NANAJI DESHMUKH VETERINARY SCIENCE UNIVERSITY
JABALPUR (M.P.)

At A Glance

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JABALPUR (M.P.)

At A Glance

नानाजी देशमुख पशुचिकित्सा विज्ञान विश्वविद्यालय
जबलपुर 482 001 (म.प्र.), भारत

NANAJI DESHMUKH VETERINARY SCIENCE UNIVERSITY
JABALPUR 482 001 (M.P.), INDIA
www.mppcvv.org

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Foreword

I am happy to note that Nanaji Deshmukh Veterinary Science University, Jabalpur is publishing University profile. The university has successfully completed seven years of its existence on 3rd November, 2016. The initiatives taken by the university have led to notable accomplishments and growth in education, research and extension, which may provide the strategic framework for enhancing livestock productivity and livelihood of livestock owners in the state.

The University with its "state of the art" research facilities in the three constituent Veterinary Colleges, one Fisheries College, Animal Biotechnology Centre, School of Wildlife Forensic & Health and five Veterinary Polytechnics, is poised to create high quality impact for livestock welfare in the state. Capacity building programmes in cutting-edge areas have also been encouraged by providing adequate facilities to the students and faculty in areas like e-resource facility with CeRA, video conferencing and library automation. Significant efforts have been made to improve upon livestock, fishery and poultry sector including animal health and productivity by taking focused and need-based research and dissemination of technologies, thus uplifting the socio-economic status of the farmers.

The sincere efforts made by Directorate of Research Services in bringing out this document, deserve high appreciation.

Prof. (Dr.) Prayag Dutt Juyal

NANAJI DESHMUKH VETERINARY SCIENCE UNIVERSITY JABALPUR (M.P.)

HISTORICAL BACKGROUND

The Nanaji Deshmukh Veterinary Sciences University, Jabalpur was established on 3rd November, 2009 under the Madhya Pradesh Act No. 16 of 2009 and the Madhya Pradesh Pashu Chikitsa Vigyan Vishwa-vidyalaya Adhiniyam, 2009 with the following objectives

- To impart education in different branches of veterinary, fisheries and allied sciences.
- To provide the advancement of learning and prosecution of research in veterinary and fisheries sciences and,
- To undertake the extension of such sciences to the rural people in co-operation with the government departments.

The University has three constituent Veterinary colleges located at Jabalpur, Mhow and Rewa, and Centre for Wildlife Forensic and Health and Animal Biotechnology Centre located at Jabalpur. Beside the colleges and centres offering degree courses, the university has also five Veterinary Polytechnic Colleges located at Jabalpur, Mhow, Rewa, Bhopal and Morena offering two years Diploma course in Animal Husbandry.

The University is imparting education and training in different branches of Veterinary and Allied sciences. The University offers Bachelor Degree in Veterinary Science and Animal Husbandry in all the three constituent colleges. Post graduate courses leading to M.V.Sc. & A.H. were introduced in Jabalpur and Mhow Colleges in 1961. A Diploma course in Animal Husbandry has been initiated by the University at Jabalpur, Mhow, Rewa, Bhopal and Morena with the objective to fulfill the

manpower requirements in the fields of animal husbandry and poultry. A College of Fisheries Science has been established at Jabalpur from the Academic Session 2012-13 under the directives of the Govt. of Madhya Pradesh.

Significant efforts have been made to mobilize financial resources for strengthening research activities and transfer of technology for the upliftment of socio-economic status of the rural farmers. A total of 45 externally funded research schemes with a financial outlay of Rs. 9541 lakhs are currently in operation in the university. Development of replica of indigenous commercial dual purpose color bird for rural poultry named "Narmada Nidhi", development of nucleus herd of Sirohi and Barbari breeds of goat, formulation of low-cost herbal wound healer and anthelmintic, efficient methods to detect antibiotic residues in milk and meat, prodution of Panchgavya products, prevalence of bluetongue virus and GIT parasites in livestock of Madhya Pradesh are the salient features of research outputs.

Various scientific training and orientation programmes for imparting technology transfer and extension education for farmers, livestock owners and rural youth have also been conducted by the university. The students have also brought laurels to the university by bagging high positions in national level exams, scientific competitions, NCC, cultural and sports events. Better infrastructure, improved laboratory facilities, updating of library, communication through video conferencing and comprehensive networking have been given attention to update the faculty and students. Special attempts have also been made to depict human capital development through imparting scientific knowledge and specialized skills to the students.

Website : www.mppcvv.org

Headquarters' location

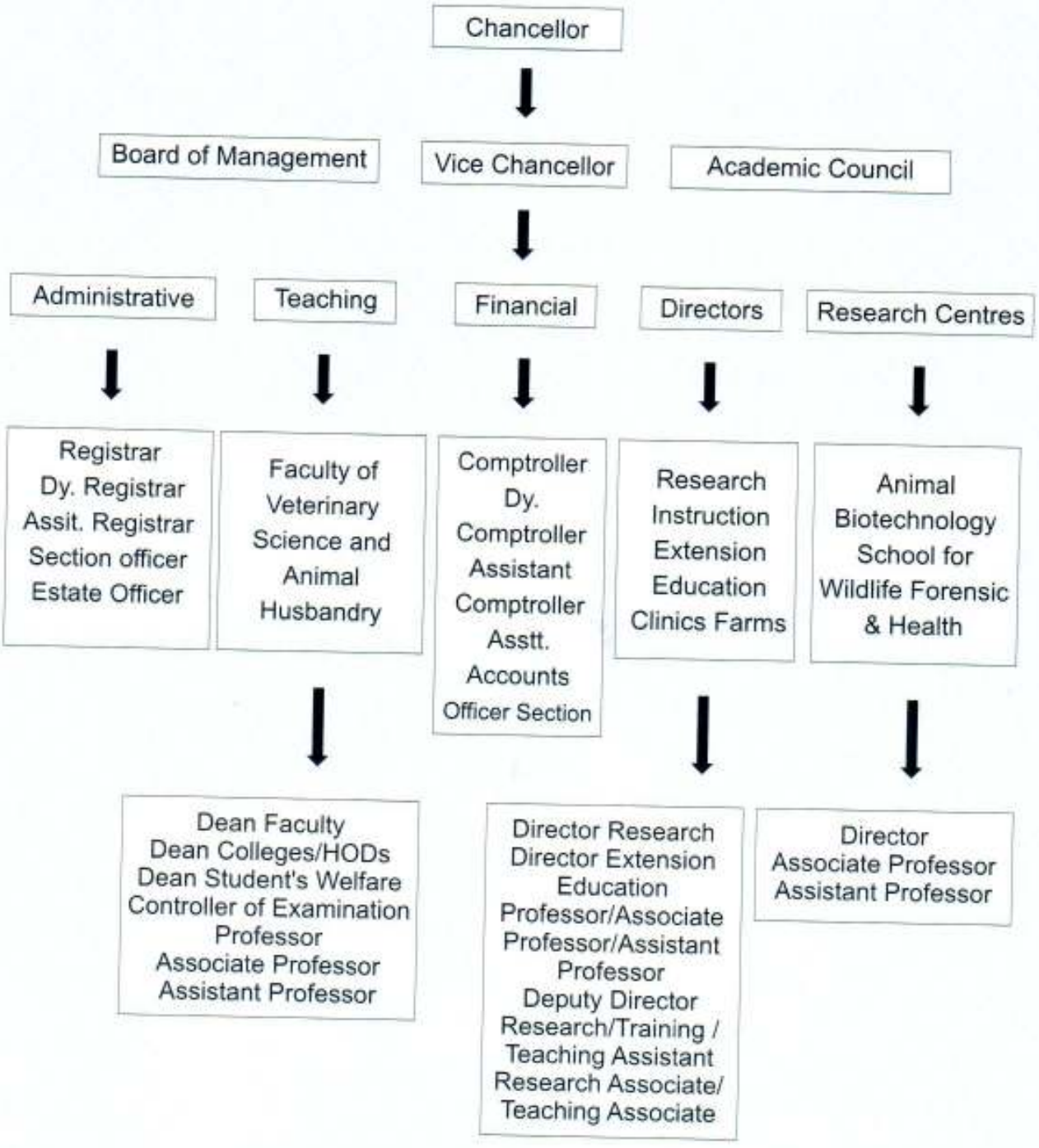
The University is located in South Civil Lines, Near Head Post Office, Jabalpur, Madhya Pradesh 482001.

By Air : Direct flight from New Delhi, Hyderabad, Bhopal and Mumbai.

By Train : Direct trains start from Delhi (Mahakoshal Express and Gondwana Super Fast), Kolkata (Shakti Punj Express), Lucknow (Chitrakoot Express), Rajkot (Rajkot Express), Bhopal (Jan-Shatabdi). Direct train connections are also available from Patna, Mumbai, Varanasi, Allahabad, Durg, Chennai, Hyderabad, Bangalore, Pune etc.

By Bus : The National Highway (NH-7) passes through the city. It is well connected to other cities of the state as well as other states by road.

ORGANIZATIONAL SETUP



Organizational setup of the University

Madhya Pradesh Pashu Chikitsa Vigyan Vishwavidyalaya Act No. 16 of 2009 mentions the following Organizational Setup:

- The Chancellor
- The Vice Chancellor
- The Registrar
- The Comptroller
- The Dean Faculty
- The Director Research Services
- The Director Extension Education
- The Director Instruction
- The Dean Students Welfare
- The Deans of various Colleges
- The Controller of Examination
- The Estate Officer

The Statutory Bodies of the University

- Board of Management
- Academic Council
- Administrative Council
- Board of Studies
- Research Advisory Council
- Extension Education Council
- Finance Committee

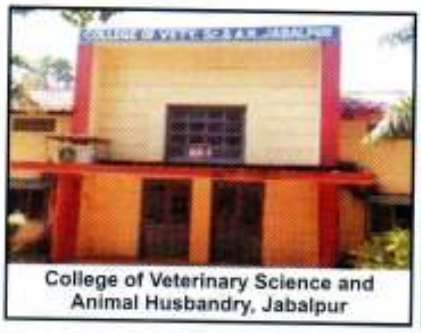
ACADEMIC PROGRAMMES

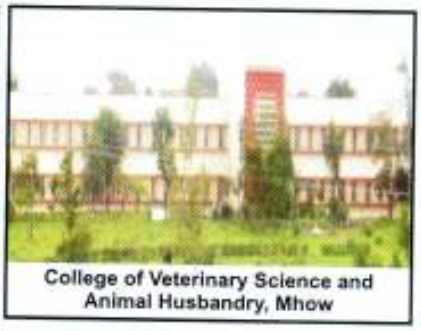
The University is imparting education and training in different branches of Veterinary and Allied sciences. The University offers Bachelor's Degree in Veterinary Science and Animal Husbandry (B.V.Sc. & A.H.) in all the three constituent colleges with total intake capacity of 261 seats. As per VCI regulations 2008, there are only 15 approved departments. New VCI regulation will be followed from academic session 2016-17.

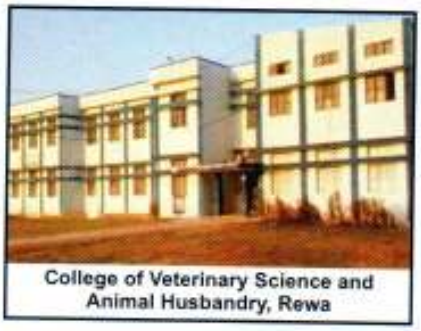
A four year Bachelor of Fisheries Science (B.F.Sc.) degree programme has been introduced under the College of Fishery Sciences established at Jabalpur from the academic session 2012-13 with an intake capacity of 30 seats. Post graduate courses leading to M.V.Sc. & A.H. were introduced in Jabalpur and Mhow Colleges in 1961. Presently, Post graduate degree courses are offered in 17 disciplines (15 in Animal Science, 1 each in Animal Biotechnology and Wildlife forensic and Health), with total intake capacity of 88 seats. Doctoral degree programmes with course work are offered in 14 disciplines at Veterinary College, Jabalpur.

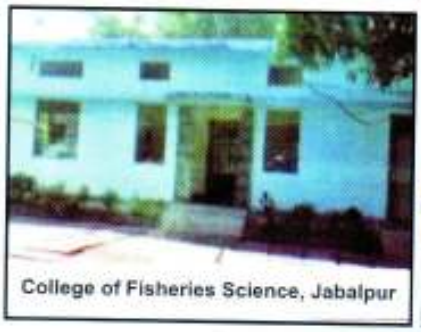
A Diploma course in Animal Husbandry has been initiated by the University at Jabalpur, Mhow, Rewa, Bhopal and Morena with total intake capacity of 300 seats, offering two years Diploma course in Animal Husbandry.

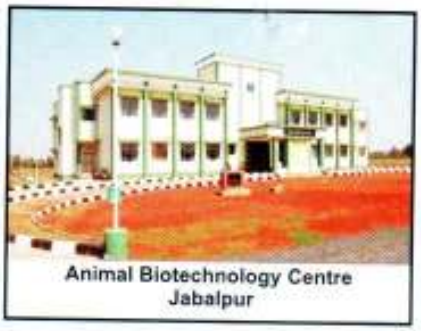
In view of effective and innovative teaching, the university has provided modern classrooms and laboratory facilities to UG and PG students. All the classrooms are well equipped with modern audio- visual aids like LCD projectors, computer aided projectors and laboratories are well equipped with instrumental facilities for conducting UG and PG practical experiments. To cater the needs of students, teachers and research scholars, the library facilities of all constituent colleges have been improved with modern library facilities such as Internet and E-Resources with CD-ROM based Bibliographical Search programmes. Online E-library facility (CERA, provided by ICAR, New Delhi) is also available in this cell providing access to more than 1,800 e-journals to the students and faculty.


College of Veterinary Science and Animal Husbandry, Jabalpur


College of Veterinary Science and Animal Husbandry, Mhow


College of Veterinary Science and Animal Husbandry, Rewa


College of Fisheries Science, Jabalpur


Animal Biotechnology Centre Jabalpur


School of Wildlife Forensic and Health Jabalpur

Programmes	Degree/ Diploma	Duration
UG	Bachelor of Veterinary Sciences and Animal Husbandry (B.V.Sc. & A.H.)	5 Years
PG	Master of Veterinary Sciences (M.V.Sc.)	2 Years
Doctoral	Ph.D. in different disciplines of Veterinary Sciences and Animal Husbandry	3 Years
UG	Bachelor of Fisheries Science (B.F.Sc.)	4 Years
Diploma	Diploma in Veterinary Polytechnic	2 Years

ACADEMIC PROGRAMMES OFFERED IN DIFFERENT COLLEGES

Colleges / Centres	Degree / Diploma
College of Veterinary Science & A.H., Jabalpur	B.V.Sc. & A.H., M.V.Sc., Ph.D.
College of Veterinary Science & A.H., Mhow	B.V.Sc. & A.H., M.V.Sc., Ph.D.
College of Veterinary Science & A.H., Rewa	B.V.Sc. & A.H., M.V.Sc.
College of Fisheries Science, Jabalpur	B.F.Sc.
School of Wildlife Forensic & Health, Jabalpur	M.V.Sc., Ph.D.
Animal Biotechnology Centre, Jabalpur	M.V.Sc./ M.Sc., Ph.D.
Veterinary Polytechnic College (Jabalpur/ Mhow/ Rewa/ Morena/ Bhopal)	Diploma in Animal Husbandry

ADMISSION PROCEDURE

B.V.Sc. & A.H.	B.F.Sc.	M.V.Sc. & A.H. / Ph.D.	Diploma in Animal Husbandry
Through All India Entrance Examination (AIPVT) conducted by Veterinary Council of India (VCI), New Delhi	Through State Level Entrance Examination (Pre-Fisheries Test) conducted by M. P. Board of Professional Examination, Bhopal.	Through All India Entrance Examination conducted by University.	Through State Level Entrance Examination (Animal Husbandry Diploma) conducted by M.P. Board of Professional Examination, Bhopal.

INTAKE CAPACITY

(For academic session 2016-2017)

Faculty of Veterinary Science

S.No.	Name of College/ Programme offered	Vety. College Jabalpur	Vety. College Mhow	Vety. College Rewa
1.	U.G. (B.V.Sc. & A.H.)	87	87	87
2.	P.G. (M.V.Sc.)	38	24	18
3.	Ph.D.	20	04	-

Fisheries College

S. No.	Programme offered	Name of College / Institution	Capacity
1.	Under Graduate (B.F.Sc.)	College of Fishery Science, Jabalpur	33

Centres/School

S.No.	Programme offered	School of Wildlife Forensic & Health, Jabalpur	Animal Biotechnology Centre, Jabalpur
1.	Post Graduate (M.V.Sc./ M.Sc.)	02	06
2.	Ph.D.	-	02

Diploma in Veterinary Polytechnic (DVP)

S. No.	Programme offered	Name of College/ Institution	Capacity (Nos.)
a.	DVP	Veterinary Polytechnic College, Jabalpur	61
b.	DVP	Veterinary Polytechnic College, Mhow	61
c.	DVP	Veterinary Polytechnic College, Rewa	60
d.	DVP	Veterinary Polytechnic College, Bhopal	59
e.	DVP	Veterinary Polytechnic College, Morena	59

Start of Academic Session : Month of August - September

EXAMINATION - PROCESS OF EVALUATION

- **Mode of Student Evaluation (Per cent weightage)**

Mode	UG	PG/ Ph.D.
Theory Examination Pattern	Semester examination is given 50 % weight age while 50 % weightage is given to Annual Board Examination.	Examination pattern comprises of 20% marks for Midterm exam while rest 80% for the semester examination.
Practical Examination Pattern	Semester examination is given 50 % weightage while 50 % weightage is given to Annual Board Examination.	Semester examination is given 100% weightage.
Seminar	-	PG/ Ph.D. seminars are considered separate subjects essential for PG/ Ph.D. completion.
Tracking Programme	These programmes have been developed to allow students to exercise practical experience over the profession and motivate them for self-teaming through virtual classroom, distant learning, internet etc. A student has to compulsorily take any two programmes of two credits each (2x2=4 credits) during second year to fifth year of B.V.Sc. & A.H. Degree Course.	-
Study Circle Programme	Each student of B.V.Sc. & A.H. degree course shall have to enroll himself/ herself for at least two Study Circle activities during the B.V.Sc. & A.H. degree programme.	-

INSTRUCTIONAL MATERIAL

Instructional Material is in the form of manuals, handouts, notes, flowcharts, models and PPT slides are prepared by the faculty members as teaching aids for the students.

FACILITIES FOR STUDENTS

Hostels

S.No.	Name of College	Name of Hostel	Intake Capacity
1.	College of Veterinary Science & A.H., Jabalpur	Subash Hostel	166
2.	College of Veterinary Science & A.H., Jabalpur	New Hostel	36
3.	College of Veterinary Science & A.H., Jabalpur	Girls' Hostel	72
4.	College of Veterinary Science & A.H., Mhow	Gandhi Hostel	108
5.	College of Veterinary Science & A.H., Mhow	Tagore Hostel	60
6.	College of Veterinary Science & A.H., Mhow	Girls' Hostel	54
7.	College of Veterinary Science & A.H., Rewa	Boys' Hostel	50
8.	College of Veterinary Science & A.H., Rewa	Girls' Hostel	50

SPORTS

- **Indoor facilities -** The boys' and girls' hostels are having facilities for indoor games like Badminton, Table Tennis, Chess and Carom etc.
- **Out door -** Courts, Play grounds, etc.
- **College of Veterinary Science & A.H., Jabalpur**
  - One outdoor play ground for Football, Cricket, NCC, Horse riding and Athletics
  - One basketball, One Volleyball and Kabbadi grounds

- **College of Veterinary Science & A.H., Mhow**
  - One outdoor play ground for Football, Cricket, NCC, Horse Riding and Athletics
  - One basketball, two Volleyball and Kabbadi grounds
  - Long jump and High jump pits
- **College of Veterinary Science & A.H., Rewa**
  - One outdoor play ground for Football, Cricket, NCC, Horse Riding and Athletics
  - One Volleyball and Kabbadi grounds

- **Teaching Veterinary Clinical Complex (TVCC)**

  - College of Veterinary Science & A.H., Jabalpur, Mhow and Rewa are having fully established Teaching Veterinary Clinical Complex (TVCC) for treatment of animals.

- **Instructional Livestock Farms**

  - Livestock Farm Complex, Adhartal, Jabalpur
  - Livestock Farm, Amanala, Jabalpur
  - Fish Farm, Adhartal, Jabalpur
  - Livestock Farm Complex, Mhow
  - Livestock Farm Complex, Rewa

OTHER FACILITIES

- **Entrepreneurial Training**

Each student of B.V.Sc. & A.H. degree course is required to undertake one of the activities of Entrepreneurial Training. This training is aimed at developing entrepreneurial skill for self employment. The university/ college provide interest free loans out of a revolving fund to a group of students along with technical support and infrastructure for these activities. Inputs, day-to-day work and financial accounting are undertaken by the students. The profits/loss, if any, is borne by the students. However, in case of loss, the Dean of the college through the Entrepreneurship Committee consisting of four faculty members may evaluate the reasons of such losses and provide compensation in case it is found that the losses were inadvertent.

- **ICAR - Experiential Learning Programme**

  - On account of establishment of the advanced Teaching Veterinary Clinical Service Complex under ICAR Experiential Learning scheme, undergraduate and post graduate students are developing the confidence in the diagnosis and the treatment of the animals using advanced diagnostic techniques.

- Likewise ICAR Experiential Learning project on hatchery practices in Poultry Science department is very useful for exposure of students towards commercial poultry production practices.
- Under the ICAR Experiential Learning scheme in the College of Fisheries Sciences at Livestock Farm Adhartal, Jabalpur, the facilities are being utilized for hands-on practical training to UG students of Fisheries Sciences.

• Internship Programme

Every student of B.V.Sc. & A.H. degree course is required to undergo compulsory rotating internship after passing the fifth annual examination for a minimum period of six calendar months so as to be eligible for the award of the degree of B.V.Sc. & A.H. The compulsory rotating internship shall be in the following areas:

- Clinical training covering veterinary medicine, surgery and radiology, animal reproduction, gynaecology and obstetrics, clinical emergencies, indoor ward care, hospital management record keeping etc. for three months.
- Livestock production and management training, covering farm routines of Cattle and Buffalo farms, Piggery/ Rabbitry, Sheep and Goat farms, and Equine/ Camel unit etc. for one month.
- Poultry production and management covering layer and broiler production, hatchery and chick management quail, turkey, duck units etc. as well as Fishery or any other recycling unit where feasible, for one month.
- Livestock technology and services covering familiarization in biological product units, disease control campaigns (disease investigation and sample collection and dispatch, vaccination, mass testing etc.) in meat & milk processing units, training in Zoo/ Wildlife Centre/National parks for one month.

STUDENTS' WELFARE

- **Student Counseling & Placement Cell**
  - All the Colleges have a well established student counselling and placement cell for the placement of pass out students during campus selection drive. Students are placed in the different organizations including government and private institutions.

- **1 MP R & V Sqn.**
  - 1 MP R & V Sqn. units have been established in all the three Veterinary Colleges for developing character, comradeship, discipline, a secular outlook, the spirit of adventure and ideals of selfless service amongst students.

- **National Service Scheme (NSS)**
  - National Service Scheme for development of personality of students through community service has also been established

- **Awards**
  - Tashina Roy Chaudhary bagged 2 Gold, 1 silver and Best Rider Trophy 2015 in Inter Directorate Equestrian Competition during RDC 2015. She was also felicitated by Hon'ble Chief Minister Shri Shivraj Singh Chauhan with cash prize of Rs. 4000/-

  - Gaurav Samanta and Priya Walia of the college were adjudged first and second, respectively at college level in Zydus All India Painting Competition on theme wildlife. Gaurav Samanta also secured 8th position at national level.

- **Health Complex/ Hospital/ Dispensary**
  - Medical dispensary for treatment of staff and students is available in the three colleges with male and female doctors.

- **Inter College Youth Festival**
  - Inter college Youth festival is organized at Veterinary College, Jabalpur. Series of activities including games, athletics and cultural competitions are organized during the Youth Festival.

- **Inter Class Cultural, Literary and Fine arts Competition**
  - Inter class cultural, Literary and fine arts competitions are organized during January-February.

LIBRARY SERVICES & INFORMATION NETWORKING

- **Library**
  - Each college has a well established central library which contains Text Books, Reference Books, Research and extension Journals, CD ROM, Magazines for current affairs. Internet facility for Under Graduate and Post Graduate students and faculty members is also provided. Photocopy machine is also operational in the library for the students and staff of the college.

- **Agricultural Research Information Service (ARIS) Cell**
  - Each college has fully established ARIS Cell with adequate computers connected by internet facility for use by the students, faculty and staff of the college. On-line e-library facility (CERA, provided by ICAR, New Delhi) is also available in this cell providing access to more than 1,800 e-journals to the students and faculty members.

CONVOCATIONS

- First Convocation Ceremony of the University was held on 13th January 2012.
- Second Convocation of the University was held on 3rd November, 2012.
- Third Convocation of the University was held on 7th October, 2013

Recipients of Honorary Degree of Doctor of Philosophy by the University

First Convocation	-	Dr. (Miss) Amrita Patel Chairperson National Dairy Development Board
Second Convocation	-	Lt. Gen. Dr. Narayan Mohanty President, Veterinary Council of India
		Shri Vishwanath Dubey Prominent Poultry Entrepreneur of Country
Third Convocation	-	Dr. K.M.L. Pathak Deputy Director General (Animal Science) ICAR, New Delhi

RESEARCH

The Directorate of Research Services has been established along with the inception of the University on 3rd November, 2009. The mission of Directorate is to undertake, coordinate and implement research activities for enhancing productivity and sustainability of livestock, poultry and fisheries for the benefit of rural livelihood in the state of Madhya Pradesh.

MANDATE

- To design and develop research schemes for formulation of need-based and discipline-specific research projects for various disciplines of Veterinary and Animal Sciences.
- To plan, coordinate and implement the research programmes for the improvement of livestock, poultry and fisheries in Madhya Pradesh.
- To develop effective research linkages with State/ National/ International organizations for technology exchange and entrepreneurship development.

RESEARCH PROJECTS

- Presently a total of 45 externally funded research schemes with a financial outlay of Rs. 9541 Lakh are in operation in the university.

S. No.	Status of Research Projects	No. of Projects	Financial layout (Rs. in Lakh)
1.	Before inception of University	10	524
2.	New Research Projects (2012-13)	7	2808
3.	New Research Projects (2013-14)	12	1590
4.	New Research Projects (2014-15)	10	2720
5.	New Research Projects (2015-16)	6	1899
6.	Research Projects in operation (2015-16)	45	9541

SCIENTIFIC LINKAGES

1.	Rastriya Krishi Vikas Yojna (RKVY), Bhopal (M.P.)
2.	Indian Council of Agricultural Research (ICAR), New Delhi
3.	Madhya Pradesh State Agricultural Marketing Board (MANDI), Bhopal (M.P.)
4.	Madhya Pradesh Council of Science & Technology, Bhopal (M.P.)
5.	MP Biotechnology Council, Bhopal (M.P.)
6.	Ministry of Forest, Govt. of M.P.
7.	MP Biodiversity Board, Bhopal (M.P.)
8.	Department of Biotechnology, New Delhi

KEY RESEARCH ACCOMPLISHMENTS

DEVELOPMENT OF SUITABLE COLOUR BIRD FOR RURAL POULTRY PRODUCTION

Commercial dual purpose colour bird (25 per cent kadaknath: 75 per cent JBP Colour):

- A multicoloured dual purpose bird has been developed by crossing and backcrossing of Kadaknath and Jabalpur colour population.
- Birds mature at 162 days of age and produce more than 220 eggs in intensive, 191 eggs in semi intensive and 173 eggs annually in free range system. Birds are very popular among farmers and have greater demand in rural backyard poultry for both table and egg production purposes.
- Project Directorate on Poultry, ICAR has released this variety for rural poultry bird named "Narmada Nidhi" during scientist meet held at NDVSU, Jabalpur on 31st Oct. 2015.

Crossbred Kadaknath

- (50 per cent Kadaknath : 50 per cent JBP Colour) : A replica of Kadaknath but bigger in size and superior in egg production has been developed by crossing of Kadaknath male x JBP Col. (black) female. Birds produce 165 eggs under intensive and 130 eggs under free range system.

DEVELOPMENT OF HATCHERY UNIT OF KADAKNATH AT VETY. COLLEGE, MHOW

- A hatchery unit including brooder, grower and layer house has been developed at College of Veterinary Science, Mhow. Installation of feed plant is under progress. At present there are more than 1000 birds in the flock belonging to Kadaknath breed. Birds of first lot have attained the age of egg production.
- Training programmes on scientific rearing of poultry have been organized for farmers at Jhabua and Mhow. An extension booklet "Unnat Murgi Palan" has also been published to provide basic knowledge of poultry farming to rural farmers.

UP-GRADATION OF LOCAL GOAT POPULATION

- Goat rearing farm and an Advance Artificial Insemination cum semen laboratory have been established at Amanala Livestock Farm, NDVSU, Jabalpur.
- Male and female goats of Sirohi and Barbari breeds were procured from their respective breeding tracts and from Central Institute for Research on Goats (CIRG) Makhdoom, Farah, Mathura.

- Nucleus herd of more than 500 goats of both sexes belonging to Sirohi and Barbari breeds have been established.
- Reproduction parameters of goats and growth parameters of kids are recorded as per standard proformas.
- The breeding bucks produced at the farm are distributed to rural farmers for upgrading of local goats.
- The local goat farmers are being trained for advance managemental practices and artificial insemination technique in local goat population.

STRATEGIC NUTRIENT SUPPLEMENTATION: AZOLLA AS A PROTEIN SUPPLEMENT

- In the diet of non-descript cows, mustard oil cake (MOC) as a conventional protein source was successfully replaced by azolla meal as unconventional protein source.
- Azolla meal supplementation lowered the cost of milk production and also improved the health status of non-descript cattle.
- The 6 months azolla meal supplementation study was conducted in Ghana village of Bargi block of Jabalpur district. The experimental design consisted of 3 groups viz., GC : Control, GS : Strategically supplemented (using conventional protein source) and GA : Azolla meal (replacing conventional protein source with DAP) in non-descript cows. In GC group, body wt. non-significantly reduced by 1.38 per cent whereas in GS & GA groups body wt. increased significantly (GS 5.78 per cent & GA 5.42 per cent).
- Further, net increase in milk production with comparison to control group was 66.9 lit in GS group and 159.3 lit in GA group for the period of 180 days.
- Finally, after calculation of economics of milk production, farmers income increased by Rs. 4.09/cow/day in GS group while, Rs. 9.35/cow/day in GA group.

DEVELOPMENT OF PANCHGAVYA PRODUCTS

- A Research Centre for the development, production and marketing of various Panchgavya products obtained from indigenous cow urine and cow dung has been established.
- Four Panchgavya Production and Testing Units, viz. Cow Urine Distillation Unit, Mosquito coil Manufacturing Unit, Ghanvati Manufacturing Unit and Raw Material Processing Unit have been established.
- Pilot production of various Panchgavya products have been initiated for standardization and commercial production. These products are:

- Cow urine distillate
- Herbal mosquito coil
- Havan samgri
- Anthelmintic and Hepatoprotective ghanvati tablets
- Organic fertilizer

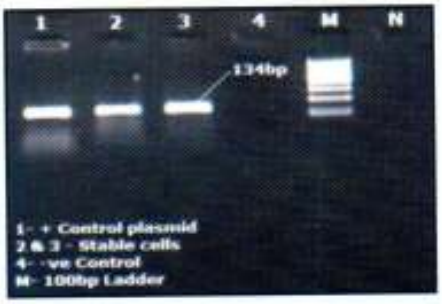
- Under this project, technology transfer of various Panchgavya products has been established as source of income for the rural household including farmers, farm women and rural youth by utilization of the Panchgavya constituents for manufacturing of various products.
- The impact of Panchgavya products is ascertained through training and awareness programmes for livestock owners and farmers.




MONITORING OF METAL TOXICANTS IN WATER BODIES OF RIVER NARMADA

- The concentration of metal toxicants such as bodies copper, lead, cadmium and zinc was estimated in the water of Narmada River at Jabalpur and Amarkantak.
- The concentration of metal toxicants; Copper, Cadmium and Zinc in Narmada river at Amarkantak was found below the detectable limit.
- The concentration of metal toxicants for Lead in 11 target stations and Cadmium in 3 target stations of Narmada River at Jabalpur was found above the Maximum Permissible Limit (MPL).
- The concentration of Lead in Narmada River at Hoshangabad in 4 target stations HWB-1, HWB-2, HWB-3 and HWB-4 was found above the Maximum Permissible Limit.
- The concentration of other metal toxicants; Copper, Cadmium and Zinc in Narmada river in Hoshangabad was found below detectable limit.
- The investigation revealed that concentration of Lead in 17 water bodies out of 29 water bodies of Narmada River was found above the Maximum Permissible Limit.
- The concentration of Cadmium was found above the Maximum Permissible Limit in 3 water bodies out of 29 water bodies.
- The concentration of Copper and Zinc was found below detectable limit in all 29 water bodies undertaken for the study.

DEVELOPMENT OF 'MYOSTATIN GENE KNOCKED-DOWN GOAT' TO ENHANCE MEAT PRODUCTION



- A total of 4 ShRNA constructs (Hush A,B,C,D) were designed having mammalian promoter with GFP marker and Puromycin selection gene.
- Best construct D revealed more than 80 percent silencing by using Real time analysis.
- Further stable cell line was created having knocked-down MSTN in adult and fetal fibroblast cells using Lentivirus which contains sh1.pLKO.1-puro-CMV-tGFP vector (Sigma Aldrich) backbone.
- Knockdown efficiency of MSTN in stable adult fibroblast cell line was evaluated after 11th passage and it was about 90 percent as compared to mock control.
- From these stable cells, transgenic embryos having knocked-down myostatin gene was produced, which is responsible to enhance meat production in goat.

PREVALENCE OF CHROMOSOMAL ABERRATIONS AND THEIR EFFECTS ON REPRODUCTIVE PERFORMANCE OF CATTLE AND BUFFALOES

- A total of 35 bulls reared at Central Semen Station, M.P. Livestock and Poultry Development Corporation, Bhopal were screened for their chromosomal complement.
- Good quality metaphase plates were micro-photographed and karyotypes were prepared.
- None of the bulls showed any of the chromosomal abnormalities and showed normal chromosome number in buffaloes (50 XY), and in Sahiwal, Jersey crosses and HF crosses (60 XY).

ASSOCIATION OF IL-8 RECEPTOR GENE POLYMORPHISM WITH SUB-CLINICAL AND CLINICAL MASTITIS IN DAIRY CATTLE

- The genetic polymorphism across regions of genes associated with the nature of mastitis has been identified in crossbred cattle populations.
- The sample of 60 Frieswal and 60 crossbred lactating cows were screened for clinical and sub clinical mastitis by California Mastitis Test (CMT) and Somatic Cell Count (SCC) and then the polymorphism of IL-8R and TLR-4 genes were detected using PCR-SSCP methods.
- The amplicons 311 bp of IL-8R and 316 bp of TLR-4 genes were amplified and were further subjected for SSCP analysis.

HERBAL ANTHELMINTIC FOR LIVESTOCK

The anthelmintic efficacy of indigenous drugs and their combinations namely;

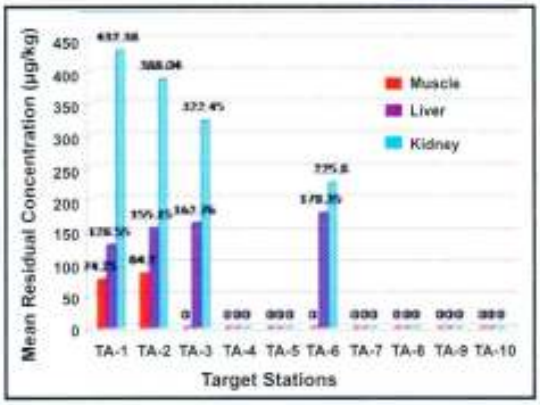
- *Swertia chirata* (Chiryata)
- *Nigella sativa* (Kalongi)
- *Butea frondasa* (Palash)

- *Azadirachata indica* (Neem)
- *Azadirrchata indica* (Neem) + *Butea frondasa* (Palash) was evaluated on parasitic infested animals by conducting in-vitro and in-vivo studies.

- The findings revealed a significant and progressive reduction in EPG counts of Bunostomum, Stronyles, Ascaris and Strongylus on post-treatment with indigenous drugs.
- Clinical trials were also undertaken in Jabalpur, Mandla, Dindori and Anuppur districts of Madhya Pradesh which indicated the therapeutic clinical efficacy of herbal formulation viz. *Swertia chirata* (Chiryata), *Butea frondasa* (Palash) and *Azadirachata indica* (Neem) for parasitic infestation in livestock.

ANTIBIOTIC AND DRUG RESIDUES

- The surveillance study conducted at fifty poultry farms in and around Jabalpur revealed the prophylactic, therapeutic and growth promoting use of a wide range antibiotics including tetracyclines, fluoro-quinolones, beta-lactams and macrolide antibiotics.
- Fifty six percent poultry farmers did not consult the veterinarian for addition of antibiotics in the feed.
- Eighty six percent poultry farmers were unaware of rules and regulations for the use of antibiotics and their residue in relation to public health.



- The two commonly used antibiotics viz. Doxycycline and Levofloxacin were short listed for the experimentation under the period of study.
- The poultry meat samples (muscle, liver, kidney) were collected from five target stations/ poultry farms of Jabalpur Division and were analyzed to find out mean residues levels of antibiotics.
- Out of 180 poultry meat samples analyzed for Doxycyline, 23 samples (12.78 per cent) were found positive for Doxycyline residues.
- Among 23 positive samples, 5 samples were detected above Maximum Residue Limit (MRL) as per standards recommended by Commission Regulation of European Union for Doxycyline in chicken muscle, liver and kidney samples.
- Out of 180 samples analyzed for Levofloxacin, 21 samples (11.67 per cent) were found positive for Levofloxacin residues, however all 21 positive samples were detected below Maximum Residue Limit (MRL) as recommended by Commission Regulation of European Union for Levofloxacin in chicken muscle, liver and kidney samples.
- The residual concentration of Levoflaxacin and Doxycycline was detected higher in kidney samples followed by muscle and liver samples.
- Boiling significantly reduced the residual concentration of Levofloxacin and Doxycycline by 58.8 and 69.2 percent respectively in chicken meat samples.

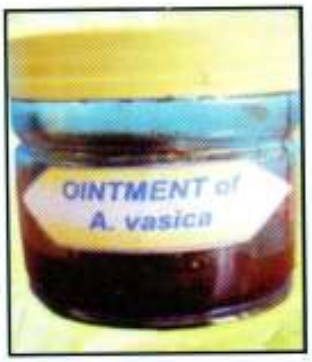
SURVEILLANCE OF DISEASES OF CAPTIVE AND FREE RANGE TIGERS IN M.P.

- The microbial quality of buffon fed to captive tigers was evaluated.
- A higher incidence of bacteria was recorded in buffon fed to tigers at three zoos of Madhya Pradesh.
- Amongst the overall percentage of bacterial isolates, *Bacillus subtilis* had the highest occurrence i.e. in 19 samples (63.3 per cent) followed by Streptococcus spp. in 13 samples (43.3 per cent), Staphylococcus spp. in 11 samples (36.6 per cent), *Escherichia coli* in 8 samples (26.6 per cent), Salmonella spp. in 6 samples (20 per cent) and Listeria spp. in 1 (0.03 per cent).
- Further, the nutritional quality of meat fed to captive tigers was estimated.
- The calcium and phosphorus ratio of buffon in the study was 1:13 against the demand ratio of 2:1. Proximate principles revealed average values of moisture (77.25 per cent), crude protein (20.19 per cent), ether extract (1.58 per cent) and ash (1.16 per cent). The average value of calcium and phosphorus was 0.005183 per cent and 0.0696 per cent, respectively.

HERBAL WOUND HEALER

- Indigenous medicinal plants were identified on basis of their availability and traditional practices used by villagers / tribals in target areas and have been used in the study for the validation as Wound healer:

  Adhatoda vasica
  Vitex negundo



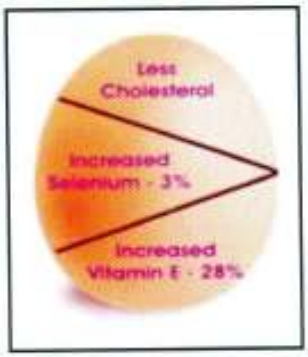
- The application of 10% ointment of EVM preparations on clinical wounds exhibited significant wound healing activity of *Adhatoda vasica* and *Vitex negundo*, as mentioned below:

Indigenous plant	Wound healing activity
Adhatoda vasica	Alc. ext. > Crude powder > Aq. ext.
Vitex negundo	Alc ext.> Aq. ext > Crude powder

- The cost economics of herbal anthelmintic and herbal wound healer have been calculated which were found highly economical in comparison to commercially available drugs. The work is in progress to develop marketing strategies for commercialization of the herbal formulations.

DESIGNER EGG

- The dietary supplementation of Indigenous herbs, *Nigella sativa* (20 gm/kg feed, for 56 days) in layer birds reduced the egg cholesterol and triglycerides to 9.22, 3.35 percent respectively.
- Similarly, the layer birds supplemented with *Withania somnifera* (20 gm/kg feed each, for 56 days) also produced reduction in egg cholesterol and triglycerides to 7.79 and 4.58 percent respectively.



- The dietary supplementation of *Nigella sativa* and *Withania somnifera* in combination (10 gm/kg feed, for 56 days) produced synergistic effect to reduce the egg cholesterol and triglycerides to the extent of 13.09 and 7.25 percent respectively.
- The combination of indigenous herbs (*Nigella sativa* and *somnifera*) along with feed supplementation of Vit. E and Seleno-l-methionine further reduced the egg cholesterol and triglycerides, suggesting a better combination.
- The dietary supplementation of indigenous herbs with Vit. E and Seleno-l-methionine also exhibited egg enrichment for α-Tocopherol concentration in egg yolk to the extent of 34.48 percent.
- Indigenous herbs *N. sativa* and *W. somnifera* alone and in combination significantly increased the mRNA expression levels of Sterol Regulatory Element Binding Protein-2 (SREBP-2) and Low Density Lipoprotein receptor (LDLr) gene in liver and ovarian follicles of birds indicating the role of these two genes in hypocholesterolemic activity of indigenous herbs. The mRNA expression of SREBP-2 and LDLr was up-regulated more in ovarian follicles than in liver
- The cost economics of egg production with dietary enrichment of *N. sativa, W. somnifera*, selenium and Vitamin E was calculated to be Rs. 8.45 per egg.

PATENT FILED

- Development of cost effective microtools for oocyte enucleation during SCNT embryo production Patent file No.: 1762/MUM/2012
- Development of Species Specific PCR Primers for Identification of India Wild Pig. Patent file No. : 43/MUM/2015A

HERBAL GARDEN

- A herbal garden has been established in the University wherein the cultivation of 30 medicinal plants has been initiated.
- Raw material of medicinal plants is used for experimental research of herbal drug formulation.

UNIVERSITY CONSULTANCY SERVICES

- University came into existence and there-after the university has created a base in areas of research, education and extension by updating the infrastructure, laboratory facilities and human resources.
- This has provided the technical competence to the staff to deliver consultancy, trainings and laboratory services for end users.
- The trajectory of this issue is aimed to impart the relevant information on various services and training programmes along with appropriate cost of the services, mode of payment and the application proforma for the users.

TECHNOLOGY TRANSFER CENTRE

- A Technology Transfer Centre has been established with a view to access the scientific information of the research projects of the university in terms of innovations and/or technologies for end-users as business enterprenuers.

- It comprise of 4 Units as :
  - Functional food and food safety unit
  - Herbal testing unit
  - Biotechnology Unit
  - Panchgavya product unit

TECHNOLOGIES DEVELOPED

- Development of commercial dual purpose bird
- Development of panchagayva products
- Development of designer eggs
- Composition of azolla as feed supplement
- Herbal drug development as anthelmintic and Wound healer
- Determination of drug residues in milk & meat
- Detection of toxic elements in water bodies
- Designed anti myostatin RNAsh
- Value addition of milk products

MEMORANDUM OF UNDERSTANDING (MoU)

Memorandum of Understanding with Veterinary Universities / Institutes / Private organization have been executed to undertake Joint collaborative research projects. MoU's have been signed with:

- Jeju National University, Republic of Korea
- National Dairy Research Institute, Karnal
- Ayurvet Limited, New Delhi
- Council for Research in Ayurveda and Siddha, New Delhi
- Mandi Board, Bhopal
- Wildlife Institute of India, Dehradun (in process)
- Chhattisgarh Kamdhenu Vishwavidyalya, Raipur (in process)

RESEARCH PUBLICATIONS OF THE UNIVERSITY

Year	International Journals	National Journals	Total
2011-12	13	60	73
2012-13	10	83	93
2013-14	14	85	99
2014-15	06	108	114
2015-16 (Till June, 2016)	07	55	62

EXTENSION

The Directorate of Extension Education was created for planning, organizing and coordinating Extension Education activities of the Vishwavidyalaya with the following mission:

- Socioeconomic upliftment of 455 livestock farmers with the adoption of latest scientific animal husbandry technologies.
- Educating the rural livestock owners, unemployed youth and women about scientific and profitable animal husbandry practices.
- Act as bridge between the research scientists, farmers and other beneficiaries to provide feedback.
- Training and capacity building of livestock owners.
- Establishing an effective system of research-extension linkage.
- Integration of information and communication technology with Extension Education.

The University has started various scientific training and orientation programmes for technology transfer and extension education to the farmers and field veterinarians of the state. The farmers, rural youth, farm women and field veterinarians are regularly updated with modern techniques of Animal Husbandry practices including managemental, nutritional, reproductive and health care through trainings, workshop/ seminars, exhibitions, animal fairs, news paper articles, radio talks and television programmes

Training Programmes

- The University is regularly organizing ASCAD/RKVY trainings for field Veterinarians to upgrade their knowledge in animal husbandry practices. Since inception of the University, 40 ASCAD/RKVY trainings have been conducted in various fields of animal husbandry and veterinary sciences such as strategies for improving the productivity of livestock, small and large animal surgery, diseases control in animals, radio-imaging techniques in veterinary practices, diagnostic procedures with interpretation for disease management in animals and birds and improvement in milk production.

- Under the promotion of livestock extension services, the University has organized more than 80 skill up gradation training programmes (under RKVY and various research projects) for livestock farmers, women and rural youth in the field of animal husbandry, poultry, fishery farming and fodder production.

ICAR Short Course for Faculty Development

- The ICAR short course on 'Drug Residues and Environmental Pollutants' was organized at College of Veterinary Science & A.H., Jabalpur wherein 25 faculty members have participated from different Agricultural and Veterinary Universities.

Workshop/ Seminar on Livestock Extension Services

- Review Workshop of Animal Science Subject Matter Specialists of Madhya Pradesh, Chhattisgarh and Odisha was jointly organised by Zonal Project Directorate (Zone VII), ICAR, Jabalpur and NDVSU, Jabalpur.

Kisan Mela / Kisan Sangosthi / Animal Health Camps

- The University is regularly organizing awareness cum animal health treatment camp at the door steps of livestock owners at Veterinary Colleges Jabalpur, Mhow, and Rewa.
- Staff and Post Graduate students of Centre of Wildlife Forensic & Health and different departments of College of Veterinary Sc. & A.H., Jabalpur visited various national parks and zoo for treatment of wild animals.
- Farmers' visits and farmers' tours regularly organized in all the Colleges of the University. The University organizes farmers education tours to reputed farms, research institutions of other states of the country.
- The University regularly participated and arranged exhibition stalls at Kisan Mela, Pashu Mela, Kisan Sangosthi, Vigyan and Grameen Mela organized by State Department and other research institutes. In the stalls, various activities of the University were displayed. The useful extension literatures on different aspects of livestock farming system were distributed to the farmers during the exhibitions.

Radio/TV Talks

- More than 100 Radio/TV talks were delivered by the scientists of the University in different areas of livestock production, management and health system.

Hariyali Mahotsav Avam Vriksharopan

"Haryali Mahotsav avam Vriksharopan" Programme in collaboration with Madhya Pradesh Jan Abhiyaan, Rewa District was launched by Veterinary College, Rewa, Under this programme, technical lectures on natural resource management were organized and tree plantation was carried out in the campus of the college.

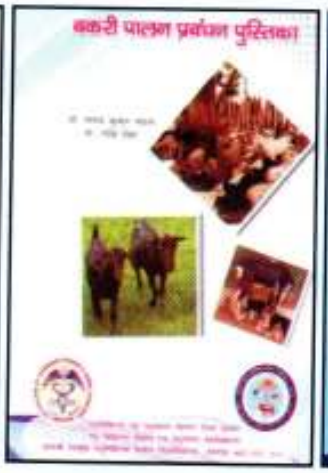
Free Anti-Rabies Vaccination Camp

A free anti-rabies vaccination camp is organised during the World Rabies Day at Teaching Veterinary Clinical Complex, Veterinary College, Jabalpur.

World Veterinary Day

World Veterinary Day is celebrated at all three Veterinary colleges. Various programmes are organized by Veterinary College on the World Veterinary Day viz. poster and debate competition for the students, a technical lecture by the teaching staff on major theme, animal health camp and vaccination camp for dogs at Teaching Veterinary Clinical Complex.

Extension Literature developed



SCHOOL OF WILDLIFE FORENSIC AND HEALTH

. An independent School of Wildlife Forensic and Health within the newly established veterinary Science University at Jabalpur was established in 2009. Based on its expertise and infrastructural facilities available, the Centre emerged as leading institution in the field of Wildlife Health Management and Forensics in the country. The Indian Council of Agricultural Research (ICAR) has recognized the Centre by awarding it with "Niche Area of Excellence of Wildlife Forensic & Health" in the year 2013.

- The centre requirements of the state Forest Department of the Madhya Pradesh for scientific wildlife health management and conservation of wildlife wealth. Centre also provide its services to states of Chattisgarh, Maharashtra, Rajasthan, Uttar Pradesh etc.
- The populations of wild animals need to be managed by quantified scientific work that involves disease diagnostic, translocation and reintroduction of wild animals like big cats, Indian bison, herd ground swamp deer etc from one part to another part.
- The centre has played the important role in reintroduction of Indian bison from kanha Tiger Reserve to Bandhavagarh Tiger Reserve, Hard ground Swamp Deer Knha Tiger Reserve to Vanvihar National Park and Satpura Tiger Reserve and Tiger from Kanha Tiger Reserve & Pench Tiger Reserve to Panna Tiger Reserve, respectively.
- The main activities are identification of species from number of biological sample like hair, cooked meat, meat, dried meat, blood, blood adhered with nails, clothes any instruments used in poaching. The Centre has developed specific primers for identification of Indian wild pig.
- The centre is also imparting higher education degree courses as MVSc, PhD, and Diploma in wildlife Health & Management for Veterinary graduates.

ANIMAL BIOTECHNOLOGY CENTRE

Looking to the tremendous potential of biotechnology for improving the socio-economic status of farmers, tribals and other weaker sections of society, Madhya Pradesh State Government had sanctioned a project entitle "Establishment of Biotechnology Centre" at JNKVV, Jabalpur, funded by Madhya Pradesh State Agriculture Cooperative (Mandi Fund), Bhopal in the year 2003. However, after the creation of separate Veterinary University in September 2009, the Animal Biotechnology Division of the combined Centre was included under the new Veterinary University, "Nanaji Deshmukh Veterinary Science University", Jabalpur.

FACILITIES AND LABORATORY WISE ACHIEVEMENTS

1. Molecular Biology & Diagnostics Laboratory

Achievements

Next Generation Sequencer (Ion Torrent)

- Characterization of β casein, MSTN and myogenic affecter genes in cattle, buffalo and goat marker
- Study of draughtibility related glutathione gene in Malvi and Nimari cattle using SSCP molecular marker
- RNAi mediated myostatin gene silencing and establishment of stably transfected cell lines by lenti virus mediated gene transfer.
- Characterization of Kiss1 gene for improvement of fecundity in goat
- Characterization of virus isolates of infectious bronchitis (IB) from five zones of India for S1 and N gene by cloning and sequencing
- PCR based detection of IB and PPR
- Molecular detection of Infectious bursal disease (IBD) in MP
- Development of shRNA constructs against IBD virus and study of their IFN response
- Whole mitogenome sequencing of domestic pig by next generation sequencing technology

2. Cell Culture and Stem Cell Laboratory

Achievements

- Generated and Cryopreserved fibroblast and cumulus cell lines for subsequent regeneration studies
- Created stably trasfected cell lines of MSTN gene
- Isolated cultured and characterized embryonic stem cell
- Isolated cultured and characterized mesenchymal stem cell and used for healing of frature in goat

Flowcytometer

3. Embryo Biotechnology Laboratory

Achievements

- The reconstructed SCNT embryos up to morulae/ blastocysts stage produced by modified hand made cloning technology.
- Gene expression studies of SCNT, IVF and parthenogenetic embryos.
- Laparoscopic aided embryos transfer in surrogate goats.
- Patent filed for innovative microtools for oocyte enucleation.

Micromanipulator & accessories

- Successfully produced and transferred good quality blastocysts from buffalos by OPU-IVF.
- Establishment of pregnancy of more than 6 months in buffalo using slaughterhouse derived oocyte and sperms.

FUTURE THRUST

- Genetic characterization of indigenous species of animals for conservation of indigenous livestock and poultry germplasm.
- Commercial development of Panchgavya products for animal health care to promote self employment opportunities for rural youth.
- Development and improvement of processing technologies for value addition, shelf life enhancement and assurance of livestock products.
- Development of herbal drugs for animal health care.
- Development of system approach for disease control through prioritization of animal diseases based on agro climatic zones of the state.

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