, which included 85 cattle, 144 buffaloes and 25 other animals like sheep, goat, horse and pigs. Out of 254, 11 were surgical cases, 106 medicine cases and 146 gynecological cases which were treated in these camps.
- ▶ The breeder and layer poultry farm and hatchery established under ICAR funded Experiential Learning programme (ELU) in Department of Poultry Science imparted hands on training to undergraduate, postgraduate, PhD and Internship students. These students were trained in various poultry farm activities including hatchery operations and record keeping etc. Entrepreneurial training on poultry production was conducted for B.V.Sc. & A.H. students. During 2017-18, total revenue generated through experiential learning unit was Rs 7,29,946 and revenue generated through farm activities was Rs 4,25,599.
- ▶ Department of LPT trained undergraduate and postgraduate students in the area of milk and meat processing which included pasteurization and processing of milk, preparation of value added



products of milk and meat like chicken nuggets, chicken patties, flavored lassi, milk loaf etc.

- ▶ Library provided “on line journals and books facilities (www.cera.jccc.in) to students and faculty.
- ▶ AKMU in University provided computer and internet facilities to students and faculty members. The website of University was redesigned to make it more informative. Internet facility is available to all the students in their respective hostels too.

## RESEARCH

- ▶ University is running 20 externally funded projects in various Departments of College of Veterinary Science and Animal Husbandry. Out of these, 07 projects are ICAR funded, 11 projects are RKVY funded and 02 projects are DAHD&AF, GOI, funded.
- ▶ Academic research in various departments has resulted in submission of 08 Ph.D and 32 M.V.Sc. theses in College of Veterinary Science and Animal Husbandry; 01 MSc and 03 PhD from College of Biotechnology.
- ▶ During the year under report, University published 109 research publications.

## EXTENSION

- ▶ During 2017-18, Directorate of Extension with the assistance of faculty of College of Veterinary Science and Animal Husbandry organized 14 trainings on the campus, twenty seven visits of farmers, animal's owners and others in Pashu Gyan Chaupal. Through these trainings, 306 farmers, Veterinary Officers and livestock owners were trained.
- ▶ Total 541 farmers, Veterinary Officers, livestock owners, students and government officers visited the Pashu Gyan Chaupal during the year.
- ▶ Training manuals, leaflets and popular articles in the form of booklets were developed by Directorate of Extension for the benefit of farmers and animal owners and keepers.
- ▶ Consultation services were provided to large number of farmers about animal husbandry and poultry farming practices.

- ▶ During the reporting period, total of 101 trainings were conducted by KVK scientists in which 3010 participants were trained. Out of this, 84 trainings were for practicing farmers / women, 10 for rural youth, 7 for extension personnels in which 2500 farmers/farm women, 250 rural youth and 260 extension functionaries were trained.
- ▶ To study the location specificity of technology, seven technologies were assessed at 15 locations through 40 trials.
- ▶ Gosthies, Diagnostic visits, Kisan Samman Diwas were organized for improving connectivity with farmers. During this year, Soil Testing Laboratory of KVK analyzed 583 soil samples were analysed in KVK laboratory and the result with recommendation for balance fertilization were given away to farmers.

## ADVISORY SERVICES:

- ▶ College of Veterinary Science and Animal Husbandry rendered advisory and consultancy services to:
  - ▶ National Zoological Park, New Delhi
  - ▶ Etawah Lion Safari, Etawah
  - ▶ Animal Husbandry Department, Govt. of UP
  - ▶ U.P. Livestock Development Board
  - ▶ Department of Animal Husbandry, Dairying and Fisheries, GOI
  - ▶ ICAR, New Delhi
  - ▶ Food Safty and Standareds Authority of India, GOI
  - ▶ Ministry of Food Processing Industries, GOI
  - ▶ Pharmaceutical and Food industry.

## UNIVERSITY FARMS:

- ▶ Dairy farm of Veterinary College produced 2, 49, 597.00 liters of milk which was 26.77% more than that of 2016-17.
- ▶ Poultry farm of Veterinary College maintained variety of species and breeds including layers, Chabro, Aseel Peela, Kadaknath, Naked neck, Japanese quail, Turkey, Guinea fowl and Emu.





Poultry farm generated a total revenue of Rs. 4, 25, 599 through sale of spent hens, Japanese quails, Japanese quails chicks, birds and eggs additionally revenue of Rs 7, 29, 946 was generated from sales of poultry products under Experience Learning Programme.

- ▶ Total grain (mustard, wheat, oats and barley and paddy) production at Madhuri Kund farm of the university during FY 17-18 is 5937.30 quintals. Out of this 1184.90 quintal barley was transferred to LFC and rest was sold generating sales revenue of Rs. 1,16,86,303/-
- ▶ Sales revenue generated from green fodder and berseem seed was Rs. 1,04,800/- and Rs. 15724/- respectively.
- ▶ During FY 17-18, total seed production by pasture section of the university was 416.60 quintals (wheat – HD 3086). Out of this, 362.60 quintal was sold to IARI – Delhi generating a revenue of Rs. 12,33,565/- (twelve lacs thirty three thousand five hundred sixty five). Remaining 54.00 quintal of grain was transferred to livestock farm complex (LFC) of the university. 79.75 quintal of sorghum fodder was also produced by the section which was transferred to LFC for utilization.
- ▶ **LFC of the University** produced 15249.54 quintal green fodder during the reported period which was transferred to LFC for utilization. The farm produced 0.42 quintal of berseem seed, 101.75 quintals of oats grain/seed and 290.15 quintal of barley grain/seed during this period.
- ▶ During the reporting period, KVK produced 856 quintals of breeder seeds worth Rs. 27,00,000/- . In addition to seeds, 28000 vegetable saplings were also sold by the KVK in FY 17-18.

#### HUMAN RESOURCE DEVELOPMENT

- ▶ One day National workshop on Go Adhaarit Arthavyavatha was organized by DUVASU, Mathura on 19<sup>th</sup> August, 2017.
- ▶ Department of Veterinary Epidemiology and Preventive Medicine, organized ICAR sponsored 10 days Short Course on “Molecular

Tools in Epidemiology of Infectious Diseases” from 06<sup>th</sup> – 15<sup>th</sup> November 2017.

- ▶ Department of Animal Nutrition organized one-day sensitization workshop on “Silage: Hare Chare ko Sanrakshit Karne ki Saral va Upyogi Vidhi” under RKVY funded project on 2<sup>nd</sup> December 2017.
- ▶ Department of Veterinary Physiology organized two days workshop on A.I. in goats under RKVY funded project on 23<sup>rd</sup> to 24<sup>th</sup> December 2017.

#### STUDENTS' WELFARE

- ▶ During 2017-18, 57 students participated in CATC NCC camp. During 2017-18, 20 and 62 cadets appeared in NCC “B” and “C” Certificate examination, respectively.
- ▶ Fresher's Day of B.V.Sc. & A.H., Diploma and B.Sc. Biotechnology students were organized.
- ▶ 4<sup>th</sup> Year B.V.Sc & A.H students went on South India Education Tour from 28 December, 2017 to 08<sup>th</sup> January, 2018.
- ▶ 16<sup>th</sup> Annual Sports Meet of the University was organized on 26-27 March, 2018. Mr. Satyendra Kumar, student of 2<sup>nd</sup> Year B.V.Sc and A.H and Miss Nikita Chaudhary, student of 2<sup>nd</sup> Year College of Biotechnology were adjudged the best male and female athletes of the sports meet, respectively. Slow cycling, musical chair for ladies and tug of war between teachers and students were the events of special attraction during sports meet.
- ▶ During 2017-18, students of the University actively participated and excelled in various national/inter-university competitions and events such as All India Inter Veterinary College Badminton and Table Tennis Tournament and All India Professional Quiz Competition organized by GBPUAT, Pantnagar from 15<sup>th</sup> to 17<sup>th</sup> March 2018 and National level Inter-University Debate Competition held from 14<sup>th</sup> -15<sup>th</sup> January 2017 organized at GB Pant University of Agriculture and Technology, Pantnagar.
- ▶ Twenty two students of B.V.Sc & A.H participated in Inter University Youth Festival “Reverie



Reiterate 2018”, organized at NDRI Karnal from 23<sup>rd</sup> –25<sup>th</sup> March 2018. The students brought laurel to the University at National platform by winning Overall Runner Up Trophy at National level competition. Besides that students won 19 prizes including 7 first, 7 second and 5 third prizes.

### **OTHER HIGHLIGHTS AND ACTIVITIES**

- ▶ The statue of Pt. Deen Dayal Upadhyaya Ji was established and unveiled in the central garden of new campus by Hon’ble Chancellor and Governor Shri Ram Naik Ji and Hon’ble Chief Minister Shri Yogi Ji on 11.02.2018 in the presence of galaxies of cabinet Minister, Local MP, MLA(s), Mathura Mayor and other dignitaries.
- ▶ A new boys hostel with 100 capacity has been constructed with an expenditure of Rs. 279 Lakhs and was inaugurated by Hon’ble Chancellor & Governor Shri Naik Ji and Hon’ble Chief Minister Shri Adityanath Yogi Ji on 11.02.2018
- ▶ Chief Minister of Haryana Hon’ble Shri Manohar Lal Khattar Ji visited the Campus and blessed our plantation drive by planting a “Kadamb Tree” in Pt. Deen Dayal Upadhyaya Aushadi Vatika on 24.02.2018.
- ▶ 7th Convocation of U.P. Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go Anusandhan Sansthan (DUVASU), Mathura was organized on 26<sup>th</sup> September, 2017. Hon’ble Governor of Uttar Pradesh and the Chancellor of the University, Shri Ram Naik Ji, presided over the function and Prof. R.S. Paroda Former Secretary DARE & Former DG, ICAR was the Chief Guest and Shri Jay Prakash Nishad, Hon’ble State Minister, Animal Husbandry, Minor Irrigation and Fisheries, Government of Uttar Pradesh and Dr. Trilochan Mohapatra, Secretary, DARE & DG, ICAR graced the auspicious occasion as the Guests of Honor.
- ▶ During 7th Convocation, Honoris causa (Doctor of Science) degree was conferred upon Dr. Trilochan Mohapatra, Secretary, DARE & DG, ICAR.
- ▶ University successfully conducted the Pre Veterinary Test-2017 in two phases viz. Preliminary Examination and Mains Examination.
- ▶ 46 faculty members have been placed to higher scale under Career Advancement Scheme (CAS) while many more are under the process of getting benefitted by this scheme.
- ▶ Bio-metric system of attendance has been installed to enhance the work culture and punctuality.
- ▶ Introduction of highly secured bar code system in the degree certificates justifies the transparency in our examination, evaluation and degree conferment system.
- ▶ Oath taking ceremony of Veterinary Graduates of the 2012 batch was organized on July 12, 2017 in which out going graduates were administered the professional oath by Dean, College of Veterinary Science and Animals Husbandry. The Chief guest of the occasion was Dr. Mangla Rai, Former Secretary, DARE & Former DG, ICAR and the guest of honor of the occasion was Dr. Rameshwar Singh, Hon’ble Vice-Chancellor, Bihar Animal Science University, Patna.
- ▶ University celebrated Ambedkar Jayanti, World Veterinary Day, Independence Day, Pt. Deen Dayal Upadhyaya birthday, Gandhi Jayanti, Republic Day and Basant Panchmi with gusto and enthusiasm.

### **AWARDS AND HONOUR / ACHIEVEMENTS**

- ▶ Total twelve students, out of which eleven students of M.V.Sc. and one student of B.V.Sc. & A.H., received Merit Scholarship.
- ▶ 07 students of B.V.Sc. & A.H. and 09 M. V. Sc. students got National Talent Scholarship provided by Indian Council of Agriculture Research (ICAR), New Delhi.
- ▶ Dr. Rahul Kumar, Assistant Professor, Department of Veterinary Pathology and Dr. Sooraj V. Nair, MVSc student of the Department of Veterinary Pharmacology have been awarded with Netaji Subhas – ICAR International fellowship for pursuing PhD Degree.



- ▶ Dr. Amit Kumar received IAAVR Merit Award-2017 on 9<sup>th</sup> April, 2017.
- ▶ Dr. Rajneesh Sirohi received Excellence in Teaching Award on 7<sup>th</sup> Oct., 2017.
- ▶ Dr Rashmi received best oral presentation award in national seminar on Small Ruminants: National scope on up-scaling production to products value addition and their safety from ICAR-CIRG, Makhdoom, Mathura held from 9<sup>th</sup>-10<sup>th</sup> Nov., 2017.
- ▶ Prof. Satish K. Garg elected as President of Society of Toxicology for second consecutive term.
- ▶ Prof. Vikas Pathak and Dr. Meena Goswami received best poster presentation award during National seminar on “Small ruminants: national scope on up scaling production to products value addition and their safety” at CIRG, Farah, Makhdoom, Mathura, Uttar Pradesh from 9<sup>th</sup>-10<sup>th</sup> Nov., 2017
- ▶ Dr. Amitav Bhattacharyya received 2<sup>nd</sup> best poster award during XXXIV IPSACON-2017 at ICAR-NAINP, Bengaluru held from 28<sup>th</sup>-30<sup>th</sup> Nov., 2017.
- ▶ Prof. Ajay Prakash received “Anatomist of Year award” from Indian Association of Veterinary Anatomists during XXXII Annual held at CVSc & AH, OUA&T, Bhubaneswar from 21<sup>st</sup>-23<sup>rd</sup> Dec., 2017.
- ▶ Dr. Prabhakar Kumar received Fellowship of the Indian Association of Veterinary Anatomists By Indian Association of Veterinary Anatomists in XXXII Annual held at CVSc & AH, OUA&T, Bhubaneswar from 21<sup>st</sup>-23<sup>rd</sup> Dec., 2017.
- ▶ Dr. Prabhakar Kumar was elected as Executive Committee member of Indian Association of Veterinary Anatomists By Indian Association of Veterinary Anatomists during XXXII Annual Convention held at CVSc & AH, OUA&T, Bhubaneswar held from 21<sup>st</sup>-23<sup>rd</sup> Dec., 2017.
- ▶ Dr. Varsha Gupta received Dr. A.M. Srivastava gold plated silver medal and award for outstanding PhD research in XXXII Annual Convention and National Symposium on “Advances and Applications of Anatomy in Livestock, Pet, Poultry, Lab Animal and Wildlife Health and Production” at CVSc & AH, OUA&T, Bhubaneswar held from 21<sup>st</sup>-23<sup>rd</sup> Dec., 2017.
- ▶ Dr Amit Verma received Best Poster Award in International Conference on “Global research initiative for sustainable agriculture and allied sciences” organized at Maharana Pratap Univ. of Agriculture and technology, Udiapur held in Dec., 2017.
- ▶ Dr. Shanker Kr. Singh received Best Oral Presentation Award and 2<sup>nd</sup> best Poster in 36<sup>th</sup> Annual Convention and National Symposium of ISVM, OUAT, Bhubaneswar held from 1<sup>st</sup>-3<sup>rd</sup> Feb., 2018
- ▶ Dr. Debashis Roy, Dr. Vinod Kumar, Dr. Muneendra Kumar, Dr. Rajneesh Sirohi and Dr. Yajuvendra Singh received Second Best Paper award of the Indian Dairy Association for research article published in Indian Journal of Dairy Science in the “Dairy Production Area” at Kochi (8<sup>th</sup>-10<sup>th</sup> Feb., 2018).
- ▶ Dr. Vikrant Sudan received Best oral presentation award in 27<sup>th</sup> NCVP at Udaipur held from 14<sup>th</sup>-16<sup>th</sup> Feb., 2018.
- ▶ Prof. Daya Shanker Dr. Vikrant Sudan and Dr. Mukesh Srivastava received 2<sup>nd</sup> best poster presentation award in 27<sup>th</sup> NCVP at Udaipur held from 14<sup>th</sup>-16<sup>th</sup> Feb., 2018.
- ▶ Prof. Vikas Pathak and Dr. Meena Goswami elected as Vice-President and Executive Body Member of Indian Meat Science Association, respectively.
- ▶ Dr. Shanker Kr. Singh has been appointed as Mock Evaluator of Performance of Veterinary Services award by National Mission of World Organization for Animal Health (OIE), 2017.
- ▶ Dr. Ruchi Tiwari chaired technical session as Chairman in the International Conference of 5<sup>th</sup> ACSE and 2<sup>nd</sup> ACSTM held in Dubai, UAE.
- ▶ Dr. Vinod Kumar Singh received Young Scientist Award by SVWS, Lucknow, 2017.
- ▶ Dr. Vinod Kumar Singh received Best Poster award GRISAAS, Udaipur, Rajasthan, 2017.



- ▶ Dr. Amit Kumar received Outstanding PhD thesis Award- 2017 By SSDAT, Meerut during GRISAAS at Udaipur, Rajasthan, 2017.
- ▶ Dr. Amit Kumar received 2<sup>nd</sup> best poster presentation award By SSDAT, Meerut during GRISAAS at Udaipur, Rajasthan, 2017.
- ▶ Dr Dilip Kumar Swain received Outstanding presentation Award during “International conference and Expo on Agriculture and Veterinary Sciences: Research and Technology” held at Telanagana University, Hyderabad.
- ▶ Dr. Jitender Kumar received J.N. Pandey Memorial best poster award during the 26<sup>th</sup> Annual conference of SAPI and national symposium held at KVASFU, Bidar (Karnatak).

#### **FINANCE AND BUDGET**

- ▶ During 2017-18, University received Rs. 3923.54 lacs and Rs. 882.00 lacs under salary and contingency heads, respectively from Govt. of U.P.
- ▶ Indian Council of Agricultural Research, New Delhi granted Rs. 871.18 lacs as development grant.

- ▶ During the year, total receipt generated by the University was Rs. 999.26 lacs.

#### **ESTATE ORGANIZATION**

- ▶ During the financial year 2017-18, University received sum of Rs 95889000 in ICAR Developmental Grant under different heads. Out of this Rs 57593000 were for construction of auditorium. Remaining 34496000 were utilized to construction of drain in Sarojini Girls Hostel, Construction of parking shed in Sarojini Girls Hostel and Gautam Hostel, Renovation of toilets in Shastri Hostel, renovation of examination hall, renovation work of dining hall, construction work of parking shed and security hut in Nehru Hostel and purchase of chemicals, teaching purposes *etc.*

#### **RIGHT TO INFORMATION ACT**

- ▶ In compliance of the order of Govt. of Uttar Pradesh and provision of RTI Act 2005, PIO received 79 applications out of which 64 applications were cleared and rest are under consideration for disposal.

# कार्यकारी सारांश

## पाठ्यक्रम

- ▶ पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय, जैव प्रौद्योगिकी महाविद्यालय एवं पैरा वैटरिनरी विज्ञान संस्थान अपने शैक्षणिक सत्र नियमित रूप से चला रहे हैं।
- ▶ वर्ष 2017-18 के दौरान 94 विद्यार्थियों ने बी० वी० एस० सी० एण्ड ए० एच० कोर्स में प्रवेश प्राप्त किया जिसमें 27.65 प्रतिशत छात्राएँ हैं। एम० वी० एस० सी० तथा पी० एच० डी० में क्रमशः 31 और 09 विद्यार्थियों ने प्रवेश प्राप्त किया। क्रमशः 42 तथा 27 विद्यार्थियों ने वैटरिनरी फार्मासिस्ट डिप्लोमा तथा पशुधन प्रसार डिप्लोमा कार्यक्रम में प्रवेश प्राप्त किया।
- ▶ वर्ष 2017-18 में जैव प्रौद्योगिकी महाविद्यालय में 14 विद्यार्थियों ने बी० एस० सी० बायोटेक्नोलॉजी तथा 04 विद्यार्थियों ने एम० एस० सी० बायोटेक्नोलॉजी में प्रवेश प्राप्त किया।
- ▶ इसी वर्ष 39 स्नातक, 33 स्नातकोत्तर, 09 पी० एच० डी० विद्यार्थियों ने उपाधि प्राप्त की। इसी दौरान 48 तथा 38 छात्रों ने क्रमशः वेटेनरी फार्मसी एवं पशुधन प्रसार में डिप्लोमा प्राप्त किया।
- ▶ टी० वी० सी० सी० सभी आधुनिक रोग निदान की सुविधाओं से सुसज्जित है तथा इसमें छोटे तथा बड़े पशुओं के लिए शल्य क्रिया हेतु कमरा, पालतू पशुओं के लिए आई० सी० यू० एक्स-रे तथा अल्ट्रासाउण्ड यूनिट, दन्त चिकित्सा यूनिट, शल्य अणुविक्षण यंत्र, लैपरोस्कोपिक शल्य क्रिया यूनिट, आर्थोपेडिक शल्य क्रिया यूनिट, नेत्र शल्य क्रिया यूनिट हेतु उपकरण तथा नेबुलाइजर की सुविधा उपलब्ध है।
- ▶ टी० वी० सी० सी० की रोग निदान प्रयोगशाला अर्धस्वचालित ब्लड एनालाइजर, बायोकेमिकल एनालाइजर, यूरिन एनालाइजर उपकरणों से सुसज्जित है। वर्ष 2017-18 में 2325 नमूनों का परीक्षण किया गया, जिनमें 1640 नमूने सामान्य खून जाँच, 529 नमूने बायोकेमिकल एनालिसिस, 139 नमूने मूत्र के तथा 17 नमूने दुग्ध के जाँचे गए।
- ▶ वर्ष 2017-18 के दौरान 13,533 रोगी पशुओं का उपचार किया गया जिनमें से 5524 बड़े रोमन्थी पशु, 859 छोटे रोमन्थी पशु, 343 अश्व प्रजाति के पशु,

6424 पालतू पशु तथा 383 अन्य पशु शामिल थे। इन सेवाओं से टी० वी० सी० सी० को ₹० 6,48,040.00 का राजस्व प्राप्त हुआ।

- ▶ 2017-18 में टी० वी० सी० सी० की सचल पशु चिकित्सा इकाई द्वारा मथुरा तथा निकटवर्ती जिलों में ग्राम पंचायत तथा पशु चिकित्सकों के सहयोग से 05 शिविरों का आयोजन किया गया, जिसमें 254 पशुओं की चिकित्सा की गयी, इनमें 85 गौवंशीय पशु, 144 महिष वंशीय पशु तथा 25 अन्य पशु जैसे भेड़, बकरी एवं शूकर शामिल थे।
- ▶ पोल्ट्री विभाग के प्रायोगिक प्रशिक्षण यूनिट स्थित पोल्ट्री ब्रीडिंग फार्म, लेयर फार्म तथा हेचरी द्वारा अधोस्नातक तथा स्नातक छात्रों को मुर्गी पालन एवं प्रबन्धन व अण्डे सेवन सम्बन्धित विषयों का व्यावहारिक ज्ञान प्रदान करने में महत्वपूर्ण भूमिका निभाई गई। वर्ष 2017-18 में प्रायोगिक प्रशिक्षण यूनिट द्वारा विश्वविद्यालय को 7,29,946/-रूपयों का राजस्व प्राप्त हुआ।
- ▶ पशुधन उत्पाद प्रौद्योगिकी विभाग द्वारा बी० वी० एस० सी० विद्यार्थियों को दुग्ध प्रसंस्करण एवं दुग्ध निर्मित उत्पाद तथा मॉस निर्मित उत्पादों जैसे चिकिन नगेट, चिकिन पेटिज, संगठित लस्सी इत्यादि बनाने हेतु प्रशिक्षण दिया गया।
- ▶ पुस्तकालय द्वारा विद्यार्थियों को विभिन्न शोध पत्रों के अवलोकन हेतु ऑनलाइन सेवा प्रदान की जा रही है।
- ▶ कृषि ज्ञान प्रबन्धन इकाई (ए० के० एम० यू०) द्वारा कम्प्यूटर तथा इन्टरनेट की सुविधा छात्रों एवं संकाय सदस्यों को नियमित रूप से उपलब्ध करायी जा रही है। वर्ष 2017-18 में वायरलैस इन्टरनेट की सुविधा एम० एन० छात्रावास को प्रदान की गई। विश्वविद्यालय की वैबसाइट को आकर्षक बनाने हेतु उसकी पुनः संरचना की गई।

## अनुसंधान

- ▶ विश्वविद्यालय के पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय के विभिन्न विभागों में 20 बाह्य वित्त पोषित परियोजनाएँ चल रही हैं। जिसमें से 07 भारतीय कृषि अनुसंधान परिषद् द्वारा, 02 भारत



सरकार के अनुदान द्वारा तथा 11 राष्ट्रीय कृषि विकास योजना द्वारा पोषित है।

- ▶ विभिन्न विभागों में चलने वाले अनुसंधान कार्यों पर आधारित विषयों पर 08 पी0 एच0 डी0, 30 एम0वी0एस0सी0 एवं 01 एम0एस0सी0 और 03 पी0एच0डी0 जैव प्रौद्योगिकी के शोधग्रंथ पूर्ण किए गए।
- ▶ वर्ष 2017-18 में विश्वविद्यालय द्वारा 109 शोध पत्र प्रकाशित किये गये।

## प्रसार

- ▶ वर्ष 2017-18 में प्रसार निदेशालय ने पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय के सहयोग से 14 प्रशिक्षण विश्वविद्यालय के प्रांगण में, 27 भ्रमण किसानों, पशुपालकों एवं अन्यके लिये पशु ज्ञान चौपाल में आयोजित किए। इन प्रशिक्षण कार्यक्रमों द्वारा लगभग 306 किसान, पशु चिकित्सक, वैज्ञानिक (विषय वस्तु विशेषज्ञ) विभिन्न विश्वविद्यालयों के सहायक आचार्य एवं सेवानिवृत्त भारतीय सेना के जवान लाभान्वित हुए।
- ▶ इस वर्ष 541 पशुपालकों, पशु चिकित्साधिकारी, छात्रों एवं अन्य सरकारी अधिकारी द्वारा पशु ज्ञान चौपाल का भ्रमण किया गया।
- ▶ कृषि विज्ञान केन्द्र द्वारा कुल 101 प्रशिक्षण आयोजित किए गए जिसमें क्रमशः 3010 किसानों ने भाग लिया।
- ▶ कृषि विज्ञान केन्द्र की मृदा विश्लेषण प्रयोगशाला में 583 मृदा नमूनों की जांच की गई तथा कृषकों को आवश्यकता अनुसार उर्वरक के प्रयोग के बारे में जानकारी दी गई।

## विश्वविद्यालय प्रक्षेत्र

- ▶ आई0एल0एफ0सी0 के डी.डी.डी. फार्म पर 2,49,593.00 लीटर दुग्ध का उत्पादन हुआ।
- ▶ महाविद्यालय के कुक्कुट फार्म पर विभिन्न प्रजातियों की मुर्गियों जैसे चाबरो, असील, कड़कनाथ, नेकड नेक, जापानी तीतर, टर्की, गिन्नी फॉऊल, ऐमू का पालन किया जा रहा है। इनके अण्डों, चूजों तथा कुक्कुट इत्यादि की बिक्री से कुल 4,25,599.00 रूपयों का राजस्व प्राप्त हुआ।
- ▶ माधुरी कुण्ड फार्म में कुल 5937.30 क्विंटल धान एवं तिल (खरीफ) का उत्पादन किया गया। हरे चारे एवं बरसीम की बिक्री से क्रमशः रु0 1,04,800.00 एवं रु0 15,724.00 का राजस्व प्राप्त हुआ।
- ▶ चरागाह एवं चारा शोध अनुभाग द्वारा वर्ष 2017-18 में 15249.54 क्विंटल (अनुमानित) चारे, दाने तथा भूसे का उत्पादन किया गया।

- ▶ इस वर्ष कृषि विज्ञान केन्द्र द्वारा 826 क्विंटल ब्रीडरसीड जिनका मुल्य रु0 27,00,000.00 का उत्पादन किया गया।

## मानव संसाधन विकास

- ▶ एक दिन गो आधारित अर्थव्यवस्था पर एक द्विवसीय राष्ट्रीय कार्यशाला का आयोजन 19 अगस्त 2017 को दुवासू मथुरा द्वारा किया गया।
- ▶ पशु चिकित्सा महामारी विज्ञान और निवारक चिकित्सा विभाग द्वारा भा0कृ0अ0प0 प्रायोजित 10 द्विवसीय लघु कोर्स 'संक्रामक रोगों के महामारी विज्ञान में आणविक उपकरणों का उपयोग' आयोजन 06-15 नवम्बर 2017 को किया गया।
- ▶ पशु पोशण विभाग ने 02 दिसम्बर 2017 को आरकेवीवाई वित पोषित परियोजना के तहत 'साइलेज: हरे चारे को संरक्षित करने की सरल एवं उपयोगी विधि' पर एक द्विवसीय संवेदीकरण कार्यशाला का आयोजन किया।
- ▶ शरीर क्रिया विज्ञान विभाग ने 'बकरियों में कृत्रिम गर्भाधान' विषय पर दो दिन का कार्यशाला 23 से 24 दिसम्बर 2017 को आरकेवीवाई वित पोषित परियोजना के तहत आयोजित की।

## छात्र कल्याण

- ▶ वर्ष 2017-18 में 56 विद्यार्थियों ने एन.सी.सी. के CATC शिविर में भाग लिया। जिसमें से 20 छात्रों ने 'B' सर्टीफिकेट तथा 62 छात्रों ने 'C' सर्टीफिकेट हेतु परीक्षा दी।
- ▶ बी0 वी0 एस0 सी0 एण्ड ए0 एच0, डिप्लोमा तथा बी0 एस0 सी0 बायोटेक्नोलोजी के विद्यार्थियों ने 'फ़ेशर्स डे' का आयोजन किया।
- ▶ वर्ष 2017-18 में साहित्यिक एवं सांस्कृतिक कार्यक्रमों का आयोजन हुआ, जिसमें पशु चिकित्सा विज्ञान एवं पशुपालन महाविद्यालय, जैव प्रौद्योगिकी महाविद्यालय एवं डिप्लोमा के छात्रों ने भाग लिया।
- ▶ चतुर्थ बी0वी0एस0सी0 एण्ड ए0एच0 के छात्र दिनांक 28 दिसम्बर 2017 से 08 जनवरी 2018 तक दक्षिण भारत शैक्षणिक भ्रमण पर गये।
- ▶ 26 से 27 मार्च 2018 को वार्षिक खेल-कूद प्रतियोगिता आयोजित हुई जिसमें छात्र वर्ग में बी0वी0एस0सी0 एण्ड ए0एच0 के द्वितीय वर्ष के छात्र श्री सत्येन्द्र कुमार तथा छात्राओं के वर्ग में सुश्री निकिता चौधरी (द्वितीय वर्ष, जैव प्रौद्योगिकी महाविद्यालय) को सर्वश्रेष्ठ एथलीट चुना गया।
- ▶ दुवासु के 22 छात्र तथा छात्राओं ने 23 से 25 मार्च 2018 के दौरान एनडीआरआई में आयोजित इंटर



यूनिवर्सिटी यूथ फेस्टिवल रेवेरी रीडररेट 2018 में भाग लिया। छात्रों ने रनर अप ट्रॉफी जीतकर राष्ट्रीय मंच पर विश्वविद्यालय को गौरान्वित किया। इसके अलावा छात्रों ने 7 प्रथम, 7 द्वितीय और 5 तृतीय पुरस्कार सहित 19 पुरस्कार जीते।

## अन्य झलकियाँ एवं कार्यकलाप

- ▶ पंडित दीन दयाल उपाध्याय जी की मूर्ति का अनावरण उत्तर प्रदेश के राज्यपाल माननीय श्री राम नाईक जी एवं माननीय मुख्यमंत्री श्री योगी आदित्यनाथ जी द्वारा 11 फरवरी 2018 को मंत्रीयो स्थानीय सांसद विधायक एवं गणमान्य अधितियों की उपस्थितियों में सम्पन्न हुआ।
- ▶ आधुनिक सुविधायुक्त नवीन छात्रावास का निर्माण रु. 279 लाख की लागत से हुआ। जिसका शिलान्यास उत्तर प्रदेश के राज्यपाल माननीय श्री राम नाईक जी एवं माननीय मुख्यमंत्री श्री योगी आदित्यनाथ जी के द्वारा 11 फरवरी 2018 को हुआ।
- ▶ हरियाणा के मुख्य मंत्री माननीय श्री मोहन लाल जी खट्टर ने विश्वविद्यालय भ्रमण एवं पंडित दीन दयाल उपाध्याय औषधी वाटिका में कदम्ब वृक्ष दिनांक 24-02-2018 लगाया।
- ▶ विश्वविद्यालय का सप्तम दीक्षांत समारोह 26 सितम्बर 2017 को आयोजित हुआ जिसकी अध्यक्षता उत्तर प्रदेश के राज्यपाल श्री राम नाईक जी ने की। प्रोफेसर आर. एस. परोदा, पूर्व सचिव, डेयर एवं पूर्व डायरेक्टर जनरल आईसीएआर ने समारोह के मुख्य अतिथि तथा श्री जय प्रकाश निसाद, माननीय मंत्री, पशुधन, उ०प्र० सरकार एवं डा० त्रिलोचन महापात्रा, सचिव, डेयर एवं डायरेक्टर जनरल आईसीएआर सम्मानीय अतिथि के रूप में उपस्थित होकर दीक्षांत समारोह की गरिमा बढ़ाई। सप्तम दीक्षांत समारोह में डा० त्रिलोचन महापात्रा को 'डाक्टर ऑफ साईंस' की मानद उपाधि से सम्मानित किया गया।
- ▶ विश्वविद्यालय द्वारा वर्ष 2017 की प्री वेटेरिनरी परीक्षा का आयोजन सफलतापूर्वक किया गया।
- ▶ विश्वविद्यालय के 46 शिक्षकों को कैरीयर एडवान्समेन्ट स्कीम के तहत उच्च वेतनमान का लाभ दिया गया।
- ▶ कार्यशैली और समयबद्धता को बढ़ाने के लिये उपस्थिति की बायोमैट्रिक प्रणाली स्थापित की गई है।
- ▶ डिग्री प्रमाण पत्र को बार कोड द्वारा अत्यधिक सुरक्षित बनाया गया।
- ▶ वेटेरिनरी स्नातक छात्रों का शपथ ग्रहण समारोह 12 जुलाई 2017 को आयोजित किया गया जिसमें

40 छात्रों ने शपथ ग्रहण की। इस समारोह में मुख्य अतिथि डा० मंगला रॉय, पूर्व सचिव, डेयर एवं पूर्व डायरेक्टर जनरल आईसीएआर एवं सम्मानीय अतिथि डा० रामेश्वर सिंह, कुलपति, बिहार पशु विज्ञान विश्वविद्यालय, पटना थे।

- ▶ विश्वविद्यालय में अम्बेडकर जयन्ती, विश्व पशुचिकित्सा दिवस, स्वतन्त्रता दिवस, गाँधी जयन्ती, गणतन्त्र दिवस तथा बसन्त पंचमी हर्षोल्लास से मनाये गये।

## पुरस्कार एवं सम्मान

- ▶ बी०वी०एस०सी एण्ड ए०एच० के 01 छात्र एवं 11 एम०वी०एस०सी० के छात्रों ने भारतीय कृषि अनुसंधान परिषद, नई दिल्ली द्वारा आयोजित राष्ट्रीय प्रतिभा छात्रवृत्ति प्राप्त की।
- ▶ प्रोफेसर सतीश कुमार गर्ग, आचार्य एवं विभागाध्यक्ष भैशज्य एवं विश्व विज्ञान विभाग को पीजीआईएमआर, चंडीगढ़ में आयोजित 'सोसाईटी ऑफ टाक्सीकोलाजी'—STOX के 37 वें वार्षिक अधिवेशन में सोसाईटी का पुनः अध्यक्ष चुना गया।
- ▶ डा० अमित कुमार को आईएएवीआर मेरिट पुरस्कार—2017 से दिनांक 09 अप्रैल 2017 को पुरस्कृत किया गया।
- ▶ डा० रजनीश सिरोही को एकसीलेंट इन टीचिंग पुरस्कार—2017 से दिनांक 07 अक्टूबर 2017 को पुरस्कृत किया गया।
- ▶ प्रोफेसर विकास पाठक, डा० मीना गोस्वामी, डा० रश्मी सिंह को आईसीएआर—सीआईआरजी, मखदूम में दिनांक 09 से 10 नवम्बर 2017 में आयोजित कार्यशाला में शोध पत्र प्रस्तुत करने पर पुरस्कृत किया गया।
- ▶ डा० अमिताव भट्टाचार्य को ICAR-NAINP, बंगलोर में आयोजित XXXIV IPSACON-2017 में द्वितीय सर्वश्रेष्ठ पोस्टर पुरस्कार से सम्मानित किये गये।
- ▶ प्रोफेसर अजय प्रकाश को पशु शरीर रचना विज्ञान के 31वें वार्षिक अधिवेशन में Anatomist of Year-2017 पुरस्कार से सम्मानित किया गया।
- ▶ डा० प्रभाकर कुमार को पशु शरीर रचना विज्ञान के 31वें वार्षिक अधिवेशन में Fellow Indian Association of Veterinary Anatomists पुरस्कार से सम्मानित किया गया।
- ▶ डा० प्रभाकर कुमार को पशु शरीर रचना विज्ञान के 31वें वार्षिक अधिवेशन में कार्यकारी समिति के सदस्य चुने गये।



- ▶ डा0 वर्षा गुप्ता को पशु शरीर रचना विज्ञान के 31वें वार्षिक अधिवेशन में पीएचडी में उत्कृष्ट शोध कार्य हेतु डा0 एएम श्रीवास्तव गोल्ड मेडल पुरस्कार से सम्मानित किया गया।
- ▶ डा0 अमित वर्मा को एमपीयूएटी, उदयपुर में आयोजित अन्तर्राष्ट्रीय सम्मेलन सर्वश्रेष्ठ पोस्टर पुरस्कार से सम्मानित किये गये।
- ▶ डा0 शंकर कुमार सिंह को भारतीय पशु औषधि विज्ञान सोसाईटी (ISVM) के 36वें वार्षिक अधिवेशन में शोध पत्र प्रस्तुत करने पर पुरस्कृत किया गया।
- ▶ डा0 देवाशीश रॉय, डा0 विनोद कुमार, डा0 मुनीन्द्र कुमार, डा0 रजनीश सिरोही एवं डा0 यजुवेन्द्र सिंह को इण्डियन जनरल ऑफ डेयरी साइंस में शोध पत्र प्रकाशित करवाने हेतु द्वितीय उत्कृष्ट शोध पत्र पुरस्कार पुरस्कृत किया गया।
- ▶ डा0 विक्रान्त सूदन को NCVP के 27वें वार्षिक अधिवेशन में शोध पत्र प्रस्तुत करने पर सर्वश्रेष्ठ पुरस्कार से सम्मानित किया गया।
- ▶ प्रोफेसर दया शंकर, डा0 विक्रान्त सूदन एवं डा0 मुकेश श्रीवास्तव को NCVP के 27वें वार्षिक अधिवेशन में द्वितीय उत्कृष्ट पोस्टर पुरस्कार पुरस्कृत किया गया।
- ▶ प्रोफेसर विकास पाठक एवं डा0 मीना गोस्वामी को इण्डियन मीट साइंस एसोसीएशन का क्रमशः उपाध्यक्ष एवं एज्यूटिव बोडी मेम्बर चयनित हुए।
- ▶ डा0 शंकर कुमार सिंह को OIE नेशनल मिशन के द्वारा मोक ईवेल्यूवेटर ऑफ परफॉर्मन्स से सम्मानित किया गया।
- ▶ डा0 रुची तिवारी ने ACSE के अन्तर्राष्ट्रीय अधिवेशन को तकनीक सत्र में अध्यक्ष के रूप में सम्पादित करवाया।
- ▶ डा0 विनोद कुमार सिंह को SBWS लखनऊ के द्वारा युवा वैज्ञानिक पुरस्कार-2017 से सम्मानित किया गया।
- ▶ डा0 विनोद कुमार सिंह को GRISAAS राजस्थान के द्वारा द्वितीय उत्कृष्ट पोस्टर पुरस्कार पुरस्कृत किया गया।

- ▶ डा0 अमित कुमार को SSDAT मेरठ के द्वारा उत्कृष्ट पी.एच.डी शोध ग्रन्थ पुरस्कार से सम्मानित किया गया।
- ▶ डा0 अमित कुमार को SSDAT मेरठ के द्वारा द्वितीय उत्कृष्ट पोस्टर पुरस्कार पुरस्कृत किया गया।
- ▶ डा0 दिलीप कुमार स्वैन को तेलंगाणा विश्वविद्यालय, हैदराबाद में आयोजित कृषि और पशु चिकित्सा विज्ञान पर अन्तर्राष्ट्रीय सम्मेलन और प्रदर्शनी में उत्कृष्ट प्रस्तुति पुरस्कार से सम्मानित किया गया।
- ▶ डा0 जितेन्द्र कुमार को बिदर में आयोजित सापी के 26वें वार्षिक अधिवेशन में जे.एन. पाण्डे स्मृति उत्कृष्ट पोस्टर पुरस्कार से सम्मानित किया गया।

## निर्माण एवं अनुरक्षण

- ▶ वर्ष 2017-18 में भारतीय कृषि अनुसंधान परिषद, नई दिल्ली द्वारा प्रदान वित्तीय सहायता से अनेक निर्माण एवं पुनरोद्धार कार्य जैसे ऑडोटेोरियम, पार्किंग स्थल, परीक्षा कक्ष, सुरक्षित चौकी, स्नातक एवं स्नातकोत्तर प्रयोगशालाओं का अनुरक्षण कार्य कराया।

## वित्त एवं बजट

- ▶ वर्ष 2017-18 में विश्वविद्यालय को वेतन मद में रु. 3923.54 लाख एवं कंटीजैन्सी मद में रु. 882.00 लाख उ0प्र0 सरकार द्वारा बजट प्राप्त हुआ।
- ▶ भारतीय कृषि अनुसंधान परिषद, नई दिल्ली द्वारा रु. 871.18 लाख की वित्तीय सहायता विकास एवं सुदृढीकरण के लिए प्रदान की गई।
- ▶ इस वर्ष विश्वविद्यालय को कुल रु. 999.26 लाख राजस्व की प्राप्ति हुई।

## जनसूचना अधिकार

- ▶ उत्तर प्रदेश सरकार के निर्देशों तथा आर0 टी0 आई0 एक्ट 2005 के अनुपालन के क्रम में 79 प्रार्थना पत्र प्राप्त हुए, जिनमें से 64 का निस्तारण किया गया तथा अन्य विचाराधीन हैं।



## MISSION

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

## VISION

- ▶ Produce competent and skilled human resource in the field of animal health and production and allied sectors who are socially sensitive and responsible professionals;
- ▶ Undertake region-based, need-based and basic research for improving animal health and productivity adopting modern technology;
- ▶ Validate indigenous traditional knowledge (ITK) on scientific basis;
- ▶ Provide efficient extension services at the doorstep of poor and marginal farmers and livestock owners and motivating them to adopt animal husbandry, poultry, fishery and related vocations as an engine of economic growth and social empowerment ;
- ▶ Social empowerment of women to become “knowledgeable stake holders” and giving them economic identity;

## MANDATE

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

## CHALLENGES

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

## UNIVERSITY TARGETS

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

# INTRODUCTION

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



University Administrative building



Administrative building of College of Veterinary Science

Government permitted the University to start College of Biotechnology under self-finance scheme. Accordingly, University started College of

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

## ORGANIZATIONAL SET-UP

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

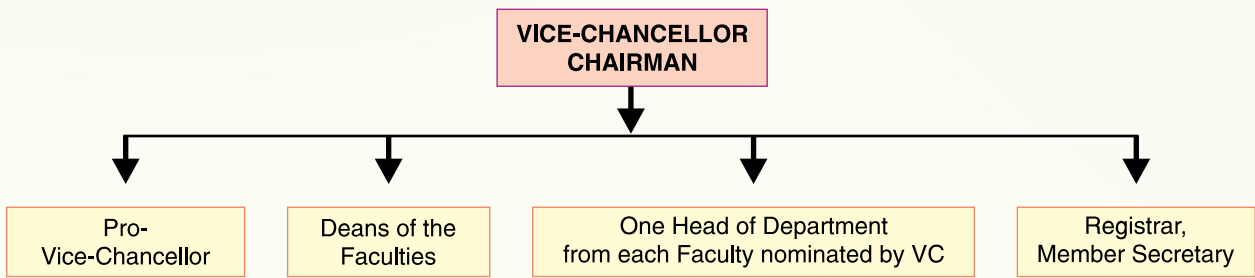
### A. AUTHORITIES OF THE UNIVERSITY:

#### 1. Executive Council

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

#### 2. Academic Council

Academic Council of the University is the principal academic body which controls and frames all the academic regulations and is responsible for maintenance of standards of instruction, education

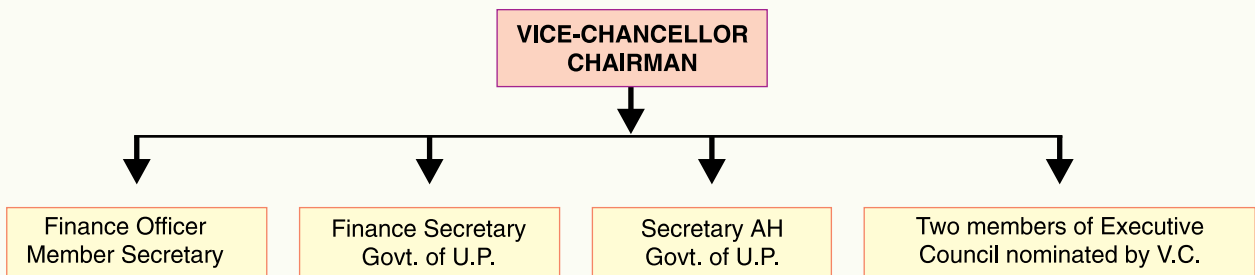


and examination in the University. The flow chart of Academic Council composition is presented below:

### 3. Finance Committee

Finance Committee of the University advises the Executive Council on matters relating to

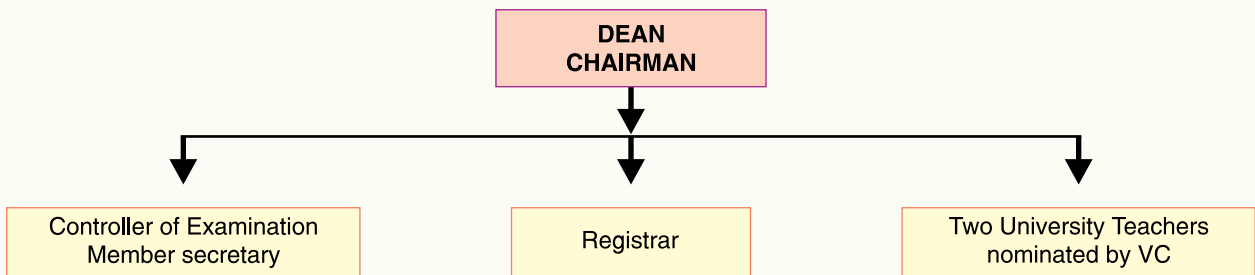
administration of property and funds of the University. The flow chart of Finance Committee composition is presented below:



### 4. Examination Committee

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

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



### 5. Board of Faculty

Board of Faculty is for framing the curricula for undergraduate and post graduate programmes and to make recommendations to the Academic Council for the establishment of new departments, abolition / subdivision / or otherwise reconstitution

of the existing departments. Dean of the Faculty is the Ex- Officio Chairman of Board of Faculty, and Faculty Secretary is elected on the basis of consensus amongst the faculty members. All Professors, Associate Professors and Assistant Professors of the faculty are the members of Board of Faculty.

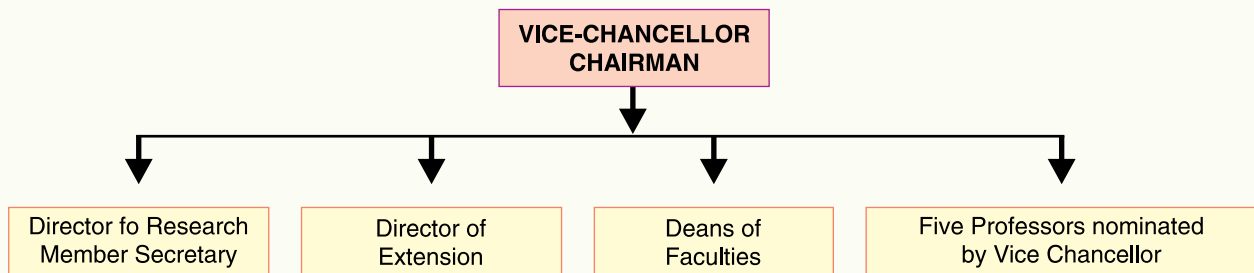


## 6. Research Advisory Committee

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

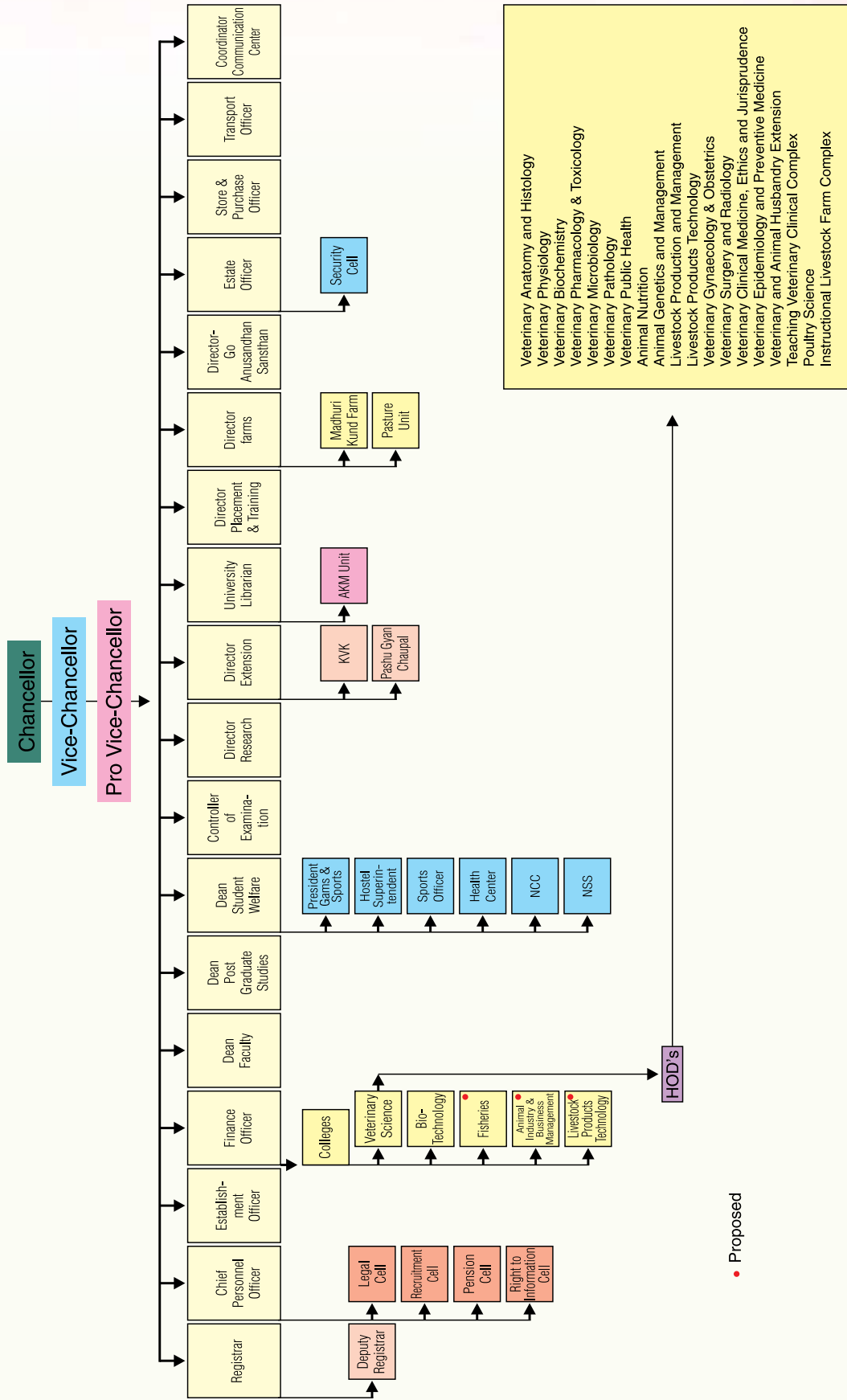
## 7. Extension Advisory Committee

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 Vishwavidyala Evan Go-Anusandhan Sansthan (DUVASU), Mathura



• Proposed



## B. Organizational Meetings

### i. Executive Council

S. No.	Meeting No.	Date	Venue
1	29th	01-07-2017	DUVASU, Mathura
2	30th	25-09-2017	DUVASU, Mathura
3	31st	30-12-2017	DUVASU, Mathura

### ii. Academic Council

S.No.	Meeting No.	Date	Venue
1	62nd	13-06-2017	DUVASU, Mathura
2	63rd	04-07-2017	DUVASU, Mathura
3	64th	10-08-2017	DUVASU, Mathura
4	65th	12-09-2017	DUVASU, Mathura
5	66th	08-01-2018	DUVASU, Mathura
6	67th	09-03-2018	DUVASU, Mathura

## C. Officers of the University

S.No.	Designation / Post	Name of Officer	Date	
			From	To
1	Chancellor	Hon'ble Shri Ram Naik Ji, Governor of U.P.		
2	Vice-Chancellor	Prof. K.M.L. Pathak	March 03, 2016	Continuing
3	Registrar	Prof. P.K. Shukla	July 05, 2016	Continuing
5	Finance Officer	Sh. M.K. Jain	June 22, 2015	Continuing
6	Controller of Examination	Prof. Daya Shanker	Aug. 29, 2012	Continuing
7	Dean, CVSc. & A.H.	Prof. Satish K. Garg	June 30, 2009	Continuing
8	Dean, College of Biotechnology	Prof. Rajesh Nigam	Feb. 05, 2013	Continuing
9	Dean PGS	Prof. P.K. Shukla	Jan. 15, 2013	Continuing
10	Dean Student Welfare	Dr. M.M. Farooqui	Dec. 05, 2016	Continuing
11	Director of Clinics	Prof. R.P. Pandey	Sept 18, 2010	Continuing
12	Director of Research	Prof. Atul Saxena	Nov. 24, 2009	Continuing
13	Director of Extension	Prof. Sarvajeet Yadav	Nov. 24, 2009	Continuing
14	Director Go-Anusandhan	Prof. S.K. Yadav Prof. Vikas Pathak	June 16, 2015 Jan 03, 2018	Jan 03, 2018 Continuing
15	Director of Farms	Prof. Ajay Prakash	May 20, 2015	Continuing
16	Director, Institute of Para Veterinary Science	Prof. Vikash Pathak	April 3, 2017	Continuing
17	Chief Personel Officer	Prof. R.P. Pandey	March 28, 2016	Continuing
16	University Librarian	Dr. Sanjay Purohit	Nov. 26, 2016	Continuing

# TEACHING

Presently, academic programmes are going on in the following two colleges of the University:

1. College of Veterinary Science and Animal Husbandry
2. College of Biotechnology

## A. COLLEGE OF VETERINARY SCIENCE AND ANIMAL HUSBANDRY

College of Veterinary Science and Animal Husbandry was established in 1947 with the aim to generate qualified AND WELL TRAINED veterinarians and address veterinary health and animal husbandry issues in the state, undertake research and ensure the extension services. Later in 2001, it became the main constituent college of the

Veterinary University. The College is running three degree programmes; namely Bachelor of Veterinary Science and Animal Husbandry (B.V.Sc. & A.H. as per VCI regulationS), Master of Veterinary Science (M.V.Sc.) in 16 Disciplines and Doctor of philosophy (Ph.D) in 15 disciplines as per ICAR academic regulations for higher agricultural education. The strength of teaching faculty of the college during 2017-18 was 85. All the faculty members were involved in teaching, research and extension activities of the College. Besides this, some of the faculty members of the College have also shared the administrative responsibilities of University. Few of the faculty members are also involved in post graduate programme as resource persons in College of Biotechnology.

## Admissions of students during 2017-18

Academic programme		Intake capacity	Male	Female	Total Students Admitted
B.V.Sc. & A.H.		102	68	26	94
M.V.Sc.		56	25	06	31
Ph.D		14	07	02	09
B. Sc. (H) Biotechnology		45	07	07	14
B. Sc. (H) Industrial Microbiology		15	01	03	04
M. Sc. Biotechnology		08	01	03	04
Diploma Course	Diploma in Livestock Extension	60	23	04	27
	Diploma in Pharmacy	60	31	11	42

## B. COLLEGE OF BIOTECHNOLOGY

College of Biotechnology is running four academic programmes; namely B.Sc. Biotechnology, B.Sc. Industrial Microbiology, M.Sc. Biotechnology and Ph.D. Biotechnology. Faculty members have been appointed on contractual basis for teaching of undergraduate courses, whereas postgraduate teaching programme is being looked after by the faculty of College of Veterinary Science and

Animal husbandry and scientists of ICAR-CIRG, Makhdoom, Farah, Mathura.

A well equipped tissue culture lab has been established in the College during FY 2017-18 to strengthen research activities in the College. To streamline and strengthen undergraduate teaching, well illustrated practical manuals have been prepared for B.Sc. students.





### C. Institute of Para Veterinary Science

Institute of Para Veterinary Science is also running two diploma programmes of two years duration each, namely- Diploma in Veterinary Pharmacy (DVP) and Diploma in Livestock Extension (DLE).

### D. ACTIVITIES OF COLLEGE OF VETERINARY SCIENCE AND ANIMAL HUSBANDRY

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

#### 1. Teaching Veterinary Clinical Complex (TVCC)

TVCC, the erstwhile Kothari Veterinary Hospital, is multi-specialty veterinary clinic. It is well equipped with the modern facilities and has operation theaters for large and small animals, radiology unit, ICU for pets, indoor unit for pets and large animals with loading and unloading platform facility, diagnostic laboratory, animal dentistry unit and also renders ambulatory services. It is the center for providing hands on training to students of B.V.Sc. & A.H., M.V.Sc. and Ph.D. degree programmes for diagnosis of diseases and treatment of animals. Students are well exposed to variety of clinical cases under the guidance and supervision of learned faculty members.

Clinical services were provided to farmers and animal owners in TVCC and also at the doorsteps of farmers through ambulatory services. Imaging diagnostic unit is equipped with 500 mA fixed and 100 mA mobile X-ray machines, ultrasonography machines, 9" C-Arm image intensifier and digital radiography unit apart from endoscopy facilities. Besides these, operating microscope, laparoscopic surgery unit, orthopaedic surgery instruments, eye surgery instruments, diathermy, multiparameter monitor, oxygenators, nebulizers and general surgery facilities are also available. In addition to this, ECG, Phaco machine, Colour Doppler, and USG facilities are also available.

Emergency clinical services are provided round the clock by teachers of clinical departments. For the farmers and animals owners coming from distant places, facility for their stay is also available.

World Veterinary Day was celebrated at TVCC on 29/04/2017. On this occasion, free anti-rabies vaccines were administered to 116 pet dogs. Honorable Vice Chancellor, Professor K.M.L. Pathak, presided over the function.

During the FY 2017 - 18, 13533 clinical cases were treated in the TVCC and the total revenue generated during the year was Rs. 6,48,040/-.



#### 2. Diagnostic Laboratory

Disease diagnostic laboratory of TVCC is equipped with semi-automatic blood and biochemistry analyzer, urine analyzer, electrolyte analyzer and slide based dry chemistry analyzer. The laboratory provides diagnostic facilities to livestock and pet owners on no-profit and no-loss and this has also serves as an important learning unit for undergraduate and postgraduate students. Samples requiring specialized microbiological, pathological, parasitological and toxicological examination were forwarded to concerned departments. During 2017-18, laboratory processed 2325 biological samples and generated a revenue of Rs. 1,25,840/-

#### 3. Ambulatory Services and Clinical Camps

Faculty members and post graduate students provided clinical services at farmer's doorstep through clinical camps organized in different villages of Mathura district.

During routine ambulatory visits to Hasanand Goshala Vrindavan, Panchayti Goshala Vrindavan and Goashala of Pt. Deen Dayal Dham, Nagla Chandrabhan, Farah, Mathura, large numbers of animals were treated.

## E. HANDS ON TRAINING OF STUDENTS UNDER EXPERIENTIAL LEARNING PROGRAMME

### Poultry Production and Management

The breeder farm, layer farm and hatchery established under Experiential Learning Unit in Poultry Science Department (ELU) served as models for U.G, P.G and PhD teaching and also to train the students on different activities in these subunits. These sub units also served as models for internship students to train them poultry farming and entrepreneurship. Students were trained in various farm activities pertaining to feeding, watering and management. Further, they were also imparted hands on training on rearing of Chabro birds and layers in the sub units of ELU during the internship training. In addition, the students were also trained on the hatchery operations. The sub units have also been used to cater the training needs of the farmers during their training courses on poultry conducted by Department of Extension. The resources of ELU viz. dead birds and embryonated eggs of different stages of development were also provided for educational and research purposes to different departments of Veterinary college and Biotechnology college. 'Entrepreneurial training on poultry production' was conducted for B.V.Sc. & A.H. 2<sup>nd</sup> Year students from 21/03/17 to 30/04/17 and 08/08/17 to 17/09/17. 25 batches of hatches and 21,728 day old coloured chicks (Chabro) were obtained during this period. Further, 884 day old turkey poults, 7748 day old Japanese quail chicks, 647 day old guinea fowl keets were obtained during this period. In addition, 2<sup>nd</sup> year, 3<sup>rd</sup> Year and internship students of B.V.Sc. & A.H. and P.G students of the department were trained on hatchery management during this period.

### Milk and Meat Processing Unit

The Department is running a Revolving fund Project on "Processing of milk, meat and eggs for value added products". The under-graduate students of 3<sup>rd</sup> Professional B.V.Sc. & A.H. and post-graduate students of the Department were imparted practical training for preparation of different milk and meat products which were made available to employees of the University as per the university rates. The Department also handles surplus milk from the

Livestock Farm Complex of the College and processed into different milk products. During 2017-18, 7292 liters of milk was processed into 1194.55 kg Paneer and 1165.5 liter of milk was used for 232.02 kg khoa production. The opening balance on 1<sup>st</sup> April, 2017 was Rs. 1,09,631.00 and the closing balance on 31<sup>st</sup> march, 2018 was Rs. 1,58,862 thus revenue of Rs. 49231.00 was generated during the reporting year.



### Feed Production and Processing

Experiential Learning Unit on "Feed Production and Processing" project was sanctioned by ICAR during 2010-11. Under this project, a total of Rs 55.6 lacs was sanctioned from which feed processing unit and one urea molasses mineral block unit were established. Since beginning of the unit, total 17,887.0 quintals concentrate feed of about Rs 3.2 crore values has been prepared from July 2012-March 2018 and more than 595 students have been given hands on training to formulate compounded feed as per the nutrients requirements of livestock. Since installation of the Unit, University has not procured any compounded feed for its farm animals from market. Feed produced from this unit is also sold to farmers and goshalas during Kisan melas and farmers training. Students have also been trained in production of urea molasses mineral blocks (UMMB), a good source of mineral and readily soluble carbohydrates and nitrogen to ruminants during lean period. Practical training of the students have made them self reliant and also competent to start their own enterprise after B.V.Sc. & A.H. Experiential learning on feed production and processing unit is very successful asset of the University. Unit also prepared area specific mineral mixture about 100 quintal/yr and provided to farmers on nominal cost and to our dairy farm. Departmental sale of mineral mixture during the year under report was about 65 quintal and revenue generated was Rs 3.9 lacs.

## RESEARCH

ONGOING PROJECTS				
S. No.	Name of Project	Funding Agency	Total Budget (Rs. Lakhs)	Released Budget of FY 2017-18 (Rs. Lakhs)
1	Entrepreneurial promotion by preparation of specimens from fallen animals.	RKVY	67.80	42.90
2	Propagation of insemination techniques in goats and establishment of semen bank for enhanced productivity and socioeconomic upliftment in state of U.P.	RKVY	312.15	207.50
3	Demonstration unit for silage making and popularization of low cost silage technology for year round fodder availability for small-scale farmers.	RKVY	90.91	64.54
4	Establishment of environment controlled chamber and calorimetric unit to enhance productivity of livestock in the scenario of climate change in Uttar Pradesh.	RKVY	260.14	252.50
5	Establishment of modernized goat farm for strengthening goat husbandry practices in state of U.P.	RKVY	449.11	172.63
6	Establishment of referral laboratory for quality evaluation of milk and milk products.	RKVY	183.40	81.80
7	Strengthening and modernization of University farm.	RKVY	924.02	462.00
8	Establishment of small scale feed processing demonstration unit to promote rural youth entrepreneurship.	RKVY	236.27	98.20
9	Strategic control of subclinical parasitism for better animal health and enhanced productivity in UP.	RKVY	124.31	55.35
10	Strengthening of clinical diagnostic and therapeutic facilities at University referral hospital for benefit of farmers and livestock owners.	RKVY	225.04	68.60
11	Establishment of semen analytical laboratory for semen certification quality assurance of breeding buck semen.	RKVY	169.00	88.00
12	Conservation and genetic improvement of Muzaffarnagari sheep for multiplication of superior germplasm	DADE, GOI	79.66	nil
13	Outreach programme on Ethno-Veterinary Medicine "Pharmacological studies and development of polyherbal formulation for reproductive disorders in animals	ICAR	—	5.73



ONGOING PROJECTS				
14	Outreach Programme on Zoonotic Diseases-Verocytotoxic E. Coli	ICAR	–	7.50
15	AICRP for Epidemiological studies on foot and mouth disease	ICAR	–	7.50
16	FMD Control Programme	ICAR	–	2.00
14	All India network programme on “Diagnostic imaging and management of surgical conditions in animals” (DIMSCA)	ICAR	–	21.10
15	Integrated indigenous cattle centre for conservation and improvement of indigenous milch breeds of cows (Gokul Gram Project)	DADF, GOI	421.00	268.00
16	AICRP on Fodder seed production	ICAR	Voluntary	
20	AICRP on Nutrition and Physiological approaches for enhancing reproductive performance in cattle and buffalo	ICAR	Voluntary	

# PROJECT REPORT

## 1. Outreach programme for ethnoveterinary medicine.

Funding agency: ICAR

### Pharmacological studies and development of polyherbal formulation for reproductive disorders in animals

- ▶ Phytochemical analysis of the methanolic extract of *Eucalyptus robusta* leaves using UP-LC and HPLC assay techniques revealed the presence of 18 different marker compounds; out of which betulinic acid was found to be present in highest concentration, followed by ellagic acid, gallic acid, shikimic acid and quinic acid. But 2,5-Dihydroxybenzoic acid and polydatin were found to be present but below the detection limits.
- ▶ Phytochemical analysis of the methanolic extract of *Polyalthia longifolia* leaves using UP-LC and HPLC assay techniques revealed the presence of 17 different marker compounds; out of which quinic acid was found to be present in highest concentration, followed by shikimic acid, ellagic acid and betulinic acid. But 2,5-Dihydroxybenzoic acid, galocatechin and polydatin were found to be present but below the detection limits.
- ▶ Polyherbal formulation “**Pyodermacare-G**” was found to be very effective against generalized demodicosis as well as bacterial and fungal pyoderma and canines. It has promising antibacterial, antifungal, antiviral and immunomodulatory potential.
- ▶ Possible target(s)/mechanism of action of methanolic extract of *Polyalthia longifolia* leaves against paramyxoviruses, namely peste des petits ruminants virus (PPRV) and Newcastle disease virus (NDV) was studied. At noncytotoxic concentration, the extract was found to inhibit

the replication of PPRV and NDV at the level of viral entry and budding, whereas other steps of viral life cycle such as attachment and RNA synthesis remained unaffected.

- ▶ Marked elevation in the expression of TLR2 in mononuclear cells of dogs with generalized demodicosis in comparison with that of the healthy dogs and dogs with localized demodicosis signifies the potential role of TLR2 in instigation and progression of clinical demodicosis in dogs. Based on our research findings, it may be inferred that there is potential association of TLR2 in pathogenesis and clinical manifestation of canine demodicosis. Hence, our findings evidently suggest possible targeting of TLR2 in treatment of demodicosis in pets.
- ▶ To evaluate the interplay between host innate immune response and *Demodex* mites, mRNA expression profiles of TLR4 and TLR6 mRNA were quantified. The dogs with both localized and generalized demodicosis revealed significantly ( $p < 0.001$ ) diminished TLR4 mRNA expression as compared with healthy controls. However, mRNA expression of TLR6 gene was significantly ( $p < 0.01$ ) diminished in dogs with LD and with GD when compared with the healthy controls. Remarkable alterations mRNA expressions of TLR 4 and TLR 6 genes was not exhibited by the dogs having GD as compared to the dogs with LD. Diminished transcription of TLR4 and TLR6 in peripheral blood in dogs with demodicosis compared with healthy ones corroborates the *Demodex*-induced immunosuppressive hypothesis attributed to clinical disease in dogs. Therefore, down-regulation of TLR4 and TLR6 transcription seen between the demodicosed and healthy dogs groups in our study is indicative of commencement and progression of disease.



## 2. Outreach programme on zoonotic diseases.

### Funding agency: ICAR

#### (a) Prevalence of verotoxic *E. coli* (VTEC) in man, animal products and environmental sources

- ▶ A total of 30 VTEC were isolated in 480 samples in the year 2017-18. The VTEC were found in 25/ 250 in poultry feces, 1/25 in hand swab, utensil swab and litter samples each and poultry products 2/20 in Raw meat. No VTEC was found in Chicken nuggets (20), Egg (40), Poultry feed (25), Water (25), and Surface swab (25).
- ▶ 21 VTEC submitted to NC- VTC, Hisar, 07 unique samples got accession nos. (RR/2017/927-933). 15 genes were submitted to NCBI GenBank, 12 genes accession no. awaited.

#### (b) Sero-prevalence & risk factors associated with brucellosis in bovines in certain areas of Uttar Pradesh

- ▶ A total of 1063 serum samples of Cows & Buffalos were tested for brucellosis from districts Mathura, Hathras, Agra, Aligarh, Kasganj and Firozabad. Out of these, 20 samples were found positive in 260 samples of serum by I-ELISA.
- ▶ 83 Pooled Milk Samples were collected from gaushalas and villagers household of Mathura and nearby areas, 3 samples were found positive for MRT.

## 3. AICRP on FMD and FMD-CP programme.

### Funding agency: ICAR

- ▶ Thirty two districts with more than 2500 sera samples were covered under random sero-surveillance programme during 2017-18.
- ▶ The presence of DIVA positive animals varied from district to district with overall 15.7% positivity.
- ▶ During the year, 8 outbreaks have been reported at different places.

## 4. AICRP on nutritional and physiological approaches for enhancing reproductive performance in cattle and buffalo

### ICAR

#### (a) Effect of Supplementation of *Tinospora cordifolia* on Reproduction and Production Parameters of Peripartum Sahiwal Cows

- ▶ The milk yield and milk composition *viz* fat, protein, lactose, SNF (%) did not vary significantly in control and treatment cows.
- ▶ The DMI (kg, %) and Body weight (kg) do not differ significantly however, the BCS of the giloy treated group was significantly higher than control group.
- ▶ The mean birth weight of calves and the Gestation period did not differ significantly ( $P > 0.05$ ) in giloy supplemented and control group. However, in giloy treated group the days to AI were significantly ( $P < 0.05$ ) lower than control group.
- ▶ The cholesterol, triglyceride and NEFA concentration was significantly lower in giloy treated group. No significant difference was found in blood haemoglobin, PCV, glucose, ALT, AST, total protein and albumin concentration. The significantly higher ( $P < 0.05$ ) TLC, lymphocyte, neutrophil count and FRAP values were found in giloy supplemented cows.

#### (b) To study the effect of Area Specific Mineral Mixture on induction of oestrus in anoestrus cows/buffaloes

- ▶ Out of 24 anoestrus cows, 14 animals reported in estrus at a mean interval of  $59.71 \pm 6.09$  days. The response to treatment for induction of estrus was 58.33 (14/24) per cent.
- ▶ Out of 14 cows inseminated, 11 conceived (78.57) taking an average per service conception of 2 services.

#### (c) To study the effect of By-pass Fat on induction of oestrus in anoestrus cows/buffaloes

- ▶ Out of 8 anoestrus cows, 5 animals reported in estrus at a mean interval of 46.60 days. The response to treatment for induction of estrus was 62.5% (5/8) per cent.



- ▶ Out of 5 animals inseminated, 3 conceived (60%) taking an average per service conception as 1 service.

**(d) To study the effect of two synchronization protocols in induction of estrus in anestrus and repeat breeder cows/ buffaloes**

**Heat Synch protocol**

- ▶ Out of 11 Murrah buffaloes, 2 conceived (2/11=18.18%) at induced estrus. Reoccurrence of estrus was reported in 2 animals.
- ▶ Out of 8 Sahiwal animals, 2 conceived (2/8=25.0%) at induced estrus. Reoccurrence of estrus was reported in 3 animals

**Double synch protocol**

- ▶ Out of 10 Murrah buffaloes, 4 conceived (4/10=40.0%) at induced estrus. Reoccurrence of estrus was reported in 2 animals.
- ▶ Out of 13 Sahiwal animals, 4 conceived (13/4=30.76%) at induced estrus. Reoccurrence of estrus was reported in 3 animals

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

**Funding agency: RKVY**

- ▶ One-day sensitization workshop on “**Silage: Hare Chare ko Sanrakshit Karneki Saral va Upyogi Vidhi**” was on 2/12/2017.
- ▶ Hands-on training for silage preparation was imparted to nearly 350 participants (farmers, livestock owners including women and students) in the workshop. The participants were actively involved in learning the technique of silage making.

**6. Conservation and Genetic Improvement of Muzzafarnagari Sheep for Multiplication of Superior Germplasm**

**Funding agency: Department of Agriculture, Dairying and Fisheries, Govt. of India (DADF)**

- ▶ Muzzafarnagari lambs maintained as nucleus herd at ILFC (DDD Farm) are evaluated at various growth stages like at birth, 3, 6, 9 and 12

months age and their average body weights were 3.51±0.12, 16.09±0.26, 22.19±0.85, 23.89±0.41 and 31.38±0.41 kg, respectively.

- ▶ Continuous efforts are being undertaken to improve the twinning rate in successive years through selective breeding and proper screening of breeding rams responsible for multiple births. The twinning rates at our farm in 2017-18 have been 24%.
- ▶ The size of nucleus flock has been rise upto five times and the total animals in nucleus herd are 259 (120 males and 159 females).

**7. Studies on feasibility of distillery raw or biomethanated spent wash as animal feeds supplement**

**Funding agency: Dhampur Sugar Mills, Bijnor, U.P**

- ▶ Results revealed that feeding of 10% spent wash as cereal replacer in concentrate mixture improved growth performance without any adverse effect in growing heifers.
- ▶ Heifers fed on diet supplemented with 10 and 20 % biomethanated distilleries spent wash had lower plasma urea nitrogen concentration and increased plasma P, total protein and total immunoglobulin concentration. However, increased plasma albumin and glucose concentration was observed in 20 % biomethanated distilleries spent wash fed growing animals. Feeding of 10% biomethanated distilleries spent wash replaced in concentrate mixture with cereals improved growth performance without any adverse effect in growing heifers.
- ▶ A >10% levels of Spent wash supplementation, moisture in concentrate feed become high and balancing of nutrients in spent wash supplemented ration should be taken care off.

**8. Effect of supplementing Herbal Digestive Stimulant with Probiotics on in vitro rumen fermentation and performance of growing indigenous heifers.**

**Funding agency: Indian Herbs, Sharanpur, U.P**

- ▶ From *in vitro* experiments, it was concluded



that Rumaxon pro, both powder and bolus, enhanced rumen microbial activity when compared with control and other treatment groups.

- ▶ Rumaxon pro equivalent to 15g/day dose level of both the form was found more effective and Powder form of Rumaxon pro was found to be more efficient than bolus form.
- ▶ In animal experimentation, Rumaxon-pro @ 15g/day/adult animal in both powder and bolus form was found to be effective for anorexic animals and they regain their feed intake within 2-3 days. Moreover they had growth promoting effect without any adverse effect on blood biochemical parameters.

### 9. Studies on Effects of Prepartal Nutritional Supplements on Production Diseases of Indigenous Transition Cows

#### Funding agency: University funded

- ▶ Remarkable immunological changes, lipid mobilization and alterations in serum metabolites occur in parturient Zebu cows predisposing them to immunosuppression and metabolic alterations for few weeks post-partum.
- ▶ Prepartal immunomodulators and anionic salts supplementations could potentially ameliorate the metabolic and immunological alteration owing to transition stress in parturient Zebu cows.
- ▶ Prepartal supplementation with immunomodulators and ammonium chloride could be one of the best strategies to curb transition induced physiological aberrations and thus production diseases in Zebu cows.

### 10. Effect of different sources of chromium on growth performance, nutrient utilization and blood biochemical in growing calves

#### Funding agency: University Funded

- ▶ Supplementation of Cr picolinate, Cr polynicotinate and Cr yeast did not affect adversely *in vitro* rumen fermentation parameters.

- ▶ Chromium yeast supplementation at 1 ppm dose rate improved DMI and TDN intake without affecting overall growth performance and nutrient utilization of Haryana heifers whereas chromium polynicotinate supplementation improved the potency of insulin while blood cortisol concentration remained unaltered in chromium supplemented animals.
- ▶ 1 ppm dose level of organic chromium source improved nutrient intake and potency of insulin utilization helping in growth promotion of animals.

### 11. Effect of Supplementation of Inorganic and Organic form of Copper on Growth performance, Nutrient Utilization and Blood Parameters in growing cattle

#### Funding agency: University Funded

- ▶ The intake, daily gain, feed:gain ratio, BCS and FCR were not affected ( $P>0.05$ ) by dietary Cu supplementation.
- ▶ The TDN intake and ADF digestibility were significantly ( $P<0.05$ ) higher in both the organic Cu supplemented groups.
- ▶ The intake of Cu was significantly higher ( $P<0.05$ ) in Cu supplemented groups. Thus, supplementation of 8 mg/kg DM Cu (as Cu proteinate, Cu propionate and  $\text{CuSO}_4$ ) had no beneficial effect on growth performance.
- ▶ Higher TDN intake and ADF digestibility in both the organic copper supplemented groups indicated that although organic copper can be a preferred form of supplementation, but chelating agents showed no effect on copper absorption.





## PROJECTS OF POST GRADUATE STUDENTS COMPLETED DURING 2017-18

### List of theses

S. No.	Title of Thesis	Name of the Student	Name of the Guide	Subject
<b>PhD: Veterinary Science</b>				
	Effect of light programme and stocking density on performance of Turkey ( <i>Meleagris gallopavo</i> )	Dr. Rajneesh Sirohi	Prof. P.K. Shukla	Livestock Production Management
2	Growth performance and carcass characteristics of coloured chicken fed on diets containing Azolla ( <i>Azolla pinnata</i> ) and supplemental chromium	Dr. Sandeep Singh Kashyap	Prof. P.K. Shukla	Livestock Production Management
3	Histological and histochemical studies on the skin of prenatal goat ( <i>Capra hircus</i> )	Dr. Prabhakar Kumar	Prof. Ajay Prakash	Veterinary Anatomy
4	Studies on influence of certain blood adipokines and their genetic polymorphism on lactation of Sahiwal cows	Dr. Vijay Pandey	Prof. Rajesh Nigam	Veterinary Biochemistry
5	Comparative studies on effect of antioxidants on plasma membrane and mitochondrial integrity of cryo-preserved bovine spermatozoa	Dr. Akhil Patel	Prof. Atul Saxena	Veterinary Gynaecology & Obstetrics
6	Studies on apoptosis like changes during cryopreservation in Hariana and Murrah bull semen	Dr. Chetna Gangwar	Prof. Atul Saxena	Veterinary Gynaecology & Obstetrics
7	Molecular pathogenesis of enterotoxaemia in neonatal goat kids	Dr. Desh Deepak Singh	Dr. R.V.S. Pawaiya	Veterinary Pathology
8	Immunomolecular studies for diagnosis and characterization of Sarcocystis species in buffaloes	Dr. Amit Singh	Prof. Daya Shanker	Veterinary Parasitology
9	Pharmacological and molecular characterization of TRP channels in buffalo uterine artery.	Dr. Abhishek Sharma	Prof. Satish Kumar Garg	Veterinary Pharmacology & Toxicology
<b>PhD: Biotechnology</b>				
10	A study on assessment of DNA integrity and protamination status of Barbari buck semen.	Deepika Kritaniya	Prof. Sarvajeet Yadav	Biotechnology
11	Molecular characterization and typing of methicillin resistant <i>Staphylococcus aureus</i> (MRSA)	Jayshree	Prof. Sharad Kumar Yadav	Biotechnology
12	Insights into Toll-like Receptors expression and Th1/Th2 cytokines regulation in peripheral blood of dogs with demodicosis	Priyambada Kumari	Prof. Rajesh Nigam	Biotechnology
<b>MVSc: Veterinary Science</b>				
13	Molecular characterization and polymorphic studies of secreted phosphoprotein 1 ( <i>SPP1</i> ) gene in Indian cattle	Dr. Mona Sharma	Dr. S.P. Singh	Animal Genetics and Breeding
14	Residual feed intake as a feed efficiency selection tool and its relationship with ingestive behavior, nutrient utilization and specific blood metabolites in dairy calves	Dr. Anil Kumar Singh	Dr. Muneendra Kumar	Animal Nutrition
15	Growth performance, nutrient utilization and blood biochemicals of heifers supplemented with organic acids	Dr. Santosh Kumar Yadava	Dr. Debashis Roy	Animal Nutrition



S. No.	Title of Thesis	Name of the Student	Name of the Guide	Subject
16	Effect of Neem oil on growth performance of heifers fed urea based diet	Dr Takshi Rehalia	Dr. Vinod Kumar	Animal Nutrition
17	Study of occurrence of differential patterns of genital prolaps in indigenous cows	Dr. Kaushalendra Singh	Dr. Yajuvendra Singh	Livestock Production Management
18	Study of urine, saliva and vaginal mucus discharge as bio-indicator of estrus in dairy animals	Dr. Krishan Kant Dhakar	Dr. Yajuvendra Singh	Livestock Production Management
19	Standardization and shelf life assessment of functional chevon sausages incorporated with essential oils	Dr. Karunakara K. N.	Prof. Vikas Pathak	Livestock Products Technology
20	Development and quality assessment of chicken meat spread	Dr. Tanveer Khanam	Dr. Meena Goswami	Livestock Products Technology
21	Anatomical observations on the centers of ossification in the long bones of appendicular skeleton in prenatal goat ( <i>Capra hircus</i> )	Dr. Avnish Chaudhary	Dr. Archana Pathak	Veterinary Anatomy
22	Observations on the gross anatomical, histomorphological and certain histochemical changes in foetal goat ( <i>Capra hircus</i> ) spleen	Dr. Nishant	Prof. Ajay Prakash	Veterinary Anatomy
23	A study on HSP expression and sperm quality following cryopreservation of Haryana bull semen supplemented with sericine.	Dr. Chhote Lal Yadavi	Prof. Atul Saxena	Veterinary Gynaecology & Obstetrics
24	Functional characterization of voltage gated potassium channels in bull spermatozoa	Dr. Rishi Kumar Gupta	Dr. Vijay Singh	Veterinary Gynaecology & Obstetrics
25	Studies on cryopreservation of Haryana bull spermatozoa in relation to seasonal variation	Dr. Vipin Singh	Dr. Anuj Kumar	Veterinary Gynaecology & Obstetrics
26	Studies on add-on effects of a polyherbal formulation on clinical recovery and immuno-competence of dogs with demodicosis	Dr. Alok Singh	Dr. Shanker Kumar Singh	Veterinary Medicine
27	Clinico-epidemiological, diagnostic and therapeutic studies on bovine trypanosomosis	Dr. Hemant Kumar	Dr. Mukesh Kumar Srivastava	Veterinary Medicine
28	Diagnostic relevance of bovine specific cardiac biomarkers and associated electrocardiographic features of theileriosis in cattle calves	Dr. Kapil Kumar Gupta	Dr. Mukesh Kumar Srivastava	Veterinary Medicine
29	Classico-molecular studies and characterization of rotat 1.2 VSG of <i>Trypanosoma evansi</i> in equines	Dr. Anjali Devi	Prof. Daya Shanker	Veterinary Parasitology
30	Pharmacological and molecular characterization of ion channels, receptors, neurotransmitters and calcium regulatory pathways in uterus and oviduct of water buffaloes ( <i>Bubalus bubalis</i> )	Dr. Pranshu Sharma	Prof. Satish Kumar Garg	Veterinary Pharmacology & Toxicology
31	Studies on endocannabinoid (s) mediated lipid signaling in mouse aorta during early and late phases of sepsis.	Dr. Preeti Singh	Dr. Soumen Choudhury	Veterinary Pharmacology & Toxicology



S. No.	Title of Thesis	Name of the Student	Name of the Guide	Subject
32	Evaluation of ameliorative potential of a-tocopherol and curcumin against cisplatin-induced nephrotoxicity in male Wistar rats.	Dr. Vishwjeet Singh Chandel	Dr. Atul Prakash	Veterinary Pharmacology & Toxicology
33	A study on effect of sericin supplementation on expression profile of heat shock protein genes in spermatozoa before and after cryopreservation of buck semen	Dr. A. Vidya Sagar Reddy	Dr. Brijesh Yadav	Veterinary Physiology
34	Prevalence and antimicrobial resistance of VTEC in Cattle farms (indigenous and exotic), Goats and their environmental sources in Brij region.	Dr. Ravneet Singh	Dr. Udit Jain	Veterinary Public Health
35	Prevalence and antimicrobial resistance of <i>Escherichia coli</i> (VTEC) in pets (dog and cat) and its public health significance in Brij region.	Dr. Usha Bais	Dr. Udit Jain	Veterinary Public Health
36	Excretory urographic and ultrasonographic studies of urinary system in canines ( <i>Canis familiaris</i> )	Dr. Achintya Gowtham	Dr. Sanjay Purohit	Veterinary Surgery and Radiology
37	Clinical studies on ultrasonographic and biometric evaluation of the eye and ocular affections in dog, horse, cattle and buffalo	Dr. Deepak Mani Tripathi	Dr. Vivak Malik	Veterinary Surgery and Radiology
38	Excretory urographic and ultrasonographic studies of urinary system in goats ( <i>Capra hircus</i> )	Dr. Manoj Kumar Verma	Dr. Sanjay Purohit	Veterinary Surgery and Radiology
39	Echocardiographic studies in healthy mongrel dogs	Dr. Prashant Raj Singh	Dr. Vivak Malik	Veterinary Surgery and Radiology
40	Effect of zinc oxide nano particles on the performance of Turkey poults	Dr. Upendra Kumar	Dr. Amitav Bhattacharyya	Department of Poultry Science
41	Influence of graded levels of Shatavari root meal on performance of coloured chicken	Dr. Binay Kumar Yadav	Prof. P.K. Shukla	Department of Poultry Science
42	Effect of feeding Sea buckthorn and Giloe leaf meal on the performance of Turkey poults	Dr. Aditya Sharma	Prof. P.K. Shukla	Department of Poultry Science
<b>MSc: Biotechnology</b>				
43	Purification and characterization of urinary antimicrobial peptides of goat	Vaibhav Tomar	Prof. Rajesh Nigam	Biotechnology

# THESES ABSTRACTS

## PhD

### Colleg of Veterinary Science and Animal Husbandry

#### 1. Effect of light programme and stocking density on performance of Turkey (*Meleagris gallopavo*)

A study was conducted to find out the optimum lighting programme and SD during different seasons for the turkeys as a meat bird. In the first experiment day old turkey poults were procured from Central Avian Research Institute, Izatnagar, Bareilly, and distributed randomly on the basis of uniform body weight in to the three treatments, T-1: The birds were subjected to conventional lighting programme (16L: 8D), T-2: The birds were subjected to continuous lighting programme (24L: 0D), T-3: The birds were subjected to intermittent lighting programme (16L:3D:2L:3D). It was found that the average weekly body weights were numerically higher for the birds reared in continuous light. The FCR during the phase of 1-8 week and the overall FCR was significantly better ( $p<0.05$ ) in continuous lighting programme than conventional and intermittent lighting programmes. No significant difference was observed among the treatments for the biochemical and haematological attributes. Total immunoglobulins and mercaptoethanol sensitive (IgM) antibody titer ( $\log_2$ ) values in response to SRBC were found to be significantly higher ( $p<0.05$ ) in continuous lighting programme than intermittent lighting programme. Further, mercaptoethanol resistant (IgG) antibody titer, cell mediated immune response and the spleen weight as % of live weight did not differ significantly among the treatment groups. Percent dressing yield of the birds reared in continuous and intermittent lighting programme was found to be significantly higher ( $p<0.05$ ) than that of the birds reared in conventional lighting programmes. No significant difference was found among the treatment groups for other carcass traits and individual cut-up parts

and development of gastrointestinal tract. The birds reared under continuous lighting programme displayed significantly lesser behaviors than the birds reared under other lighting programmes and were less active. Average femur ( $p<0.01$ ) and tibia ( $p<0.05$ ) weights were significantly higher in continuous lighting programme than conventional and intermittent lighting programmes. There were no significant differences in radiographic density of femur and tibia, walking ability and the dimensions of the eye ball, tonic immobility duration among three lighting programmes.

The continuous light was selected as best lighting program on the basis of the results of first experiment. The second experiment was performed to find out the optimum SD of turkeys during winter. Day old turkey poults were distributed randomly on uniform body weight basis in the treatment groups- T-1: The birds were subjected to standard SD (2.5 ft<sup>2</sup> per bird), T-2: The birds were subjected to high SD (1.25 ft<sup>2</sup> per bird), T-3: The birds were subjected to low SD (5 ft<sup>2</sup> per bird). It was found that at 12 weeks of age, average body weight was significantly higher ( $p<0.01$ ) in high SD than the other two SD treatments. No significant differences were found in FCR. Cholesterol level in low SD was significantly higher ( $p<0.05$ ) than standard SD. No significant difference was observed between treatments for the other biochemical and haematological attributes as well as for the umoral and cell mediated immune response and various carcass traits. Average spleen weight and average percent liver weight were found to be significantly higher in standard SD than other two SD treatments. Average percent gizzard weight was significantly higher ( $p<0.05$ ) in low SD than high SD. Average proventriculus weight and average small intestine weight were found to be significantly higher ( $p<0.05$ ) in standard and low SD treatments than high SD treatment. Average small intestine length and average large intestine length were



significantly more ( $p < 0.01$ ) in low SD than other two SD treatments. Average cecal length was found to be significantly more ( $p < 0.01$ ) in standard and low SD treatments than high SD treatment. The birds reared under high SD treatment displayed significantly lesser behaviors than the birds reared under low and standard SD treatments. These birds were displaying significantly higher standing behaviour than the other two treatments. Average femur weight and average tibia weight were found to be significantly higher ( $p < 0.05$ ) in high SD group than the other two treatments. Average femur medulla thickness was found to be significantly higher ( $p < 0.05$ ) in standard SD treatment than low SD treatment. Average tibia cortex thickness was significantly higher ( $p < 0.01$ ) in standard and high SD treatments than the low SD treatment. Further, no significant difference was found in bone parameters and radiographic density of femur and tibia, gait score and tonic immobility among the three SD treatments.

The third experiment was conducted on the lines of 2nd experiment in summer. It was found that average weekly body weight during the experiment, FCR were not significantly affected among the three SD treatments. No significant differences were found between the three SD treatments for the serum biochemical parameters, haematological attributes and humoral immune response. Cell mediated immune response was found to be significantly higher ( $p < 0.01$ ) in high and low SD treatments than standard SD treatment. No significant difference was found in different SD treatment in summer season for the spleen weight as percent of live weight, carcass traits and individual cut-up parts. Average small intestine length was found to be significantly higher ( $p < 0.05$ ) in standard and low SD treatments than high SD treatment. Average caecal length was found to be significantly higher ( $p < 0.05$ ) in low SD treatment than high SD treatment. However, there was no significant difference in the other digestive organs of turkeys reared in different SD. The birds reared under high SD treatment displayed significantly lesser behaviors than the birds reared under low and standard SD treatments. These birds were displaying significantly higher standing behaviour than the other two treatments. Average femur length was

found to be significantly higher ( $p < 0.01$ ) in standard and high SD treatments than the low SD treatment. Radiographic density of Tibia medulla was found to be significantly higher ( $p < 0.01$ ) in low SD treatment than the other two SD treatments. The gait score at 8 weeks was found to be significantly different ( $p < 0.05$ ) for three SD treatments being highest in standard SD followed by high SD and least for low SD treatment. Tonic immobility duration exhibited by turkey poult during summer did not differ significantly among the treatments. Therefore the intensive turkey farming with continuous light and high SD (1.25 ft<sup>2</sup> per bird) / (0.116 m<sup>2</sup> per bird) / (8.625 birds per m<sup>2</sup>) / (0.8 birds per ft<sup>2</sup>) can be taken as commercial enterprise without compromising the welfare of birds.

## **2. Growth performance and carcass characteristics of coloured chicken fed on diets containing azolla (*Azolla pinnata*) and supplemental chromium.**

A study was conducted to find out the optimum inclusion level of *Azolla pinnata* (powder or raw form) and supplemental level of chromium picolinate and the effect of their interaction on production performance, immune response and carcass characteristics of coloured chicken. Three experiments were conducted on straight run Chabro chicks from day old to 8 weeks of age. In each experiment 120 day old chicks were distributed randomly on the basis of uniform body weight in to the four treatments groups. The first experiment was conducted to assess the performance of coloured chicken on the raw and or the powder form of *Azolla pinnata*. Treatment diets were T1-basal diet, T2- basal diet +5% *Azolla* meal, T3- basal diet (+Raw *azolla* after 4 weeks) and T4- basal diet +5% *Azolla* meal (Basal diet + Raw *azolla* after 4 weeks). Average weekly body weight of the birds fed with T2 was found significantly or apparently better. The FCR during starter phase and 0-8 weeks (overall) was apparently better in the treatment group T2. Significantly higher ( $P < 0.01$ ) TLC, Heterophil, eosinophil, lymphocyte and monocyte count in T2 was recorded. No significant effect of feeding *azolla* on plasma protein, albumin, creatinine, uric acid, cholesterol, SGPT and ALP. The mean values observed in triglycerides and SGOT for T2, T3 and



T4 were significantly higher than ( $P < 0.01$ ) the T1. Response to 1% SRBC ( $\log_2$  titre) and cell mediated immune response to PHA-P was apparently better in T2. No significant differences in slaughter traits were recorded, only significant increase ( $P < 0.05$ ) was observed in the per cent gizzard weight in azolla fed groups. Calcium content in breast meat was apparently or significantly higher ( $P < 0.05$ ) in T2 and T4 groups. The second experiment was performed to find out the optimum supplemental level of chromium picolinate supplementation from 0, 400, 800, 1600 ppb. No significant differences on the average weekly body weight and body weight gain of coloured chicken were recorded during the course of the experiment. There was no significant difference in the average weekly feed consumption of the chicks in the duration of the experiment from first to the sixth and in eighth week. Significantly better ( $P < 0.05$ ) FCR was found at the end of third week in T1, T3 and T4 groups. Further, no significant differences were recorded in the FCR in starter and finisher phases and in overall FCR. Lymphocyte count in T2, T3 and T4 groups was significantly higher ( $P < 0.01$ ) and Monocyte count in T3 was significantly higher ( $P < 0.01$ ) than the other groups. However, the T2 and T4 groups were having apparently higher monocyte count than the control. The H.L. ratio revealed a non significant decreasing trend with increase in CrPic supplementation level. Values for triglyceride and cholesterol in control group were significantly higher ( $P < 0.01$ ) than the CrPic supplemented groups. Response to 1% SRBC ( $\log_2$  titre) and cell mediated immune response to PHA-P (foot web index) were apparently better in T3 group. No significant differences were recorded in slaughter traits, cut-up-parts and gastrointestinal tract development traits except in large intestine weight among the treatment groups, lowest weight for large intestine was found in T4. Crude protein content in breast meat were significantly higher ( $P < 0.01$ ) than the control group and ether extract content recorded apparently lower levels in CrPic supplemented groups. Whereas, in thigh meat significantly higher ( $P < 0.01$ ) crude protein and phosphorus content for CrPic supplemented groups but with significantly lower ( $P < 0.01$ ) ether extract levels were recorded. The third experiment was performed to assess the effects of the interaction

of the best inclusion level of azolla in experiment no. 1 and the best performing supplemental level of chromium picolinate in experiment no. 2. Thus the treatment diets were T1-basal diet, T2-5% of basal diet replaced with azolla meal, T3-basal die+800 ppb CrPic and T4-basal die +5% azolla meal + 800 ppb CrPic. It was observed that the weekly body weight and body weight gain of the coloured chicken in T4 was found to be higher than the control group in nearly all the weeks whether significantly or apparently. T4 recorded significantly highest weekly feed consumption up to ghird week. Thereafter this trend was also observed in most of the weeks. No significant difference in the weekly, starter and finisher phases and overall FCR was recorded. At the end of fourth week the group T4 recorded significantly highest nitrogen balance. No significantly higher ( $P < 0.05$ ) Hb was recorded in T2 group followed by T4, significant differences ( $P < 0.01$ ) were recorded in heterophil, recorded. Serum triglyceride was found highest in T2, followed by T1 and thereafter T4 group. values of IgG were found to be significantly higher ( $P < 0.01$ ) in T4 group CrPic supplemented groups gained significantly higher ( $P < 0.01$ ) higher foot web index than the control group. The total antibody titre and cell-mediated Immunity was found highest in T4 whereas IgM value in T4 was lying in-between the responses of T2 and T3 groups. No significant differences in slaughter traits, cut-up-parts and development of digestive organs at eight weeks of age amount the treatment groups were recorded. Significant ( $P < 0.01$ ) alleviation in the crude protein content of breast and thigh meat in both the chromium supplemented groups was noted. The average mean values recorded for crude fat content of breast were reduced in all the chromium provided groups and this reduction was significant ( $P < 0.01$ ) in thigh meat.

### **3. Histological and histochemical studies on the skin of prenatal goat (*Capra hircus*).**

The histological and histochemical studies were conducted on the skin of 36 healthy and normal goat embryos/ foetuses of either sex at different stages of gestation. The approximate age of each embryos/ foetuses was estimated and the material was grouped into I (0-50 days), II (51-100) and III (101-



till term). Small pieces of skin tissues were collected and processed from eight different body regions namely chin, face, neck, shoulder, back, abdomen, flank and thigh for histological and histochemical studies. Paraffin sections were stained by various staining methods to study histoarchitecture and histochemical reactions of the tissues. The epidermis of goat embryo appeared as a single layer of spindle shaped cells at 23 days of gestation which had undergone the stratification process. The periderm, stratum spinosum, stratum granulosum, stratum corneum and stratum disjunction appeared first on 32, 51, 56, 70 and 106 days gestation, respectively. The melanocytes and melanin granules (56 days), Langerhans cells (114 days) and Merkel cells (118 and 94 days) were found in stratum basale and follicles, stratum spinosum and stratum basale and sinus hair follicles, respectively. At 23 days of gestation the subepithelial tissue contained undifferentiated mesenchymal cells with scanty ground substance. In later stages of gestation the mesenchymal cells differentiated into fibroblast (38 days). The mast cells were first appeared at 43 days of gestation in the dermal tissue. The reticular, collagen and elastic fibers were first observed at 42, 75 and 87 days of gestations, respectively in chin region and subsequently became matured and found in abundance in other regions. The arrector pili muscle started appearance in face region at 87 days gestations and they were fully developed at 118 days of gestation. Hair follicles first noticed in the head region epidermis at 46 days of gestation and at 56 days in chin region. Hair follicles observed in all regions of the study from 70 days gestation. These passed through pregerm, hair placode, hair plug, hair papilla, early hair cone, hair cone, hair formation, hair in hair canal and emerging hair stages. Differentiation of inner and outer root sheaths of hair follicles began at 102 days when the follicles were in hair cone stage. At 106 days the inner root sheath was well differentiated consisting of inner cuticle layer, middle Huxley's layer and outer Henle's layer. From 131 days gestation hair began to emerge out and near term fully formed hairs from the hair follicles projected over the epidermal surface. Sinus hair follicles were confined to chin region and noticed first time at 75 days; these contained blood sinuses in their dermal sheath.

Encapsulated nerve endings and Merkel cells were encountered in external dermal sheath and outer root sheath, respectively. Only sebaceous glands and skeletal muscles were observed in association with these follicles. The sweat glands primordia were observed at 84, 87 and 94 days in chin, face and all body regions, respectively. Canalization of these glands started in chin and face regions at 94 days and in all body regions from 106 days gestation. The coiling of the terminal part of these glands began at 102 days gestation in chin region and from 145 days gestation in all body regions. Myoepithelial cells in the terminal part of gland were noticed from 102 days gestation. Sebaceous glands arose from peripheral parts of ordinary hair follicles, outer root sheath of sinus hair follicles and also directly from epidermis at 102, 102 and 108 days gestations, respectively. Epidermis showed moderate to intense PAS and AMPS reactions. Intense reaction for bound lipids was limited to stratum corneum. The nuclei of the cells of epidermis showed intense reaction for DNA. The epidermis revealed mild acid phosphatase reaction near term. The dermal tissue showed faint to moderate reaction and moderate to intense reaction for PAS and AMPS, respectively. The dermal tissue showed intense reaction for glycogen in early stages of gestation. The glycogen granules were observed in the skeletal muscle of chin region from 118 days gestation. The dermal tissue showed mild to moderate acid and alkaline phosphatase reactions. Peripheral part of hair follicles showed PAS positive granules in mid and late gestation periods. The dermal sheath of hair follicles showed moderate to intense reactions for AMPS during late stages of gestation. The glassy membrane of sinus hair follicles showed moderate to intense reaction for PAS and their dermal sheath showed moderate to intense reactions for AMPS. The margin of the cells of sebaceous glands showed highly intense reaction for bound lipids. The averages thickness of skin, epidermis and dermis were  $477.49 \pm 8.06 \mu\text{m}$ ,  $26.64 \pm 0.38 \mu\text{m}$  and  $450.5 \pm 7.95 \mu\text{m}$ , respectively. The single cell layered epithelial covering of goat embryo differentiated and attained structural complexities to form well differentiated epidermis with the advancement of gestation age. The maximum growth of epidermis took places in the mid prenatal period and all the four strata got

differentiated in this period. The dermal tissue was delicate and cellular type in early gestation. In mid prenatal period it had areolar and dense irregular connective tissues. Finally it transformed into dense irregular connective tissue in late gestation.

#### **4. Studies on influence of certain blood adipokines and their genetic polymorphism on lactation of Sahiwal cows.**

The present investigation was performed to elucidate the influence of periparturient period (-30 to +90 days), stage of lactation (early, mid and late lactation) and parity (first, second and third) of animals on circulating levels of adipokines and other biochemical indices (hormones and metabolites) and genetic polymorphism in adiponectin (ADIPOQ) and resistin (RETN) genes and their association with production and reproduction traits in Sahiwal cows.

Blood samples were collected from 6 pregnant Sahiwal cows from -30 days prepartum to +90 days postpartum at 15 days interval and from six animals each of first, second and third parity in their early (30th day), mid (90th day) and late (200th day) lactation for biochemical study while from >70 lactating cows for studying genetic polymorphism in ADIPOQ and RETN genes. Biochemical study in periparturient cows revealed sharp decrease in plasma levels of ADIPOQ, LEP, progesterone, TG, cholesterol, HDL, proteins and Ca from pregnancy to parturition and thereafter gradual increased to prepartum levels. The circulating levels of RETN, estrogen, urea and NEFA increased from pregnancy to parturition and subsequently reduced to prepartum levels. During periparturient period, ADIPOQ levels showed positive association with LEP and lipid profile while negative association with estrogen, NEFA and creatinine while levels of RETN revealed positive association with estrogen, NEFA and creatinine while negative association with LEP and lipid profile.

Association studies of ADIPOQ-I/TsAI PCR-RFLP assay revealed significant influence of genotypes on CI, LP, TMY and DRPY. ADIPOQ-II/RsaI PCR-RFLP assay showed monomorphic pattern in Sahiwal cattle due to absence of restriction site for RsaI restriction enzyme at specific location in ADIPOQ-II gene. Association studies of RETN-I

/SSCP assay revealed significant influence of genotypes on LP, AMY, MY300 and PY. Association studies of RETN-II /SSCP assay revealed significant influence of genotypes on BW, DP and LP. In conclusion, SNP identified in ADIPOQ and RETN genes suggests that these genes might serve as candidate genetic marker for selection of Sahiwal cattle with better milk yield. However further studies are needed to explore SNPs in other regions of these genes, and validation of these markers in another breed and population and their association with other production traits required to be verified.

#### **5. Comparative studies on effect of antioxidants on plasma membrane and mitochondrial integrity of cryopreserved bovine spermatozoa.**

This experiment was designed to compare the effect of two different antioxidants i.e. (a) 2.50 % Iodixanol (v/v) and (b) 1 mM BHT on plasma membrane and mitochondrial integrity of cryopreserved bovine spermatozoa. For this purpose, ejaculates were collected from four Haryana bulls using artificial vagina at biweekly interval. The semen sample which possesses more than 70 % progressive motility and concentration above 600 millions spermatozoa/ml, was subsequently subjected for processing to LN2 vapour freezing. The fresh ejaculate was divided into three parts. The first part was extended with EYTG (control), the second part with EYTG + 2.50 % Iodixanol (v/v) (Treatment 1) and third part with EYTG + 1mM BHT (Treatment 2). At different stages of freezing (After dilution, Pre-freezing) and following thawing, semen was evaluated for per cent live spermatozoa, per cent progressive motility, per cent spermatozoa with intact acrosome, per cent HOS reactive spermatozoa, per cent spermatozoa with high mitochondrial membrane potential, percent uncapacitated spermatozoa, per cent capacitated spermatozoa and percent acrosome reacted spermatozoa. Addition of antioxidants had resulted in a significant improvement in all the parameters under study compared to control group. Amongst the antioxidants, BHT proved significantly better compared to Iodixanol in preserving the different parameters under study. Thus use of 2.5% Iodixanol & 1 mM BHT can be successfully used in cryopreservation of Haryana bull semen.





## 6. Studies on apoptosis like changes during cryopreservation in Haryana and Murrah bull semen.

The present study was conducted to evaluate the effect of semencryopreservation on the various cryodamages or apoptotic changes that occur in sperm plasma membrane, acrosomal membrane (capacitation like changes) and mitochondrial membrane. For the study four Haryana and two Murrah bulla were used as semen donor, and semen was collected twice a week interval through artificial vagina. A total of (n=32) ejaculate from each Haryana bull and 10(n=20) ejaculate from each Murrah bull were collected. The study evaluated the physical, functional and structural attributes of semen like motility, viability, membrane integrity, acrosomal integrity, mitochondrial activity, capacitation like changes, apoptotic changes and sperm morphometry in fresh and frozen thawed semen. Semen evaluation at fresh, post equilibration and post-thaw showed that there was significant ( $p < 0.05$ ) decrease in progressive motility, viability, acrosomal integrity, plasma membrane integrity and head size and a significant ( $p < 0.05$ ) increase in capacitated, acrosome reacted and moribund spermatozoa after cryopreservation in Haryana bull. These parameters were more pronounced in Murrah bull semen. Supplementation of reduced Glutathione in Murrah bull semen revealed a significant ( $P < 0.05$ ) increase in motility, viability, membrane integrity, acrosomal integrity and significant ( $P < 0.05$ ) decrease in capacitated reacted and apoptotic sperm in Glutathione treated group as compared to control group at post thaw stage. Further, GSH supplementation significantly increased the percentage of spermatozoa with high transmembrane mitochondrial potential. The result of the present study clearly demonstrated that freeze thaw inflicts apoptotic changes in Haryana and Murrah bull spermatozoa and supplementation of GSH in the semen of Murrah bull reduces the apoptotic changes, which will be helpful for long term preservation of semen.

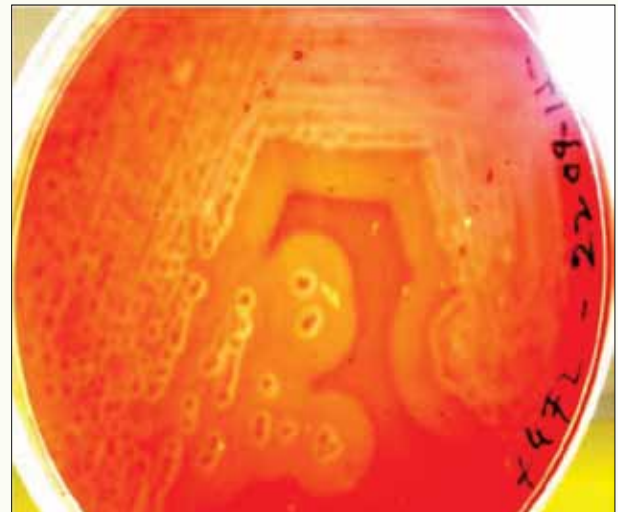
## 7. Molecular pathogenesis of enterotoxaemia in neonatal goat kids.

In this study, a total population 1156 neonatal goat kids were examined for clinical diarrhoea

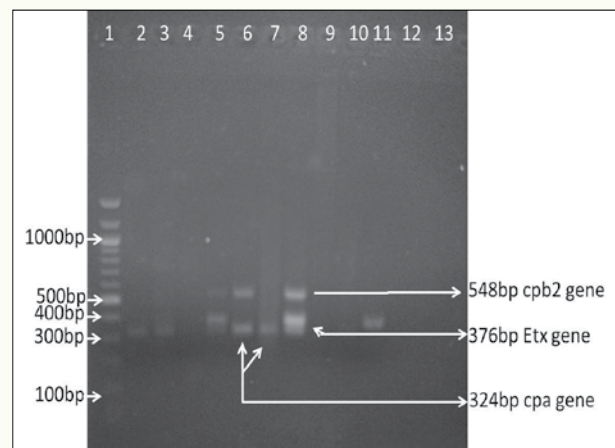
and 134 necropsied were examined for enteritis, pneumo-enteritis, tapeworms/round worm infestations and septicemia, suspectedly died due to enterotoxaemia from January, 2015 to December, 2016. A total of 238 diarrhoeic fecal and 84 intestinal loop samples were collected from ICAR-CIRG, Makhdoom, Mathura (UP) and spontaneous outbreaks of Uttar Pradesh and Rajasthan States of India. Isolation, identification and molecular detection of toxinotypes of *Clostridium perfringens* were performed in 238 diarrhoeic samples and 84 intestinal loop samples for confirmatory diagnosis of enterotoxaemia. Diarrhoeic samples and intestinal contents were used for isolation in Robertson cooked meat media (RCMM) and subsequently inoculated in 5% defibrinated sheep blood brucella agar with vitamin K1, hemin and selective clostridial supplements (CLS-BBA) and egg yolk agar (EYA) under anaerobic conditions. Toxinotyping were done by multiplex PCR using toxin genes viz., cpa, cpb, cpb2, etx and iap. After confirmatory diagnosis, molecular characterization for different isolates was done by PCR cloning and gene sequencing. The etx-full gene cloned in TA vector for various field isolates were sequenced by using Bigdye® terminator v1.1 cycle sequencing kit (Applied biosystems). Phylogenetic analysis was conducted by minimum evolution tree analysis. Experimental study using characterized isolate (CIRG-1816) was undertaken to study molecular and gene expression profiles. The inoculum was prepared in RCMM and culture supernatant (CS) containing epsilon toxin was trypsinized and titrated in mouse. Twenty male Jakhrana goat kids of 0-3 month's age weighing 9-12 kg were divided in four equal groups (n=5). Group I was treated with CS, group II with washed cells (WAC), group III with whole culture (WC) and group IV with only RCM medium (control). By laparotomy, 20% starch solution was infused into abomasum and 300 ml of inoculum into duodenum. Treated animals were kept under observation for 24 hrs. All kids treated with CS, WAS and WC, showed diarrhoea. Affected kids were euthanized and necropsied to observe the gross pathological changes and suitable samples were collected to confirm pathogen's presence at predilection site. *C. perfringens* type D was further confirmed by

cultural and molecular methods. Expression profile of inflammatory genes IL-1 $\beta$ , IL-2 and TCF-20 was studied in intestinal tissues to understand molecular pathogenesis by implying qRT-PCR. GAPDH gene (housekeeping gene) was used as control for comparing expression. Tissue samples collected from spontaneous as well as experimental cases of enterotoxaemia were subjected to histopathology and immunohistochemistry. In RCMM, gas production was observed along with turbidity, while Gram's staining showed stumpy or slender Gram positive rods with truncated or plummy ends. On CLS-BBA, greyish, rounded raised or flat colonies with double zones of hemolysis and on EYA, opalescence indicative of lecithinase activity were observed. The incidence percentage (%) of *C. perfringens* in diarrhoeic samples and necropsied kids was 15.13% and 27.38%, respectively. In clinically ill animals, 75% isolates of *C. perfringens* were toxinotype A and 25% were toxinotype D. In necropsied cases, 47.83% isolates were toxinotype A and 52.17% were toxinotype D, indicating that the epsilon toxin was principal virulence factor for pathogenesis of enterotoxaemia in goats. The gene encoding  $\beta$ 2-toxin (*cpb2*) was present in 61.11% of diarrhoeic and 30.43% of necropsied kids suggesting its virulent association with clinical diarrhoea. Pathologically in goat kids, lesions occur mostly in distal portion of ileum with additional involvement of lung, kidney and brain to variable extent. The *etx* full length gene cloning and sequencing revealed point mutation (silent) CIRG 1816 and CIRG 3716 isolates compared to IVRI Vac1 reference strain. No antigenic (phenotypic) changes were found in our strains in comparison to IVRI Vac1 reference strain. Culture supernatant containing activated  $\epsilon$  toxin experimentally induced diarrhoea in kids in the shortest period (12-14 hrs. post inoculation) followed by whole culture containing live bacteria and  $\epsilon$  toxin (18-19 hrs. post inoculation) and live bacteria (washed cells) (21-24 hrs. post inoculation). Experimentally induced ET in kids of all three groups showed major pathological lesions of congested ileum, necrosis of villi epithelium and emphysema of lungs. Presence of epsilon toxin was demonstrated by immunohistochemistry. Gene expression study revealed the highest expression

of IL-1 $\beta$  in spontaneous enterotoxaemia followed by experimental ET produced by activated  $\epsilon$  toxin which suggested severe inflammatory process of the disease and may act as a promising biomarker of acute ET disease. The mRNA expression of IL-2 gene was highest in field outbreaks followed by washed bacterial cells which indicated significance of the bacterial moiety in the clinical infection. Down regulation of TCF-20 gene in experimental and natural ET suggested that the toxin or other component of *C. perfringens* is involved in damaging the normal cellular functions during the ET pathogenesis.



**Fig.** *C. perfringens* isolate from diarrhoeic fecal sample with double hemolysis in clostridium supplemented blood agar with flat, white spreading colony morphology.



**Fig.** Gel picture showing the multiplex toxinotyping PCR with various amplicons of genes including *cpa*, *etx* and *cpb2* in diarrhoeic fecal samples of neonatal goat kids. **Row 1)** 100bp ladder; **row 2, 3, 6, 7)** alpha toxin gene with an amplified 324bp amplicon; **rows 5, 8, 11** showing epsilon toxin gene with 376bp product; **row 5, 6, 8** showing beta two toxin gene amplicon with a size of 548bp and **row 9, 10, 12, 13** are negative samples.



Fig. Intestine: severe congestion and hemorrhages in GIT due to septicemia found during necropsy of neonatal goat kid died due to enterotoxaemia in spontaneous outbreak.

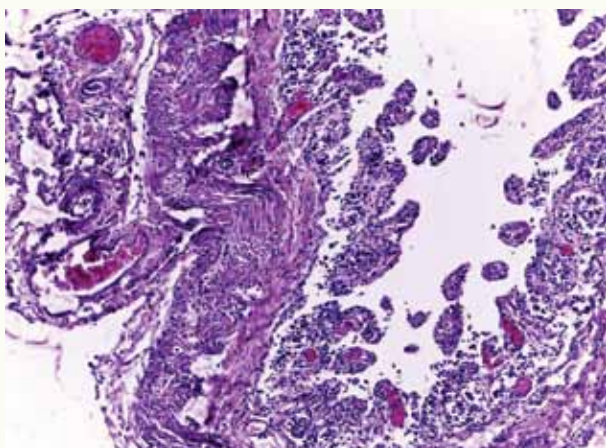


Fig. Intestine: marked congestion, degeneration and necrosis, shortening along with detachment of villi from mucosal epithelium in intestine of enterotoxaemia affected goat kids (H&E, x100).

## 8. Immunomolecular studies for diagnosis and characterization of *Sarcocystis* species in buffaloes.

A study was conducted for the diagnosis and molecular characterization of *Sarcocystis* species in buffaloes. Representative tissue samples (oesophagus, tongue, heart and diaphragm) and blood samples were collected from each of the 160 buffaloes slaughtered at local slaughter house of Mathura. Sera was extracted from the blood samples for western blot analysis and antibody detection enzyme immunoassay whereas tissue samples were subjected to macroscopic and microscopic examination (muscle squash method and pepsin digestion method) for the detection of *Sarcocystis* infection. Isolated cysts and bradyzoites were stored in alcohol for DNA isolation to be used later

for molecular identification of species. Cysts and bradyzoites were also stored in phosphate buffered saline for antigen preparation. For histopathological observations, positive tissue samples preserved in 10% neutral buffered formalin were used. Overall prevalence, pattern of distribution of infections in organs as well as sex wise occurrence of disease was recorded. Tissue examination revealed overall prevalence of 56.25% as 90 out of 160 buffaloes were detected with cysts/bradyzoites in tissues. Microscopic examination detected more number of animals (54.37%) than the macroscopic examination (33.75%) positive for *Sarcocystis* infection. No significant difference in the occurrence of the sarcocystosis was found between males (53.84%) and females (56.71%). Organ wise, maximum infection was in oesophagus (56.25%) followed by tongue (14.32%) and diaphragm (4.3%). However, no cysts were detected in cardiac tissues. Species identification was done by morphometry and micrometry measurement. Macroscopic size cysts were fusiformis, spindle and globular in shape. The mean (Mean  $\pm$  S.E.) length and width of the macroscopic size cysts was 6.6mm  $\pm$  0.70mm and 1.75mm  $\pm$  0.10mm, respectively whereas that of bradyzoites liberated from the crushed macroscopic cysts, mean length and width was 13.35 $\mu$ m  $\pm$  0.34  $\mu$ m and 4.17  $\mu$ m  $\pm$  0.06  $\mu$ m, respectively. Mean length and width of the microscopic size cysts and the bradyzoites released from it was 811.55  $\mu$ m  $\pm$  14.10  $\mu$ m x 79.8  $\mu$ m  $\pm$  4.17 $\mu$ m and 12.55  $\mu$ m  $\pm$  0.26  $\mu$ m x 3.88  $\mu$ m  $\pm$  0.047  $\mu$ m, respectively. Bradyzoites recovered by pepsin digestion measured 11.68  $\mu$ m  $\pm$  0.22 $\mu$ m in length and 4.05  $\mu$ m  $\pm$  0.066 $\mu$ m in width. By morphometry and micrometry analysis, macroscopic and microscopic like cysts appeared to be *Sarcocystis* fusiformis which later got confirmed by molecular study. Histopathological analysis showed thin walled cysts with mild infiltrations of the inflammatory cells with mild loss of striations of muscle fibrils. For genetic confirmation, 18S rRNA gene was amplified by species specific set of primers and the amplified products (approximately, 900bp) of one macroscopic cysts, two microscopic cysts and one minute bradyzoites pellet were subjected to gene sequencing and RFLP for species identification. Two *S. fusiformis* specific fragments of approximately 768bp and 99bp were seen in all the four PCR



products after digestion with RE (Dra1). Out of four, gene sequencing results obtained successfully for one macroscopic, one microscopic and one pellet of bradyzoites which were then submitted in NCBI to receive accession number (Mathura 1 isolate: accession no. MF508604; Mathura 3 isolate: accession no MF508605; Mathura 4 isolate: accession no: MF508606). Genes of Mathura isolates were aligned with seven published sequence of *Sarcocystis* spp. taking *Neospora caninum* and *Theileria annulata* as outgroups. Three isolates of Mathura showed more than 99% homology in nucleotide sequence among themselves. Comparison of Mathura isolates with other strains of *S. fusiformis* showed 97-98% similarity in nucleotide sequences with Indian strain (accession number: JQ713824), Egyptian strain (Accession number- KR186117), Sweden strain (accession no- U03071) and China strain (accession number-U03071). Multiple alignments of genes of all the isolates of *S. fusiformis* including three of Mathura origin showed that the 18S rDNA gene sequence varied by single nucleotide polymorphisms and indels. Phylogenetic study showed Mathura isolates of *S. fusiformis* closer to five previously reported *S. fusiformis* strains (accession number-JQ713824, KR186117, KR 186130, U03071, AF 176927). Hence, the molecular study showed the presence of only *S. fusiformis*. After species confirmation, WCL antigen of *S. fusiformis* was prepared for protein profiling and antibody detection enzyme immunoassay. Hyperimmune serum was raised against this WCL antigen in Wistar rats. Out of 12 major polypeptides (78, 66, 53, 50, 42, 39, 32, 29, 27, 24, 19 and 15 kDa) resolved by SDS-PAGE, six (32, 39, 42, 53, 66, 78kDa) with HIS and only two (53 kDa and 66 kDa) with pooled positive serum were found immunoreactive by western blot analysis. None of the polypeptides showed reactivity with pooled known negative serum. Whole cyst lysate antigen based ELISA detected antibodies of sarcocystosis in 102 (63.75%) serum samples with 88.88% sensitivity and 68.57% specificity. Therefore, antibody ELISA employing WCL antigen was found with moderate sensitivity and specificity despite detecting more number of positive animals than tissue examination. In the present study, *S. fusiformis*

was the only species encountered as confirmed by molecular and morphological examination. So, molecular characterization tools were found useful in identifying or confirming the species.

### **9. Pharmacological and molecular characterization of TRP channels in buffalo uterine artery.**

Present study was undertaken to unravel the underlying signaling mechanisms of GSK-induced vaso-relaxation in uterine artery of non-pregnant buffaloes. GSK1016790A-induced vaso-relaxation in non-pregnant buffaloes collected from the local slaughter house. Passive tension and pre-contractile agonists studies revealed that, endothelin 1 was the best effective spasmogen and 2 gm passive tension was optimum for uterine arterial rings in MKHS. Following an equilibration period of about 1 hr, uterine arterial rings were pre-contacted with 60 mM KDS and thereafter pre-contracted with endothelin 1 to check endothelium intactness by using acetylcholine. Acetylcholine-induced relaxation was endothelium-dependent (65-70 %) and relaxation was almost comparable both in the uterine artery of non-pregnant and early-pregnancy stage buffaloes. SNP-induced vaso-relaxation was found to be significantly different in the endothelium-intact and endothelium-denuded uterine arterial rings of non-pregnant and early-pregnancy stage buffaloes and was faster in denuded uterine artery compared to that with intact-endothelium but the effect of SNP in the presence L-NAME was similar to following denudation of endothelium. Activation of TRPV4 channels with the selective agonist GSK caused fast relaxation in endothelium-intact than in endothelium-denuded buffalo uterine artery rings and the TRPV4 channel selective antagonist HC067047 significantly attenuated the vasodilator response to GSK. Interestingly, GSK-induced maximal relaxant response ( $R_{max}$ ) was almost similar in both endothelium-intact and endothelium-denuded uterine arterial rings but the potency of GSK was significantly higher in endothelium intact uterine artery. In uterine artery of buffaloes with endothelium, inhibition of nitric oxide synthase by L-NAME or inhibition of soluble guanylate cyclase (sGC) by ODQ did not attenuate the vasodilator response to GSK. These



observations suggest that NO/sGC pathway does not contribute significantly in TRPV4 channel-mediated endothelium-dependent relaxation in buffalo uterine artery. Rather, it was very interesting to note that following inhibition of NO synthase by L-NAME (300  $\mu$ M) the vasodilator response to GSK was significantly potentiated compared to that of GSK alone. Indomethacin, an inhibitor of cyclooxygenase, significantly attenuated (35 %) the endothelium-dependent vaso-relaxant effect of GSK but significantly potentiated when the tissues were pre-incubated with L-NAME plus indomethacin. Compared to the DRC of GSK in the presence of L-NAME and indomethacin, the DRC of GSK was significantly shifted towards right in the presence of L-NAME + indomethacin + apamine + TRAM-34 but the DRC was significantly shifted towards left when compared with the DRC of GSK in the presence of indomethacin alone. In the presence of indomethacin + apamine + TRAM-34, DRC of GSK was significantly shifted towards right when compared to DRC of GSK in the presence of indomethacin alone and that in the presence of L-NAME + indomethacin + apamine + TRAM-34. In high KDS (60 mM), arterial rings pre-incubated with L-NAME + indomethacin exhibited significantly higher (21 %) GSK-induced vaso-relaxation compared to that of only 7 % in the absence of these blockers. Uterine artery with denuded endothelium, GSK failed to produce any appreciable decrease in the basal tone as it was only around 2 % of the 60 mM K<sup>+</sup>-induced contraction and GSK-induced vaso-relaxation was inhibited in endothelium-denuded uterine arterial ring of buffaloes in the presence of iberiotoxin. Molecular characterization of TRPV4, TRPC3/6/7 and TRPM3 channels using western blot and PCR methods and immunolocalization of channels protein in endothelium and vascular smooth muscle cells of buffalo uterine artery and protein expressions of TRPV4 and TRPC3/6/7 channels were found to be increased during pregnancy while TRPM3 channels protein expression was decreased during pregnancy. Immuno-histochemistry revealed the expression of TRPM3 protein signals in the endothelium and smooth muscular layers of uterine artery of buffaloes while TRPC3/6/7 proteins could be

appreciated mainly in endothelium layer. Presence of TRPV4 channel mRNA and TRPC3 channel mRNA in non-pregnant buffalo uterine artery revealed their presence in uterine artery of buffaloes. These findings suggest that GSK-induced vaso-relaxations is mainly COX and EDHF dependent (involvement of IKCa and SKCa) in endothelium-intact uterine artery but endothelium-independent/smooth muscle-dependent relaxation by GSK is mediated by activation of BKCa channels of VSMS. Augmentation of the GSK-induced vaso-relaxation response in the presence of L-NAME in uterine artery of buffaloes needs further investigation.

### College of Biotechnology

#### 10. A study on assessment of DNA integrity and protamination status of Barbari buck semen.

Evidences regarding deprotamination, apoptosis like changes, DNA fragmentation and cryocapaciation during ultralow freezing of spermatozoa in different species of animals have been established, however literature regarding these alterations in buck spermatozoa is less known and hence the present study was proposed in buck spermatozoa to study these cryo-alterations after freezing and thawing. Six apparently healthy Barbari bucks and 8 ejaculates were collected from each buck. The study was designed with aim to evaluate the presence of Protamine I in buck spermatozoa and its variation at high and low temperature (if any), apoptosis and capacitation like changes in frozen thawed buck spermatozoa. Collected semen was frozen with 16% egg yolk and 6% glycerol and analysis of various sperm attributes were done after 24 h and on different days (14 and 30) after freezing and thawing. Different sperm attributes like total progressive motile spermatozoa, per cent live spermatozoa, per cent spermatozoa having intact acrosome, intact membrane were evaluated using established and standard protocols of the department. Protamine I was evaluated using western blotting and immunolocalisation was carried out using indirect fluorescence. Early apoptosis like changes were evaluated by using Annexin V FITC assay and evaluation of mitochondrial membrane potential (MMP) using JC I staining. Late apoptotic like changes were evaluated by using



TUNEL assay. Cryocapacitation like changes were studied by using chlortetracycline assay (CTC) and molecular insights in to capacitation like changes were evaluated using immunoblotting and immunofluorescence. Motion and Kinematic analysis of spermatozoa was carried out using CASA. Immunoblot confirmed the presence of Protamine I in buck spermatozoa and immunofluorescence confirmed its nuclear organization. Results revealed significant reduction in per cent live spermatozoa, per cent total progressive motile spermatozoa, per cent spermatozoa having intact membrane, per cent spermatozoa having intact acrosome after all the days of freezing and thawing. Per cent spermatozoa showing early apoptotic like changes significantly increased in terms of Annexin V positive and spermatozoa showing low MMP after all the days of freezing and thawing. Per cent of spermatozoa showing deprotamination and DNA fragmentation significantly increased after all the days of freezing and thawing. Frozen thawed spermatozoa showed significant increase in B- and AR-pattern spermatozoa indicating rise in cryocapacitation and acrosome reaction like changes after all the days of freezing and thawing. It was evident that cryocapacitation like changes were mediated through phosphorylation of tyrosine containing proteins and in specific p54 exhibited highest phosphorylation. Deprotamination and DNA fragmentation were found positively correlated with B- and AR- pattern spermatozoa and all other parameters were found negatively correlated. Motion parameters as analyzed by CASA indicated reduction in total progressive motile spermatozoa, altered path velocities and hyperactivation in spermatozoa due to freezing and thawing. In conclusion the study reported presence of Protamine I in buck spermatozoa and indicated that with freezing and thawing, cryocapacitation and apoptosis like changes occur in evidently in spermatozoa resulting in poor quality of spermatozoa after freezing and thawing.

### **11. Molecular characterization and typing of methicillin-resistant *Staphylococcus aureus* (MRSA).**

The present study included 312 samples collected from 212 and 100 human and animal

cases, respectively. The prevalence of *S. Aureus* in human pyogenic and clinical cases of animals was comparable with 38.6% and 40%, respectively. The amplification of *coa* genes was not related with the ability to produce slide coagulase or bound coagulase test. The prevalence of MRSA in *S.aureus* isolates was significantly higher in animal isolates (50%). On drug sensitivity test, irrespective of group of drug, resistance was higher in human isolates in comparison to animal isolates. The drug resistance against  $\beta$  lactam antibiotics ranged up to 100%. Following to  $\beta$  lactam antibiotics, resistance was against cephalosporin and quinolones. All the animal isolates were sensitive to glycopeptides vancomycin, while only 80.4% human isolates were sensitive to vancomycin. Following the vancomycin, sensitivity was highest against clindamycin, followed by amino glycosides like amikacin and gentamicin. The drug resistance patterns suggested that the drugs like chloramphenicol and tetracycline, which are not being used in commonly used are regaining sensitivity against drug resistant bacteria. The antibiotype of all isolates revealed 51 antibiotypes including 30 human and 21 animal antibiotype exclusively. None of the animal and human isolates shared antibiotype suggesting different pattern of exposure to antibacterials. The level of resistance in animal isolates was lesser than human isolates and majority of isolates showed resistance to less than four antibacterials and those are mainly  $\beta$  lactam antibiotics. The resistance of healthy human isolates against all the used antibacterials suggested harboring of drug resistant isolates as carrier. The AP-4 primer based RAPD typing revealed 5 and 6 patterns in human and animal MRSA with two common patterns. The presence of 9 different patterns suggested possible different phylogeny of isolates. AluI digestion of *mecA* amplicons revealed 2 and one patterns in animal and human MRSA. Similarity in human and animal MRSA, digestion pattern further suggested common ancestral relationship. The plasmid profiling clearly indicated difference in animal and human isolates. The presence of single plasmid in all human MRSA and multiple plasmid might be the reason of difference in drug resistance pattern of human and animal isolates. The SDS-PAGE based typing of



all MRSA revealed 23 polypeptides with 12 major polypeptides in all the human and animal MRSA in the range of 20-200 kDa. The major polypeptides were of 20kDa, 28 kDa, 33kDa, 43kDa, 59kDa, 64 kDa, 72 kDa, 86 kDa, 97 kDa, 121 kDa, and 200 kDa. To conclude, the prevalence of MRSA in *S. Aureus* is alarming with high prevalence in human and their companion animals. The drug resistance pattern showed resistance against almost all antibacterials used in study. The presence or absence of pathogenicity related *coa* genes and methicillin resistance *mecA* genes were not related to major polypeptides and their immunoreactivity in *S.aureus*. The typing performed with limitation suggested . MRSA with common ancestral origin in human and animal with different phylogeny that can be further confirmed by sequencing of the PCR products and phylogenetic analysis.

## **12. Insights into toll like receptors expression and Th1/Th2 cytokines regulation in peripheral blood of dogs with demodicosis.**

Canine demodicosis is a common but unwieldy noncontagious parasitic dermatosis caused by overpopulation of the host-specific follicular mites of various *Demodex* species. An over proliferation of *D. canis* mites is paramount factor for occurrence of clinical demodicosis and disease progression. Host immune response and mechanisms associated with *Demodex* mites population control requires extrapolation to unravel the host-parasite interface in demodicosis. There is limited knowledge related to clinical manifestation and/or over-proliferation of *Demodex* mites and TLRs transcription. Therefore, the present study was projected with objectives to insight the expression of TLRs in canine demodicosis; to divulge the association of TLRs with progression of canine demodicosis and to unveil the link between TLRs expression and TH1/TH2 cytokines levels for canine demodicosis. Client-owned dogs presented for clinical and dermatological examination was examined and diagnosis of demodicosis by detection of *D. canis*. The dogs diagnosed with localized (LD), with generated (GD) and with generalized and concurrent pyoderma were grouped in to three respective groups. Another 12 apparently healthy dogs was kept as healthy controls. It was observed that *D. canis* mites might be utilizing cholinergic

immunosuppressive pathways for their own perpetuation and induction of clinical demodicosis in dogs. Markedly elevated circulatory IL-10 and decreased TNF- $\alpha$  levels could be attributed to triggering and progression of canine demodicosis and thus shifting of Th1/Th2 cytokines balance towards Th2 side could be associated with induction of generalized demodicosis. An upregulation of TLR2 gene expression in peripheral blood of dogs might be accountable for *Demodex*-induced clinical phenotypes in dogs, whereas down regulation of TLR4 & TLR6 genes expression could be the paramount strategy of mites to snag the innate immune response of dogs. Therefore, it is apparent that *D. canis* mites play with the both innate and adaptive immune system of the host and manage to evade the host immune response.

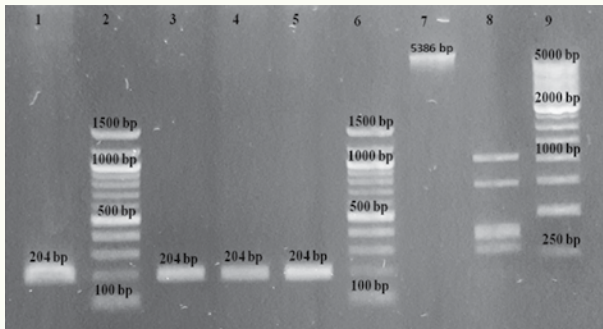
## **Masters' Theses**

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

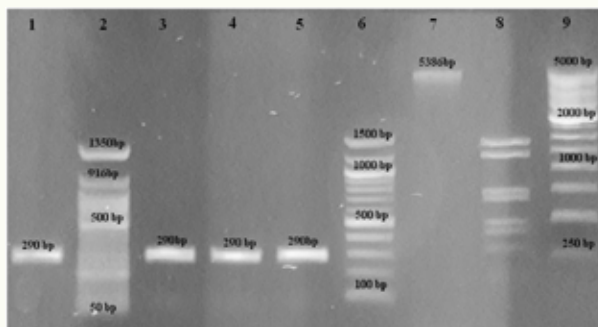
## **13. Molecular characterization and polymorphic studies of secreted phosphoprotein 1 (SPP1) gene in Indian cattle.**

Secreted phosphoprotein 1 (*SPP1*) is a highly negative phosphorylated glycoprotein that is a prominent component of the mineralized extracellular matrices of bones and teeth and is found in plasma and milk. *SPP1* gene also has potent roles in growth, production and reproduction of the animals. It plays important role in initiation and maintenance of pregnancy, as well as in the development of the fetus. In the present study, CDS sequence of *SPP1* gene has been cloned and characterized in Haryana breed of Indian cattle and also investigated the DNA polymorphism of *SPP1* gene in Indian cattle breeds viz., Sahiwal and Haryana. Multiple sequence analysis using DNASTAR revealed that Haryana *SPP1* sequence was 99.5-99.9% and 98.9-99.6% similar to that of Indian as well as exotic cattle breeds at nucleotide and amino acid level, respectively. The *SPP1* CDS of Haryana cattle breed contained one unique nucleotide changes, C to T transition at nucleotide position 11 which resulted into amino acid substitution of alanine (A) to valine (V). Phylogenetic analysis revealed that, Haryana was clustered together with

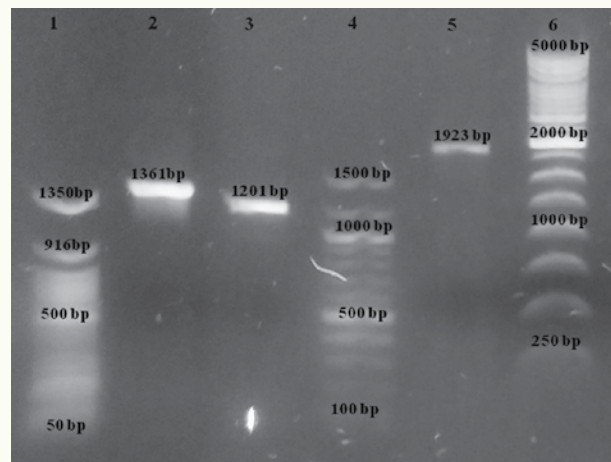
Vechur and other exotic cattle breeds in bovine clad. In the present study, polymorphism study was undertaken in 147 Sahiwal (n = 72) and Hariana (n = 75) cattle maintained at ILFC, DUVASU, Mathura using PCR-RFLP assay. The amplified fragments of the *SPP1* intron IV (C>T) and exon 7 (G>T) regions revealed 204 bp and 290 bp, respectively. The amplified products were digested with *BsrI* and *HpyCH4IV* restriction enzymes, respectively. The *BsrI*/PCR-RFLP assay of *SPP1* gene revealed only TT genotype (290 bp; 100%) with T allele (1.0). The *HpyCH4IV*/PCR-RFLP assay of *SPP1* gene also revealed only TT genotypes (204 bp; 100%) with T allele (1.0). Therefore, association analysis could not be performed with milk production traits.



**Fig.** Agarose (1.0%) gel electrophoresis showing amplification of *SPP1* gene of Hariana cattle Lane 1: Marker (50 bp DNA ladder), 2: *SPP1* part I (1361 bp), 3: *SPP1* part II (1201 bp), 4: Marker (100 bp DNA ladder), 5: *SPP1* part III (1923 bp) and 6: Marker (250 bp DNA ladder).



**Fig.** *SPP1*/*BsrI* PCR-RFLP assay in 1.5% agarose gel showing monomorphic pattern Lane 1: Undigested PCR product (290 bp), 2: Marker (50 bp DNA ladder), 3-5: TT genotype (uncut band; 290 bp), 6: Marker (100 bp DNA ladder), 7:  $\phi$  x 174 RF I DNA (5386 bp), New England Biolabs, Cat No. N3021G, 8: *BsrI* digested  $\phi$  x 174 RF I DNA, 9: Marker (250 bp DNA ladder).



**Fig.** *SPP1*/*HpyCH4IV* PCR-RFLP assay in 1.5% agarose gel showing monomorphic pattern Lane 1: Undigested PCR product (204 bp), 2: Marker (100 bp DNA ladder), 3-5: TT genotype (uncut band; 204 bp), 6: Marker (100 bp DNA ladder), 7:  $\phi$  x 174 RF I DNA (5386 bp), New England Biolabs, Cat No. N3021G, 8: *HpyCH4IV* digested  $\phi$  x 174 RF I DNA, 9: Marker (250 bp DNA ladder).

#### 14. Residual feed intake as a feed efficiency selection tool and its relationship with ingestive behavior, nutrient utilization and specific blood metabolites in dairy calves.

This study aimed to evaluate differences in feed utilization efficiency between low and high residual feed intake (RFI) Sahiwal calves by comparing growth performance, feed intake, nutrients digestibility, ingestive behaviour, blood metabolites and cost of feeding. Eighteen female growing Sahiwal calves were fed *ad libitum* on a total mixed ration (TMR, concentrate: green oat fodder: wheat straw=50:20:30) for a period of 90 days (30 days adjustment/preliminary period and 60 days measurement period). Calves were monitored daily for dry matter intake (DMI), fortnightly for body weight (BW) gain and feed efficiency measures. Blood samples were collected at start, mid and end of experimental period and analyzed for biomarkers of protein metabolism, biomarkers of lipid and energy metabolism, enzymatic and hormonal activity and plasma concentration of calcium (Ca) and phosphorus (P). To compare the differences in nutrient digestibility in low and high RFI calves, a digestion trial for a collection period of 7 day was conducted at the end of experimental period. RFI was calculated as the difference between the actual and the expected feed intake.





Expected DMI of individual calf was calculated by using linear regression models involving DMI, average daily gain (ADG) and mid test metabolic ( $W^{0.75}$ ) BW and calves were allocated into low (negative) and high (positive) RFI groups. In the present study, RFI varied from -0.53 to 0.40 kg DM/day with a mean RFI of -0.27 to 0.17 kg/day in low and high RFI Sahiwal calves, respectively. Calves had a mean DMI of 3.01 and 4.06 kg/day and an ADG of 549 and 570 g/day in low and high RFI groups, respectively showing that low RFI calves consumed 35% less feed while gaining at similar rate as high RFI calves. RFI showed positive correlation with daily DMI ( $r=0.756$ ) and ADG ( $r=0.191$ ) whereas, negative correlation were observed between nutrient digestibility. Low RFI calves required less ( $P<0.05$ ) metabolizable energy for maintenance (ME<sub>m</sub>) compared to high RFI calves (4.66 vs. 6.96 Mcal/day); whereas, ME observed for gain (ME<sub>g</sub>) was similar between two groups (2.37 vs. 2.49 Mcal/day). Eventhough the digestibility of nutrients were better in low RFI calves compared to high RFI calves but values showed non significant ( $P<0.05$ ) differences. Traditional measures of feed efficiency differed between two groups and efficiency measures like feed conversion ratio (FCR), feed conversion efficiency (FCE), Kleiber ratio (KR) and relative growth rate (RGR) were found better in low RFI calves. Although the feed intake was different in low and high RFI calves but feeding behaviour and body condition score (BCS) were observed similar among calves of both groups. In low RFI calves higher ( $P<0.05$ ) globulin, plasma urea nitrogen (PUN), creatinine, insulin like growth factor-1 (IGF-1), growth hormone (GH) and lower albumin and triglycerides were detected. No significant differences in plasma levels of total protein, glucose, cholesterol, non-esterified fatty, (NEFA), beta-hydroxy butyrate (BHBA), enzymatic activity, Ca and P among low and high RFI calves were observed. RFI showed positive correlation with plasma albumin ( $r=0.808$ ), cholesterol ( $r=0.419$ ), triglycerides ( $r=0.477$ ) and ALT ( $r=0.324$ ) negative correlation with total protein ( $r=-0.377$ ), globulin ( $r=-0.693$ ), PUN ( $r=-0.509$ ), creatinine ( $r=-0.570$ ), glucose ( $r=-0.015$ ), NEFA ( $r=-0.268$ ), BHBA ( $r=-0.161$ ), AST ( $r=-0.041$ ), ALP ( $r=-0.119$ ), Ca ( $r=-$

0.115), P ( $r=-0.162$ ), IGF-1 ( $r=-0.222$ ) and GH ( $r=-0.766$ ). Low RFI calves consumed less feed compared to high RFI calves; therefore, selection of calves for low RFI is always beneficial. In conclusion, low RFI calves are more efficient in feed utilization and the variability in blood metabolites might be due to differences in feed intake and body metabolism.

### 15. Growth performance, nutrient utilization and blood biochemicals of heifers supplemented with organic acids

Present study was conducted to see the effect of supplementing different organic acids on *in vitro* rumen fermentation parameters, growth performance, nutrient utilization and blood biochemical parameters of Haryana heifers. Malic acid, fumaric acid, formic acid and aspartic acid were tested at five doses (1.0, 2.5, 5.0, 7.5, 10.0 Mm/L) to determine their effects on *in vitro* rumen fermentation. Organic matter and dry matter degradability were found significantly higher ( $P<0.05$ ) and ammonia nitrogen and TCA precipitable were significantly lower ( $P<0.05$ ) at 5.0, 7.5 and 10 mM/L dose level of fumaric acid and malic acid. Formic and aspartic acid did not show any significant difference in any of the *in vitro* parameters. 5 Mm/L dose levels of fumaric and malic acid were found optimum and selected for feeding in animal experimentation. Eighteen Haryana heifers of 1 to 2 years of age were taken from ILFC and randomly allocated into 3 groups (control, T<sub>1</sub> and T<sub>2</sub>) having 6 animals in each group, on body weight basis. The nutrient requirements of heifers were met by feeding basal diet comprising of concentrate mixture, wheat straw and oat fodder as per standard requirements. Animals in T<sub>1</sub> and T<sub>2</sub> groups were fed basal ration with 0.5% malic and fumaric acid supplementation on DM basis. The doses were calculated on the basis of *in vitro* result. The average initial body weight of control, T<sub>1</sub> and T<sub>2</sub> were 116.80 kg. The average BW and metabolic BW of all the fortnights were similar ( $P>0.05$ ) between groups. The overall daily gain (g/d) and fortnightly BW were found similar ( $P>0.05$ ) in all the experimental groups. Dry matter intake (kg/d and kg/100kgBW) did not affected by different organic acid treatment. Feed efficiency and body condition of animals remained unaltered by supplementation

of organic acids. The NDF digestibilities of control, T<sub>1</sub> and T<sub>2</sub> groups were reported as 54.54, 62.18 and 62.34% respectively. The NDF digestibility coefficients were significantly higher in both the treatment groups than control (P<0.05). Digestibilities of other nutrients remained similar in all the treatment groups. The overall plasma concentration glucose, cholesterol, total protein and albumin were found similar in both the treatment groups with control. Creatinine concentration was found lower in malic acid supplemented group than control (P<0.05). Plasma TIg concentration of malic acid supplemented group was found higher than control (P<0.05). ALT and ALKP activity was lower in fumaric acid supplemented group than control (P<0.05). NEFA concentration was also found lower in fumaric acid supplemented animals (P<0.05). Growth biomarkers like IGF-I and GH concentration of plasma were found higher in all the treatment groups than control. In conclusion, supplementation of fumaric and malic acids at 5 Mm/L dose levels were found optimum for improving *in vitro* rumen fermentation. Supplementation of fumaric and malic



acids did not affect overall growth performance and nutrient utilization of Hariana heifers though NDF digestibility and blood biomarkers was improved without adversely affecting blood metabolites and liver function.

#### 16. Effect of Neem oil on growth performance of heifers fed urea based diet.

Present study was conducted to see the effect of supplementation of neem oil treated urea on rumen fermentation parameters *in vitro*, growth performance, nutrient utilization, blood biochemical parameters of indigenous cattle heifers. The effect of different levels (5, 10 and 20% w/w) of neem oil treatment of urea, uncoated urea and commercially available neem coated urea were included @1% (DM basis) in TMR by replacing mustard cake to determine their effects on *in vitro* rumen fermentation taking the diet at concentrate and roughages in the ratio of 50:50. Total gas production, true organic matter and dry matter degradability, ammonia nitrogen concentration, partitioning factor and microbial biomass production remained similar in all the treatment groups at all dose levels. On the basis of these observations and 20% (w/w) dose level of neem oil treated urea was selected for *in vivo* experiment. Twenty four Hariana heifers of 1.5 to 2 years of age were randomly allocated into 4 groups (C, T1, T2 and T3) having 6 animals in each group on body weight basis. Animals in C, T1, T2 and T3 groups were fed basal ration (concentrate: roughage 50:50 without urea), basal ration with uncoated urea 2%, basal ration with neem coated urea 2% (commercial) and basal ration with neem oil coated urea 2% (20% w/w) on DM basis, respectively. Body weight, body condition score and dry matter intake were recorded fortnightly. Average body weight, metabolic body weight, body weight gain and body condition score were not impacted by neem oil treated urea supplementation. Feed conversion ratio and overall DM intake also remained similar in all the experimental groups. Nutrient digestibility and digestible nutrient intake were not impacted by supplementation of neem oil treated urea to Hariana heifers. Dry matter intake (kg/100 kg BW) and TDN intake (g/kg W<sup>0.75</sup>) were similar in all the experimental groups during digestion trial. Total plasma protein, albumin,

globulin, blood urea nitrogen and creatinine concentration were also not impacted by neem oil treated urea supplementation without any adverse effect on liver function test. Neem oil treated urea supplementation did not affect adversely plasma calcium and phosphorus concentration. It may be concluded that commercially available neem coated urea or 20% neem oil treated urea can be included at 1% level in total mixed ration of dairy animals without any adverse effect on animal performance.



### 17. Study of occurrence of differential patterns of genital prolaps in indigenous cows.

The present investigation was performed to investigate the differential patterns of occurrence of pre partum vaginal prolapsed in Sahiwal and Haryana cows maintained at DDD Farm of ILFC at DUVASU, Mathura. During the experimental period of five months a total of five Sahiwal and no Haryana cow were found to be suffering from pre partum vaginal prolapsed. The blood biochemical, mineral, endocrine profile, physiological and haematological attributes of prolapsed Sahiwal cows were compared

with those of healthy Sahiwal and healthy Haryana cows. Moreover, changes in these attributes of prolapsed Sahiwal cows during the different stages of recovery i.e. 0, 12, 24, 36, 48 and 60 hrs after the onset of clinical signs were also observed. In affected Sahiwal cows the mean values for blood glucose ( $103.73 \pm 6.01$  mg/dl), SGOT ( $90.34 \pm 2.31$  IU/L), NEFA ( $127.35 \pm 5.41$  mEq/L) ( $p < 0.01$ ) and total cholesterol ( $119.64 \pm 6.01$  mg/dl;  $p < 0.05$ ) were observed to increase significantly while a significant ( $p < 0.01$ ) decrease was observed for plasma ALP ( $87.14 \pm 9.56$  IU/L) concentration as compared to the corresponding values for healthy Sahiwal and Haryana cows. The mean plasma concentration of blood glucose total cholesterol ( $p < 0.01$ ) and SGOT ( $p < 0.05$ ) decreased significantly during the different stages of recovery in prolapsed Sahiwal cows. In present study a significant ( $P < 0.01$ ) decrease in plasma concentration of calcium and phosphorus ( $6.10 \pm 0.64$ ,  $3.90 \pm 0.37$  mg/dl, respectively) while an increase in plasma concentration of sodium ( $154.40 \pm 2.36$  mEq/L) was observed in affected Sahiwal cows as compared to healthy Sahiwal and healthy Haryana cows. However, a significant ( $P = 0.07$ ) decrease in plasma concentration of sodium was only observed in affected Sahiwal cows during different stages of recovery. The mean plasma concentration of relaxin ( $1295.19 \pm 101.67$  pg/ml) in affected Sahiwal cows of present study was only found to be significantly ( $P < 0.05$ ) decrease in plasma concentration of both estrogen and relaxin hormone of affected Sahiwal cows was observed in present study. Out of various haematological and physiological attributes only mean value for total leukocyte count ( $8750 \pm 246.85$  per  $\text{mm}^3$ ) was observed to increase significantly ( $P < 0.05$ ) in affected Sahiwal cows, remaining attributes were found to be unaffected. A significant ( $P < 0.05$ ) decrease in mean total leukocyte count of affected Sahiwal cows was also observed during the due course of recovery. Therefore, the above changes in blood biochemical attributes, mineral and endocrine profiles may be considered as the indicator of occurrence of prolapsed in Sahiwal cows. Moreover as the values of many of these attributes in prolapsed Sahiwal cows were almost closer to healthy Sahiwal cows as compared to healthy Haryana cows therefore, Sahiwal cows are more prone to prolapsed.

### 18. Study of urine, saliva and vaginal mucus discharge as bio-indicator of estrus in dairy animals

The present study was carried out to find out the most efficient bio indicator of estrus out of urine, saliva and vaginal mucus discharge. Simultaneously, discrimination of pre standing, standing and end of standing heat conditions of estrus Sahiwal cows was also attempted by observing various physiological, haematological, blood biochemical, endocrine profile, pH and fern patterns in vaginal mucus discharges. The experiments were conducted on eight healthy, cyclic Sahiwal cows maintained at DDD farm of ILFC at DUVASU, Mathura. Significantly ( $P < 0.01$ ), higher mean values for some of the behavioral responses of teasure bulls viz. Flehmen score ( $5.63 \pm 0.18$ ), frequency of Flehmen response ( $3.50 \pm 0.18$ ) and lower mean values for time elapsed in penile erection ( $1.00 \pm 0.15$  mins.), protrusion ( $1.30 \pm 0.13$  mins.) and mounting ( $1.61 \pm 0.18$  mins.) in response to urine samples as compared to saliva and vaginal mucus discharge reflected urine as the most efficient indicator of estrus in Sahiwal cows. Out of various physiological and hematological parameters studied a significant difference for three different stages of estrus in Sahiwal cows could be observed only for rectal temperature, PCV ( $P < 0.01$ ) and hemoglobin ( $P < 0.05$ ). During standing heat stage of Sahiwal cows, the mean values for rectal temperature ( $39.00 \pm 0.10^\circ\text{C}$ ), hemoglobin ( $12.45 \pm 0.20$  mg/dl) and PCV ( $44.77 \pm 0.77$  %) were found to be significantly higher than during pre standing and end of standing heat stages. Interestingly, no significant difference for any of the bio chemical attribute in Sahiwal cows could be observed during three different stages of estrus but few of the parameters viz. total protein, alkaline phosphatase, total immunoglobulin, albumin and calcium, reflected non significantly higher values during standing stage as compared to other stages of estrus. This finding indicated that none of the bio chemical attribute is helpful in discrimination of the above said three stages of the estrus in Sahiwal cows. In response to standing heat condition of Sahiwal cows the mean plasma concentration of testosterone ( $15.62 \pm 3.30$  ng/ml) in teasure bulls was observed to be significantly ( $P < 0.05$ ) higher as compared to pre

standing and end of standing heat stages. Similarly, mean plasma concentration of estrogen and pH of vaginal mucus discharge during standing heat stage ( $21.75 \pm 0.97$  ng/ml and  $7.71 \pm 0.04$ ) of Sahiwal cows were significantly ( $P < 0.01$ ) higher as compared to pre standing and end of standing heat stages. Vaginal mucus discharge in Sahiwal cows reflected a typical fern pattern during standing heat, atypical fern pattern during pre standing heat and no pattern during end of standing heat stages of estrus. Thus, from present study it was concluded that urine may be used as the most efficient indicator of estrus in Sahiwal cows. Moreover, none of the biochemical, physiological and hematological attributes except, rectal temperature, blood hemoglobin, PCV up to some extent may help in discrimination of pre standing, standing and end of standing heat stages of Sahiwal cows. But, pH and fern pattern of vaginal mucus discharge and plasma concentration of testosterone in bulls and estrogen in cows may more effectively discriminate, the above said stages of estrus in Sahiwal cows.

### 19. Standardization and shelf life assessment of functional chevon sausages incorporated with essential oils

The present study was conducted to extend the shelf life of low salt fibre enriched functional chevon sausages with incorporation of essential oils. First experiment was attempted to standardize the optimum level of salt replacer mixture in chevon sausages. Preliminary trials were conducted to standardize the formulation of different salt replacers combinations using potassium chloride and herbs. The best herb blends as salt replacers were incorporated in chevon sausages under three sub experiments replacing 25, 50 and 75% salt respectively. On comparison of selected treatments, cheovn sausages incorporated with 1.0% herb blend-3 replacing 50% salt (L2) was selected and was taken as control in next experiment. Second experiment was carried out to improve the functionality of chevon sausage by incorporation of different natural dietary fibres *i.e.* wheat bran, rice bran and oat bran at 5%, 10% and 15% levels separately where low salt chevon sausage incorporated with 10% oat bran (O2) was selected on the basis of sensory evaluation and was taken as



control in next experiment. Third experiment was carried out to optimize the levels of essential oils in functional chevon sausages by incorporation of thyme, caraway and cinnamon at 0.1%, 0.2% and 0.3% levels separately. Functional chevon sausages incorporated with 0.1% thyme essential oil (A1); functional chevon sausages incorporated with 0.1% caraway essential oil (B1) and functional chevon sausages incorporated with 0.1% cinnamon essential oil (C1) were selected on the basis of physico-chemical properties and sensory evaluation. Fourth experiment was carried out to assess the storage stability of functional chevon sausages at refrigeration temperature. A1, B1 and C1 along with control (O2) were stored at  $4\pm 2^{\circ}\text{C}$  and evaluated for physico-chemical, microbiological and sensory properties at every 3 days interval. Overall highest treatment pH mean was observed in C1 followed by  $A1 > B1 > O2$ . The highest TBARS treatment mean were observed in  $A1 > B1 > C1$ , however highest FFA treatment mean were observed in  $B1 > A1 > C1$  among the treatments. Overall highest microbial count was observed in  $O2 > A1 > B1 > C1$ . There was no *Coliform* count throughout the storage in control and treatments. All sensory attributes decreased significantly ( $P < 0.05$ ) in control and treatments with progression of storage. The control (O2) was not evaluated after 15<sup>th</sup> day due to microbiological spoilage and rejection by sensory panelists, whereas treatments were acceptable up to 24<sup>th</sup> day. Among the treatments, C1 had significantly ( $P < 0.05$ ) higher overall acceptability scores till the end of storage. It can be concluded that low salt fibre enriched functional chevon sausages may be prepared with incorporation of herb blend salt replacer containing KCl, herbs and spices at 1% level replacing 50% salt and 10% oat bran as natural fibre source. The shelf life of functional chevon sausages may be extended up to 24 days under refrigeration with incorporation of cinnamon essential oil at 0.1% level with well acceptability on the basis of microbiological studies and sensory evaluation.

## 20. Development and quality assessment of chicken meat spread

The present study was attempted to develop and to assess the quality characteristics of chicken spread. First experiment was carried out to optimize

the processing technology of chicken spread using different cooking methods with three cooking times *viz.* Braising for 10 (B1), 15 (B2) and 20 (B3) minutes; microwave cooking at 540 MHz for 3 (M1), 5 (M2) and 7 (M3) minutes and steam cooking without pressure for 25 (S1), 30 (S2) and 35 (S3) minutes. On comparison of selected treatments, B2- chicken meat spread prepared by braising for 15 minutes was selected and taken as control in next experiment. Second experiment was carried out to improve the spreadability of chicken spread by incorporation of different plasticizers/humectants *i.e.* sorbitol, pectin and glycerol at 0.5%, 1.0% and 1.5% levels separately where chicken spread incorporated with 1.5% sorbitol (SB3) was selected on the basis of sensory evaluation and used as control in next experiment. Third experiment was carried out to optimize the levels of essential oils in chicken spread by incorporation of anise, clove and oregano at 0.1%, 0.2% and 0.3% levels separately. Chicken spread incorporated with 0.2% anise essential oil (AN2); chicken spread incorporated with 0.1% clove essential oil (CL1) and chicken spread incorporated with 0.1% oregano essential oil (OR1) were selected on the basis of physico-chemical properties and sensory evaluation. Fourth experiment was carried out to assess the shelf life of developed chicken meat spread at refrigeration temperature. AN2, CL1 and OR1 along with control (SB3) were stored at  $4\pm 2^{\circ}\text{C}$  and evaluated for physico-chemical, microbiological and sensory properties at every 5 days interval. Overall highest treatment mean pH was observed in  $OR1 > CL1 > AN2$ , however highest TBARS and FFA treatment mean were observed in  $OR1 > CL1 > AN2$  among the treatments. pH, TBARS and FFA values of control as well as treatments increased significantly ( $P < 0.05$ ) with progression of storage period, however TBARS and FFA values of AN2 were significantly ( $P < 0.05$ ) lower than control and other treatments throughout the storage. Total plate count, psychrophilic count and yeast and mould count of control were significantly ( $P < 0.05$ ) higher than treatments, whereas AN2 had significantly ( $P < 0.05$ ) lower microbiological count among the treatments throughout the storage period. There was no *Coliform* and *Salmonella* count detected throughout the storage in control and treatments.

The control (SB3) was not evaluated after 25<sup>th</sup> day due to microbiological spoilage and rejection by sensory panelists, whereas treatments were acceptable upto 35<sup>th</sup> days from microbiological and sensory point of view. Among the treatments, AN2 had significantly ( $P < 0.05$ ) higher overall acceptability scores till the end of storage. It can be concluded that well accepted chicken spread may be prepared by braising for 15 minutes with incorporation of 1.5% sorbitol and 0.2% anise essential oil and this product may be acceptable under refrigeration storage upto 35 days on the basis of microbiological studies and sensory evaluation.

### **21. Anatomical observations on the centers of ossification in the long bones of appendicular skeleton in prenatal goat (*Capra hircua*).**

The study was conducted on the long bones of fore and hind limbs of apparently healthy embryos/foetuses of non descript goats irrespectively of sex from 1 to 150 days of gestation, divided into three group viz; Group I ( $\leq 50$  days of gestation), Group II ( $> 50$  days to  $\leq 100$  days of gestation) and Group III ( $> 100$  days till parturition) comprising of 8 embryos/foetuses in each group. The study revealed that in early prenatal goats the fore limb bud was laid as a conspicuous extension from the cranio-lateral aspect of trunk region on 35 days of gestation. It became more elongated and divided into two segments on 37 days, three segments on 38 days and four segments on 39 days of gestation to form shoulder, arm, forearm and manus regions. The bud for the hind limb was seen as a paddle shaped out growth from the caudal aspect of trunk region on 35 days of gestation. It became more elongated on 37 and 38 days of gestation. On 39 days three distinct segments were present which would form thigh, leg and pes regions. On 44 days miniature fore and hind limbs were seen in cartilaginous form.

Histologically, on 35 days of gestation, the primordium comprising of mesenchymal cells surrounded by several blood vessels was laid. At 37 days, the anlagen were formed of early stages of developing cartilages. On 39 days they presented typical chondrocytes in the capsules surrounded by a dense layer of matrix. The peripheral mesenchymal cells formed the perichondrium.

At 46 days of gestation the centres of ossification were observed for the diaphyses of humerus, radius and ulna (Alizarin Red-S stained specimen). The centre of ossification for the shaft of metacarpals, appeared on 55 days of gestation and for I phalanx and II phalanx it appeared on 62 days of gestation. The total length and ossified length of various long bones of fore limb increased with the increase in age (from 46-148 days of gestation). The centres of ossification for the proximal and distal extremities of humerus appeared at 119 and 135 days of gestation respectively. In radius, the centres of ossification for proximal and distal extremities were exhibited on 135 days of gestation. The centre of ossification for olecranon tuberosity of ulna appeared on 129 days of gestation. The centres of ossification for the distal and proximal extremities of metacarpus were exhibited on 135 and 148 days of gestation, respectively.

The centres of ossification for the diaphyses of femur, tibia and fibula, appeared on 46 days and for metatarsus on 55 days of gestation (Alizarin Red-S techniques). The centres of ossification for the shaft of I and II phalanges were exhibited on 62 days of gestation. The centres of ossification for the head of femur and distal extremity were observed on 129 days of gestation but for trochanter major it appeared on 135 days of gestation. In tibia the centres of ossification for proximal and distal extremities appeared on 135 days of gestation. The shaft of fibula was not traceable after 55 days of gestation. The centre of ossification for the distal extremity of metatarsus was seen on 135 days of gestation.

Radiographically, the centres of ossification for the diaphyses of humerus, radius, ulna and metacarpals were exhibited on 71 days of gestation. The centres of ossification for distal and proximal epiphyses of humerus were detected on 129 and 135 days of gestation, respectively. The centres of ossification for proximal and distal epiphyses of radius exhibited on 129 and 135 days of gestation. The centre of ossification for olecranon tuberosity of ulna appeared on 148 days of gestation. The centre of ossification for distal extremity of metacarpals was exhibited on 135 days of gestation. The centers of ossification for the shaft of I and II phalanges in



fore limb appeared on 71 and 82 days of gestation and for proximal extremity of both phalanges it appeared on 148 days of gestation.

The centres of ossification for the diaphyses of femur, tibia and metatarsals were detected on 71 days of gestation. The centres of ossification for the proximal and distal epiphyses of femur were detected on 129 days of gestation, but for trochanter major was appreciated on 135 days. The centres of ossification for proximal and distal extremities of tibia appeared on 129 and 135 days, respectively. For the distal extremity of metatarsals, the centre of ossification was exhibited on 135 days of gestation. The centres of ossification for the diaphyses of I and II phalanges appeared on 71 and 82 days of gestation, respectively. For the proximal extremity of both the phalanges the centre of ossification appeared on 148 days of gestation.

It is concluded that, the early centre of ossification can be detected quite satisfactorily by Alizarin Red-S technique. Radiographically these can be detected either on the same day or after that. Thus among the two methods, the staining methods is more of academic importance while the radiographic procedure is more practical and can be effectively used for diagnostic purposes.

## **22. Observations on the gross anatomical, histological and certain histomorphological changes in foetal goat (*Capra hircus*) spleen.**

Gross anatomical, histomorphological and certain histochemical studies were conducted on the spleen of 24 healthy and normal goat embryos/ foeti of either sex at different gestation. Approximate age of embryos/ foeti was estimated and the material was grouped in to I (up to 50 days), II (51- 100 days) and III (101- till term). The primordium of spleen in goat foetus was first observed at 32 days gestation. Up to 50 days gestation it was in the form of white thickening on the dorso medial aspect of the stomach tube near its cranial end. It became nearly triangular between 51 to 58 days gestation and quadrilateral in outline from 70 days gestation. Between 51 days to 58 days gestation the splenic primordium changed its position from dorso medial aspect to dorso lateral aspect of the developing rumen. The visceral surface was toward the developing rumen and parietal

surface was towards the ribs. The hilus became distinct near the cranio dorsal angle on the visceral surface at 81 days of gestation. At 32 days gestation the primordium consisted of densely packed mesenchymal cells in the dorsal mesogastrium. The dorsal surface of the spleen in goat foetus up to 41 days gestation was covered by a layer of simple squamous epithelium, the mesothelium. At 46 days gestation the fibroblasts began to appear. The capsule was distinctly demarcated from the parenchyma at 70 days gestation and was more cellular. From 83 days gestation the capsule was divided in two distinct layers whereas, from 101 days onwards it was distinctly divided in to three layers. In 148 days old goat foetus the smooth muscle cells formed a continuous and dense layer in the capsule close to the parenchyma. At age of 76 days gestation trabeculae were observed for the first time in the spleen of goat foetus. From 135 days gestation onwards trabeculae became highly pronounced which at some places completely divided the parenchyma in to the compartments. Fine but short reticular fibers were observed for the first time in the spleen of 46 days old foetus; these were sparsely distributed in the parenchyma but were relatively dense towards the surface of the organ. From 55 days gestation the reticular fibers were around the developing splenic sinuses and around the developing blood vessels. From 76 days gestation these fibers were condensed to form capsule and trabeculae. In goat foetus fine collagen fibers were observed for first time in the splenic capsule and trabeculae at 76 days gestation. At 148 days gestation reticular, elastic and collagen fibers were found in the splenic nodules around the nodular artery. At 32 days gestation the parenchyma of foetal goat splenic primordium consisted of condensed mass of densely packed and irregularly arranged mesenchymal cells along with few blood islands with nucleated erythrocytes. The red and white pulps were first time observed in goat foetal spleen at 55 days and 70 days gestation, respectively. From 70 days gestation the major part of splenic parenchyma had rich network of sinuses which were filled with densely packed erythrocytes. From 83 days of foetal age thin bundles of smooth muscle cells were noticed in the parenchyma and from 89 days gestation onwards aggregated plasma



cells were observed. From 107 days gestation ill developed network of splenic cords was observed which became distinct at 121 days gestation. The megakaryocytes were observed for the first time in the splenic red pulp at 63 days gestation and their occurrence gradually increase from 81 to 121 days gestation beyond this their occurrence was greatly reduced. The blood vessels were fewer in the splenic parenchyma at 51 days gestation but these became distinct and numerous from 70 days gestation onwards. The trabecular arteries were observed from 104 days gestation onwards. The nodular arteries were observed from 107 days gestation and were found usually in the center of the nodules. In late prenatal period large sinuses were formed by the confluence of small sinuses. In 70 days old foetus the beginning of initial stages of periarterial lymphatic sheath (PALS) differentiation was observed as concentrically arranged mesenchymal cells and fibroblasts around small arteries. The lymphoblasts and lymphocytes in PALS were observed first time at 81 days and 101 days gestations, respectively. The splenic nodules in the white pulp of goat foetus were first observed from 107 days gestation. The mesenchymal cells of splenic parenchyma and mesothelial cells that covered the spleen showed mild to moderate reaction for PAS positive substances whereas, the stromal tissue showed intense reaction for PAS. The mesenchymal cells, stromal tissue and wall of blood vessels showed mild to moderate reaction for bound lipids. In early prenatal period the nuclei of mesenchymal cells showed moderate to intense Feulgen's reaction. In mid and late prenatal goat the nuclei of mesenchymal cells, lymphoblasts, lymphocytes exhibited mild to moderate reaction. It was concluded that up to 55 days gestation the foetal goat spleen was engaged in the erythropoiesis. Between 63 to 121 days it was active in thrombopoiesis. From 70 days to 135 days gestation it had storage function and the spleen in goat foetus started worked as lymphoid organ from 83 days onwards but it became a proper lymphoid organ from 107 days gestation onwards, however, the germinal centers were not observed during the entire study. It might be due to lack of exposure of foetus to the antigen.

### **23. A study on HSP expressions and sperm quality following cryopreservation of Haryana bull semen supplemented with sericine.**

The present study evaluate the beneficial of Sericin as an antioxidant in Tris egg yolk based extender in Haryana bull semen opted for ultra low freezing. The study evaluate seminal attributes (motility, liveability, acrosomal integrity and host reactive spermatozoa) and expression of heat shock protein (HSP70 and HSP90). Six ejaculates from four Haryana bull were divided into three aliquots: One aliquot diluted with egg yolk tris citrate (EYTG) extender (Control), second aliquot was diluted with EYTG but supplemented with sericin @ 0.25% (T1) and the third aliquot was diluted with EYTG and supplemented with sericin @ 0.50% (T2) and were cryopreserved. Semen evaluation at equilibration and post-thaw showed supplementation of sericin @0.25% to EYTG extender significantly ( $P < 0.05$ ) increase motility, viability and spermatozoa with intact acrosome and HOS positive spermatozoa.

The expression of HSP70 and 90 mRNA were found to be significantly lower in cryopreserved semen compared to fresh semen. The concentration of HSP 70 and 90 expression were significantly higher in sericin treated samples and 0.25% sericin was found to be significantly superior compare to 0.50% concentration.

### **24. Functional characterization of voltage gated potassium channels in bull spermatozoa.**

In the current study, molecular and functional characterisation of Kv 1.1 was carried out in spermatozoa of Haryana bulls. Sixty four ejaculates were collected from four haryana bulls and were based for series of experiments. Immunoblotting and immunocytochemistry were employed for the molecular characterisation of Kv 1.1 Immunoblotting identified a single band of 56 kDa corresponding to Kv1.1 in Haryana bull spermatozoa. Positive immunoreactivity was seen in head, middle piece and principal piece of the spermatozoa for Kv1.1 Functional study was carried out using antagonist 4-Aminopyridine and two agonists were used namely cromakalim and pinacidil during the entire study, in the study, three





groups were used namely, control (100 $\mu$ L of sperm dilution medium (SDM) containing 10x10<sup>6</sup> cells, DMSO- 1 $\mu$ L) and drug (99 $\mu$ L of SDM containing 10x10<sup>6</sup> cells, drug 1 $\mu$ L containing drug). Blocking of Kv using 4-AP resulted in significant ( $p < 0.05$ ) decrease in sperm progressive motility, capacitation (B-pattern) and acrosome reaction (AR-pattern), however, significant ( $p < 0.05$ ) increase in per cent swollen spermatozoa was observed. Activation of Kv channels using both cromaklim and pinacidil in significant ( $p < 0.05$ ) increase in sperm motility, capacitation (B-pattern) and acrosome reaction (AR-pattern), however, significant ( $p < 0.05$ ) decrease in per cent swollen spermatozoa was seen. Treatment of spermatozoa with both agonist and antagonist resulted in capacitation like changes in spermatozoa and these changes were confirmed by immunoblotting and immunolocalisation. Blotting of proteins confirmed the presence of p78, p110 and p115 tyrosine phosphorylated proteins and these were found to be localized at middle piece of the spermatozoa. Protein p115 showed highest band intensity indicating the significant protein involved in the process of capacitation after modulation of Kv channels. Computer assisted semen analysis of motion and kinematic parameters in 4-AP treated spermatozoa indicated in sperm motion parameters like LIN, STR, VSL and VAP and higher ALH, VCL and BCF indicating sperm hyperactivity and reverse was seen in agonist cromakalim treated samples. In conclusion- Kv1.1 was found to be present in bull spermatozoa and was selectively associated with regulation of functional dynamics of spermatozoa. It was not possible to deduce from the study that how it is associated with induction of hyperactivity and further studies are warranted to undermine its mechanistic involvement of sperm function.

### **25. Studies on cryopreservation of Haryana bull spermatozoa in relation to seasonal variation.**

The present experiment was design to study the effect of seasonal variations on semen quality, freezability and semen biochemical indices in Haryana bull. Study was accomplished with the participation of four fertile, healthy adult Haryana bulls aged between 5.5-6.5 years and weighing more than 450-550 kg. The study was conducted over a period of four months and divided into two seasons

as winter season (December-January) and summer season (May-June). Twenty-four semen samples ( $n=24$ ) were collected in each season (six ejaculates from each bull) by using Artificial Vagina. Each ejaculate was divided into two aliquots; one was assessed for physicomorphological and functional attributes, while other was used for evaluation of seminal biochemical and enzymatic profile. The results of the study showed physico-morphological characteristics of semen viz. reaction time, volume (ml), mass activity (0-5 scale), pH, sperm concentration (million/ ml), progressive motility (%), sperm livability (%), HOST (%), total sperm abnormal morphology (%) and acrosomal integrity (%) were estimated at different stage in the different seasons. The reaction time, volume of ejaculate and pH was significantly ( $p < 0.05$ ) higher in summer than winter season. Percentage of progressively motile spermatozoa were significantly ( $p < 0.05$ ) higher in winter than summer season at post-thaw stage. Live (%) spermatozoa were significantly ( $p < 0.05$ ) higher in winter than summer season at fresh and pre-freeze stage. HOST positive and acrosomal integrity was significantly ( $p < 0.05$ ) higher in winter season than summer at all three stage. Total morphologically abnormal spermatozoa % were significantly higher in summer than winter season. In the present study showed seminal biochemical and enzymatic profile of semen viz. SOD, GST, MDA, GOT and LDH were evaluated. Among the seminal enzymatic profile significant ( $p < 0.05$ ) difference were observed for SOD and GST enzymes activity. Haryana bull seminal plasma contains high activities of SOD and GST enzymes activity in winter season that have an influence on the functional competence of cryopreserved spermatozoa.

### **26. Studies on add-on effects of a polyherbal formulation on clinical recovery and immuno-competence of dogs with demodicosis.**

A breach in the immune status of the young dogs may results into the occurrence of generalized demodicosis. Cytokines secretions from T lymphocytes have played important roles in the immune response of the dogs against generalized demodicosis. Therefore, the present study aimed to evaluate the effects of a polyherbal formulation on clinical recovery and immuno-competence of dogs



with generalized demodicosis. Total 19 client-owned dogs with generalized demodicosis of juvenile onset were allocated into two groups. Control group (n=9) were treated with conventional miticide (Amitraz), whereas other 10 demodicosis dogs were supplemented with a polyherbal formulation (Pyodermacare-G) adjunct with Amitraz regime. Clinico-haemato-biochemical and circulatory cytokines (TNF- $\alpha$ , IFN- $\gamma$  and IL-10) were estimated pre- and post-therapies. Demodicosed dogs of the control group have not revealed remarkable amelioration in most of the altered serum haemato-biochemical and immunological panels at day 60 post-therapy. Remarkable parasitological and clinical recovery could not be achieved by the dogs of control group at day 60 post-therapy. Whereas, the demodicosed dogs supplemented with Pyodermacare-G revealed remarkable amelioration in haemato-biochemical and immunological panels (TNF- $\alpha$ , IFN- $\gamma$  and IL-10) at day 60 post-therapy. Remarkable improvements in clinical and parasitological recovery were also revealed by the demodicosed dogs of Pyodermacare-G supplemented group. Therefore, it can be concluded that miticidal therapeutic regimens of canine generalised demodicosis warrants supplementary medicines having immunomodulatory potential for the holistic management and to get rid of the wretched clinical condition. The polyherbal formulation (Pyodermacare-G) could be promising candidate for the holistic managements of immuno-clinico-pathological anarchies of canine generalized demodicosis.

### **27. Clinico-epidemiological, diagnostic and therapeutic studies on bovine trypanosomiasis.**

The study was performed at TVCC, DUVASU Mathura from June, 2016 to May 2017. The epidemiological data was recorded on the basis of month, sex, age, breed, parity and pregnancy status. Hospital based prevalence of trypanosomiasis was found to be 11.41% and 22.90 % in cattle and buffaloes, respectively. Highest prevalence of trypanosomiasis in cattle and buffaloes was recorded during the rainy season and lowest in summer. It has been found that prevalence of trypanosomiasis in

cattle and buffaloes does not vary with the sex and breed. Maximum occurrence of trypanosomiasis is found in the age group of more than 5 years and more than, three parity and the lowest in the age group of less than 2 years and zero parity. The important clinical signs exhibited by the trypanosome positive cattle and buffaloes having highest frequency were anorexia, fever, depression and reduced milk yield. Out of 50 blood samples screened, significantly higher percentage of animals were diagnosed positive for *T. evansi* with PCR followed by BCT and minimum with blood smear. Sensitivity and specificity of BCT (75.0% and 100%) and blood smear (37.5% and 100%) of *T. evansi* was reported, respectively. and it was found that PCR is more sensitive than the conventional method of examination. There was a significant reduction in hemoglobin concentration, packed cell volume and total erythrocyte count in all the positive cases. There was an increase in the hemoglobin concentration, packed cell volume and total erythrocyte count at the day 7th and day 14th after the treatment in all treatment groups. There was an increase in serum ALT, AST and ALP concentration in the positive cases of cattle and buffaloes. On the basis clinical improvement in terms of disappearance of clinical signs & parasitological examination in present study, the percent recovery shown by the isometamidium chloride along with enrofloxacin and diminazine acetate along with enrofloxacin on day 7th and day 14th post-treatment was found to be 100 percent. Animals treated by diminazine acetate on day 7th and day 14th post-treatment was found to be parasitologically cured however moderate and mild clinical sign were present on day 7th and day 14th respectively. Animals treated by the isometamidium chloride on day 7th and day 14th post-treatment was found to be parasitologically cured however mild clinical sign were present on day 7th and on day 14th 100% recovery observed. Therefore, isometamidium chloride along with enrofloxacin and diminazine acetate along with enrofloxacin is found as most effective and among isometamidium and diaminazine acetate, isometamidium chloride is found better than the diaminazine acetate during present investigation.



## 28. Diagnostic relevance of bovine specific cardiac biomarkers and associated electrocardiographic features of theileriosis in cattle calves

Bovine tropical theileriosis is an important tick born disease causing widespread alteration in physical, haemato-biochemical, electrocardiographic and cardiac biomarkers parameters. For the study, total seventy one calves were screened and out of them twelve were confirmed for theileriosis by PCR, and taken for further investigation. Classical symptoms of theileriosis affected calves were fever followed by anorexia, enlargement of lymph node, pale mucous membrane, ocular and nasal secretions, exophthalmoses, petechial hemorrhage on conjunctival mucous membrane along with melena and hemoglobinuria with least occurrence. Physical parameters like rectal temperature, respiration rate and pulse rate were significantly elevated with simultaneous fall in mean value of hemoglobin concentration, packed cell volume, total erythrocyte count and total leucocyte count. However the mean value of neutrophils, monocytes, eosinophils was considerably decreased with increase in lymphocytes. The mean values of AST, ALT, creatinine, urea and total bilirubin were elevated, while ALP, albumin, globulin and total protein, were decreased in theileriosis affected calves. Electrocardiographic findings revealed presence of sinus tachycardia, atrial premature complex, bilateral atrial hypertrophy and first degree AV block in few theileriosis affected calves. Results of cardiac biomarkers analysis showed significant increase in mean value of both the cardiac biomarkers (cTnI and CPK-MB), which indicate cardiac involvement in pathogenesis of theileria with subsequent damage of myocardial cell membrane resulting into leakage of cardiac biomarkers like cardiac troponin-I (cTnI) and creatinine phosphokinase (CPK-MB). Conventional treatment was applied to theileriosis affected calves and all the data except electrocardiography were re-evaluated after 15 days of treatment. Conventional treatment of present investigation included buparvoquone, long acting oxytetracycline, iron dextron (20%) along with vitamin and other supportive therapy as per need according to clinical signs, which resulted in recovery

of 8 calves out of 12 theileriosis affected calves. Primary outcome variable in post treatment group include clear improvement in 50%, improvement and insufficient improvement in 8.33% and failure in 33.33% after 14 days of therapy. Cardiac biomarker analysis in recovered calves showed 87.5% have concentration of cardiac troponin lower than pretreatment value, while 100% of the calves had concentration of creatinine phosphokinase-MB lower than their pre-treatment value. Significantly reduced levels of these biomarkers in post treatment calves were indicative for halt of further myocardial damage after conventional treatment described above. From above discussion it can be concluded that the conventional treatment, used in present study, has good efficacy in term of improvement of cardiac health in theileriosis affected calves.

## 29. Classico-molecular studies and characterization of rotat 1.2 VSG of *Trypanosoma evansi* in equines

Trypanosomiasis (Surra), caused by the *Trypanosoma evansi* is a major constraint in the health and productivity of domestic animals throughout the tropics and subtropics. The disease is mainly transmitted mechanically through the bite of blood sucking flies. Widespread morbidity in the form of progressive emaciation, anaemia, oedema, pyrexia, lowered weight gains, lowered milk yield, lowered work capacity and abortions, results in heavy economic losses to the livestock owners. The Office Internationale des Epizooties listed it as the list B disease among notifiable diseases of significance. In present study, prevalence of trypanosomiasis was screened in equines from clinical camps organized by Brooke Hospital for Animal in Mathura, Unnao and Raebareli alongside those animals which are brought to Teaching Veterinary Clinical Complex (TVCC), DUVASU, Mathura. A total of 86 animals were screened for trypanosomiasis using Giemsa stained thin blood smears out of which 3 were found positive for trypanosomiasis. Trypanosomiasis was found to be more likely affecting the animals which were of adult age group. So far as sex wise distribution of prevalence rates is concerned, males were found to be more infected (5.55%) than females (2.00%). DNA was isolated from these samples by phenol chloroform method. The primer used in the



study was RoTat 1.2 VSG F/R. These primers target the most commonly conserved VSG repertoire in *T. evansi*. Out of 86 samples tested, 3 were found to be positive by blood microscopy and 5 by PCR. Again 3 samples were found positive both with microscopy as well as PCR. There was no such sample which was positive by blood smear and negative by PCR. The sensitivity (95%CI) and specificity (95%CI) of PCR method was 100% and 93.98% in comparison to giemsa staining method with kappa value of 0.521. The study characterized two RoTat 1.2 VSG repertoires, viz., VSG 1 and VSG 2. The RoTat 1.2 VSG 1 *T. evansi* horse isolates (KY457408) used in the present study showed cent percent homology with that from camel isolates from Egypt and yielded comparatively lesser homologies with that of isolates of camel and buffalo origin from India. RoTat 1.2 VSG 2 (KY457409) revealed 100.0% homology with other isolates of buffalo, camel and horse isolates from Karnataka and Bikaner, India; Kenyan isolate; camel and cattle isolates from Egypt.

### 30. Pharmacological characterization of calcium regulatory pathways in oviduct of water buffaloes (*Bubalus bubalis*).

Present study was embarked upon to extricate the underlying calcium signaling mechanisms responsible for spasmogens (PGF<sub>2</sub>α, and oxytocin)-induced muscular contractions in oviducts of non-pregnant buffalo in oestrous stage. Isometric tension in longitudinal oviductal in both ampulla and isthmus strips was recorded under the resting tension of 1 ± 0.2 g following mounting the tissue in Ringer-locke solution. Following an equilibration period of about 120 to 150 min, oviductal strips both ampulla and isthmus presented a consistent and rhythmic pattern of spontaneity. Mean Integral Tension (MIT) and amplitude (g) of ampulla and isthmus in normal spontaneous tissue did not differ significantly. The frequency (BPM) of ampulla and isthmus in normal spontaneous tissue differed significantly (P<0.05). PG<sub>2</sub>α produced significantly (P<0.05) greater contraction than oxytocin in both ampulla and isthmus of buffalo oviduct in concentration-dependent manner. In isthmus the contraction produced by oxytocin was negligible. PGF<sub>2</sub>α produced a significant change in tonic contraction between ampulla and isthmus but

the change in phasic contraction between ampulla and isthmus was not significant. PGF<sub>2</sub>α produced significantly (P<0.05) greater contraction in ampulla than in the isthmus of buffalo oviduct. The normal spontaneity was almost abolished in calcium free RLS and also PGF<sub>2</sub>α mediated contractile effect was also negligible in both ampulla and isthmus. Nifedipine, a L-type Voltage Dependent Calcium Channel (VDCC) blocker completely abolished the spontaneity and DRC of PGF<sub>2</sub>α was significantly (P<0.001) shifted towards right and the maximal contraction(%) was significantly (P<0.05) decreased in both ampulla and isthmus. NNC55-0396, a T-type VDCC blocker abolished spontaneity in ampulla but not in isthmus, but DRC was significantly (P<0.001) shifted towards right in the presence of NNC55-0396 both in ampulla and isthmus. The maximal contraction(%) significantly (P<0.05) decreased in both ampulla and isthmus. Concurrent use of NNC55-0396 and nifedipine to determine the extent of involvement of VDCCs, the E max values were almost comparable to that observed when these blockers were used alone. In presence of SKF96365, a non specific Store operated calcium channel (SOCC)/ Transient receptor potential canonical (TRPC) blocker spontaneity was completely abolished in both ampulla and isthmus and DRC of PGF<sub>2</sub>α was significantly shifted (P<0.001) shifted towards right in the presence of SKF96365 of both ampulla and isthmus. The maximal contraction(%) was significantly decreased in both ampulla and isthmus. Pyr3, a specific TRPC3 channel blocker did not abolish the spontaneity in both ampulla and isthmus. DRC of PGF<sub>2</sub>α was significantly shifted towards right in both ampulla and isthmus in the presence of Pyr3. The maximal contraction(%) was significantly (P<0.05) decreased in both ampulla and isthmus. Histological study of buffalo oviduct showed that the muscular layer was greater in thickness in isthmus as compared to ampulla whereas mucosal layer was thicker in ampulla than in the isthmus. TRPC3 and TRPM3 protein expression was studied by immunohistochemistry and TRPC3 protein was shown to be localized in muscular layer whereas TRPM3 was localized in mucosal and muscular layer of ampulla. In isthmus TRPC3 and TRPM3 proteins were shown to be localized



in both serosal and muscular layer of isthmus of buffalo oviduct. So, on the basis of present finding it can be concluded that ampulla and isthmus of buffalo oviduct exhibit spontaneous contractility which is not markedly different from each other and is dependent on extracellular calcium. Oxytocin mediated contraction does not seem to play a major role in oviductal contraction mechanism during oestrus. PGF<sub>2</sub>α exert concentration-dependent contraction in both ampulla and isthmus which is dependent on extracellular calcium. Ampulla is more sensitive to contractile effect produced by PGF<sub>2</sub>α than isthmus. PGF<sub>2</sub>α -induced contraction is sensitive to both L and T type calcium channels in both ampulla and isthmus contributing equally in PGF<sub>2</sub>α- induced contraction. SOCCs also regulate spontaneity and PGF<sub>2</sub>α. induced contractions in ampulla and buffalo oviduct.

### **31. Studies on endocannabinoid(s)-mediated lipid signaling in mouse aorta during early and late phases of sepsis.**

The present study was carried out to assess the role of endogenous cannabinoids in regulating aortic vascular response during early and late phases of sepsis. Polymicrobial sepsis was induced by caecal ligation and puncture (CLP) in mice. Besides, recording the isometric tension in arterial rings, estimation of haemato-biochemical parameters, histopathological examinations of vital organs, mRNA expression of CB1 receptor and MAGL enzyme and their role in the vasoconstrictor response to noradrenaline in the aorta of septic mouse were studied. Sepsis significantly reduced RBC, Hb and WBC counts during both early (CLP-6h) and late (CLP-20h) phases of sepsis whereas neutrophil count was increased during early phase. There was also a marked fall in lymphocyte count during late phase of sepsis indicative of immunosuppressive state. Significant rise in the plasma ALT, AST, BUN and creatinine levels during early and late phases of sepsis were suggestive of liver and kidney dysfunctions which were further substantiated by histopathological examinations of these vital organs. Sepsis produced a state of hypoproteinaemia with significant reduction in plasma albumin level. Histopathological examination of lungs, heart and intestine showed progressive degenerative changes

which were more prominent with progression from early to late phase of sepsis. In addition, sepsis also impaired the vascular reactivity to noradrenaline (NA) and relaxant response to acetylcholine (indicative of endothelial damage), in the mouse aorta during both early and late phases of sepsis without affecting the relaxant response at vascular smooth muscle cell level as evidenced by non-significant alteration in the relaxant response to sodium nitroprusside (SNP), a nitovasodilator.

Among the two endocannabinoids (2-AG and AEA) studied in the present study, 2-arachidonylglycerol (2-AG) produced concentration-dependent contractile effect on phenylephrine (PE)-induced vascular tone in sham-operated (SO) mice as well as early phase septic animal which were sensitive to indomethacin or nimesulide suggesting the role of COX-1 and COX-2-derived metabolites, respectively, in the vasoconstricting effect of 2-AG. However, 2-AG-induced vasoconstriction in late phase septic mouse aorta was resistant to indomethacin and nimesulide. Unlike 2-AG, arachidonoyl ethanolamide (AEA) did not produce any effect either on basal tone or PE-induced tone in the mouse aorta from SO mice as well as early and late phases septic animals.

Significant potentiation of NA response in the presence of KT109, a specific inhibitor of DAGL, and attenuation of NA-induced vasoconstriction in the presence of JZL184, a specific inhibitor of MAGL, in SO mice suggest a functionally relevant role of endogenously produced 2-AG in controlling vascular reactivity to NA. However, in the presence of JZL 184, the vascular hyporeactivity to NA in septic mice (early and late phase) was not affected which may be due to significant attenuation of mRNA expression of MAGL in the mouse aorta from these groups of animals as compared to SO mice. Role of CB1 receptor activation in regulating vascular hyporeactivity to NA in mouse aorta during early and late phases of sepsis was evidenced by the significant reversal of NA-induced attenuated vasoconstriction in the presence of AM 251, a specific antagonist of CB1 receptor. Accordingly, we have found a significant increase in the mRNA expression of CB1 receptor in mouse aorta from early and late phases of sepsis as compared to SO

mice. Unlike AM 251, rimonabant, another CB1 receptor antagonist, failed to produce any significant effect on vascular reactivity to NA in mouse aorta either from SO mice or both the phases septic mice. Interestingly, AM 251 failed to produce any effect on altered vascular contractility which are mediated by direct influx of Ca<sup>2+</sup> through voltage gated Ca<sup>2+</sup> channels into the cells without involving G-proteins-coupled signalling mechanism.

Taken together, based on the findings of the present study, it may be inferred that caecal ligation and puncture produces time-dependent progression of sepsis in mice affecting multiple organs including cardiovascular system. 2-AG plays an appreciable role in regulation of vascular reactivity to NA in mouse aorta. Further, excess expression of CB1 receptor in mouse aorta is responsible for vascular hyporeactivity to NA during sepsis and inhibition of this receptor by AM 251 restores the vascular reactivity to NA in sepsis. However, vascular contraction unrelated to G-proteins coupled signalling mechanism remains unaltered by AM 251-induced CB1 receptor inhibition in mouse aorta.

### **32. Evaluation of ameliorative potential of $\alpha$ -tocopherol and curcumin against cisplatin-induced nephrotoxicity in male Wistar rats.**

Present study was undertaken to evaluate the ameliorative potential of  $\alpha$ -tocopherol, curcumin and/or in combination with cisplatin following 28 days continuous exposure. Forty eight male wistar rats of 190-210 g were divided into eight groups group I (NSS, i.p.), group II (corn oil, oral gavage) served as vehicle control, group III received cisplatin, group IV ( $\alpha$ -tocopherol), group V (curcumin), group VI (cisplatin +  $\alpha$ -tocopherol), group VII (cisplatin + curcumin), group VIII (cisplatin + curcumin +  $\alpha$ -tocopherol). Cisplatin was given by intra-peritoneal route @ 0.5mg/kg b.wt., while  $\alpha$ -tocopherol @ 100 mg/kg b.wt. and curcumin @ 50 mg/kg b.wt. by oral gavage continuously for 28 days. Cisplatin produced apparent signs of toxicity like rough coat, cachexia, decreased activity but no mortality in rats. Body weight and percent weight gain in rats with cisplatin alone and in combination with  $\alpha$ -tocopherol and curcumin treated groups were significantly lower. Absolute and relative organ

weight did not differ between different groups. Significant reduction in Hb on 21 day and 28 day after exposure. Marked reduction in PCV, TLC and platelet count in cisplatin alone treated group following 28 day exposure however DLC remain unaltered. Significant decrease in creatinine clearance in all cisplatin exposed groups when compared to control groups. Protein urinary creatinine ratio in cisplatin alone treated group increased significantly on 28 day of experiment, while did not differ significantly when cisplatin given in combination with  $\alpha$ -tocopherol and curcumin. Significant rise in serum creatinine, urea, BUN, uric acid, ALT, AST, LDH, GGT was found in rats of cisplatin alone, cisplatin +  $\alpha$ -tocopherol and cisplatin + curcumin treated groups with maximum increase in cisplatin alone group. Exposure of rats to cisplatin alone and in combination with  $\alpha$ -tocopherol and curcumin revealed significant increase in MDA levels, decrease in GSH level, decrease in activity of CAT and SOD. Activity of GST and GPx were significantly reduced in cisplatin alone group, but no difference in activity of GST and GPx were observed among control and cisplatin +  $\alpha$ -tocopherol and cisplatin + curcumin treatment groups. Urinary KIM-1 expression was increased significantly on 7 day of experiment, while KIM-1 expression among cisplatin +  $\alpha$ -tocopherol, cisplatin + curcumin treated groups and control did not differ significantly. After 28 day of experiment significant increase in urinary KIM-1 expression in cisplatin exposed groups. Compared to control groups, kidneys of cisplatin alone in combination treated groups revealed accumulation of proteinaceous fluid in the renal tubules with cellular swelling, degeneration, sloughing of renal tubular epithelium and congestive changes in the renal parenchyma, but changes were less severe in cisplatin +  $\alpha$ -tocopherol and cisplatin + curcumin treated groups.

### **33. A study on effect of sericin supplementation on expression profile of heat shock protein genes in spermatozoa before and after cryopreservation of buck semen**

The present experiment was design to study the effect of sericin supplementation on semen quality, semen biochemical indices and expression profile of HSPs in Babari buck. Study was accomplished



with the participation five fertile, healthy adult Barbari bucks of similar age and body weight. Thirty ejaculates were collected in total by employing Artificial Vagina. Each ejaculate was divided into three aliquots. Sericin was supplemented at 0 % (C), 0.25 % (T1) and 0.5% (T2). The physico-morphological characteristics of semen viz. volume (ml), mass activity (0-5 scale), sperm concentration (million/ ml), progressive motility (%), sperm livability (%), HOST (%), total sperm abnormal morphology (%) acrosomal integrity (%) and kinematic parameters were estimated at different stages. qRT-PCR was done to evaluate the relative expression of HSP70 and HSP90 during the process of cryopreservation and effect of sericin supplementation was studied on the same. Assessment of antioxidative status, enzyme leakage, cryocapacitative damages and apoptotic changes were recorded in post-thaw samples. Percentage of progressively motility, HOST positivity and acrosomal integrity spermatozoa were significantly ( $p < 0.01$ ) higher in T1 than in control and T2. Live (%) spermatozoa showed no significant difference ( $p > 0.05$ ) post-thaw. A significant ( $p < 0.01$ ) reduction of abnormal spermatozoa was observed in sericin supplemented samples. The result of the study showed that sericin supplementation improved the antioxidative status (SOD, GST, CAT) by reducing lipid peroxidation (MDA), prevented enzyme leakage (ALT, LDH), reduced the incidences of cryocapacitative and apoptotic changes (CTC, JC I, TP, MTMP) and had a protective effect on HSP70 in cryopreserved Barbari buck semen (immunoblot). A positive correlation was found to exist between expression of HSPs and semen motility and viability parameters and a negative correlation was found between expression of HSPs and cryocapacitation and apoptotic changes.

#### **34. Prevalence and antimicrobial resistance of VTEC in Cattle farms (Indigenous and Exotic), Goats and their environmental sources in Brij region**

The study was conducted to provide the information on prevalence and antimicrobial pattern of VTEC in Cattle and Goats feces as well as from their environments. Out of 375 fecal samples taken, 18.93% were found positive for virulent

genes; 20.94% were from Cattle and 14.75% were from Goats fecal samples. Among Cattle, 21.28% were from Indigenous Cattle and 20% of them were from Exotic Cattle. In environmental samples, 7.14% samples were found positive for VTEC and the positivity among them was 5%, 10%, 5%, 5%, 20%, and 5% from soil, manure, effluent, water, hand swabs, and flies respectively. In different organized farms taken in this study, the highest percentage (27.5%) was found in Kamdhenu dairy, Karnaval, Mathura.

Molecular characterization of isolates through mPCR revealed 53.08% isolates positive for the *stx1* gene alone while all the other isolates were found carrying two or more VTEC genes. Also, the combinations found were *stx1* & *stx2*, *stx1* & *hlyA*, *stx1* & *eae*, and *stx1*, *stx2* & *hlyA* with a percentage of 11.11%, 13.58%, 3.70% and 18.51% respectively. The *eae* gene was found among 3 isolates only while the *Saa* gene was found in 21 isolates with overall percentage of 29.92%. The virulent genes combinations were found among Cattle isolates however *stx1*, *stx2* and *stx,eae* combinations was not found among any of the VTEC isolates of Goats. All the VTEC isolates were also screened for O157 by mPCR but no positive results was found.

The antibiotic resistant genes, ESBL genes viz TEM, CTX, and SHV through mPCR screened from VTEC positive strains and found 42 isolates carrying the ESBL genes either singly or in combinations with TEM being the most prevalent of all. The overall percentage of ESBLs genes from the VTEC isolates came as 54.43%, out of which more percentage found in the indigenous breeds with a total percentage of about 67.85%. The positive of ESBL in VTEC isolates of Cattle and Goats were 60.37% and 50% respectively.

The VTEC positive isolates were also screened phenotypically by Combination disk test (CDT) and Ezy MIC™ Strip test which revealed 6 isolates as ESBL positive by CDT (Cefotaxime) method while the Ezy MIC™ Strip method revealed 7 as MBL+ESBL positive while 39 as MBL positive. Also, by mPCR the screening of ESBL genes (TEM, SHV & CTX) showed 54.43% positive VTEC strains carrying these genes alone and in combinations.

The overall percentage of ESBL in the indigenous breeds, exotic breeds of cattle as well as in goats was found 67.85%, 52% and 50% respectively. Most of the isolates found positive phenotypically also revealed ESBL genes taken in this study, using mPCR. Also, the Antibiogram testing has been done on all positive VTEC isolates using 16 antibiotics. Out of which Imipenam/EDTA (96.62%) showed highest sensitivity followed by Imipenam (68.53%). While antibiotics like Ampicillin (100%), Cefixime (94.39%) and Cefaperazone (92.14%) showed highest resistance towards the positive VTEC isolates.

### 35. Prevalence and antimicrobial resistance of *Escherichia coli* (VTEC) in pets (dog and cat) and its public health significance in Brij region

A total no. of 310 samples comprising of 180 dog faeces (60 healthy, 60 diarrhoeic and 60 diseased), 30 cat faeces (25 healthy and 5 diarrhoeic) and 100 samples from environmental sources (10 hand swabs of dog owner, 10 hand swabs of veterinarian, 10 commercial dog food, 10 home-made food, 20 dog drinking water, 20 surface swabs of dog kennel and veterinary hospital, 20 flies around dog kennel and veterinary hospital) were processed to screen *E.coli* with verotoxigenic potential in Brij region.

Out of total 310 samples, 142 *E.coli* isolates were obtained. The overall percent of *E.coli* from dogs, cats and environmental samples were found 61.66 %, 60.00 %, 13.00%, respectively. A total no. of 69 VTEC were obtained, which is 48.59% of the total *E.coli* and 22.25% of the total sample collected. The overall percent of VTEC from dogs, cats and environmental samples were found 32.22% (26.66% in healthy, 40.00% in diarrhoeic and 30.00% in diseased), 16.66% (16.00% in healthy and 20.00% in diarrhoeic) and 6.00% (15.00% in fly, 10.00% in surface swabs and 10.00% in hand swabs of dog owner), respectively. Out of 69 VTEC, total 44 samples were found positive for *stx1* (38 from dogs, 3 from cats, and 3 from environmental samples), 8 for both *stx1* and *stx2* (6 from dogs, 1 from cats and 1 from environmental samples), 3 for both *stx1* and

*hlyA* (2 from dogs, 1 from cats), 12 for both *stx1* and *aeA* (11 from dogs, 1 from environmental samples), 2 for *aeA*, *stx1* and *hlyA* (1 from dogs and 1 from environmental samples).

Among virulence markers of VTEC Congo red dye binding ability played an important role in identifying the pathogenicity of bacteria. In present study, Congo red dye binding ability was found 86.95%.

Epidemiological risk factors associated with prevalence of VTEC in dogs are breed, age, sex, coprophagic habit and cohabitation with other dogs. Prevalence of VTEC was higher in non-descript breed, 0-3 month age group of pups, female, coprophagic dog and dog having co-habitation with other dogs in comparison to global breed, higher age group (more than 3 month), male, non-coprophagic dogs and dogs not having co-habitation with other dogs, respectively.

All the VTEC were subjected to antibiotic drug sensitivity test against 17 antibiotics. Imipenam EDTA (92.75%) showed highest sensitivity followed by Chloramphenicol (68.11%). Antibiotics like Ampicillin/Sulbactam (100%), Erythromycin (100%), Ofloxacin (100%), Cefotaxime/ Clavulanic acid (100%), Clindamicin (100%) showed highest resistance.

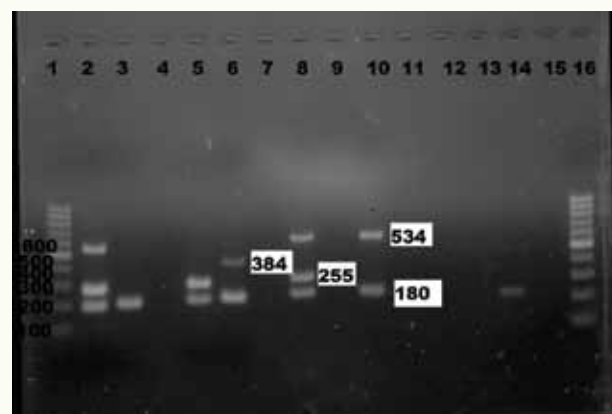


Fig. Agarose gel showing PCR amplified product for VTEC genes. Lane 1 & 16: 100bp DNA Ladder Lane 2 & 8: *stx1*, *stx2* & *hlyA*  
Lane 3 & 14: *stx1* Lane 5: *stx1* and *stx2*  
Lane 6: *stx1* & *aeA*



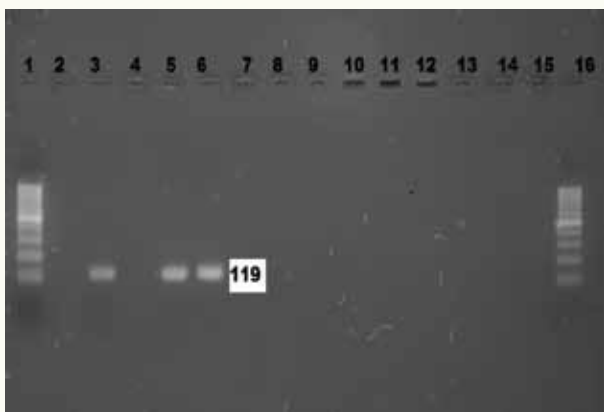


Fig. Agarose gel showing PCR amplified product for *Saa* gene. Lane 1 & 16: 100bp DNA Ladder  
Lane 2 & 8: *Saa* (119bp)



Fig. Agarose gel showing PCR amplified product for ESBL genes. Lane 1: 100bp DNA Ladder Lane 2 & 3: SHV (383bp)  
Lane 4, 5 & 8: CTX (560bp) Lane 6 & 7: SHV & CTX



Fig. Agarose gel showing PCR amplified product for ESBL (TEM) gene. Lane: 1 100bp DNA Ladder  
Lane: 2, 3, 4, & 5: TEM (516bp)

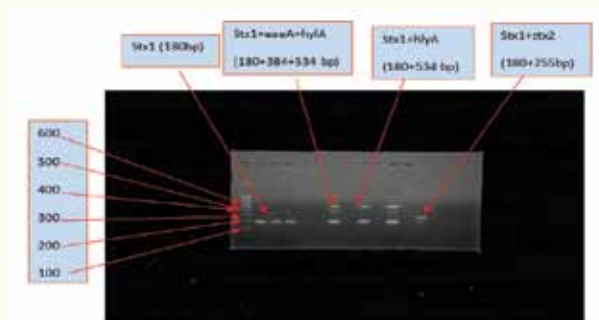


Fig. 10: Depicts positive Ezy MIC™ strip test for MBL+ESBL. MBL+ESBL positive represented by no zone on ESBL side while well depicted zone on ESBL+ side.

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

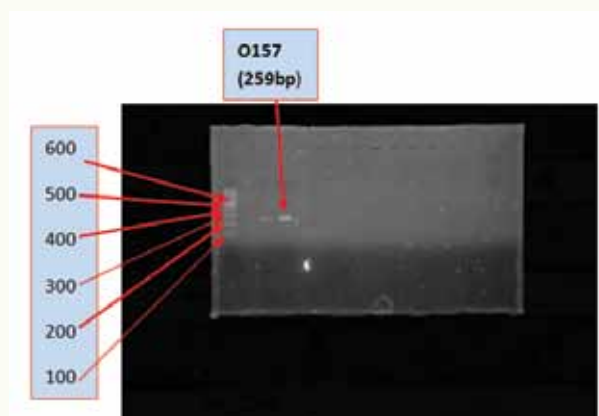


Fig. Agarose Gel showing PCR amplified product for O157.

### 36. Excretory urographic and ultrasonographic studies of urinary system in canines (*Canis familiaris*).

Present study was conducted on 8 healthy dogs of either sex to evaluate the urinary system by excretory urography, ultrasonography, urine analysis, hematology, and serum biochemistry. Nine radiographic biometric parameters were measured i.e. kidney length, width, length of second lumbar vertebral body, ratio of kidney length to the length of second lumbar vertebrae, ratio of kidney width to the length of second lumbar vertebrae (at 5 min interval), ureter luminal diameter, ureter length (at 15 min interval) and ratios of ureteral length to the length of second lumbar vertebrae using the in-built calipers in the CR system. VD and right lateral radiographic exposures were made 0, 5, 15, 30 and 45 min intervals after iohexol contrast agent infusion @ 800 mg I/kg body weight. The excretory urograms were evaluated based on the visibility of iohexol

in the urinary organs in both the views wherein, the best visualization of the kidneys, ureters and urinary bladder were observed at 0 min to 5 min intervals, 15 min interval, and 15 to 45 min intervals, respectively. Seven ultrasonographic biometric parameters were measured i.e. kidney length, width, height, volume, cortex thickness taken length-wise and width-wise, and urinary bladder wall thickness by 3.5-7.5 MHz micro-convex transducer with suitable gain. Urine analysis, haematological and biochemical parameters were measured by using standard techniques. Non-significant ( $P \leq 0.05$ ) difference was observed in all radiographic, ultrasonographic, urine, hematological and biochemical parameters when compared male and female dogs. Significant ( $P \leq 0.05$ ) difference was observed when the ultrasonographic measurement of cortex thickness taken length wise was compared with that taken width-wise, irrespective of side of the kidney and sex of the animal. A prospective study of affection of urinary system was carried out. Six types of urinary system affection were diagnosed in 17 dogs wherein excretory urographic, ultrasonographic, urine analysis, hematological and serum biochemical parameters were evaluated, out of which 9 (52.94%) were male and 8 (47.06%) were female dogs, aged between 2 to 11 years of various breeds. Urolithiasis (52.94 %), chronic renal failure (11.76 %), urethritis (11.76 %), vaginal tumour (11.76 %), urinary bladder tumour (5.88 %) and



**Fig.** Right lateral radiograph of case 10 at 15 min interval showing good pyelogram, cystogram and slight visualisation of urethra till site of obstruction (arrow).

pyelonephritis, prostatitis and testicular tumour in monorchid dog (5.88%) were the six type of cases encountered. It was concluded that combination of diagnostic procedures are required for accurate evaluation of anatomy and physiological function of the urinary system.

### **37. Clinical studies on ultrasonographic and biometric evaluation of the eye and ocular affections in dog, horse, cattle and buffalo.**

The purpose of this study was to describe the ultrasonographic appearance, to measure different intraocular echo-biometric indices in normal adult dogs, horses, cattle and buffaloes and to study hospital incidence of different ocular affections and their management during May, 2016 to June, 2017. As there has been no such study undertaken on the measurement on the normal intraocular echobiometric parameter in these animals, obtaining these measurements could be a benchmark to diagnose some of the disease and eye problems in these animals. B-mode transcorneal ultrasonographic scanning of left and right eyes of six adult healthy animals of each species viz. horse, cattle, and buffalo were performed. Additionally, six healthy adult dogs from three different breeds viz. German shepherd, Labrador retriever and Indian mongrels were also selected for the same purpose. Qualitative echo-biometric findings of the eyes were described and measurements of the intraocular structures were obtained. In present transcorneal intraocular echo-biometric study six parameter were measured i.e. aqueous chamber depth (ACD), lens depth (LDe), lens diameter



**Fig.** Renal scan, longitudinal view showing measurement of length (1), Width (3), cortex thickness taken length-wise (2) and cortex thickness taken width-wise (4).



(LDi), vitreous depth (VD), scleroretinal rim thickness (SRT), and globe axial length (GAL) by using high end ultrasound machine (Mylab30vet), with 2.5-7.5 MHz microconvex transducer and the depth of scanning was set at 5-9 cm with suitable gain without administration of any general/local anesthetic. Non-significant difference ( $P < 0.05$ ) was observed in all parameters when compared between left and right eye of different breeds and species of animals used in the study. The average values of LDi and GAL of both eye of German shepherd dog were significantly higher from Labrador retriever and Indian mongrel dogs. The average value of SRT of both eyes of German shepherd and Labrador were significantly higher than that of Indian Mongrel dogs. The average value of ACD of both eye of horse showed significant difference from buffalo. The average value of LDe of both eyes of horse were significantly different from cattle. The average value of LDi of both eyes of buffaloes and horses were significantly different from cattle. The average value of VD of both eyes of horse showed significant difference from cattle and buffaloes. The average value of SRT of both eyes of horse show significant difference with cattle. The average values of GAL of both eyes were significantly different in among three species. The study also included hospital incidence of ocular affections. Total 65 cases were presented with complaints of ocular affections during the study period. The study revealed that overall incidence of ocular affections in canine contributed (57%) of the ophthalmic cases, followed by buffalo (22%), bovine (12%) and equine (9%). Ocular affection recorded during this study period were corneal opacity (17 %), cataract (14%), neoplasm (9 %), dermoid (9 %), cherry eye (8%), trauma (8%), exophthalmos (5%) and eye worm (5%). The incidence of each affection viz. corneal ulcer, descemetocele, chemosis, traumatic lens expulsion and prolapse of iris was (3%) whereas, the incidence percentage of blindness, glaucoma, pigmentary keratopathy, vitreous hemorrhage, anterior uveitis and anophthalmia was 2% for each affections. In all the cases, where possible, ultrasonography was performed done and cases were managed by medicinal, surgical or medico-surgical interventions as per the requirement.

### 38. Excretory urographic and ultrasonographic studies of urinary system in goats (*Capra hircus*).

Present study was conducted on 8 healthy goats of either sex to evaluate the urinary system by excretory urography, ultrasonography, urine analysis, hematology, and serum biochemistry. Four radiographic biometric parameters were measured i.e. kidney length, width, ratio of kidney length to the length of second lumbar vertebrae, ratio of kidney width to the length of second lumbar vertebrae (at 5 min interval) using the in-built calipers in the CR system. VD and right lateral radiographic exposures were made at 0, 5, 15, 30 and 45 min intervals after iohexol contrast agent infusion @ 700mg I/kg body weight. The excretory urograms were evaluated based on the visibility of iohexol in the urinary organs in both the views wherein, the best visualization of the kidneys, ureters and urinary bladder were observed at 0 min to 15 min intervals, 0 min interval, and 15 to 45 min intervals, respectively. The kidneys and ureters were visualized in the right lateral view than the VD view. Seven ultrasonographic biometric parameters were measured i.e. kidney length, width, height, volume, cortex thickness taken length-wise and width-wise, and urinary bladder wall thickness by 3.5-7.5 MHz microconvex transducer with suitable gain. Urine analysis, haematological and biochemical parameter were measured by using standard techniques. Non-significant ( $P \leq 0.05$ ) difference was observed in almost all radiographic, urine, hematological and biochemical parameters except some ultrasonographic parameters, when compared male and female goat. However Significant ( $P \leq 0.05$ ) difference was observed in the radiographic biometry of right kidney length and left kidney length; the ultrasonographic biometry of right kidney length, width and volume and left kidney; left kidney length width, height, volume, length of cortex thickness taken width-wise; urinary bladder thickness and total protein level in the serum. A prospective study of urinary tract affection was carried out. Two types of urinary tract affection were diagnosed in 6 goats wherein excretory urographic, ultrasonographic, urine analysis, hematological and serum biochemical parameters were evaluated, out

of which all were males (100%) goats, aged between 1 month to 2 years of various breeds. Urolithiasis (83.33%), and urethral diverticulum (16.67%) were the two type of cases encountered. It was concluded that combination of diagnostic procedures are required for accurate evaluation of anatomy and physiological function of the urinary system.

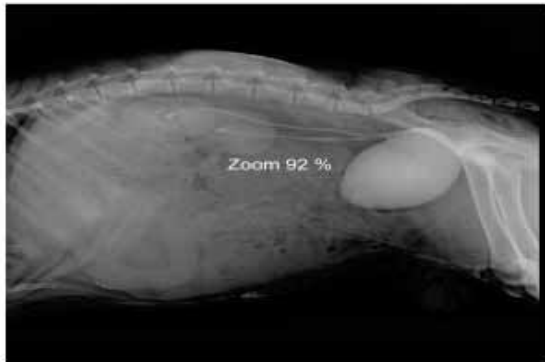


Fig. Lateral excretory radiographs case 1 male goat at 30 min showing Very good pyelogram, cystogram, slightly dialated ureters and distended urinary bladder.



Fig. Case of urethral diverticulum of male goat.

### 39. Echocardiographic studies in healthy mongrel dogs.

Twelve healthy mongrel dogs which included seven males and five female dogs, were selected for the present study to perform echocardiographic examinations. The animals were confirmed as healthy based on their clinico-physiological, radiographical, haematological and electrocardiographical examinations. Animals found with any deviation in the values of pre-echocardiographic evaluations were excluded from the study. 2D mode, M-mode and Doppler mode examinations were performed for each animal in order to fulfil the aim of this study which was to

generate the reference values of echocardiographic parameters in mongrel dogs. The mean age of male and female animals included in the study was  $2.92 \pm 0.27$  (mean  $\pm$  S.E.) years and  $2.70 \pm 0.29$  (mean  $\pm$  S.E.) years, respectively. The selected male and female animals were with their mean body weight of  $19.35 \pm 1.19$  (mean  $\pm$  S.E.) kg and  $14.10 \pm 1.02$  (mean  $\pm$  S.E.) kg, respectively. 2D mode echocardiographic examinations of animals showed normal structural conformations of various cardiac structures. On M-mode echocardiographic examinations in present study, most of the parameters were found to be non-significantly different between male and female animals, except posterior wall thickness percentage (PW%) value was found significantly higher in male animals than female animals. The values of right ventricular dimension in diastole (RVDd) of all animals, aortic root diameter (Ao) of female animals, ejection fraction (EF %) and cardiac output of male animals were found to be correlated negatively with body weight and body surface area of the animals, in M-mode echocardiography. Remaining all the parameters of M-mode echocardiographic examinations of the animals showed positive correlations with body weight and body surface area of the animals. In Doppler mode echocardiography, significantly higher values were recorded in the values of the A wave peak of mitral and tricuspid valves and aortic flow velocity in female animals than male animals. In male animals, all the Doppler mode measurements were found to be correlated negatively with body weight and body surface area. However, in female animals A peak of mitral valve (MVApeak) and aortic flow velocity (AV) showed positive correlation and remaining Doppler mode parameters correlated negatively with body weight and body surface area.

### 40. Effect of zinc oxide nano particles on the performance of Turkey poults

The present study was conducted to assess the effect of supplementation of zinc oxide nanoparticles in turkey poults. Day old turkey poults (n= 84) were distributed into four dietary treatment groups, having three replicates of 7 birds each. The study was conducted in turkey poults during 0-8 weeks of age. During these phase, poults were fed basal ration, T1 (control), supplemented with 60 mg/kg inorganic



ZnO, T2- basal ration, supplemented with 20 mg/kg ZONPs, T3- basal ration, supplemented with 60 mg/kg ZONPs, T4- basal ration supplemented with 100 mg/kg ZONPs. T2 and T3 poult had significantly higher ( $P<0.05$ ) body weight compared to T1 and T4 treatment groups at 2nd and 3rd week of age respectively. T2 and T3 poult had a significantly higher ( $P<0.05$ ) body weight gain than T1 and T4 treatment groups at 1st week of age. T2 and T3 poult had a significantly higher ( $P<0.05$ ) feed consumption than T4 at 2nd week of age. The feed conversion ratio of turkey poult supplemented with 20 and 60 mg/kg ZONPs had significantly better ( $P<0.01$ ) at 1st week and 3rd week ( $P<0.05$ ) as compared to the other treatment groups. Further, 20 and 60 treatment groups had a significantly better ( $P<0.05$ ) FCR than control at 4th week. Similarly, 60 mg/kg treatment groups had a significantly better ( $P<0.05$ ) FCR at 6th week as compared to control and 20 mg/kg treatment groups respectively. Over all FCR was significantly better ( $P<0.05$ ) in T3 as compared to T1 and T4 and comparatively better than T2 during the experimental period. The humoral immune response (HA) was significantly higher ( $P<0.05$ ) in T4 as compared to T2 and T3. Further HA titre was comparatively higher in T4 than T1. IgG response was significantly higher ( $P<0.01$ ) in T1 than T2 and T3. Plasma cholesterol was significantly higher ( $P<0.05$ ) in T3 and T4 as compared to the control group. Plasma uric acid was significantly higher ( $P<0.01$ ) in T1, T2 and T4 than T3. Further, AST was significantly higher ( $P<0.05$ ) in T1 and T2 than T3 and T4. The Cu-Zn-SOD value was significantly higher ( $P<0.01$ ) in T3, T4 than T1 and T2. Similarly, LPO value was significantly higher ( $P<0.01$ ) in the control (T1) group as compared to the nano zinc supplemented groups (T2, T3 and T4). Nano zinc supplemented groups (T2, T3 and T4) had significantly higher ( $P<0.01$ ) percent lymphocytes than control (T1). Further, T1 had significantly higher ( $P<0.01$ ) percent heterophils than T2, T3 and T4 groups respectively. In addition, the heterophil-lymphocyte ratio was significantly higher ( $P<0.01$ ) in the T1 compared to the T2, T3 and T4 groups. Percent liver weight was significantly higher ( $P<0.05$ ) in T4 group (3.69) as compare to T1 (1.66) and T2 (2.34) groups. Further, calcium level

in breast muscle of turkey poult was significantly higher ( $P<0.01$ ) in T4 as compared to T1, T2 and T3 and Zinc level was significantly higher ( $P<0.01$ ) in T2 and T3 as compared to T1 and T4. Zn level in thigh (ilio tibialis) meat was significantly higher ( $P<0.01$ ) in T2, T3 and T4 groups as compared to the control (T1) group. It may be concluded that nano zinc supplementation @ 20 mg /kg or 60 mg/kg may elicit growth performance and improve feed conversion efficiency in turkey poult, reduce the adverse effects of stress as depicted by a decreased heterophil lymphocyte ratio in the nano zinc supplemented groups and dietary supplementation of nano zinc in turkey poult @ 20 mg/kg or 60 mg/kg may lead to increase deposition of zinc in breast and thigh meat cuts.

#### **41. Influence of graded levels of Shatavari root meal on performance of coloured chicken**

Present study was conducted to evaluate the efficacy of Shatavari root meal as a dietary feed supplement in coloured chicken. Day old coloured chicken (Chabro) were distributed into seven dietary treatments having three replicates each with ten birds. The study was conducted in coloured chicken during 0-8 weeks of age. During the experiment, the birds were fed basal ration, (control) T1 - (broiler starter diet till 4 weeks and there after broiler finisher diet till eight weeks), T2- basal ration was supplemented with Shatavari root meal @ 0.25%, T3- basal ration was supplemented with Shatavari root meal @ 0.5%, T4- basal ration was supplemented with Shatavari root meal @ 0.75%, T5- basal ration was supplemented with Shatavari root meal @ 1%, T6- basal ration was supplemented with Shatavari root meal @ 1.25%, T7- basal ration was supplemented with Shatavari root meal @ 1.5%. There was no significant difference in the weekly body weight among the treatment groups. However, T2 birds had apparently higher body weight compared to other treatment groups at 2nd week of age and this trend was maintained there after throughout the experiment. T2 coloured chicken had a significantly higher ( $P<0.05$ ) body weight gain than T1 and T6 at 2nd week of age (129.67 vs.101.73 and 101.40g). Further, T2 coloured chicken had an apparently higher body weight gain compared to the other treatment groups throughout



the experiment. T1 group chicks had significantly higher ( $P<0.05$ ) weekly feed consumption than T2, T3, T5 and T6 group chicks at 2nd week of age (231.67 and 233.20 vs. 215.47, 215.47, 210.27 and 213.73g). T2 coloured chicken had a significantly better ( $P<0.05$ ) feed conversion ratio than T1, T6, T7 during 2nd week. FCR was comparatively better in T2 as compared to other treatment groups during 0-4 wks, 4-8 wks and 0-8 wks of growth phase. There was no significant difference in HA, IgG and IgM response to 1% SRBC (log 2 titre) among the different treatment groups at 8 weeks of age. T3 coloured birds had significantly better ( $P<0.01$ ) cell mediated immune response than T1, T4, T5 and T7 and comparatively better immune response than the other treatment groups at 8 weeks of age. Plasma protein was significantly higher ( $P<0.01$ ) in T4, T5, T6 and T7 than T1, T2 and T3 at 8 weeks of age. T1 and T2 had significantly higher ( $P<0.01$ ) plasma cholesterol than the other treatment groups. T1, T2, T3, T4 and T5 had significantly higher ( $P<0.01$ ) plasma ALP values than T6 and T7. However, no such difference was observed in plasma uric acid, ALT and AST among the different treatment groups. No significant difference was observed in the development of digestive organs among the different treatment groups. No significant difference was observed on the carcass quality parameters and cut up parts among the different treatment groups. However, Percent heart weight was significantly higher ( $P<0.05$ ) in T3 than other treatment groups (0.55 vs. 0.44, 0.44, 0.47, 0.45, 0.46 and 0.49). T1, T2, T3, T5, T6 and T7 had significantly higher ( $P<0.01$ ) protein and Ca percent in breast meat as compared to T4. Similarly, T1, T2, T3, T5, T6 and T7 had significantly higher ( $P<0.05$ ) P percent in breast meat as compared to T4. T1, T2, T3, T4, T6, T7 thigh meat had significantly higher ( $P<0.01$ ) moisture as compared to T5. EE percent of thigh meat of T1, T2, T3 was significantly higher ( $P<0.01$ ) as compared to T5. Similarly, protein percent in thigh meat of T1, T2, T3, T6, T7 was significantly higher ( $P<0.01$ ) compared to T4 and T5. Total ash percent in thigh meat of T7 was significantly higher ( $P<0.01$ ) as compared to other treatment groups. Thigh meat of T1, T2, T3, T4, T7 had significantly higher ( $P<0.01$ ) P percent as compared to T5.

Thus, it may be concluded that supplementation of dietary supplementation of Shatavari root meal @ 0.25% although not significant but increased the growth performance and improve feed conversion ratio in coloured chicken. Dietary supplementation of Shatavari root meal did not have any adverse effect on the immunocompetence traits of coloured chicken. Further, dietary supplementation of Shatavari root meal @ 0.5% and above may reduce plasma cholesterol in chicken.

#### **42. Effect of feeding Sea buckthorn and Giloe leaf meal on the performance of Turkey poults**

Present study was conducted to evaluate the efficacy of SBT and giloe leaf as a dietary feed supplement in turkey poults. A total of (n=84) day old turkey poults were distributed into four dietary treatments having three replicates each with seven birds. The study was conducted in turkey poults during 0-8 weeks of age. During the experiment, the poults were fed basal ration, (control) T1- CP- 28%, ME-2800 Kcal/kg, T2- basal ration was supplemented with sea buckthorn leaf meal powder @ 0.5%, T3- basal ration was supplemented with giloe leaf meal powder @ 0.5% and T4- basal ration was fed along with supplementation of both sea buckthorn @ 0.5% and giloe leaf meal powder @ 0.5%. T2 group birds had an apparently higher body weight compared to the other treatment groups throughout the experiment. T2 turkey poults had a significantly higher ( $P<0.01$ ) body weight gain than T3 and T4 at 7th week of age. Weekly body weight gain was significantly better ( $P<0.05$ ) in T2 than T3 during 5th-8th weeks and 0-8th weeks of growth phase. T2 poults had a significantly better ( $P<0.05$ ) feed conversion ratio than T3 at 1st week and at 4th week. FCR was significantly better ( $P<0.05$ ) in T2 than other treatment groups during 5th-8th weeks phase of growth (2.08 vs 2.24, 2.27 & 2.34). Overall, FCR was significantly better ( $P<0.01$ ) in T2 group as compared to other treatment groups (1.96 vs 2.18, 2.21 & 2.26). The HA and IgM response to 1% SRBC was comparatively better in the T3 group as compared to the other groups. Plasma uric acid was found significantly increased ( $P<0.05$ ) in T1 than T3 and T4 and ALP value was significantly higher ( $P<0.05$ ) in T1 and T3 than T2. Percent shrinkage in live weight was significantly higher ( $P<0.05$ ) in T1



than T2 and T3. Percent liver weight was significantly higher ( $P < 0.05$ ) in T3 than T1 and T4. Percent yield of drumstick was significantly higher ( $P < 0.05$ ) in T1 and T2 as compared to T3 group. Percent small intestine weight was significantly higher ( $P < 0.05$ ) in T3 and T4 groups as compared to T1 group. Zinc level of breast (pectoralis major) muscles were significantly higher ( $P < 0.05$ ) in T2 and T4 as compared to T1, while ether extract in thigh (ilio tibialis) muscles were significantly higher ( $P < 0.05$ ) in T2 as compared to the other treatment groups. The economics of turkey poult revealed that total feed cost per kg live bird was significantly lower in T2 group than other treatment groups (62.62 vs 68.97, 69.99 and 70.11). Thus, it may be concluded that supplementation of sea buckthorn leaf meal @ 0.5% may elicit production performance of turkey poults. Further, there was no adverse effect on the blood biochemical attributes of turkey poults subjected to SBT and giloe leaf meal supplementation @ 0.5%. Further, supplementation of sea buckthorn and giloe leaf meal may have hepatoprotective effect in turkey poults. Supplementation of 0.5% sea buckthorn leaf meal may result in higher levels of zinc and ether extract in the breast and thick cuts of turkey poults. In addition, supplementation of 0.5% sea buckthorn leaf meal in turkey poults may be economical due to decreased feed cost per kg gain in body weight.

## MSc

### College of Biotechnology

#### 43 Purification and characterization of urinary antimicrobial peptides of goat.

The present study was aimed for identifying urinary antimicrobial peptides in healthy Goats. In this study, urine samples were collected from 30 healthy non-pregnant goats and evaluated for

physio-chemical parameters. The urine samples were pooled together and protease inhibitor was added. Thereafter filtered through 0.2 $\mu$  membrane filter and stored at 40C till further analysis. The samples were subjected to Dia-filtration using Amicon 10 kDa Fiter to concentrated proteins in urine and proteins were extracted by ion exchange chromatography and acetone precipitation. Cationic peptides were extracted from concentrated urine by using weak Cation exchange beads from the dia-filtered urine. Cationic and anionic peptides fractions obtained were estimated by different method for determining the recovery of protein. The results of protein estimation by different method revealed highest values of protein by BCA method compared to Lowry and Bradford method giving protein ranged between 0.029 $\mu$ g/ $\mu$ l to 6.03 $\mu$ g/ $\mu$ l. Further cationic peptides were confirmed by AU-PAGE revealed 5 bands and the anionic fraction by SDS PAGE revealed 12 bands of molecular weight ranged from 10.0 to 93 kDa proteins. Out of these one protein band from each were identified by MALDI-TOF MS analysis revealed the presence of significant proteins: Zinc Transporter 9 (ZnT9) in AU-PAGE HAUS augmin-like complex subunit 5 (HAUS5) in SDS-PAGE. The antimicrobial activity of both cationic and anionic fractions was examined by Radial Diffusion and microtiter broth dilution method. The cationic fractions revealed 23 and 26 mm zones of inhibition against *S. aureus*. and *E. coli*. respectively and MIC of cationic peptides observed was 0.039  $\mu$ g/ $\mu$ l and 0.0199 $\mu$ g/ $\mu$ l against *E. coli* and *S. aureus* respectively. It can be concluded from the study that the cationic peptides present in the goat urine may contribute in antimicrobial activity of goat urine.

# EXTENSION

## 1. DIRECTORATE OF EXTENSION

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

S.N.	Theme of Training	Duration	No. of Trainees	Beneficiaries	Funding Agency
1.	Pashudhan evam Kukkut Palan prashikshan	18 <sup>th</sup> – 20 <sup>th</sup> April, 2017	35	Selected farmers under Samajothan Seva Sansthan	Samajothan Seva Sansthan, Balbhavan, Motijheel, Kanpur
2.	Pashupalan Evam Prabhandhan Ke Siddhant	17 <sup>th</sup> - 21 <sup>st</sup> July, 2017	30	Selected farmers by the Agency	Department of Irrigation & Water Resources, Hathrus (UP)
3.	Vaigyanik Paddhati Se Vyawasaik Dairy Palan	09 <sup>th</sup> – 13 <sup>th</sup> October, 2017	21	Selected Farmers under Kamdhenu/ Mini & Micro Kamdhenu Scheme	U.P. Animal Husbandry Department/ Self
4.	Refresher training programme on “ Capacity building of Veterinary Officers for effective delivery of critical services ”	29 <sup>th</sup> – 30 <sup>th</sup> January, 2018	27	Selected Veterinary officers from UP Animal Husbandry Department	UP Veterinary Council of India
5.		26 <sup>th</sup> – 27 <sup>th</sup> February, 2018	24		
6.		22 <sup>nd</sup> – 23 <sup>rd</sup> March, 2018	15		
7.	Sheep & Goat Training “Improved Production & Management of small ruminants”	13 <sup>th</sup> – 17 <sup>th</sup> February, 2018	21	Veterinary Officers	U.P. Animal Husbandry Department
8.	Sheep & Goat Training “Improved Production & Management of small ruminants”	20 <sup>th</sup> – 24 <sup>th</sup> February, 2018	15		







## B. Visits of Farmers/Students/Officials

S.N.	Date	Details of Visit	Sponsoring Agency	Remarks
1.	10/04/2017	11 farmers from Block- Bamhnidih, District- Jajgir Champa, Chhatisgarh state under the leadership of Dr. K. K. Patel	Animal Husbandry Department	Provided information & literature regarding dairy farming
2.	24/04/2017	34 Farmers From District Surajpur, Chhatisgarh State under the leadership of Dr Dilip Kumar	Livestock Development Department	
3.	11/05/2017	Shri Suresh Chandra Chaudhary Village- Kanchanpur Mathura	Self	
4.	27/6/2017	Shri Hariom Sharma s/o Shri Ram Babu Sharma Village- Amela Khragarh Dist- Agra	Self	Provided information & literature regarding Goat farming
5.	20/07/2017	One Farmer (Shri Kartar Singh S/O Shri Mahendra Singh) Village- Nagla Amra (Saunkh Road) Post- Krishna Nagar Mathura	Self	Provided information & literature regarding dairy farming & Visit of PGC and dairy
6.	03/08/2017	38 Farmers from Guna district of Madhya Pradesh state under the leadership of Shri Amit Singh	Karyalaya Up-Sanchalak Krishi - Guna (MP)	Provided information & literature regarding dairy farming and, profitable animal husbandry practices and importance of vaccination
7.	28/08/2017	24 Farmers from Gwalior District of Madhya Pradesh state under the leadership of Dr G.R. Goyal	ATMA Yojana by DAVS, Gwalior	Farm Visit & Demonstration of Farm activities
8.	31/08/2017	26 Farmers from Mungeli District of Chhatisgarh state under the leadership of Dr Tanmay Ottalwar and Dr Prashant Dewangan	Krishak Kaushal Vikas Yojana	Provided information & literature regarding animal husbandry and given one expert lecture on selection criteria of dairy animals
9.	31/08/2017	10 Farmers from Panna District of Chhatisgarh state under the leadership of Dr Vivek Kumar Naik	Krishak Kaushal Vikas Yojana/ Krishak Bhraman Yojana	Provided information & literature regarding animal husbandry and delivered one expert lecture on importance of clean milk production
10.	31/08/2017	15 Farmers from Panna District of Chhatisgarh state under the leadership of Dr Jaychand Lodhi	ATMA Kisan Kalyan Evam Krishi Kalyan Yojana	Provided information & literature regarding animal husbandry and delivered one expert lecture on scientific management practices for optimum production
11.	19/09/2017	10 Farmers from Bilaspur District of Chhatisgarh state under the leadership of Dr Javed Siddiqui	Krishak Kaushal Vikas Yojana	Visit to PGC, Dairy Farm and delivered one expert lecture on calf management



S.N.	Date	Details of Visit	Sponsoring Agency	Remarks
12.	09/10/2017	10 Farmers from Bilaspur District (Block- Bilha) of Chhatisgarh state under the leadership of Dr O P Tiwari & 01 AVFO	Krishak Kaushal Vikas Yojana	Visit to PGC, Dairy Farm and delivered one expert lecture on importance of vaccination & deworming on production efficiency of dairy animals
13.	09/10/2017	10 Veterinary Officers from Gwalior District of Madhya Pradesh state under the leadership of Dr G R Goyal	ATMA Exposure Visit Scheme	Visit to PGC, Dairy Farm and delivered one expert lecture on significance of A <sub>1</sub> & A <sub>2</sub> milk
14.	09/10/2017	10 Farmers from Bilaspur District (Block-Kota) of Chhatisgarh state under the leadership of Dr Sanjay Raj	Rashtriya Krishak Kaushal Vikas Yojana	Visit to PGC, Dairy Farm and delivered one expert lecture on importance of vaccination & deworming on production efficiency of dairy animals
15.	18/10/2017	10 Farmers from Bilaspur District (Block- Pendra) of Chhatisgarh state under the leadership of Dr M S Mavavi	Krishak Kaushal Vikas Yojana	Visit to PGC, Dairy Farm & delivered one expert lecture on feed & fodder requirements for dairy animals
16.	28/10/2017	42 Farmers from Gonda District of Uttar Pradesh state under the leadership of Satya Prakash Shukla	Ganna Kisan Sansthan, Prashikshan Kendra	Visit to PGC, Dairy Farm and delivered one expert lecture on herd health management
17.	28/10/2017	38 Women Farmers from Jaipur District of Rajasthan state under the leadership of Puran Mal Bairwa	RACP, Rajasthan Agriculture Department, Jaipur	Visit to PGC, Dairy Farm and delivered one expert lecture on milking methods & clean milk production
18.	01/11/2017	30 Farmers from Surajpur District of Chhatisgarh state under the leadership of Dr D K Paikra, Dr S N Patel & Dr V P Gupta (VAS)	Kaushal Krishak Vikas Yojana	Provided information & literature regarding dairy farming & Visit of PGC and dairy
19.	01/11/2017	16 Under Graduate Students of RLB CAU, Jhansi	Educational Tour	Provided needful information & one short lecture on dairy farming and breeds of cattle & buffaloes
20.	28/11/2017	35 Women Farmers from DPMU, RACP, Jaipur	Exposure visit cum Training	Visit to PGC, Dairy Farm and delivered one expert lecture on milking methods & ideal dairy characters.
21.	06/12/2017	42 Farmers from Bilaspur District (Block- Akaltara, Ganiyari & Champa) of Chhatisgarh state under the leadership of Dr. Raj Jaiswal, Dr. Tapsi Mandal, Dr. Suresh Kanwar	Krishak Kaushal Vikas Yojana	Visit to PGC, Dairy Farm and delivered one expert lecture on herd health management & record keeping
22.	20/01/2018	22 Farmers with 4 Officers from Bilaspur District (Block- Baloda & Jangir) of Chhatisgarh state under the leadership of Dr. K. L. Maitri & Dr. S. L. Ogre	Krishak Kaushal Vikas Yojana	Visit to PGC, Dairy Farm and delivered one expert lecture on milking management & selection criteria for dairy animals.
23.	03/02/2018	13 Farmers with 2 Officers from Ramgarh District (Block- Kharasia) of Chhatisgarh state under the leadership of Dr. R.K. Manhar & Shri B D Saxena	Shaikshanik Bhraman Yojana	Visit to PGC, Dairy Farm and delivered one expert lecture on care & management of pregnant, new born & lactating animals.



S.N.	Date	Details of Visit	Sponsoring Agency	Remarks
24.	22/02/2018	15 Farmers from Shyopur District of Madhya Pradesh state under the leadership of Nawal Singh Prajapati	Krishak Prashikshan Yojana under ATMA	Visit to PGC, Dairy Farm and delivered one expert lecture on breeds of dairy animals & feeding management.
25.	25/02/2018	28 Farmers with 4 staff members from Ganna Kisan Sansthan Gorakhpur district of Uttar Pradesh state under the leadership Mohammad Umar	Krishak Kaushal Vikas Yojana	Visit to PGC, Dairy Farm and delivered one expert lecture on economics of dairy farming & breed characters.
26.	26/02/2018	13 Farmers with 02 officers from Bilaspur District (Block- Mastuni) of Chhatisgarh state under the leadership of Dr. Yashwant Kumar Dahariya	Krishak Kaushal Vikas Yojana	Visit to PGC, Dairy Farm and delivered one expert lecture on milking management & selection criteria for dairy animals.
27.	09/03/2018	36 Farmers from Ganna Kisan Sansthan Varanasi district of Uttar Pradesh state under the leadership Mr. Vishwanath Prasad	Farmers Visit	Visit to PGC, Dairy Farm and delivered one expert lecture on importance of vaccination & deworming on production efficiency.





## 2. DEPARTMENT OF VETERINARY AND ANIMAL HUSBANDRY EXTENSION

This department was created in the year 1962 to provide livestock owners with information and innovative knowledge of improved technologies for

enhancing health and productivity of their livestock health and thereby making them economically sound. The department provides under-graduate and post-graduate teaching to the students to equip them with methodologies to diffuse innovative researches among livestock owners in order to make them economically viable.





## A. Trainings coordinated:

### 1. Trainings coordinated by the department

#### i. Training Program for Veterinary Officers

S. No.	Title	Number of participants	Duration and Place	Funding agency	Grant (in Lakh Rs)
1.	Capacity Building of Extension Functionaries for Promotion of Entrepreneurship among Farmers.	21	01-10 January 2018	National Institute of Agricultural Extension Management. (MANAGE)	3.00
2.	Capacity Building of Extension Functionaries for Doubling Farmers Income.	20	01-10 February 2018	National Institute of Agricultural Extension Management (MANAGE)	3.00
3.	Capacity Building of Extension Functionaries to Explore Organic Livestock Products.	20	05-14 March 2018	National Institute of Agricultural Extension Management (MANAGE)	3.00
4.	AI in Bovines & Livestock Management.	15	15- 24 January 2018	Uttar Pradesh Livestock Development Board, Lucknow	4.00

#### ii. Training Program for Gaushala Workers.

S. No.	Title	Number of participants	Duration	Funding agency	Grant (in Lakh Rs)
1.	Commercial Management of Gaushalas	21	12-21 February 2018	Uttar Pradesh Go-Seva Aayog	2.761
2.	Commercial Management of Gaushalas	21	12- 21 March 2018		

### 2. Exhibition of technologies in different events

S. No.	Title	Place	Date
1.	New India Manthan-Sankalp se Siddhi	Parkham, Farah, Mathura	29 August 2017
2.	Krishi Evam Gram Vikas Pradarshani,	Village: Nagala Chandrabhan, Block: Farah, District: Mathura	21 - 25 September, 2017
3.	Silage: Hare Chare ko Surakshkit karne ki saral evam Upyogi Vidhi.	DUVASU, Mathura	02 December 17
4.	World Soil Health Day, Rabi Fasal Production Awareness Programme and Exhibition	DUVASU , Mathura	05 December 2017



### 3. Extension Literature published

#### i. Folders

1. जैविक पशुपालन की उपयोगिता, दुवासु प्रकासन संख्या-164
2. जैविक दूध की महत्वता, दुवासु प्रकासन संख्या-165
3. उत्तम दुधारू पशु का चुनाव, दुवासु प्रकासन संख्या-166
4. दूध के मूल्य संवर्धन से लाभ अर्जित करने के उपाय, दुवासु प्रकासन संख्या-167
5. नवजात बच्चों को खीस पिलाने का महत्व, दुवासु प्रकासन संख्या-168

#### ii. Training manuals

S. No	Title of Manual	Year	Authors/Editors
1.	Scientific Method of Dairy and Poultry Farming (18/04/2017 to 20/04/2017)	2017	Prof. Sarvajeet Yadav, Dr. Deep Narayan Singh & Dr. Amit Singh
2.	Scientific Principles of Animal Husbandry and Management (17/07/2017 to 21/07/2017)	2017	Prof. Sarvajeet Yadav, Dr. Amit Singh & Dr. Deep Narayan Singh
3.	Scientific Practices in Commercial Dairy Farming (09/10/2017 to 13/10/2017)	2017	Prof. Sarvajeet Yadav, Dr. Amit Singh and Dr. Deep Narayan Singh
4.	Capacity Building of Extension Functionaries for Promotion of Entrepreneurship among Farmers (DUVASU publication no. 171)	2018	Prof. Satish Kumar Garg, Sanjeev Kumar Singh & Amit Singh
5.	Artificial Insemination in Bovine and Livestock Management, (DUVASU publication no. 172)	2018	Prof. Satish Kumar Garg, Dr. Sanjeev Kumar Singh and Dr. Amit Singh
6.	Capacity Building of Veterinary Officers for Effective Delivery of Critical Services. (DUVASU publication no. 173)	2018	Prof. Sarvajeet Yadav, Dr. Amit Singh, Dr. Brijesh Yadav and Dr. Sanjeev Kumar Singh
7.	Capacity Building of Extension Functionaries for Doubling farmers Income (DUVASU publication no. 174)	2018	Prof. Satish Kumar Garg, Dr. Sanjeev Kumar Singh and Dr. Amit Singh
8.	Improved Production and Management of Small Ruminants (DUVASU publication no. 175)	2018	Prof. Sarvajeet Yadav, Dr. Amit Singh, Dr. Mukul Anand and Dr. Yajuvendra Singh
9.	Capacity Building of Extension Functionaries to Explore Organic Livestock Products, (DUVASU publication no. 176.)	2018	Prof. Satish Kumar Garg and Dr. Sanjeev Kumar Singh
10.	Commercial Management of Gaushalas (DUVASU publication no. 177)	2018	Prof. Satish Kumar Garg, Dr. Sanjeev Kumar Singh, Prof. Atul Saxena, Dr. Rashmi, Dr. Madhu Tiwari and Dr. Meena Goswami



### 3. OTHER EXTENSION ACTIVITIES BY THE COLLEGE OF VETERINARY SCIENCE AND ANIMAL HUSBANDRY

#### Disease outbreaks

Date of Visit	District	Attended by
20 April 17	Shree Gaushala Society, Valkeshar Road, Agra	Dr Barkha Sharma, Dr. Neeraj Gangwar, Dr Mukesh Srivastava
10 July 2017	Shree Mathura-Vrindavan, Hasanand Gochar Bhumi Trust, Village- Dhaurera	Dr Ashish Srivastava Dr Rahul Kumar
06 July 2017	Village-Hardalmau, Teh. Sandila, Dist. Hardoi,	Dr Mukesh Srivastava Dr Amit Verma
08 November 2017	Etawah Wildlife Safari Park, Etawah	Prof. R. P. Pandey
20 November 2017	Etawah Wildlife Safari Park, Etawah	Dr Mukesh Srivastava Dr. Arvind Tripathi
14 March 2018	Etawah Wildlife Safari Park, Etawah	Dr Mukesh Srivastava Dr. Udit Jain

#### Clinical and Animal Welfare Camps

Faculty members from the Department of Veterinary Medicine, Veterinary Surgery and Radiology and Veterinary Gynaecology and Obstetrics attended the clinical camps in different villages of Mathura district as per the details given below:

S.No.	Date	Name of Village	Total number of animals treated	No. of Clinical Cases		
				Surgery	Medicine	Gynae
1.	29 April 2017	Gotholi	63	02	35	26
2.	25 June 2017	Javara (Maat)	83	04	30	49
3.	05 August 2017	Baati (Mathura)	15	01	05	09
4.	23 September 2017	Pt. DeenDayal Dhamm (Farah)	41	02	09	29
5.	17 March 2018	Pt. DeenDayal Dham (Farah)	52	02	27	33
<b>Total</b>			<b>254</b>	<b>11</b>	<b>106</b>	<b>146</b>

#### 4. KRISHI VIGYAN KENDRA, DUVASU, MATHURA.

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



## 1. Training

Clientele	No of Training	Participants
Practising farmers	84	2500
Rural Youth	10	250
Rural Youth	7	260
<b>Total</b>	<b>101</b>	<b>3010</b>

## 2. Frontline Demonstration

In FY 2017-18, 256 frontline demonstrations (FLDs) were organized by the KVK covering an area of 245.5 acres.

(a) Kharif-2017			
Discipline	Crop	Area (Acre)	No. of Demonstrations
Crop Production	Paddy	16	16
	Bajra	14	14
Horticulture	Brinjal	10	11
Soil Science	Paddy	10	10
<b>Total</b>	-	<b>50</b>	<b>51</b>
(b) Rabi-2017-18			
Crop Production	Mustard (CFLD)	125	139
	Wheat	13	13





(a) Kharif-2017			
Discipline	Crop	Area (Acre)	No. of Demonstrations
Horticulture	Cauliflower	10	10
Soil Science	Wheat	10	10
Animal Science	Berseem	10	30
	Oats	2.5	3
Total		170.5	205
(c) Zaid-2017-18			
Crop Production (CFLD)	Moong	25	26
Grand Total (a+b+c)	-	245.5	256

### 3. On Farm Testing:

No. of technologies assessed	No. of Trials	No. of farmers	No. of Locations
7	40	40	15

### 4. Seed and sapling production (KVK Farm)

During the reporting period, KVK produced 856 quintal of breeder seeds worth Rs. 27,00,000/-. In addition to seeds, 28000 vegetable saplings were also sold by the KVK in FY 17-18.

### 5. Soil sample analysis

During FY 17-18, 583 soil samples were analyzed by the KVK and soil health cards were provided to all farmers.

### 6. Other Extension Activities of KVK

Sl. No.	Date	Name of activity	Venue	No. of participants
1	15 April 17	Scientist, Farmers/ Pashupalak Interaction meeting to double farmers income	Kisan Bhawan, DUVASU	150
2	1 June 17	Scientist, Farmers/ Pashupalak Interaction meeting to double farmers income	KVK, Mathura	50
3	16-22 August 2017	Parthenium control week	KVK, Mathura	-
4	19 August 2017	World Honey Bee Day	KVK, Mathura	80
5	29 August 2017	New India Manthan: Sankalp Se Siddhi Programme	Vill.-Parkham (Farah)	1000
6	06 September 2017	Seminar cum Training on Cooperative	KVK, Mathura	75
7	17 Sep. – 2 Oct., 2017	Swachhta Hi Sewa Campaign	KVK, Mathura & Nearby villages	12
8	03 December 2017	Agriculture Education day	Chaumuhan	100
9	05 December 2017	World Soil Health Day	University Campus	1000
10	21 December 2017	Kisan Jagrukta Sammelan evam Krishi Pradarshini on PPV & FRA	Village Palson (Goverdhan)	1000
11	16-19 March 2018	Krishi Unnati Mela	IARI, PUSA New Delhi	110

# UNIVERSITY FARMS

## A. INSTRUCTIONAL LIVESTOCK FARM COMPLEX (ILFC)

At ILFC Mathura, the total numbers of animals on 31.03.2018 were 643. It included Haryana cattle (207), Crossbred cattle (60), Sahiwal cattle (285), Murrah buffalo (95) and Nili Ravi buffalo (06). During 2017-18, total milk production at the farm was 2,49,597.00 liters, out of which, the production of cow milk was 1,98,933.50 liters and buffalo milk was 50,663.50 liters. The average milk production was 683.82 liters per day.

## B. POULTRY FARM

The different species, breeds and varieties of birds maintained in poultry farm of the Department of poultry science during 2017-18 were

Sl. No.	Species, Breeds and varieties	Flock Population
1.	Layers	146
2.	Chabro breeders	206
3.	Chabro chicks	990
4.	Aseel Peela birds	17
5.	Kadaknath birds	18
6.	Naked Neck	23
7.	Japanese quail	833
8.	Turkey	131
9.	Guinea Fowl	29
10.	Emu	3
11.	Other breeds (Black Rock, White Rock, Red Cornish, Dahlem Red, Barred Rock, Punjab Brown)	104

During FY 2017-18, the farm generated a revenue of Rs. 4,25,599/- (four lacs twenty five thousand five hundred ninety nine) from sale of different birds and eggs. Additionally, a sum of Rs. 7,29,946/- (seven lacs twenty nine thousand nine hundred forty six) was generated from sales of poultry products under Experiential Learning Unit (ELU) in Poultry.

## C. DIRECTORATE OF FARMS

### 1. Madhuri Kund Agriculture Farm

- ▶ Total grain (mustard, wheat, oats and barley and paddy) production at Madhuri Kund farm of the university during FY 17-18 was 5937.30 quintals. Out of this 1184.90 quintal barley was transferred to LFC and rest was sold generating revenue of Rs. 1,16,86,303/-
- ▶ Revenue generated from sale of green fodder and berseem seed is Rs. 1,04,800/- and Rs. 15724/- respectively.
- ▶ Additionally, the farm supplied 1140 quintal wheat straw to LFC of the university for utilization.

### 2. Pasture Unit

1. **Fodder research section:** During FY 17-18, total seed production of fodder research section of the unit was 416.60 quintal (Wheat – HD 3086). Out of this, 362.60 quintal was sold to IARI – Delhi generating a revenue of Rs. 12,33,565/- (Rs Twelve lacs thirty three thousand five hundred sixty five). Remaining 54.00 quintal of grain was transferred to Livestock Farm Complex (LFC) of the university. 79.75 quintal of sorghum fodder was also produced by the section which was transferred to LFC for utilization.
2. **LFC - Pasture unit:** The farm produced 15249.54 quintal green fodder during the reported period which was transferred to LFC for utilization. The farm produced 0.42 quintal of berseem seed, 101.75 quintals of oats grain/seed and 290.15 quintal of barley grain/seed during this period.

The unit has procured two tractors (60 HP) in FY 17-18 for efficient functioning.

# HUMAN RESOURCE DEVELOPMENT

## Training programmes

### ICAR Short course



Department of Veterinary Epidemiology and Preventive Medicine, organized ICAR sponsored 10 days Short Course on “**Molecular Tools in Epidemiology of Infectious Diseases**” from **06<sup>th</sup> – 15<sup>th</sup> November 2017**. Out of 46 applications, 25 were selected including 20 Assistant Professors/ Subject Matter Specialists from different parts of the country. Inaugural ceremony was presided over by Prof. K.M.L. Pathak, Vice Chancellor, DUVASU, Mathura. Dr. U.D. Gupta, Director, ICMR-JALMA, Agra was Guest of Honor along with Dr. K. L.

Khurana, Principal Scientist, Education Division, ICAR, New Delhi. The Course Director was Dr. Amit Kumar Verma and Course Coordinator was Dr. Amit Kumar. Theory and Practical sessions were conducted by eminent professionals. Two educational visits to CIRG, Makhdoom and ICMR-JALMA, Agra were also arranged. In the valedictory function, Prof. K.M.L. Pathak, Vice Chancellor, DUVASU, Mathura was the Chief Guest and Dr. P. K. Malik, Director, NIAH, Baghpat was the Guest of Honor.

### Sensitization workshop on Silage



Department of Animal Nutrition organized one-day sensitization workshop on **“Silage: Hare Chare ko Sanrakshit Karne ki Saral va Upyogi Vidhi”** under RKVY funded project on 2<sup>nd</sup> Dec. 2017. Shri Shailjakant Mishraji, Vice President Brij Vikas Trust was the Chief Guest of the occasion. A booklet and a leaflet were released by dais dignitaries. About

350 farmers, livestock owners including women and students participated and were imparted hands-on training for silage preparation in the workshop. Altogether, workshop was of great interest to participants and was a motivation to induct the concept of preserving green fodder as silage for its round the year availability.

### Workshop on “Bakariyon mein Kritrim Garbhadhan”



Department of Veterinary Physiology organized two days workshop on A.I. in goats under RKVY funded project on 23<sup>rd</sup> - 24<sup>th</sup> Dec. 2017. Fifty Veterinary Officers from 20 selected districts of U.P. participated in the workshop. Sh. Pooran Prakash, MLA, Baldeo, Mathura was the chief guest on the inaugural function while Prof. K. M. L. Pathak presided over the function. Dr. DC Verma, MLA Meerganj, and President U.P. Veterinary Council was the Guest of Honour. The valedictory function organized on 24 Dec. 2017, was presided over by Prof. K. M. L. Pathak, Hon'ble Vice Chancellor wherein Sh. Sanjay Bhoosreddy, IAS, Principal Secretary, Sugar Industries and Sugar Cane Commissioner was the Chief Guest, Sh. S. K. Singh, IAS, Managing Director, U.P. Sugar Federation and Dr. S. C. Gupta, Jt. Director, Animal Husbandry Govt of U.P. were the Guests of Honour.

### National workshop on Go Adharit Arthavyavatha



One day National workshop on Go Adharit Arthavyavatha was organized by DUVASU, Mathura on 19<sup>th</sup> August, 2017. Speaking on the occasion, Sri Krishna Gopal ji said that there are 37 breeds of indigenous cattle throughout our country. Kosi breed of cattle is very popular in Mathura region. Hence, it is necessary to conserve this breed locally and efforts should be made to conserve various indigenous breeds of cattle popular in their respective breeding tract regions. Prof. K.M.L. Pathak, Vice Chancellor, DUVASU, Mathura stressed on creating awareness among people to make indigenous cattle more productive. It was emphasized by various

experts that gomutra (cow urine) and gobar (cow dung) have lots of utility and hence marketing of different useful commodities prepared from urine and cow dung should be explored. There were 110 participants from different parts of the country. Dr. Arvind Dixit, Vice Chancellor, B R Ambedkar University, Agra, Dr. Vallabhkhair Kathiria, chairman, Gujarat Go Seva Ayog, Sri. Rajiv Gupta, Chairman, Uttar Pradesh Go Seva Ayog, Dr. R.S. Chauhan, Dr. Balbhadra Singh Yadav, Sri. Sunil Mansinghka, were the other important dignitaries who attended the workshop. Prof. Sharad Kumar Yadav, Director, Go Anusandhan Sansthan was the Organizing Secretary and Dr. S. K. Singh, Asst. Professor, Extension, was the Co Organizing Secretary.



### Executive Committee Meeting of IAUA

Executive Committee Meeting of Indian Agricultural Universities Association was organized by DUVASU, Mathura on 5<sup>th</sup> July, 2017. Dr. K. M. Bujarbaruah, Vice Chancellor, Assam Agricultural University and President of the Association emphasized the importance of storage and marketing of agricultural products under 'Seed to Market Plan'. He also said that steps are being taken for formation of 'Farmers Producers Organization'. Dr. V. S. Tomar, Vice Chancellor, Jabalpur Agricultural University, Dr. A. R. Pathak, Vice Chancellor, Junagadh Agricultural University, Dr. N.C. Patel, Vice Chancellor, Anand Agricultural University, and Dr. R. P. Singh, Secretary of the Association were the other dignitaries who attended the meeting.



**PARTICIPATION OF FACULTY MEMBER IN INTERNATIONAL AND NATIONAL TRAININGS/WORKSHOPS**

Sl. No.	Name of faculty member	Title of event	Date
1	Dr Rashmi Singh	International Conference on “Virus Diseases: One Health-One World”, Kuching, Malaysia	25 <sup>th</sup> – 27 <sup>th</sup> July, 2017
2	Dr. Ruchi Tiwari	IV International Annual Conference of ACSE and WCSTM, Deira, Dubai, UAE	12 <sup>th</sup> – 14 <sup>th</sup> Aug. , 2017
3	Dr Dilip Kumar Swain	International conference and Expo on “Agriculture and Veterinary Sciences: Research and Technology” held at Telanagana University, Hyderabad.	23 <sup>rd</sup> -25 <sup>th</sup> Oct., 2017
4	Dr. Amit Kumar Dr. Vinod Kumar Singh	International conference on Global Research on Agriculture and Allied Sciences, RAU, Udaipur, Rajasthan	2 <sup>nd</sup> – 4 <sup>th</sup> Dec., 2017
5	Dr. Ruchi Tiwari	V International Annual Conference of ACSE and II ACSTM, Deira, Dubai, UAE	20 <sup>th</sup> – 22 <sup>nd</sup> March, 2017
6	Dr Amit Verma	International Conference on “Global research initiative for sustainable agriculture and allied sciences” organized at Maharana Pratap Univ. of Agriculture and Technology, Udiapur, Rajasthan	Dec., 2017
7	Dr. Archana Pathak Dr. Vikas Pathak Dr. Amit Kumar Dr. Vinod Kumar Singh	17 <sup>th</sup> Indian Veterinary Congress and XXIV Annual Conference of IAAVR and National Symposium on “Newer Generation vaccines, diagnostics for improvement of Animal Health and productivity vis-à-vis genomic interventions for the societal benefit” held at IVRI Izatnagar.	8 <sup>th</sup> – 9 <sup>th</sup> April, 2017
8	Prof. Sarvajeet Yadav	National Seminar Organized by Uttar Pradesh Council of Agricultural Research, Lucknow at Indian Institute of Sugarcane Research.	14 <sup>th</sup> June, 2017
9	Dr. V P Singh	National seminar on “Food adequacy and climate change: strategies for sustainable food production” at Kerala Veterinary and Animal Sciences University (KVASU), Thrissur	3 <sup>rd</sup> – 4 <sup>th</sup> Nov. , 2017
10	Dr. Archana Pathak Dr. Shriprakash Dr. Abhinov Verma Dr. Vikas Pathak Dr. Meena Goswami Dr. Amit Kumar Dr. Rashmi Dr Brijesh Yadav Dr Mukul Anand	ISSGPU National Seminar on “Small Ruminants: National scope on up-scaling production to products value addition and their safety” at ICAR-CIRG, Makhdoom Farah, Mathura	9 <sup>th</sup> – 10 <sup>th</sup> Nov. , 2017
11	Dr. Rashmi Singh	National Symposium Animal experimentation in Biomedical Research: Scientific Ethical Perspectives & Annual Convention of LASAI’ on at National JALMA Institute for Leprosy and other Mycobacterial diseases, Tajganj, Agra	10 <sup>th</sup> – 11 <sup>th</sup> Nov., 2017
12	Dr. Rashmi Singh	India-EU dialogue seminar on ‘The use of veterinary medicines and antimicrobial resistance’, Export Inspection Council, Ministry of Commerce & Industry, Govt. of India. New Delhi.	15 <sup>th</sup> – 16 <sup>th</sup> Nov. , 2017
13	Prof. Satish K. Garg	37 <sup>th</sup> Annual Conference of Society of Toxicology (STOX-2017), New Paradigms in Toxicology its current challenges and future fact..... PGIMR, Chandigarh, India Held at Chandigarh	17 <sup>th</sup> – 19 <sup>th</sup> Nov. , 2017



Sl. No.	Name of faculty member	Title of event	Date
14	Prof. P.K.Shukla Dr. Amitav Bhattacharyya Dr Rajneesh Sirohi	XXXIV IPSACON, at ICAR-National Institute of Animal Nutrition and Physiology, Bengaluru.	28 <sup>th</sup> – 30 <sup>th</sup> Nov. , 2017
15	Dr Udit Jain	XV Annual Conference of Indian Association of Veterinary Public Health Specialists and National Symposium on Intersectoral Approaches to Combat Zoonoses: Strategies and Challenges organized by Department of Vety. Public Health & Epi., COVS, Sri Venkateswara Veterinary University, Tirupati	12 <sup>th</sup> – 13 <sup>th</sup> Dec. , 2017
16	Prof. Satish K. Garg Dr. Rajesh Mandil	XVII Conference of ISVPT and National Symposia on combating antimicrobial resistance held at Department of veterinary pharmacology & toxicology, CVSc Hisar, Haryana	20 <sup>th</sup> – 22 <sup>nd</sup> Dec. , 2017
17	Dr. Rajneesh Sirohi	XXVI Annual Conference of Society & Animal Physiologists (SAPI) and National Symposium on “Strategies for Sustainable Livestock Production” held at Department of Veterinary Physiology and Biochemistry, Veterinary College, Nandi Nagar, Karnataka Veterinary and Fisheries Science University, Bidar (Karnataka)	21 <sup>st</sup> – 22 <sup>nd</sup> Dec. , 2017
18	Prof. Ajay Prakash Dr. Prabhakar Kumar Dr. Varsha Gupta	XXXII Annual Convention of Indian Association of Veterinary Anatomists and National Symposium on “Advances and applications of Veterinary anatomy in livestock, pet, poultry and laboratory animal and wildlife – health and production”. At OUAT (Bhubaneshwar)	21 <sup>st</sup> – 23 <sup>rd</sup> Dec. , 2017
19	Dr. Muneendra Kumar Dr Shalini Vaswani	XVII Biennial Conference of Animal Nutrition Society of India on “Nutritional Challenges for Raising Animal Productivity to Improve Farm Grazing”.	1 <sup>st</sup> – 3 <sup>rd</sup> Feb., 2018
20	Dr. Ashish Srivastava, Dr. Shanker Kr. Singh Dr. Arvind Tripathi	National Symposium- Organized at College of Veterinary Science and Animal Husbandry, Orissa University of Agriculture and Technology	1 <sup>st</sup> – 3 <sup>rd</sup> Feb. , 2018
21	Dr Jitendra Kumar	33 <sup>rd</sup> Annual Convention & National Symposium of Indian Society for Study of Animal Reproduction on “Use of Reproductive Technologies and Production Improvements in Livestock Species Aiming to Socio-economic Development of Rural Mass”	9 <sup>th</sup> -11 <sup>th</sup> Feb. , 2018
22	Prof. Daya Shanker, Dr. Amit Kumar Jaiswal, Dr. Vikrant Sudan	27 <sup>th</sup> National Congress of Veterinary Parasitology (NCVP) on “Technologies for sustainable parasite control and readdressal of detection methods directed for upliftment of rural economy”	14 <sup>th</sup> – 16 <sup>th</sup> Feb. , 2018
23	Prof. S.K.Mishra, Dr. Braj Mohan Dr. Ravindra Kr. Rajput	International conference on Agriculture CSAUA&T, Kanpur	14 <sup>th</sup> – 17 <sup>th</sup> Feb. , 2018
24	Dr. Soumen Choudhury Dr. Amit Shukla	Golden Jubilee concluding celebration & Annual Conference of Indian Pharmacological Society (IPSCON-2017) [Theme: Integrating Pharmacology with Modern Healthcare] at SVKM's-NMIMS, Mumbai, Maharashtra	15 <sup>th</sup> – 17 <sup>th</sup> Feb. , 2018
25	Dr. Mukesh Kumar Srivastava	National Convention on Agriculture for Prosperity and Sustainable Development organized by Vidhyarthi Kalyan Nyas, Bhopal and ICAR, held at NAAS COMPLEX, ICAR, New Delhi	25 <sup>th</sup> – 27 <sup>th</sup> March, 2018



**Participation of faculty members in training/ workshops**

Sl. No.	Name of faculty member	Title of event	Date
1	Dr Amit Singh Dr. Sanjeev Kumar Singh Dr. Rashmi	Workshop on “Mentoring Young Extension Professionals for Conduct of Scientific Research at DUVASU, Mathura	12 <sup>th</sup> - 13 <sup>th</sup> April, 2017
2	Prof. S.K.Mishra	24 <sup>th</sup> Annual Zonal Workshop of KVKs at ICAR-ATARI, Kanpur	8 <sup>th</sup> – 10 <sup>th</sup> June, 2017
3	Prof. Sarvajeet Yadav	Zonal Workshop at ICAR ATRI, Kanpur, UttarPradesh	7 <sup>th</sup> -10 <sup>th</sup> June, 2017
4	Dr Mukul Anand	21 Days Training program on Embryo Transfer Technology (ETT) held at Embryo Biotechnology Research and Training center ( EBRTC) Animal breeding farm, Kalsi, Dehradun, Uttarakhand.	15 <sup>th</sup> June – 05 <sup>th</sup> July, 2017
5	Prof. S.K.Mishra	Training cum workshop on Portal updation, ICAR-ATARI, Kanpur	22 <sup>nd</sup> July, 2017
6	Dr. Amit Kumar	Workshop on “Development of surveillance framework for antimicrobial resistance in food animals and environment” organized by Centre for Science and Environment, India Habitat Centre, New Delhi.	3 <sup>rd</sup> - 4 <sup>th</sup> Aug. , 2017
7	Dr Amit Singh Dr. Sanjeev Kumar Singh Dr. Rashmi Dr. Rajneesh Sirohi Dr. Yajuvendra Singh Dr. D.N. Singh Dr. Ajay Kumar Dr. Deepak Sharma Dr. Madhu Tiwari Dr. S.P. Singh Dr. Vijay Kumar Dr. Avneesh Kumar	National workshop on “Go Aadharit Arthvyavastha” at DUVASU, Mathura	19 <sup>th</sup> Aug. , 2017
8	Dr Brijesh Yadav	21 Days Training program on “Upstream Reproductive Technologies on Augmentation of Livestock Production” held at CAFT, Division of Veterinary Physiology and Climatology, ICAR-IVRI, Izatnagar, UP.	1 <sup>st</sup> -21 <sup>st</sup> Sept, 2017
9	Prof. S.K.Mishra	National Workshop on Skill Development, Chandigarh	15 <sup>th</sup> Sep., 2017
10	Dr. B.L.Yadav Dr. Braj Mohan	Workshop cum training on IFS model at ICAR-ATARI, Kanpur	25 <sup>th</sup> - 26 <sup>th</sup> Oct. , 2017
11	Prof. S.K.Mishra	Mid Term Review Workshop, ICAR - ATARI, Kanpur	9 <sup>th</sup> – 10 <sup>th</sup> Nov. , 2017
12	Dr. Barkha Sharma	Two days OPZD workshop on “Laboratory Biosafety and Biosecurity” at NIHSAD, Bhopal	12 <sup>th</sup> – 13 <sup>th</sup> Dec. , 2017
13	Dr. Mukesh Kumar Srivastava	Two days sensitization workshop on “Artificial Insemination to Augment Farmers income” sponsored by RKVY under the project “Propagation of insemination techniques in goats and establishment of semen bank for enhanced productivity and socio-economic upliftment in state of UP, organized by Department of Veterinary PHYSIOLOGY, COVSc& A.H., DUVASU, Mathura	23 <sup>rd</sup> – 24 <sup>th</sup> Dec. , 2017





Sl. No.	Name of faculty member	Title of event	Date
14	Dr. Archana Pathak	Plastination: Hands on workshop-2	5 <sup>th</sup> – 7 <sup>th</sup> Jan., 2018
15	Prof. S.K.Mishra	State workshop on PPV&FRA at IISR Lucknow	15 <sup>th</sup> – 17 <sup>th</sup> Jan. , 2018
16	Dr. Y.K.Sharma	Review workshop of CFLD, ICAR - ATARI, Kanpur	7 <sup>th</sup> – 8 <sup>th</sup> Feb. , 2018
17	Dr. Deepak Sharma	21 days Summer school on “Improving reproduction rate through assisted reproduction and stem cell technologies for enhancing production in small ruminants” organized by CIRG, Makhdoom, Farah.	6 <sup>th</sup> - 27 <sup>th</sup> July, 2017
18	Dr. B.L.Yadav	Training Programme at ICAR - ATARI, Kanpur	5 <sup>th</sup> Aug.
19	Dr. B.L.Yadav	Training Programme at ICAR - ATARI, Kanpur	6 <sup>th</sup> Aug., , 2017
20	Dr. Y.K.Sharma	Training Programme at ICAR - ATARI, Kanpur	9 <sup>th</sup> – 10 <sup>th</sup> Aug. , 2017
21	Dr. Ravindra Rajput	Training Programme at ICAR - ATARI, Kanpur	20 <sup>th</sup> – 21 <sup>th</sup> Aug. , 2017
22	Dr. Braj Mohan	Training Programme at ICAR - ATARI, Kanpur	26 <sup>th</sup> Aug. , 2017
23	Dr. B.L.Yadav	Training Programme on Fodder at IGFRI, Jhansi	Aug. , 2017
24	Dr. Rashmi	21 days CAFT training programme on ‘Extension Strategies for Nutrition Sensitive Agriculture to address. ICAR- Indian Agricultural Research Institute (IARI), New Delhi.	2 <sup>nd</sup> – 22 <sup>nd</sup> Sep. , 2017
25	Dr. Meena Goswami	21 days winter school on “New Edge Technologies in Livestock Products Processing, Preservation and Quality Control” at GADVASU, Ludhiana (Punjab)	05 <sup>th</sup> - 25 <sup>th</sup> Sept. , 2017
26	Dr. Barkha Sharma Dr. Amit Kumar Jiaswal	ICAR sponsored 21 days Winter School on “Recent Approaches in Animal Disease Diagnostics and Vaccinology” at Scool of Biotechnology, GADVASU, Ludhiana.	26 <sup>th</sup> Sep. - 16 <sup>th</sup> Oct. , 2017
27	Dr. Amit Singh Dr. Prabhakar Kumar	21 days CAFT training programme on “Advances in Instructional Technologies for Enhancing Teaching-Learning and Training Competencies” at ICAR-Indian Agricultural Research Institute, New Delhi.	13 <sup>th</sup> Oct. - 2 <sup>nd</sup> Nov. , 2017
28	Dr. Vikrant Sudan	10 day short course on “Advances in risk analysis and GIS based prediction modelling of livestock parasitic diseases” at NIVEDI, Bengaluru.	23 <sup>rd</sup> Oct. - 1 <sup>st</sup> Nov. , 2017
29	Dr. Deepak Sharma	Short course on “In situ conservation of Indigenous livestock and poultry breeds” organized by ICAR-NBAGR, Karnal	25 <sup>th</sup> Oct. - 3 <sup>rd</sup> Nov. , 2017
30	Dr. Rajneesh Sirohi	Winter school training programme on “Conservation and Promotion of Indigeneous Breeds of Livestock” held Rajasthan University of Veterinary and Animal Sciences, Bikaner (Raj.)	30 <sup>th</sup> Oct. – 19 <sup>th</sup> Nov. , 2017
31	Dr. Amit Singh Dr. Rashmi	Basics of Entrepreneurship Development in Agriculture. Department of Extension Education BHU, Varanasi and Centre for Development of Technical Education IIT Kanpur	Oct. , 2017
32	Faculty Members	One month, Massive Open Online Course (MOOC) on Teaching Management, ICAR-National Academy of Agricultural Research Management, Hyderabad	1 <sup>st</sup> - 30 <sup>th</sup> Nov. , 2017



Sl. No.	Name of faculty member	Title of event	Date
33	Dr. Mukesh Kumar Srivastava Dr Ashish Srivastava Dr. Ruchi Tiwari	ICAR short course (10 days) on “Molecular tools in the epidemiology of infectious diseases” sponsored by ICAR, New Delhi held at DUVASU, Mathura	6 <sup>th</sup> - 15 <sup>th</sup> Nov., 2017
34	Dr. Soumen Choudhury	21 days Training programme on “Microbial genomics and proteomics in diagnosis and control of diseases of veterinary importance” organized by ICAR Centre for Advance Faculty Training (CAFT), Dept. of Veterinary Microbiology, LUVAS, Hisar.	07 <sup>th</sup> - 27 <sup>th</sup> Nov. , 2017
35	Dr. Satyendra Pal Singh	Winter school - Innovative Approaches for Conservation and Improvement of Indigenous Bovine Genetic Resources in Modern IPR era under changing climate scenario	8 <sup>th</sup> – 28 <sup>th</sup> Nov., 2017
36	Dr. Shanker Kumar Singh Dr. Jitendra Tiwari	21 days national training on “Updates on vectors and vector borne diseases” organized by Centre of Advanced Faculty Training (CAFT) in Parasitology, Veterinary College, KVAFSU Regional campus, Hebbal, Bengaluru	14 <sup>th</sup> Nov. - 4 <sup>th</sup> Dec. , 2017
37	Dr. Rajesh Mandil Dr Udit Jain	ICAR sponsored CAFT training courses on “Recent approaches in clino-pathological diagnosis of diseases (21 days). Department of Veterinary Pathology, GADVASU, Ludhiana	17 <sup>th</sup> Nov. - 7 <sup>th</sup> Dec. , 2017
38	Dr. Barkha Sharma	Two days training on “Basic Epidemiology”	24 <sup>th</sup> - 25 <sup>th</sup> Nov. , 2017
39	Dr. Varsha Gupta	10 days short course training programme on “Diagnostic Imaging Techniques in Veterinary Medical Practice” at Department of Veterinary Surgery and Radiology , COVSc, LLRUVAS, Hisar, Haryana.	30 <sup>th</sup> Nov. –20 <sup>th</sup> Dec. , 2017
40	Dr. S K Bharti	21 day CAFT training programme on “Advances in validation of functional foods” at National Dairy Research Institute, Karnal, Haryana	1 <sup>st</sup> – 21 <sup>st</sup> Dec. , 2017
41	Dr Ajay Pratap Singh Dr Shyama N. Prabhu	ICAR sponsored 21 days winter school on ‘Antimicrobial resistance in fish and aquatic environment and its impact on human health’. Central Institute of Fishery Technology, Kochi, Kerala	1 <sup>st</sup> – 21 <sup>st</sup> Dec. , 2017
42	Prof. S.K.Mishra Dr. Braj Mohan	Doubling farmer income DUVASU, Mathura	1 <sup>st</sup> – 10 <sup>th</sup> Jan. , 2018
43	Dr. Y.K.Sharma	ToT training programme for the Job Agriculture Extension Service Provider IGKV, Raipur, Chattisgarh	4 <sup>th</sup> – 6 <sup>th</sup> Jan. , 2018
44	Dr Amit Singh Dr. Sanjeev Kumar Singh Dr. Rashmi Dr. Deepak Sharma, Dr. Madhu Tiwari, Dr. S.P. Singh, Dr. Avneesh Kumar Dr. Rajneesh Sirohi Dr. Yajuvendra Singh Dr. D.N. Singh Dr. Ajay Kumar Dr. Debashis Roy Dr Muneendra Kumar Dr Shalini Vaswani	Agricultural Skill council of India (ASCI) – Master Trainers training Programme, at DUVASU, Mathura	09 <sup>th</sup> - 11 <sup>th</sup> Jan., 2018



Sl. No.	Name of faculty member	Title of event	Date
	Dr. Avinash Prof. V. Pathak Dr. Meena Goswami Dr. Mukesh Kumar Srivastava Dr. Ashis Srivastava Dr. Arvind Tripathi Dr. P.N.Panigrahi		
45	Dr. Atul Prakash Dr. Rajkumar Singh Yadav	21 days CAFT Training on Recent Advances in stress genomics for livestock production at Division of Physiology and Climatology, ICAR-Indian Veterinary Research Institute, Izatnagar, Bareilly	9 <sup>th</sup> - 29 <sup>th</sup> Jan. , 2018
46	Dr. Shriprakash	21 days Recent Advances in Stress Genomics for Livestock Production in Division of Physiology & Climatology ICAR-Indian Veterinary Research Institute Izatnagar.	9 <sup>th</sup> – 30 <sup>th</sup> Jan. , 2018
47	Dr. V. P. Singh	21 days CAFT training programme on “Dairy and food process engineering: equipments, processing and value addition” at National Dairy Research Institute, Karnal, Haryana	10 <sup>th</sup> – 30 <sup>th</sup> Jan. , 2018
48	Dr. B.L.Yadav	Training Programme on IFS Model at IIFSR, Meerut	31 <sup>st</sup> Jan. 1 <sup>st</sup> Feb. , 2018
49	Dr. Mukesh Kumar Srivastava	National training programme (21 days) on “Updates on clinical diagnostic techniques in veterinary practice” sponsored by ICAR, New Delhi held at centre of advanced faculty training in Veterinary Clinical Medicine, Ethics and Jurisprudence, Madras Veterinary College, Tamilnadu Veterinary and Animal Sciences University, Chennai	1 <sup>st</sup> - 21 <sup>st</sup> Feb. , 2018
50	Dr. Parul Dr. Rahul Kumar	Diagnosis and control of Emerging and Re-emerging trans-boundary diseases of poultry	7 <sup>th</sup> – 27 <sup>th</sup> Feb. , 2018
51	Dr. Amitav Bhattacharyya	21 days National Training Program on ‘Advances in poultry production and its impact on changing global scenario’ at Centre of Advanced Faculty Training in Avian Sciences, Veterinary College and Research Institute, Namakkal, Tamil Nadu, India.	7 <sup>th</sup> - 27 <sup>th</sup> Feb. , 2018
52	Dr. Debashis Roy	Nutrition for Health: Advances in the Science of Animal Nutrition	7 <sup>th</sup> – 27 <sup>th</sup> Feb. , 2018
53	Dr. Vijay Kumar	21 days training course on “Application of OMICS tools and techniques for agricultural germplasm improvement” organized by ICAR-IASRI, New Delhi	9 <sup>th</sup> Feb. – 1 <sup>st</sup> March, 2018
54	Dr. Vijay Pandey	10 days National Training Program on Molecular techniques in shrimp health management held at Central Fishery Research Institute (CIFE), Mumbai	24 <sup>th</sup> Feb. - 5 <sup>th</sup> March, 2018
55	Dr. Barkha Sharma	21 days Training Programme on “Techniques in Molecular Biology and Genetic engineering” at Div. of Animal Biotechnology, LUVAS, Hisar	6 <sup>th</sup> - 26 <sup>th</sup> March, 2018

## DIGNITARIES VISITED DUVASU

The period under report is memorable in terms of the visitors of par excellence to campus and blessed us for the prosperity of this great Veterinary University. Hon'ble Chancellor of this University and Governor of Uttar Pradesh Shri Ram Naik, Hon'ble Chief Minister of Uttar Pradesh Shri Yogi Adityanath Ji, Hon'ble Chief Minister of Haryana, Shri Manohar Lal Khattar Ji, Union Agriculture & Farmers Welfare Minister Hon'ble Shri Radhamaan Singh Ji, Mrs. Hema Malini ( Hon'ble MP, Mathura), Hon'ble Cabinet Ministers of Uttar Pradesh Shri Srikant Sharma, Prof. S.P. Singh Baghel, Shri Laxmi Narain Chaudhary, Dr Krishna Gopal jee, Shri Jai Prakash Nishad (Hon'ble MoS, Animal Husbandry, UP), Shri Rajeev Gupta (Chairman, Go Seva Ayog, UP), Dr. Vallabhbbhai Kathiria (Chairman, Go Seva Ayog, Gujarat), Shri Shiv Prakash (Rastriya Sah Sangthan Mantri), Shri Alok Kumar (Chhetra Pracharak), Shri Rajendra Prasad (Director, Deen Dayal Dham), Shri Padam Singh (Prachar Pramukh), Shri Puran Prakash (MLA, Baldev), Shri Karinda Singh (MLA Goverdhan), Dr Dalchand Varma (MLA, Meer Ganj), Dr. Mukesh Arya (Mayer, Mathura), Dr. R.S. Paroda (former Secretary of DARE & Director General, ICAR), Dr. Magala Rai (former Secretary of DARE & Director General, ICAR), Dr Trilochan Mohapatra (Secretary of DARE & Director General, ICAR), Dr. Baldev Bhai Sharma (Chairman, National Book Trust), Dr. Suresh Honappagol (Animal Husbandry Commissioner), Dr Sudheer K. Bobde (Principal Secretary, Animal Husbandry), Shri Sanjay Bhoosreddy (Principal Secretary, Sugarcane Development), Shri O.P. Chaudhary (Joint Secretary, DADE, New Delhi), Shri Amit Mohan Prasad (Principal Secretary, Agriculture), Dr K.M.

Bajrubaruah (Vice Chancellor, Assam Agricultural University), Dr N.C. Patel (Vice Chancellor, Anand Agricultural University), Dr A.R. Pathak (Vice Chancellor, Junagarh Agricultural University), Dr V.S. Tomar (Vice Chancellor, JNKVV, Jabapur), Dr M.P. Yadav (former Vice-Chancellor, SVBPUA&T & Director IVRI), Dr Rameshwar Singh (Vice Chancellor, Bihar Veterinary University), Dr. A.C. Varshney (former Vice - Chancellor, DUVASU, Mathura), Dr Durg Singh Chauhan (Vice Chancellor, GLA University), Dr. Arvind Dixit (Vice Chancellor, Bhim Rao Ambedkar University), Dr S. R. Rao (Senior Advisor, DBT) and Dr A.K. Rawat (Advisor, DBT).



Dairy Minister, Shri Laxmi Narayan Ji visited DUVASU on April, 15, 2017. An interactive meeting was organized in the Kisan Bhavan. Shri Laxmi Narayan stressed the need for self-processing of milk and proper value added live stock products and selling them in market so that farmers get the maximum profit and the role of middleman becomes limited. Prof. Atul Saxena, Prof. Vikas Pathak and Dr. Vinod Sidhu were the speakers in the technical session during the interactive meeting.



Prof. S.P. Singh Baghel, Minister of Animal Husbandry, Minor Irrigation and Fisheries, Govt. of U.P. visited DUVASU on April 17, 2017. He emphasized on the issue of health cards to animals of this state. He apprised that new scheme 'Gopalak Yojana' would soon be launched for the benefit of small farmers rearing 10-20 animals. He appreciated the efforts of teachers in catering the needs of farmers of Uttar Pradesh from time to time. He was also apprised about the facilities available in our Kothari Teaching Veterinary Hospital and also the need for improving the facilities in our hospital to develop it as "Siuper-specility hospital".



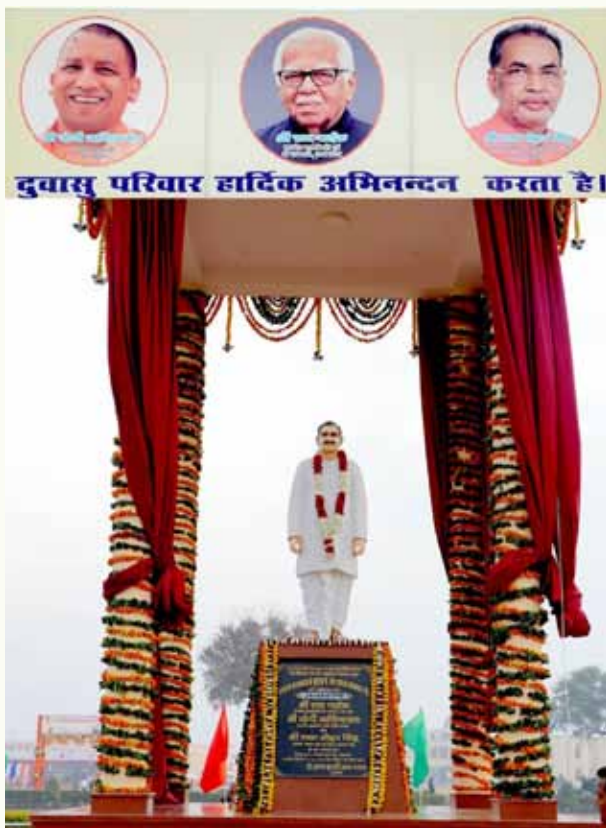
Dr. Krishan Gopal Ji visited DUVASU, Mathura on May 22, 2017. After visiting the dairy Farm of the college, he emphasized on conservation of the native breeds of cattle and encourage use of herbal drugs in treatment of animals. During visir to Aushadhi Vatika, he planted a sapling of "Arjuna" tree.





Shri Shrikant Sharma Hon'ble Minister of Energy, Government of UP visited DUVASU on 9<sup>th</sup>-10<sup>th</sup> December 2017. Two days National Seminar was organized in University for discussion on inspirational thoughts of Pandit Deen Dayal Upadhyaya Ji. The seminar was inaugurated by Shri Shrikant Sharma Hon'ble Minister of Energy, Government of UP along with Guest of Honours Shri Baldeo Bhai Sharma, Chairman Book Trust of India and Shri Arvind Dixit Vice Chancellor, BR Ambedkar University, Agra. All the guests were

warmly welcomed by Prof. KML Pathak, Hon'ble Vice Chancellor of the University. In inaugural speech, Hon'ble Minister Shri Sharma said that their party believes in 'Ekam Manav-vad' vision of Pandit Deen Dayal Upadhyaya and following this idea for the progress and prosperity of each individual of the society. In the end Hon'ble Vice Chancellor of the University Prof KML Pathak shared that the organization of such kind of unique seminar in the University is matter of pride for the University.





The statue of Pt. Deen Dayal Upadhyaya Ji was unveiled in the central garden of new campus by Hon'ble CM of UP, Shri Yogi Aditya Nath ji, on Feb., 11, 2018. The occasion was graced by the benign presence Hon'ble Governor of UP Shri Ram Naik ji, Smt. Hema Malini ji (MP Mathura), Shri S.P. Singh Baghel ji (Animal Husbandry Minister),

Shri Sri Kant Sharma ji (Energy Minister) Ch Laxmi Narayan ji (Dairy Minister) and many other MLAs and dignitaries of Mathura and nearby districts. On this occasion Hon'ble CM of UP declared to start two new colleges namely College of Fishery and College of Dairy Technology in the University.

# STUDENTS WELFARE

## National Cadet Corps

During 2017-18, 20 and 62 cadets appeared in “B” and “C” Certificate examination, respectively. 22 students participated in Army Attachment Camp at RVC Centre and College Merut Cantt from 17-31 August, 2017. 57 students participated in CATC camp at Sanjay Institute of Engineering and Management Chaumuha, Mathura from 19-28 Sept, 2017. On the occasion of 7<sup>th</sup> Convocation of the University and *Pratima Anawaran Samaroh*, NCC students gave ‘Guard of Honour’ to the Hon’ble Governor of Uttar Pradesh on 26.09.2017 and 11.02.2018 respectively under the leadership of Associate NCC Officer Lt. Rajneesh Sirohi. NCC cadets also escorted and gave ‘Guard of Honour’ to the Hon’ble Vice Chancellor of the University on Republic day and Independence Day.



## Literary and Cultural festival

Literary and Cultural festival was organized by DUVASU in which students from COVS and AH, COB and Diploma Programme participated. During this, events like drawing and painting, collage making, clay modeling, essay writing, rangoli, poster making, songs, debate, declamation, general knowledge quiz, antakshari and extempore speech competitions were held. The students participated with gusto and enjoyed. The festival concluded with prizes distribution by Dean, COVS and Dean, PGS.







## Educational Tours

### South India Educational Tour of Students



38 Students including 28 boys and 10 girls of 4<sup>th</sup> Year B.V.Sc & A.H went on South India Educational Tour from 28<sup>th</sup> Dec. 2017 to 08<sup>th</sup> Jan. 2018. During this tour, they visited Veterinary Colleges at Chennai, Mumbai, Bangalore, Hyderabad, and Pookode (Kerala). The students were exposed to

various facilities available and recent development in these institutions. Dr. Amitav Bhattacharyya, Assistant Professor, Department of Poultry Science and Dr. Mukesh Shrivastava, Assistant Professor, Department of Veterinary Medicine accompanied the students in tour.

### 16<sup>th</sup> Annual Sports Meet

16<sup>th</sup> Annual Sports Meet of the University was organized on 26<sup>th</sup>-27<sup>th</sup> March 2018. The meet was inaugurated and declared open by Chief Guest of the occasion Prof. K.M.L. Pathak, Hon'ble Vice-Chancellor of the University. After the march past by players, salutation and sports oath, white doves were released as a token of peace and freedom. Prof. Daya Shankar, President Games and Sports welcomed the chief guest, officers, teachers and students of the University. Majority of inter-class competition of in-door and out-door games and sports were completed on 24.03.2018 and remaining

athletics events were organized on 26<sup>th</sup> and 27<sup>th</sup> March 2018. Mr. Satyendra Kumar, student of 2<sup>nd</sup> Year B.V.Sc and Miss Nikita Chaudhary, student of 2<sup>nd</sup> Year Biotechnology were adjudged as the best male and female athletes of the Annual Sports Meet-2018, respectively. Slow cycling, musical chair for ladies and tug of war between teachers and students were the special attraction of the sports meet. The "Closing Ceremony" was held on 27<sup>th</sup> March 2018 in which Prof. K.M.L Pathak, Hon'ble Vice-Chancellor of the University was the Chief Guest and he distributed prizes to the winners of sports meet and literary events.



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

Eighteen students of the College of Veterinary Science participated in All India Inter Veterinary Colleges Badminton and Table Tennis Tournament and All India Professional Quiz Competition organized by GB Pant University of Agriculture and Technology, Pantnagar from 15<sup>th</sup> to 17<sup>th</sup> March 2018. Dr. Januddin H Khorajiya, Assistant Professor, Department of Veterinary Pathology, accompanied the students in the tour.

### Participation in National level Inter-University Debate Competition, Pantnagar

Four students of College of Veterinary Sciences and Animal Husbandry participated in National level Inter-University Debate Competition held from 14<sup>th</sup> -15<sup>th</sup> January 2018 organized by GB Pant University of Agriculture and Technology, Pantnagar. Dr. Dilip Swain, Assistant Professor, Department of Physiology and Dr. Meena Goshwami, Assistant professor Department of LPT, College of Veterinary Sciences & Animal Husbandry were the tour leaders.

### Participation in Reverie at NDRI, Karnal

Twenty two students of B.V.Sc & A.H participated in Inter University Youth Festival “Reverie Reiterate 2018”, organized at NDRI Karnal from 23<sup>rd</sup> –25<sup>th</sup> March 2018. Dr. Amitav Bhattacharya, Assistant Professor, Department of Poultry Science got the students equipped for different cultural events and accompanied the team as mentor. The students brought laurels to the University at National platform by winning Overall Runner Up Trophy at National level competition.



Besides that, students won 19 prizes including 7 first, 7 second and 5 third prizes. All the winner students dedicated this Runner Up Trophy to their beloved teacher Late Dr. Jitendra Kumar, Associate Professor, Department of Veterinary Physiology.

### Scholarships received by the students of DUVASU, Mathura

- ▶ 338 students of the University belonging to general, OBC, SC and minority categories received the Uttar Pradesh Government Scholarship through “Samaj Kalyan Vibhag” of Govt. Of U.P.
- ▶ Four B.V.Sc & A.H students received ICAR JRF based on the All India Entrance Examination conducted by ICAR.
- ▶ Eleven students of M.V.Sc. and one student of B.V.Sc. & A.H., received University Merit Scholarship.
- ▶ 07 students of B.V.Sc. & A.H. and 09 students of M. V. Sc. received National Talent Scholarship provided by Indian Council of Agriculture Research (ICAR), New Delhi.

### Netaji Subhas-ICAR International Fellowship



**Dr. Rahul Kumar**, Assistant Professor, Department of Veterinary Pathology

And

**Dr. Sooraj V. Nair**, MVSc student of the Department of Veterinary

Pharmacology and Toxicology received the prestigious **Netaji Subhas – ICAR International** fellowship for pursuing PhD studies in USA.



### **DUVASU Premier League Cricket tournament:**

DUVASU Premier League (DPL)-2017 was held from 27th Aug. 2017 to 5 Nov. 2017. Eleven teams of students, teachers and staff participated in the tournament with great fervor and zeal. Diploma 2<sup>nd</sup> Year (Blue Bulls) won the DPL-2017 trophy by beating Non-Teaching staff (Orange Tigers). The prizes were distributed by Prof. D.P. Singh, former OSD of the University and Prof. P. K. Shukla, Dean PGS. Mr. Gaurav of final year BVSc and Mr. Swapnil of Diploma 2<sup>nd</sup> year were adjudged as the Best Batsman (Orange cap) and Best Bowler (Purple cap) of the tournament, respectively. Dr. Vijay Pandey, Dr. Rahul Kumar and Mr. Dinesh Rautela actively participated and coordinated in successful organization of the DPL-2017 tournament.

### **Run for unity**

To foster and reinforce dedication, unity and integrity in University, 142<sup>nd</sup> birth day of Sardar Vallabhbhai Patel the 'Iron Man of India' was celebrated on 31<sup>st</sup> Oct. 2017. On this occasion, Prof. S.K. Garg, Dean, College of Veterinary Science along with Dr. M.M. Farooqui, DSW and Prof. Vikas Pathak, Director, Institute of Paraveterinary Science flagged off the 'Run for Unity'. Mr. Mandhata Yadav of Diploma 2<sup>nd</sup> year, Gaurav Kumar of Diploma 1<sup>st</sup> year and Mahesh Kumar of final year B.V.Sc. won gold, silver and bronze medals, respectively in boys category and Miss Nikita Chaudhary of 2 year B.Sc. Biotechnology won gold medal in girls category.

### **Inauguration of New Deendayal Hostel**

During the period under report, the Deendayal hostel in the new campus of the University was inaugurated on Feb. 11, 2018 by Shri Ram Naik Ji, Hon'ble Governor, Govt of Uttar Pradesh in the gracious presence of Shri Yogi Adityanath Ji, Hon'ble Chief Minister, Govt of Uttar Pradesh, Smt Hema Malini, Hon'ble Member of Parliament, Mathura, Dr. S.P. Singh Baghel, Hon'ble Minister of Animal Husbandry, Govt of Uttar Pradesh, Prof. KML Pathak, Hon'ble Vice Chancellor, DUVASU, Mathura and other officers, teachers, students and employees of the university.

## OTHER HIGHLIGHTS AND ACTIVITIES

### Entrance Examination

University conducted Pre-Veterinary (Preliminary and Main), Pre- Diploma and Postgraduate entrance examinations 2017 in which 687, 98, 41 and 3 candidates qualified the examinations, respectively.

University conducted the Pre-Veterinary Test-2017. It was conducted in two phases. PVT preliminary examination was conducted on **28<sup>th</sup> May 2017** at five centers, namely - Allahabad, Kanpur, Barielly, Lucknow and Mathura in which total **3860** candidates appeared. Out of these, **922** candidates qualified the examination. The PVT main was conducted on **25<sup>th</sup> June, 2017** at two centers of Mathura in which **687** candidates qualified. Candidates were admitted to the B.V.Sc. & A.H. programme on the basis of their merit in the competitive examination under various categories as per availability of seats in the College of Veterinary Science & Animal Husbandry for session 2017-18.



### Oath taking ceremony 2017

Oath taking ceremony of B. V. Sc. & A. H. students batch 2012 was organized on 12<sup>th</sup> July 2017 at Pant Hall. On this auspicious occasion, the outgoing students were sworn oath to utilize their professional knowledge with dignity and follow the principles of veterinary medical ethics. The chief guest of the occasion was Dr. Mangla Rai, Former Secretary, DARE Govt. Of India & Former DG, ICAR and the Guest of Honor was Dr. Rameshwar Singh, Hon'ble Vice-Chancellor, Bihar Animal Science University, Patna. Hon'ble Vice-Chancellor Prof. K. M. L. Pathak graced the occasion with his encouraging words to the students. Prof. S. K. Garg, Dean, Veterinary Faculty administered oath to the outgoing students. "Chaudhary Charan Singh Smriti Pratibha Puraskar" by Kisan Trust was awarded to the two topper students of the batch; namely **Abhinit Kumar** and **Mamta Mishra**.



### Guest Lectures Organized

Prof. M.B. Chhabra (Retd.) Department of Veterinary Parasitology, HAU, Hisar presented an enlightening lecture on 25th July 2017 at Pant Hall on the topic: "Enhancing the competence and efficiency of teachers in Higher Education Institutions. Prof. Chhabra was given a warm welcome by Hon'ble Vice Chancellor Prof. K.M.L.Pathak. Prof. S.K. Garg, Dean, Veterinary Faculty welcomed the gathering. All the faculty members attended the lecture. Hon'ble Vice-Chancellor addressed the faculty. On this occasion Dr. S. K. Misharaq, Ex-Head of the Division of Pharmacology, IVRI, Izatnagar was also present.



Prof. J. L. Vegad (Retd.) Department of Veterinary Pathology, Veterinary College, Jabalpur presented guest a lecture on 29th Sept. 2017 in the Pant Hall on the topic: "Epigenetics and Cancer". Prof. Vegad was given a warm welcome by Prof. S.K. Garg, Dean, Veterinary Faculty. All the faculty members attended the lecture.



### ICAR Development Grant

During the financial year 2017-18, university received sum of Rs 9.5889 crores from ICAR Developmental Grant. Out of these Rs 5.7593 crores were for construction of the University auditorium and remaining amount was utilized for construction of drain in Sarojini Girls Hostel, Construction of parking sheds in Sarojini Girls and Gautam Boys Hostel,

Renovation of toilets in Shastri Hostel, renovation of Examination hall, renovation work of the dining hall, construction of parking sheds and security hut in Nehru Hostel, purchase of chemicals, teaching and research purpose etc. Rs. 19.00 lakhs was utilized to strength the University library. University library utilized Rs 13,56,565 for purchase the books and Rs. 6,00,000 in automation of library. To enhance the writing and communication skill of the newly admitted students, placement cell of the University organised English class for UG students of College of Veterinary Science. Similarly, final year students of B. V. Sc. & A. H. Were given coaching for JRF and other competitive examinations. Placement cell of the University organised special coaching classes.

Guest lectures of the eminent teacher/scientists were organized for their interaction with the faculty and students. In this, Prof. M.B. Chhabra (Retd.) Department of Veterinary Parasitology, HAU, Hisar presented an enlightening lecture on 25th July 2017 at Pant Hall on the topic: "Enhancing the competence and efficiency of teachers in Higher Education Institutions and Prof. J. L. Vegad (Retd.) Department of Veterinary Pathology, Veterinary College, Jabalpur presented guest lecture on "Epigenetics and Cancer" on 29th Sept. 2017.



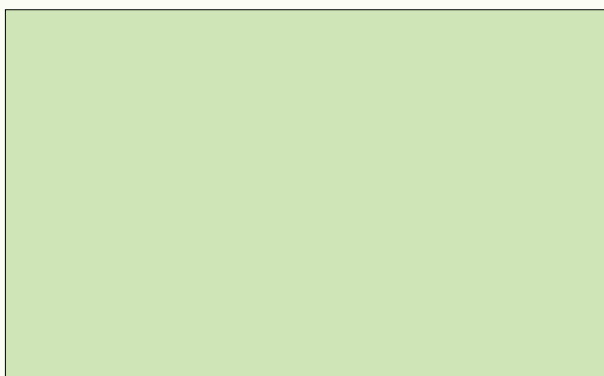
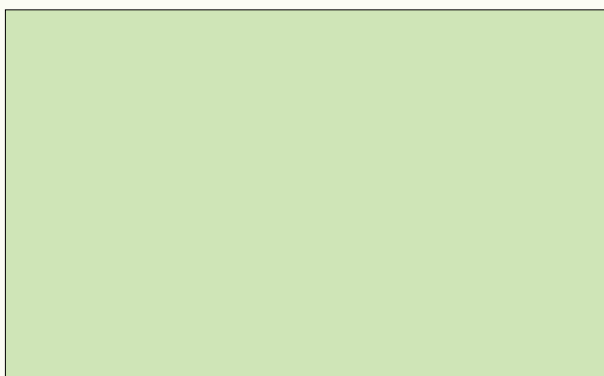
Newly renovated Nehru Hostel



Under construction University Auditorium

### Establishment of Gokulgram at university campus

Under this scheme, elite hard of Sahiwal and Haryana breed of cow has been established at Instructional Livestock farm Complex (ILFC). Under this scheme conservation and improvement of these breed are being carried out.



### Celebrations

#### Independence Day

*Aan Desh ki, Shaan Desh ki,  
Desh ki Hum Santan hein,  
Teen rangon se ranga tiranga,  
Apni yeh pehchan hai.....*

The overwhelming vibe of patriotism, pride and a feeling of gratitude to the sacrifices of the heroes who laid their lives to attain the freedom from British rule.....Hon'ble Vice-Chancellor, Prof. K.M.L Pathak hoisted the National flag on 15<sup>th</sup> Aug. 2017. Honourable Vice-Chancellor and the other officers of the University paid floral tributes to Mahatma Gandhi. Let us plant trees!!! Let us green our DUVASU... and celebrate this day!!! was the theme to celebrate the occasion. University staff

members planted trees and the function ended with distribution of sweets.

#### Gandhi Jayanti/Shastri Jayanti

Father of the Nation, Mohandas Karamchand Gandhi was remembered on 2<sup>nd</sup> Oct. 2017 in DUVASU. The portrait of Gandhiji was garlanded by Hon'ble Vice-Chancellor, Prof. K.M.L Pathak and other officers of the University. Shastri Jayanti was also celebrated on 2<sup>nd</sup> Oct. with traditional zeal and fervour in Shastri Hostel.



#### Pt. Deen Dayal Upadhyaya Jayanti

Birth anniversary of Pandit Deen Dayal Upadhyaya was celebrated on 25<sup>th</sup> Sept., 2017. Hon'ble Vice Chancellor, officers, teachers and employees offered floral tributes to Pandit Deen Dayal Upadhyaya on his birth anniversary and his golden words of guidance were remembered.





### Book Exhibition

University library organized a books exhibition of various subjects related to veterinary science and biotechnology in the campus on 27th Dec. 2017. Ten publishers/distributors participated in the exhibition with their sample books displayed in a large scale. The book exhibition was attended in mass by students and faculty members of the University.

### Fresher's Day

Students of 2<sup>nd</sup> Year along with senior students, faculty and staff members formally and warmly welcomed the newly admitted students of First BVSc & AH, BSc Biotechnology and Diploma. On the welcome day lively cultural programs were presented by the first year student with full of hues and amusement. Hon'ble Vice-Chancellor Prof K.M.L Pathak graced the occasion as Chief-Guest and distributed the prizes of Miss and Mr Performers of the occasion.



### Foundation Day

DUVASU celebrated its foundation day on 25<sup>th</sup> Oct., 2017 in Kisan Bhawan of the University. Dr. Arvind Dixit, Hon'ble Vice Chancellor, Baba Bhimrao Ambedkar University, Agra graced the occasion as the chief guest and addressed the gathering. Honorable Vice Chancellor Prof. K.M.L.Pathak, Dean, Veterinary Science, Prof. S. K. Garg and other higher officials of the University were present to celebrate the occasion.

### 7<sup>th</sup> Convocation of DUVASU, Mathura

The seventh convocation of DUVASU, Mathura was held on 26<sup>th</sup> Sept. 2017. Convocation function was presided over by Hon'ble Governor of Uttar Pradesh and Chancellor of U.P. Pt. Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go Anusandhan Sansthan, Mathura Shri Ram Naik ji. Prof. R.S. Paroda, Former Secretary DARE , Govt. of India and Former DG, ICAR was the Hon'ble Chief Guest. Shri Jay Prakash Nishad, Hon'ble State Minister, Animal Husbandry, Minor Irrigation and Fisheries, Government of Uttar Pradesh and Dr. Trilochan Mohapatra, Secretary, DARE & DG, ICAR graced the auspicious occasion as the Guests of Honor. As customary, the proceedings of convocation commenced with lighting of lamp, Saraswati Vandana followed by University song. After a warm welcome to Hon'ble Governor of Uttar Pradesh and Chancellor of U.P. Pt. Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go Anusandhan Sansthan, Mathura Shri Ram Naik ji and distinguished dais dignitaries, the convocation was declared open by Hon'ble Governor of Uttar Pradesh. Hon'ble Vice Chancellor presented the University progress report for 2016-17. Dr. Trilochan Mohapatra was conferred Degree of "Doctor of Science" by Hon'ble Chancellor of the University. Hon'ble Chancellor conferred degrees to 91 students. Out of a total 91, 04 students received their Ph.D. degree, 26 students received M.V.Sc., 41 B.V.Sc. & A.H. and 20 students received B.Sc. degree in Biotechnology. 10 students were awarded medals for their academic excellence and extra-curricular activities. Hon'ble Chancellor, DUVASU blessed and congratulated the degree recipients. Hon'ble Chief Guest Prof. R.S. Paroda Former Secretary DARE & Former DG, ICAR delivered the convocation address and congratulated the degree recipients.





**Republic Day**

69<sup>th</sup> Republic Day was celebrated on 26<sup>th</sup> January 2018 in the main ground of the College of Veterinary Science. Chief Guest on the occasion, Prof. K.M.L, Pathak Hon'ble Vice-Chancellor of the University unfurled the Tricolour National Flag. Floral tributes

were also paid to the Father of Nation Mahatma Gandhi on this occasion. A blood Donation Camp was also organized on this auspicious day under the patronage of Prof. K.M.L Pathak. The students, non teaching staff and faculty members of the University contributed seventy three units of blood during this camp.



**Ambedkar Jayanti**

University celebrated 126<sup>th</sup> Birth anniversary of Dr. Bhimrao Ramji Ambedkar on 14<sup>th</sup> April 2017 with zeal and enthusiasm. The officers, faculty members, staff and students of the University paid floral tributes to Dr. B.R. Ambedkar and remembered his contribution to this country.



### World Veterinary Day Celebration:

On 29<sup>th</sup> of April 2017, World Veterinary Day was celebrated in Kothari Veterinary Hospital of DUVASU. On this eve, Hon'ble Vice-Chancellor, Prof. K. M. L. Pathak graced the occasion by vaccinating a dog against rabies. 116 animals were treated for various diseases including 92 dogs and pups, which were vaccinated against rabies free of cost. Prof. S. K. Garg, Dean, College of Veterinary Science & A.H., Prof. R.P. Pandey, Director Clinics, Heads/In-Charges of different department's, teachers and students were present during the celebration.



### International Yoga Day

International Yoga Day was celebrated at DUVASU on 21st June 2017. Prof S. K. Garg, Dean Veterinary College, faculty members, non-teaching staff and students participated on the occasion with enthusiasm at the main ground of the College of Veterinary Science and Animal Husbandry. The program started at 6.30 AM. Dr. D.N. Gautam, President, Rastriya Samanvit Chikitsa Samiti, Gayatri Tapobhumi, Vrindavan road, Mathura along with his team led the programme. Dr. Gautam demonstrated the prevention and treatment of different diseases through specific yoga exercises.

### Celebration of Brij Holi Rasotsava

DUVASU witnessed one of the milestone events known as "Holi Rasotsav" organised by Smt. Hema Malini Ji, Hon'ble MP. This two days event was inaugurated by Hon'ble CM of UP Yogi Aditya Nath ji on 23<sup>rd</sup> Feb, 2018. It was a grand programme which portrayed the beauty of Brij-culture. During the programme, the entire campus was well – lighted and was enjoyed by thousand of spectators. The program was first of its kind and its organization in the campus was a matter of great pride for DUVASU. The program had performances of widely acclaimed artists like Pt. Jashraj ji, Smt. Hema Malini Ji, Pt. Hari Prasad Chaurasia and Shri Kailash Kher Ji.



## AWARDS AND HONOUR/ACHIEVEMENTS

S. No.	Name	Name of award	Event	Date
1	Dr. Amit Kumar	IAAVR Merit Award-2017	in recognition of outstanding profile in the Veterinary Profession and remarkable contributions in the field of Microbiology in 17 <sup>th</sup> Veterinary Congress at IVRI, Izatnagar	9 <sup>th</sup> April, 2017
2	Dr. Rashmi Singh	DBT-CTEP & INSA Travel Grant	International Conference on “Virus Diseases: One Health-One World”, Kuching, Sarawak, Malaysia.	25 <sup>th</sup> -27 <sup>th</sup> July, 2017
3	Dr. Rajneesh Sirohi	Excellence in Teaching Award	In 2 <sup>nd</sup> National Agricultural Convention on Agricultural Skill Development for Doubling Farmers Income (ASDFI-2017), RAJUVAS, Bikaner	7 <sup>th</sup> Oct., 2017
4	Dr. Udit Jain	Elected as Member of executive committee of IAVPHs	XV Annual Conference of Indian Association of Veterinary Public Health Specialists and National Symposium on Intersectoral Approaches to Combat Zoonoses: Strategies and Challenges organized by Department of Vety Public health & Epi, COVS, Sri Venkateswara Veterinary University, Tirupati	11 <sup>th</sup> -13 <sup>th</sup> Oct., 2017
5	Dr. Dilip Kumar Swain	Outstanding presentation Award	International conference and Expo on Agriculture and Veterinary Sciences: Research and Technology” held at Telanagana University, Hyderabad	23 <sup>rd</sup> -25 <sup>th</sup> Oct., 2017
6	Dr. Rashmi	Best oral presentation award	In national seminar on Small Ruminants: National scope on up-scaling production to products value addition and their safety from ICAR-CIRG, Makhdoom, Mathura	9 <sup>th</sup> -10 <sup>th</sup> Nov., 2017
7	Prof. Vikas Pathak Dr. Meena Goswami	Best poster Award	National seminar on “Small ruminants: national scope on up scaling production to products value addition and their safety” at CIRG, Farah, Makhdoom, Mathura, Uttar Pradesh	9 <sup>th</sup> -10 <sup>th</sup> Nov., 2017
8	Prof. Satish K. Garg	Elected as President STOX	STOX-2017, PGIMR, Chandigarh	17 <sup>th</sup> -19 <sup>th</sup> Nov., 2017
9	Dr. Amitav Bhattacharyya	2 <sup>nd</sup> best poster award	XXXIV IPSACON, at ICAR-NAINP, Bengaluru	28 <sup>th</sup> -30 <sup>th</sup> Nov., 2017
10	Prof. P.K.Shukla	Presented key note Address	XXXIV IPSACON, at ICAR-NAINP, Bengaluru	28 <sup>th</sup> -30 <sup>th</sup> Nov., 2017
11	Dr. Jitender Kumar	Best Poster Award	XXVI Annual conference of SAPI and national symposium held at KVASFU, Bidar (Karnatak)	21 <sup>st</sup> -22 <sup>nd</sup> Dec., 2017
12	Prof. Ajay Prakash	Anatomist of Year by Indian Association of Veterinary Anatomists	In XXXII Annual Convention and National Symposium on “Advances and Applications of Anatomy in Livestock, Pet, Poultry, Lab Animal and Wildlife Health and Production” at CVSc & AH, OUA&T, Bhubaneshwar.	21 <sup>st</sup> -23 <sup>rd</sup> Dec., 2017



S. No.	Name	Name of award	Event	Date
13	Dr. Prabhakar Kumar	Fellow Indian Association of Veterinary Anatomists Elected as Executive Committee member of Indian Association of Veterinary Anatomists	By Indian Association of Veterinary Anatomists in XXXII Annual Convention and National Symposium on “Advances and Applications of Anatomy in Livestock, Pet, Poultry, Lab Animal and Wildlife Health and Production” at CVSc & AH, OUA&T, Bhubaneshwar.	21 <sup>st</sup> -23 <sup>rd</sup> Dec., 2017
14	Dr. Varsha Gupta	Dr. A.M. Srivastava gold plated silver medal and award for outstanding PhD research	In XXXII Annual Convention and National Symposium on “Advances and Applications of Anatomy in Livestock, Pet, Poultry, Lab Animal and Wildlife Health and Production” at CVSc & AH, OUA&T, Bhubaneshwar.	21 <sup>st</sup> -23 <sup>rd</sup> Dec., 2017
15	Dr Amit Verma	Best Poster Award	International Conference on “Global research initiative for sustainable agriculture and allied sciences” organized at Maharana Pratap Univ. of Agriculture and technology, Udaipur	Dec., 2017
16	Dr. Shanker Kr. Singh	Rapporteur Best Oral Presentation Award 2 <sup>nd</sup> best Poster Award	36th Annual Convention and National Symposium of ISVM, OUAT, Bhubneshwar	1 <sup>st</sup> -3 <sup>rd</sup> Feb., 2018
17	Dr. Debashis Roy Dr. Vinod Kumar Dr. Muneendra Kumar Dr. Rajneesh Sirohi Dr. Yajuvendra Singh	Second Best Paper award by Indian Dairy Association	For research article published in Indian Journal of Dairy Science in the “Dairy Production Area” at Kochi	8 <sup>th</sup> -10 <sup>th</sup> Feb., 2018
18	Dr. Vikrant Sudan	Best oral presentation award	27 <sup>th</sup> NCVP at Udaipur	14 <sup>th</sup> -16 <sup>th</sup> Feb., 2018
19	Prof. Daya Shanker Dr. Vikrant Sudan Dr. Mukesh Srivastava	2 <sup>nd</sup> best poster presentation award	27 <sup>th</sup> NCVP at Udaipur	14 <sup>th</sup> -16 <sup>th</sup> Feb., 2018
20	Prof. Vikas Pathak	Elected as Vice-President	Indian Meat Science Association	2017
21	Dr. Meena Goswami	Elected as executive body member	Indian Meat Science Association	2017
22	Dr. Shanker Kr. Singh	Mock Evaluator of Performance of Veterinary Services	National Mission of World Organization for Animal Health (OIE)	2017
23	Dr. Ruchi Tiwari	Chairman of technical session	International conference of 5 <sup>th</sup> ACSE and 2 <sup>nd</sup> ACSTM in Dubai, UAE.	2017
24	Dr. Vinod Kumar Singh	Young Scientist Award	SVWS, Lucknow	2017
25	Dr. Vinod Kumar Singh	Best Poster award	GRISAAS, Udaipur, Raj.	2017
26	Dr. Amit Kumar	Outstanding PhD thesis Award- 2017	SSDAT, Meerut during GRISAAS at Udaipur, Rajasthan.	2017
27	Dr. Amit Kumar	2 <sup>nd</sup> best poster presentation award	SSDAT, Meerut during GRISAAS at Udaipur, Rajasthan.	2017
28	Dr. Neeraj Kumar Gangwar	Expert	Pashu Arogya Mela-2017 held at Varanasi	2017

## RESEARCH PUBLICATIONS

1. Agrawal, J.K., Kharche, S.D., Saxena, A., Yadav, S. and Panday, R.P. (2017). A Study On Embryo Production Through *In-Vitro* Fertilization of Caprine oocytes. *Ruminant Science*, 6 (2): 333-336.
2. Anand, M., Yadav, S., Kumar, J., Yadav, B. and Swain, D. (2017). Effect of different levels of turkey egg yolk on physical attributes of Barbari buck semen. *Indian Journal of Small Ruminants (The)*, 23(2):190-193.
3. Bharti, S. K., Pathak, V., Goswami, M., Ojha, S. and Anita. (2017). Quality assessment of *Nelumbo nucifera* supplemented functional muscle food. *Journal of Entomology and Zoology Studies*. 5(4): 445-451.
4. Chaturvedi, S., Singh, S.V., Srivastava, A.K., Gangwar, A.K., Kumar, N., Rawat, K.D., Gupta, S., Chaubey, K.K., Singh, R., Singh, R. and Dhama, K. (2017). Comparative evaluation of fat, is900 pcr and microscopy vis-a-vis histopathology for the detection of *mycobacterium avium* subsp *paratuberculosis* infection in tissues of goats naturally died in herds endemic for Johne's disease. *Indian Journal of Animal Sciences*, 87(6): 685-693.
5. Chaudhary, A.K., Chaudhary, S., Tiwari, R. and Shrivastva, M. 2017. Microbiological Investigation and Therapeutic Management of Acute Gangrenous Mastitis in a Goat. *Journal of Immunology & Immunopathology*, 19(2): 70-74.
6. Chauhan, D.S., Swain, D. K., Shah, N., Yadav, H.P., Sharma, A., Yadav, B., ... & Garg, S.K. (2017). Modulation of voltage-gated sodium channels induces capacitation in bull spermatozoa through phosphorylation of tyrosine containing proteins. *Theriogenology*.
7. Devi, A., Daya Shanker, Sudan, V., Jaiswal, A., Singh, A. (2017). Molecular characterization and phylogenetic sequence analysis of unique conserved portion of VSG of *Trypanosoma evansi*. *Indian Journal of Animal Sciences*, 87(8):974-976.
8. Devi, A., Sudan, V., Jaiswal, A., Singh, A. Daya Shanker. (2017). B1 gene based semi nested PCR for detection of toxoplasmosis from poultry hearts. *Indian Journal of Animal Sciences*, 87(8):980-981.
9. Dharmendra Singh, Ajay Prakash, M.M. Farooqui, Sri Prakash Singh., Satish K. Pathak and Vijay Kumar (2017). Histochemical Studies of Pancreas in Prenatal Goat (*Capra hircus*). *International Journal of Current Microbiology Applied Science*, 6(8): 1163-1169.
10. Farooqui, M.M., Sharma, C.P., Gupta, V., Kumar, P. and Prakash, A. Anatomical And Histochemical Studies Of Prenatal Bulbourethral Gland in Goat (*Capra hircus*). *Ruminant Science* (accepted).
11. Goswami, M., Sharma, B.D., Mendiratta, S.K. and Pathak, V. (2017). Development and quality assessment of fiber enriched functional carabeef cookies. *Veterinary Practitioner*, 18 (1): 136-140.
12. Goswami, M., Sharma, B.D., Mendiratta, S.K. and Pathak, V. (2017). Development and quality assessment of nutritional carabeef cookies. *Ruminant Science*, 18(1): 136-140.
13. Goswami, M., Sharma, B.D., Mendiratta, S.K., Chaudhary, U.B., Tyagi, N. and Pathak, V. (2017). Development and quality assessment of health promoting functional carabeef cookies. *British Food Journal*, 120(1): 210-223.



14. Goswami, M., Sharma, B.D., Mendiratta, S.K., Pathak, V., Kumar, R. R. and Talukder, S. (2017). Development and quality assessment of mango peel powder incorporated functional carabeef cookies. *Journal of Meat Science*, 12(1): 33–38.
15. Gupta, R.K., Singh, V., Sachan, V., Agrawal, J.K. and Saxena, A. (2017). Successful Management of Dystocia due to Schistosomus Reflexus Fetus in a Cow. *The Indian Journal of Veterinary Sciences & Biotechnology* 12 (04): 97–98.
16. Gupta V., Farooqui M.M., Prakash, A. and Kumar, P. (2017). Morphometrical Analysis of Stomach of Prenatal Goat (*Capra hircus*). *Indian Journal of Small Ruminants*, 23(2): 232–235.
17. Gupta V., Farooqui M.M., Prakash, A., Archana and Verma, A. (2017). Gestational Variations in The Macro Anatomy of the Fore Stomach of Goat (*Capra hircus*). *Indian Journal of Animal Research*, DOI:10.18805/ijar.B-3326
18. Gupta, K.K., Srivastava, M., Sudan, V., Singh, S.K., Choudhury, S., Daya Shanker (2018). Variation In Cardiac Markers And Electrocardiographic Alterations in Young Calves Naturally Infected With Bovine Tropical Theileriosis. *Tropical Animal Health and Production*. doi.org/10.2007/s11250-018-1548-0.
19. Gupta, R. K. , Singh, V. , Sachan, V., Yadav, M. K., Yadav, D. K. and Saxena, A. (2017). Two different obstetrical techniques to manage dystocia due to fetal emphysema in bovine (2017). *Indian Journal of Animal Health*. 56(2):307-31.
20. Gupta, R.K., Singh, V., Sachan, V., Agrawal, J.K. and Saxena, A. (2017). Successful Management of Dystocia due to Schistosomus Reflexus Fetus in a Cow. *IJVSBT* 12 (4): 97-98
21. Gupta, S.K., Pathak, A., Farooqui, M.M. and Prakash, A. (2017). Topographical and morphometrical studies of the heart in early foetal development of goat (*Capra hircus*). *Indian Journal of Veterinary Anatomy*, 29(2):13–17.
22. Gupta, S.K., Pathak, A., Farooqui, M.M. and Prakash, A. (2018). Prenatal development of heart of goat (*Capra hircus*): Morphometrical observations. *Journal of Animal Research*, 7:1–8.
23. Gupta, V., Farooqui, M.M., Prakash, A., Pathak, A. and Kumar, P. (2017). Organogenesis of rumen of goat (*Capra hircus*) in early prenatal stage (0-50 days) of gestation. *Ruminant science* 6 (2): 247-254.
24. Gupta, V., Farooqui, M.M., Prakash, A., Pathak, A. and Kumar, P. (2017). Morphological and cytological differentiation of goat spleen (*Capra hircus*). *Indian Journal of Animal Research*, 51(6): 1027–1032.
25. Gupta, V., Farooqui, M.M., Prakash, A., Pathak, A. and Kumar, P. (2017). Certain histochemical studies on the rumen of goat (*Capra Hircus*) during prenatal development. *Indian Journal of Animal Research* 7(6): 1–6.
26. Jayshree, Singh, V.K., Kumar, A. and Yadav, S.K. (2018). Prevalence of methicillin resistant Staphylococcus Aureus (MRSA) at tertiary care hospital of Mathura, India *Progressive Research- An International Journal*.
27. Kesharwani, P.K., Kumar, V., Roy, D., Kumar, M., Singh, S.K., Kushwaha, R., Vaswani, S. (2018). Effect of Feeding Sugarcane Molasses Based Distilleries Raw Spent Wash on Growth Performance, Nutrient Utilization and Blood Biochemical Parameters in Heifers. *Indian Journal of Animal Nutrition*, 35(1): 22–30.
28. Khorajiya, J., Srivastava, M.K., Kumar, R. and Panigrahi, P.N. (2017). Hospital based prevalence of haemoprotozoan infections in cattle and buffalo during summer season in Mathura region of Uttar Pradesh. *Veterinary Practitioner*, 18(2): 204–206.
29. Kumar A., Gupta, V.K. Verma, A.K., Rajesh, M., Anu, R. and Yadav, S.K. (2017). Lipid peroxidation and antioxidant system in erythrocytes of Brucella vaccinated and challenged goats. *International Journal of Vaccines and Vaccination*, 4(5):00092.



30. Kumar, A., Gupta, V.K., Verma, A.K., Kumar, A. and Yadav, S.K. (2017). Assessment of hematological bio markers during vaccination and challenge of *Brucella melitensis* in goats. *International Journal of Vaccines*, 4(2): 00078.
31. Kumar, A., Gupta, V.K., Verma, A.K., Mandil, R., Rahal, A., Yadav, S.K. (2017) Lipid Peroxidation and Antioxidant System in Erythrocytes of *Brucella* Vaccinated and Challenged Goats. *International Journal of Vaccines* 4(5): 92.
32. Kumar, D., Yadav, B., Choudhury, S., Kumari, P., Madan, A.K., Singh, S.P., Rout, P.K., Ramchandran, N., Yadav, S. (2017). Evaluation of adaptability to different seasons in goat breeds of semi-arid region in India through differential expression pattern of heat shock protein genes. *Biological Rhythm Research*, DOI: 10.1080/09291016.2017.1377984.
33. Kumar, J., Kumar, M., Madan, A. K., Singh, Y., Yadav, B., & Anand, M. (2017) Effect of season on physiological parameters and production profile of Haryana and Sahiwal cattle. *Haryana Veterinarian*, 56 (1) 69–71.
34. Kumar, J., Madan, A. K., Kumar, M., Sirohi, R., Yadav, B., Reddy, A.V. and Swain, D. K. (2017). Impact of season on antioxidants, nutritional metabolic status, cortisol and heat shock proteins in Haryana and Sahiwal cattle. *Biological Rhythm Research*, 1-10.
35. Kumar, J., Singh, S.K., Singh A. and Rashmi (2017). Factors affecting adoption and level of satisfaction among dairy owners towards livestock insurance. *Agricultural Rural Development*, 4: 25–28.
36. Kumar, P., Prakash, A., Farooquui, M.M., Pathak, A., Singh, S.P. and Gupta, V. (2017). Histogenesis of skin in early prenatal goat (*Capra hircus*). *Journal of Animal Research*, 7 (2):377–384.
37. Kumar, P., Prakash, A., Farooquui, M.M., Pathak, A. and Singh (2017). Micrometrical studies on the skin of prenatal goat (*Capra hircus*). *Ruminant Science* 6(2): 269-272.
38. Kumar, S., Sharma, D., Singh, S.P., Tiwari, M., Goel, R., Singh, S.K. and Pandey, V. (2017). Characterization of 5' upstream region and identification of polymorphism in intron1 of prolactin (PRL) gene using *HaeIII* PCR-RFLP in Indian cattle breeds. *Journal of Animal Research*, 7(4):1–5.
39. Kumar, V., Singh, S.P., Farooqui, M.M., Gangwar, C., Kumar, P. and Prakash, A. (2017) Acid and alkaline phosphatase activity in uterus of goat in different stage of pregnancy. *International Journal of Livestock Research*, 7(7): 92–97
40. Kumari, P., Nigam, R., Choudhury, S, Singh, S.K., Yadav, B., Kumar, D., Garg, S.K. (2018). *Demodex canis* targets TLRs to evade host immunity and induce canine demodicosis. *Parasite Immunology*. 40(3).e. 12509. doi: 10.1111/pim.12509
41. Kumari, P., Nigam, R., Singh, A., Nakade, U.P., Sharma, A., Garg, S.K., Singh, S.K. 2017. *Demodex canis* regulates cholinergic system mediated immunosuppressive pathways in canine demodicosis. *Parasitology*, 144(10):1412–1416.
42. Lamba, H., Pal, A., Sharma, D., Tiwari, M., Singh, S.P. and Vijay Pandey. (2017). Polymorphism studies of Kappa-casein ( $\kappa$ -CN), Beta-lactoglobulin ( $\beta$ -Lg) and DRB3 genes in Indian Murrah buffalo. *International Journal of Livestock Research*. 7(9): 140–147.
43. Lamba, H., Sharma, D., Singh, S.P., Tiwari, M., Goel, R., Pandey V. and Singh, S.K. (2017). BoLA-DRB3 polymorphism and their association with milk production traits in Indian cattle breeds. *Journal of Livestock Biodiversity*, 7(1): 52–56.
44. Mahima, Tomar, S.K., Kumar, V., Roy, D., Rahal, A. and Mandil, R. (2017). Effect of supplementation of formaldehyde treated mustard oil cake on feed intake, growth rate, blood biochemical and mineral constituents in Haryana heifers. *International Journal of Livestock Research*, 7 (4): 82–92.



45. Mishra, R.P., Jain, U., Sharma, B., Ojha, S., Tripathi S. and Chappalwar, A.N. (2017). Genotypic study of verocytotoxic E.coli in cattle by multiplex polymerase chain reaction. *Journal of Animal Research*,7(4):785–788.
46. Mishra, R.P., Jain, U., Sharma, B., Ojha, S., Tripathi, S. and Chappalwar, A.M. (2017). Genotypic study of verocytotoxic E.coli in cattle by multiplex polymerase chain reaction. *Journal of Animal Research*, 7(4): 785–788.
47. Nair, S.V., Sharma, V., Sharma, A., Nakade, U.P., Jaitley, P., Choudhury, M.K. and Garg, S.K. (2017). The functional and molecular studies on involvement of hydrogen sulphide in myometrial activity of non-pregnant buffaloes (*Bubalus bubalis*). *BMC Veterinary Research*, 13(1):379.
48. Nakade, U.P., Choudhury, S., Sharma, A., Yadav, R.S. and Garg, S.K. (2017). Calcium-dependending and calcium-mimicking pathways regulate lead- induced myometrial contraction in water buffaloes (*Bubalus bubalis*). *Indian Journal of Animal Science*, 87(7): 804–809.
49. Neha, Verma, A.K., Kumar, A. and Ahmed, I. (2017). Comparative efficacy of serological diagnostic methods and evaluation of polymerase chain reaction for diagnosis of bovine brucellosis. *Iranian Journal of Veterinary Research*, 18(04): 279–281.
50. Ojha, S., Pathak, V., Goswami, M., Bharti, S.K., Singh, V.P. and Singh, T. (2017). Quality and safety assessment of cow milk in different regions of Mathura. *Nutrition and Food Scienc*, 47(3): 1–12.
51. Pandey, V., Nigam, R., Rambachan, Sudan, S., Jaiswal, A.K., Dayashankar, Kumar, R., Mandil, R. and Yadav, B. (2017). Oxidative and haemato-biochemical alterations in theileriosis affected cattle from semi arid endemic areas of India. *Indian Journal of Animal Science*, 87(7): 846–850.
52. Pandey, V., Nigam, R., Singh, S.P., Sharma, D., Tiwari, M. and Rambachan (2017). Effect of leptin gene polymorphism on reproduction and milk production traits in Sahiwal cattle. *Ruminant Science* 6(2):237-242.
53. Panigrahi, P.N., Srivastava, A., Khorajia, J.H. and Srivastava, M. (2017). Therapeutic management of haemorrhagic bovine parafilariosis. *Veterinary Practitioner*, 18(2): 243–244.
54. Parihar, G., Sharma, D., Singh, S.P., Tiwari, M., Goel, R., Singh, S.K. and Pandey, V. (2017). Absence of NsiI polymorphism in Growth Hormone Receptor (GHR) gene in Indian cattle breeds. *Journal of Animal Research*, 7(4): 1–3.
55. Parihar, G., Sharma, D., Singh, S.P., Tiwari, M., Goel, R., Singh, S.K. and Pandey, V. (2017). Genetic polymorphism study in prolactin receptor (PRLR) gene and their association with milk production traits in Indian cattle breeds. *Journal of Animal Research*. 7(5):813–819.
56. Patel, A., Yadav, D., Agrawal, J.K. and Saxena, A. (2017). Dystocia Due to a Conjoined Twin Monster in a Non-Descript Buffalo. *Indian Veterinary Journal*, 94 (04):68–69.
57. Pathak, A., Gupta, S.K., Verma, A., Farooqui M.M. and Gupta, V. (2017). Comparative anatomical studies on the pelvis of fowl (*Gallus domesticus*), turkey (*Meleagris gallopavo*), peacock (*Pavo cristatus*) and white-breasted waterhen (*Amaurornis phoenicurus*). *Indian Journal of Poultry Science*, 52(1): 83–86.
58. Pathak, A., Gupta, S.K., Verma, A., Farooqui, M.M., Prakash, A. and Kumar, P. (2017). Comparative gross anatomy of the sternum in peacock (*Pavo cristatus*), Turkey (*Meleagris gallopavo*), duck (*Anas platyrhynchos*) and white breasted waterhen (*Amaurornis phoenicurlus*). *Journal of Animal Research*, 7(3):501–505.
59. Rambachan, Pandey, V., Nigam, R., Singh, P., Singh, S.P. and Sharma, D. (2017). Genetic polymorphisms of leptin gene in relation with reproduction traits in Haryana cows. *Journal of Animal Research*, 7(3): 1–5.





60. Sachan, V., Kumar, B. and Saxena A. (2017). **Foetal Maceration in a Jamunapari Cross Bred Doe.** *Indian Veterinary Journal.* 94(06) : 49 – 50.
61. Sachan, V., Sonker V. and Saxena, A. (2017). Influence of Different Level of Egg Yolk on Cryopreservation of Haryana Bull Spermatozoa. *International Journal of Livestock Research,* 7(5): 146-154
62. Saroj V., Nakade U.P., Sharma, A., Yadav, R.S., Hajare S.W. and Garg, S.K. (2017). Functional involvement of L-type calcium channels and cyclic nucleotide-dependent pathways in cadmium-induced myometrial relaxation in rats. *Human and Experimental Toxicology,* 36(3):276–286.
63. Saroj, V., Nakade, U.P., Sharma, A., Choudhury, S., Hajare, S.W. and Garg, S.K. (2018). Dose-dependent differential effects of *in vivo* exposure of cadmium on myometrial activity in rats: involvement of VDCC and Ca<sup>2+</sup>-mimicking pathways. *Biological Trace Elements Research,* 181(2):272–280.
64. Sharma, A., Shukla, P.K., Bhattacharyya, A., Kumar, U., Roy, D., Yadav, B., Prakash, A. (2018). Effect of dietary supplementation of sea buckthorn and giloe leaf meal on the body weight gain, feed conversion ratio, biochemical attributes and meat composition of turkey poults, *Veterinary World,* 11(1): 93–98.
65. Sharma, B., Parul, Verma, A.K., Jain, U., Yadav, J.K., Singh, R., Mishra, R. (2017) Occurrence of multidrug resistant *Escherichia coli* in groundwater of Brij region (UP) and its public health implications, *Veterinary World,* 10(3): 293–301
66. Sharma, B., Singh, P., Bharti, S., Jain, U., Singh, R. and Yadav, J.K. (2017). Comparison of the quality of various sources of drinking water available in Mathura, Uttar Pradesh. *International Journal of livestock research,* 7(9): 92–106.
67. Sharma, B., Singh, P., Bharti, S., Jain, U., Singh, R. and Yadav, J.K. (2017). Comparison of the quality of various sources of drinking water available in Mathura, Uttar Pradesh. *International Journal of Livestock Research,* 7(9): 92–106.
68. Sharma, S., Pathak, V., Singh, V. P., Goswami, M. and Bharti, S.K. (2018). Comparative quality assessment of meat nuggets prepared from meat of different food animals. *International Journal of Livestock Research.* 8(1): 139–148.
69. Sharma, Shukla, P.K., Bhattacharyya, A., Kumar, U. and Roy, D. (2018). Effect of dietary supplementation of sea buckthorn and giloe leaf meal on the body weight gain, feed conversion ratio, biochemical attributes and meat composition of turkey poults. *Veterinary World,* 11(1): 93–98.
70. Sharma, V., Nair, S.V., Jaitley, P., Nakade, U.P., Sharma, A., Choudhury, S. and Garg, S.K. (2018). ATP-sensitive and maxi potassium channels regulate BRL 37344-induced tocolysis in buffaloes. *Theriogenology,* 107:194–202.
71. Shukla, M., Bhattacharyya, A., Shukla, P.K., Roy, D., Yadav, B. and Sirohi, R. (2018) Effect of Azolla feeding on growth, feed conversion ratio, blood biochemical attributes and immune competence traits of growing turkeys. *Veterinary World,* 11(4): 459–463.
72. Singh S.K., Singh, V.K., Kumari, P., Nakade, U.P., Garg, S.K. (2018). *Trypanosoma evansi* induces detrimental immuno-catabolic alterations and condition like type-2 diabetes in buffaloes. *Parasitology international,* 67(2): 140–143.
73. Singh, A., Gupta, V.K., Kumar, A., Singh, V.K. and Shivasaranappa, N. (2018). Comparative evaluation of conventional serological tests and in house recombinant Omp31 (rOMP31) based dot- and indirect ELISA for the detection of caprine brucellosis. *Indian Journal of Small Ruminant Research,* 24(1): 84–88.
74. Singh, A., Srivastava, M., Shah, H. K., Gupta, K., Tripathi A.K. and Chaudhary, A.K. (2017). Mix infestation of trypanosomiasis and theileriosis in buffaloes. *Veterinary Practitioner,* (17)2:260.



75. Singh, A.P., Singh, R., Singh, T. and Yadav, S.K. (2017). Randomised field trial to evaluate serological response after foot-and-mouth disease vaccination in Uttar Pradesh, India, *Indian Journal of Animal Sciences*, 87 (12): 1485–1487.
76. Singh, D.D., Pawaiya, R.V.S., Gururaj, K., Gangwar, N.K., Mishra, A.K., Andani, D., Singh, M.K., Bhushan, S. and Kumar, A., (2018). Molecular detection of *Clostridium perfringens* toxinotypes, Enteropathogenic *Escherichia coli*, rotavirus and coronavirus in diarrheic fecal samples of neonatal goat kids. *Veterinarski Arhiv*, 88 (1): 1–20.
77. Singh, K.V., Sharma, D., Singh, S.K., Srivastava, M., Garg, S.K and Yadav, B.K. (2017). Assessment of alteration in metabolic profile and milk composition of buffaloes with subclinical mastitis. *Buffalo Bulletin*, 36(2): 295–302.
78. Singh P., Purohit S. And Pandey, R.P. (2017). Ultrasonographic evaluation of tets in buffaloes (*Bubalus bubalis*). *Ruminant Science* 6 (2):377-381.
79. Singh, P., Srivastava, A.K., Gangwar, N.K., Prabhu, S.N., Yadav, R. and Kumar, R. (2017). Protective role of s-Adenosyl methionine (SAME) in cadmium induced toxicopathological changes in Wistar rats. *Toxicology International*, 24(1): 58–64.
80. Singh, U., Singh, R., Singh, A.P., Yadav, S.K., Sircar, S. and Malik, Y.P.S. (2017). Detection and characterization of caprine and ovine rotaviruses in India. *Indian Journal of Animal Sciences*, 87 (11): 1358–1361.
81. Singh, V., Gupta, R. K., Sachan, V., Yadav, C.L., Kumar, A. and Yadav, D. K. (2017). Expulsion of conjoined twin monster fetus in a murrah buffalo through fetotomy . *Indian Journal of Animal Health*. 56(1) : 109-110)
82. Singh, V. K., Kumar, A., Jayshree and Yadav S. K. (2017). Prevalence and Antibigram of the *Psuedomonas aeruginosa* from Isolates in Clinical Samples of Companion Animals. *Indian Journal of Comparative Microbiology, Immunology and Infectious Diseases*. 38(1): 37–42.
83. Singh, V.P. and Pathak, V. (2017). Contribution of Carcass Cuts in Meat Production of Kadaknath, Aseel and Vanraja Breeds of Chicken. *Journal of Animal Research*, 7 (1): 213–217.
84. Singh, V.P. and Pathak, V. (2017). Physico-chemical, colour and textural characteristics of Cobb-400, Vanraja, Aseel and Kadaknath meat. *International Journal of Livestock Research*. 7(11): 98–106.
85. Singh, V.P., Pathak, V., Kumar, A., Singh, V.K. (2017). Protein Profile of Meat Produced by Aseel, Kadaknath and Vanraja Indigenous Chickens. *International Journal of Livestock Research*, 7(2), 64-70. doi:10.5455/ijlr.20170130064610
86. Singh. A.P., Tripathi, A.K. Verma, Srivastava, A.K. and Singh, R.K. (2017). Epidemiological studies and determination of clinical markers of trypanosomosis in naturally infected buffaloes in Braj region of Western UP, India. *Buffalo Bulletin*. 36(3): 473–482.
87. Srivastava, M.K., Ahuja, A., Velhankar, R.D., Panigrahi, P.N., Singh, A.P., Sharma, A. and Kacchawaha, S. (2018). Performance analysis of endothelin-1 for diagnosis of dilated cardiomyopathy in dogs. *Journal of Entomology and Zoological Studies*, 6(2): 644–649.
88. Sudan, V., Daya Shankar, Sharma, B., Jaiswal, A.K. and Singh, A. (2017). Molecular characterization and sequence phylogenetic analysis of *Babesia bigemina* cattle isolate from Mathura based on 18S ribosomal DNA gene. *Indian Journal of Animal Science*, 87 (8): 977–979
89. Sudan, V., Daya Shanker, Jaiswal, A., Singh, A., Pandey, V. (2017). Standardization and validation of simple PCR, duplex PCR and RAPD in comparison to blood smear examination for diagnosing bovine tropical theileriosis. *Biologicals* 46: 88–91.



90. Sudan, V., Daya Shanker, Sharma, B., Jaiswal, A., Singh, A. V. (2017). Molecular characterization and sequence phylogenetic analysis of *Babesia bigemina* cattle isolate from Mathura based on 18S ribosomal DNA gene. *Indian Journal of Animal Sciences*, 87 (8): 977–979.
91. Sudan, V., Jaiswal, A.K., Shanker, D. and Verma, A. K. (2017). First report of molecular characterization and phylogenetic analysis of RoTat 1.2 VSG of evansi from equine isolate. *Tropical Animal Health and Production*, 49(8): 17976–1798.
92. Tanuja, Pathak, V. and Goswami, M. (2017). Development and quality evaluation of apple pomace incorporated functional apple burfi. *Indian Journal of Dairy Science*, 70(2): 162–166.
93. Tanuja, Pathak, V., Verma, A.K., Goswami, M. and Rajkumar, V. (2017). Quality assessment of value added chicken momos incorporated with corn starch. *Indian Journal of Poultry Science*, 51(1): 99–103.
94. Tiwari, A., Singh, P., Jaitley, P., Sharma, S., Prakash, A., Mandil, R., Choudhury, S., Gangwar, N.K. and Garg, S. K. (2017). Eucalyptus robusta leaves methanolic extract suppresses inflammatory mediators by specifically targeting TLR4/TLR9, MPO, COX2, iNOS and inflammatory cytokines in experimentally-induced endometritis in rats. *Journal of Ethnopharmacology*, 213: 149–158.
95. Tiwari, M., Sharma, D., Singh, S.P. and Goel, R. (2017). Association between polymorphisms of solute carrier 27 A1 gene with milk production traits in Indian Sahiwal and Haryana cattle. *International Journal of Livestock Research*, 7(6):219–224.
96. Tiwari, R., Singh, S.K., Choudhury S. and Garg, S.K. (2017). Antifungal Activity of *Eucalyptus citriodora* and *Saraca indica* Leaves Methanolic Extracts Against Fungal Isolates from dermatological disorders in canines. *International Journal of Pharmacology*, 13(6): 643–648.
97. Tiwari, R., Singh, S.K., Choudhury, S., Garg, S.K. (2017). Antifungal activity of *Eucalyptus citriodora* and *Saraca indica* leaves methanolic extracts against fungal isolates from dermatological disorders in canines. *International Journal of Pharmacology*, 13:643–648.
98. Tomar, V., Nigam, R., Pandey, V., Singh, A.P., Roy, D., Sharma, A., Singh P. and Pal A. (2018). Evaluation of in vitro anti-microbial activity of goat urine peptides. *Journal of Animal Research*, 7 (6): 1-5.
99. Tomar, V., Nigam, R., Pandey, V., Singh, A.P., Roy, D., Sharma, A., Singh, P. and Pal, A. (2018) Evaluation of in vitro Anti-Microbial Activity of Goat Urine Peptides. *Journal of Animal Research*, 7(6): 01–05.
100. Umaraw, P., Pathak, V., Rajkumar, V., Verma, A.K., Singh, V.P. and Verma, A.K. (2018). Quality characteristics of edible byproducts compared to *Longissimus Dorsi* muscle of barbari kids. *Indian Journal of Small Ruminants*, 24(1): 134–138.
101. Vaswani S. (2017). Effect of different sources of organic chromium on in vitro rumen fermentation pattern. *Indian Journal of Dairy Sciences*. 70(2): 241–243.
102. Vaswani, S., Kumar, R., Kumar, V., Roy, D. and Kumar, M. (2017). Nutrient digestibility and plane of nutrition of different varieties of normal and high quality protein maize (HQPM) fodder at pre-cob and post-cob stage in lactating Sahiwal cows. *Journal of Animal Research* 7(3): 531–536.
103. Vaswani, S., Kumar, R., Kumar, V., Roy, D. and Kumar, M. (2017). Evaluation of maize grain varieties for *in vitro* gas production and methane emission. *The Indian Journal of Small Ruminants*, 23(1): 35–38.
104. Vaswani, S., Kumar, V., Roy, D., Kumar, M. AND Kushwaha, R. (2017). Effect of copper supplementation on *In Vitro* Rumen fermentation characteristics. *International Journal of Livestock Research*, 7 (3):35–41.



105. Verma, A., Archana, Gupta, S.K., Farooqui, M. M. and Ajay Prakash. 2017. Morphometrical studies on the gastrointestinal tract of rabbit (*Oryctolagus cuniculus*). *Indian Journal of Veterinary Anatomy*, 29(1):70–72.

106. Verma, A., Pathak, A., Prakash, A., Farooqui, M., & Singh, S.P. (2017) Functional Anatomy of Scapula of Monkey (*Macaca mulatta*). *International Journal of Livestock Research*, 7(9): 69–74.

107. Verma, A.K., Tripathi, A.K. and Neha (2017). Investigation of FMD Outbreak in Distt Bulandhsher, UP. India, *International Journal of Livestock Research*, 7(4): 113–119.

108. Verma, M.K., Purohit, S., Gowtham, A., Singh, P.R., Tripathi, D.M., Pandey, V. and Pandey, R.P. (2017). Excretory urographic and ultrasonographic studies of urinary system in goats (*Capra hircus*). *Ruminant Science*, 6(1):177–184.

109. Yadav, B.K., Singh, S.K., Nakade, U.P., Singh, V.K., Sharma, A., Srivastava, M., Yadav, B., Singh, Y., Sirohi, R., Garg, S.K. (2017). Ameliorative potential of prepartal trace minerals and vitamins supplementation on parturition-induced redox balance and myeloperoxidase activity of periparturient Sahiwal cows. *Biological Trace Element Research*, 177: 72–79.

## ESTATE ORGANIZATION

During the financial year 2017-18, university received sum of Rs 95889000 in ICAR Developmental Grant in different heads. Out of this Rs 57593000 were for construction of auditorium. Remaining 34496000 were utilized to construction of drain in Sarojini Girls Hostel, Construction of parking

shed in Sarojini Girls Hostel and Gautam Hostel, Renovation of toilets in Shastri Hostel, renovation of examination hall, renovation work of dining hall, construction work of parking shed and security hut in Nehru Hostel, chemicals, teaching purposes etc.

## FINANCIAL STATUS

State Government	Salary	Contengency	Total
	3923.54	882.00	4805.54
ICAR- Developmental Grant			871.18
University Receipt			999.26

## RIGHT TO INFORMATION ACT

In compliance of the order of Govt. of Uttar Pradesh and provision of RTI Act, 2005, PIO received 79 applications out of which 64 applications were cleared and rests are under consideration for disposal.