



# Vision 2050



नानाजी देशमुख पशुचिकित्सा विज्ञान विश्वविद्यालय

जबलपुर-482 001 (म.प्र.), भारत

NANAJI DESHMUKH VETERINARY SCIENCE UNIVERSITY

JABALPUR- 482 001 (M.P.) INDIA

website : [www.ndvsu.org](http://www.ndvsu.org)

Vision - 2050

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**NANAJI DESHMUKH VETERINARY SCIENCE UNIVERSITY**  
**JABALPUR (M.P.) 482 001**  
Website : [www.ndvsu.org](http://www.ndvsu.org)





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## INDIAN COUNCIL OF AGRICULTURAL RESEARCH

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This is to certify that

**Nanaji Deshmukh Pashu Chikitsa Vigyan Vishwavidyalaya, Jabalpur**

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(N.S. Rathore)  
Dy Director General (Edn)

16 July 2018, New Delhi

  
(Trilochan Mohapatra)  
Director General



## INDIAN COUNCIL OF AGRICULTURAL RESEARCH NEW DELHI

### NATIONAL AGRICULTURAL EDUCATION ACCREDITATION BOARD


#### CERTIFICATE OF ACCREDITATION

On the recommendations of the ICAR Peer Review Team, the National Agricultural Education Accreditation Board, ICAR, New Delhi hereby grants accreditation to the **Nanaji Deshmukh University of Veterinary Sciences, Jabalpur (Madhya Pradesh)** and its following constituent colleges upto March 31, 2021.

- College of Veterinary Sciences and Animal Husbandry, Jabalpur
- College of Veterinary Sciences and Animal Husbandry, Mhow

The accredited academic programmes are listed overleaf.

March, 2017  
New Delhi

  
(Narendra Singh Rathore)  
Deputy Director General (Agril. Edn.), ICAR  
and Vice-Chairman, NAEAB

  
(Trilochan Mohapatra)  
Secretary, DARE & Director General, ICAR  
and Chairman, NAEAB

**Note : College of Veterinary Sciences and Animal Husbandry, Rewa is also accredited vide ICAR F.No.Edn. 11/2/2016-EQR, Dated : 11th August 2017**

**Nanaji Deshmukh Veterinary Science University**

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आनंदीबेन पटेल  
राज्यपाल,  
मध्यप्रदेश



राजभवन,  
भोपाल  
मध्यप्रदेश

14 फरवरी, 2019

## संदेश

मुझे यह जानकर खुशी हुई कि नानाजी देशमुख पशु चिकित्सा विज्ञान विश्वविद्यालय, जबलपुर द्वारा “विजन डॉक्यूमेंट 2050” का प्रकाशन किया जा रहा है।

यह व्यापक दस्तावेज शिक्षण, अनुसंधान और विस्तार शिक्षा के क्षेत्र में पिछली उपलब्धियों पर आधारित है और भविष्य में किसानों और पशुपालकों की समृद्धि के लिए किये जाने वाले कार्यों का रोडमैप है। विगत दस वर्षों में इस विश्वविद्यालय ने उल्लेखनीय विकास किया है एवं पशु चिकित्सा, मत्स्य पालन और पशु जैव प्रौद्योगिकी, वन्यजीव और पशु चिकित्सा पॉलिटैक्निक में नए शैक्षणिक कार्यक्रम शुरू किए गए हैं।

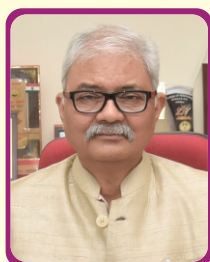
मुझे आशा है कि आने वाले वर्षों में यह दस्तावेज वैज्ञानिकों को उच्च प्रौद्योगिकी आधारित अनुसंधान कार्यक्रमों को अंजाम देने के लिए बहुमूल्य मार्गदर्शन प्रदान करेगा, जिससे किसानों और पशुपालकों की आर्थिक स्थिति को मजबूत किया जा सके।

विश्वविद्यालय के उज्ज्वल भविष्य के लिए शुभकामनाएँ।

आनंदीबेन  
(आनंदीबेन पटेल)







**Prof. (Dr.) P.D. Juyal**  
Vice Chancellor

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## FOREWORD

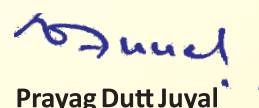
The vision of the university contained herein aims at fulfilling the ever increasing need of human resource in the livestock sector, to meet the challenge of feeding the increasing population and dissemination of promising newly developed technologies and practices over the next two decades. In the pages that follow, we set out in detail our ambitious vision for the future – describing our programme of activities, and articulating the values and ideas that underlie those activities. This document sets out precisely how we plan to do this, where we want to focus and the progress we expect to achieve, till 2050.

Central to all our efforts is our commitment to educate students through high-quality teaching and access to experiential learning opportunities. We take pride in our accomplishments, yet share a belief that we have even greater potential to realize.

While formulating this document, the lessons learned on critical analysis of the achievements of the university since its existence over nearly a decade have been amicably addressed as a foresight in light of the challenges ahead and the changing needs of the livestock farming community for overall development of the university in years to come.

It has been very well said that 'vision without action is a day dream and action without vision is a nightmare'. I hope this vision document 2050 of the university will serve as a guideline for the future generation of administrators and Teachers/ Scientists to act with a focused vision for propelling the university to global levels.

This document represents the concerted efforts of the university community, whose valuable inputs have been incorporated. Let me take this opportunity to thank all for their invaluable contribution in the preparation of the document.



**Prayag Dutt Juyal**



**Prof. (Dr.) S.N.S. Parmar**  
Dean Faculty

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## **PREFACE**

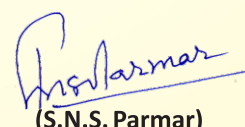
Nanaji Deshmukh Veterinary Science University, Jabalpur was established in the year 2009 to impart undergraduate and post graduate education, basic and advanced research and dissemination of advanced technologies in different branches of veterinary, dairy and fishery sciences to the farmers in co-operation with the concerned government departments.

Since its establishment, the university has played a pivotal role in harnessing veterinary and animal science research, education and extension for the all-round development of the livestock and fishery sectors in the State of Madhya Pradesh. For achieving the above, better infrastructure, improved laboratory facilities, updation of library, improved communication skills for dissemination of scientific knowledge to the students and end users have been addressed.

Central to all our efforts is our commitment to educate students through high-quality teaching and research. To achieve research excellence in specific areas, a focused institutional research strategy, along with inter institutional and industrial collaboration will be developed to address global national and regional challenges. Campus infrastructure and facilities will be enhanced to support new University initiatives.

This vision document outlines the direction and aims for achievement of food security of the nation and in promoting rural employment, income generation and empowerment of the farmers by efficient utilization of livestock, dairy and fisheries resources of the State.

I express my sincere thanks to all the scientists and other staff members of the university for their inputs, suggestions and tireless efforts to prepare this valuable document.



(S.N.S. Parmar)



## STATE PROFILE

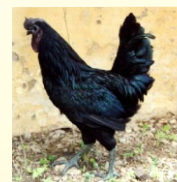
The State of Madhya Pradesh has been established on November 1, 1956, and in its present form, came into existence on 1st November, 2000 following its bifurcation to create a new state of Chhattisgarh. Madhya Pradesh (MP) is the second-largest state in the country by size with an area of 308,000 sq. Kms. With over 75 million inhabitants, it is the fifth-largest state in India by population. It borders the states of Uttar Pradesh to the north-east, Chhattisgarh to the south-east, Maharashtra to the south, Gujarat to the west, and Rajasthan to the northwest. In recent years, the state's GDP growth has been above the national average. The state is rich in mineral resources and has the largest reserves of diamond and copper in India. More than 30% of its area is under the forest cover. Its tourism industry has seen considerable growth, with the state topping the National Tourism Awards in the year 2010–11. In food grain production it is only next to U.P. and Punjab and contributes 7.7% of total food grain production in India. The state by contributing 24 and 25% of total pulse and oil seeds production in India occupies first position in the country. The state has total area of 308.00 lakh hectares with Net Sown Area of 152.23 lakh hectares and Gross Cropped Area of 221.49 lakh hectares.

Livestock sector plays an important role in the economy of the state, as livestock rearing provides regular income and employment to the rural folk especially to the small and marginal farmers. The aggregate share of agriculture and allied sectors, including animal husbandry to the state GDP of Madhya Pradesh is 36.48 per cent during 2016-17 at current price. Contribution of animal husbandry to the state GDP was 2.96 per cent during 2011-12 and increases to 5.54 per cent during 2016-17 at current price. The share of animal husbandry to the total agriculture GDP was 10.82 during the year 2011-12 and increases to 15.19 during the year 2016-17.



The state is a pride owner of some important cattle breeds, like Nimari and Malvi, though poor milk producers but their bullocks are highly valueable for agricultural operations. The North East M.P. (Panna and adjoining areas) has Kenkatha cattle breed used mainly for draught purpose. Gaolao is another cattle breed found in Madhya Pradesh.

Among buffaloes, Bhadawari breed is known for higher fat percentage (10-12%) with average milk production of 800-1000 Kg per lactation. Jalauni breed of sheep, Jamunapari breed of goat and Kadaknath breed of poultry also belongs to this state.





## Climate

Madhya Pradesh has a subtropical climate. Like most of north India, it has a hot dry summer (April–June), followed by monsoon rains (July–September) and a cool and relatively dry winter. The average rainfall is about 1,371 mm (54.0 in). It decreases from east to west because monsoon wind moves from east to west and drained clouds in eastern parts takes less quantity of water vapours with them to western parts. The south-eastern districts have the heaviest rainfall, some places receiving as much as 2,150 mm (84.6 in), while the western and north-western districts receive 1,000 mm (39.4 in) or less.

## Ecology

According to the 2011 figures, the recorded forest area of the state is 94,689 km<sup>2</sup> (36,560 sq mi) constituting 30.72% of the geographical area of the state. It constitutes 12.30% of the forest area of India. Legally this area has been classified into "Reserved Forest" (65.3%), "Protected Forest" (32.84%) and "Unclassified Forest" (0.18%). Per capita forest area is 2,400 m<sup>2</sup> (0.59 acres) as against the national average of 700 m<sup>2</sup> (0.17 acres). The forest cover is less dense in the northern and western parts of the state, which contain the major urban centres. Variability in climatic and edaphic conditions brings about significant difference in the forest types of the state.

The major types of soils found in the state are:

- Black soil, most predominantly in Malwa region, Mahakoshal and in southern Bundelkhand.
- Red and yellow soil, in Baghelkhand region.
- Alluvial soil, in Northern Madhya Pradesh.
- Laterite soil, in highland areas.
- Mixed soil, in parts of Gwalior and Chambal division.

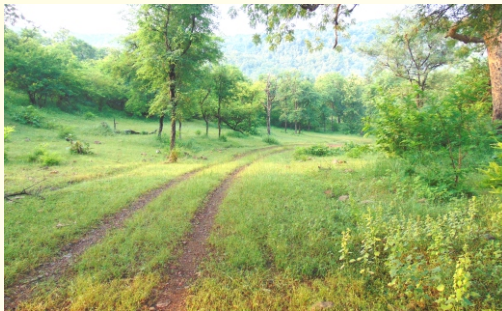
## Flora and fauna

The state is home to 09 National Parks, including Bandhavgarh National Park, Kanha National Park, Satpura National Park, Sanjay National Park, Madhav National Park, Van Vihar National Park, Mandla Plant Fossils National Park, Panna National Park, and Pench National Park. There are also a number of natural preserves, including Amarkantak, Bagn Caves, Balaghat, Bori Natural Reserve, Ken Gharial, Ghatigaon, Kuno Palpur, Narwar, Chambal, Kukdeswar, Narsinghgarh, Nora Dehi, Pachmarhi, Panpatha, Shikarganj, Patakot and Tamia. Pachmarhi Biosphere Reserve in Satpura Range and Amarkantak biosphere reserve are two of the 18 biosphere reserves in India.

Kanha, Bandhavgarh, Pench, Panna, and Satpura National Park are managed

as Project Tiger areas. Sardarpur sanctuary in Dhar and Sailana are managed for conservation of kharmor or lesser florican. Ghatigaon sanctuary is managed for great Indian bustard or Son Chiriya. The National Chambal Sanctuary is managed for conservation of gharial and mugger, river dolphin, smooth-coated otter and a number of turtle species. Ken-gharial and Son-gharial sanctuaries are managed for conservation of gharial and mugger. Barasingha is the state animal and dudhraj is the state bird of Madhya Pradesh.

Based on composition, the teak and sal forests are the important forest formations in the state. Bamboo-bearing areas are widely distributed.



## Rivers

The Narmada is the longest river in Madhya Pradesh. Its tributaries include Banjar, Tawa, Machna, Shakkar, Denwa and Sonbhardra rivers. The Narmada–Tapti systems carry an enormous volume of water and provide drainage for almost a quarter of the land area of Madhya Pradesh. Chambal, Shipra, Kali Sindh, Parbati, Kuno, Sind, Betwa, Dhasan and Ken rivers being the main tributaries of the Yamuna. Shipra River is one of the most sacred rivers of Hinduism. It is the site of the Simhastha Kumbh Mela, which is held every 12 years. The land drained by these rivers is agriculturally rich, with the natural vegetation largely consisting of grass and dry deciduous forest types, largely thorny. The eastern part of the Ganges basin consists of the Son, the Tons and the Rihand Rivers. Son, which arises in the Maikal hills around Amarkantak, is the largest tributary that goes into the Ganges on the south bank and that does not arise from the Himalayas.

## Agro-climatic Zones

Madhya Pradesh is broadly divided into 11 Agro-climatic Zones (ACZ) which are as follows:

1. Chhattisgarh plains
2. Northern Hill Region of Chhattisgarh
3. Kymore Plateau & Satpura Hills
4. Central Narmada Valley
5. Vindhya Plateau
6. Gird Region
7. Bundelkhand
8. Satpura Plateau
9. Malwa Plateau
10. Nimar Plains
11. Jhabua Hills

## Demographics

The state is home to a large tribal population, who have been largely cut off from the mainstream development. As per details from Census 2011, Madhya Pradesh has population of 7.27 crores, an increase from figure of 6.03 crore in 2001 census. Total population of Madhya Pradesh as per 2011 census is 72,626,809 of which male and female are 37,612,306 and 35,014,503 respectively. In 2001, total population was 60,348,023 in which males were 31,443,652 while females were 28,904,371. The total population growth in this decade was 20.35 percent while in previous decade it was 24.34 percent. The population of Madhya Pradesh forms 6.00 percent of India in 2011. In 2001, the figure was 5.87 percent. The literacy rate has increased from 63.74 % in 2001 to 69.32 % in 2011.

## Livestock

Livestock sector plays an important role in the economy of the state, as livestock rearing provides regular income and employment to the rural folk especially to the small and marginal farmers. The aggregate share of agriculture and allied sectors, including animal husbandry to the state GDP of Madhya





Pradesh is 36.48 per cent during 2016-17 at current price. Contribution of animal husbandry to the state GDP was 2.96 per cent during 2011-12 and increases to 5.54 per cent during 2016-17 at current price. The share of animal husbandry to the total agriculture GDP was 10.82 during the year 2011-12 and increases to 15.19 during the year 2016-17.

The state is a pride owner of some important cattle breeds, like Nimari and Malvi, though poor milk producers but their bullocks are highly valueable for agricultural operations. The North East M.P. (Panna and adjoining areas) has Kenkatha cattle breed used mainly for draught purpose. Gaolao is another cattle breed found in Madhya Pradesh. Among buffaloes, Bhadawari breed is known for higher fat percentage (10-12%) with average milk production of 800-1000 Kg per lactation. Jalauni breed of sheep, Jamunapari breed of goat and Kadaknath breed of poultry also belongs to this state.

Milk production in M.P is 13.4 million tonnes per annum which is 3rd in India (2016-17). The per capita milk availability of the state is 468 g/day against national average of 355 g/day (2016-17).

Waters reservoirs, ponds and tanks are spread over 3.45 lakh hectares area in the state, from which area under waters reservoirs is 2.88 million hectares and area under rural ponds and puddle is 0.57 million hectares. Total area of 3.36 million hectares has been brought under fish culture which include 2.86 million hectares of water reservoirs and 0.50 million hectares of rural lakes and ponds.

### **Livestock Population**

The state has vast resource of livestock (36.33 million) and poultry (11.9 million). The state also has the highest cattle population in India (19.6 million) (Livestock census, 2012). Among the total livestock, Cattle contributes highest with 53.95% followed by Buffalo 22.54%, Goat 22.06% and sheep 0.85% besides marginal contribution is attributed by other livestock species such as Pigs, Camel, Mules, Donkeys, Horses and Ponies. There is a 10.55% decrease in number of cattle during the inter censuses period (2007-2012). The total exotic/crossbred cattle population has increased from 0.31 million in 2003 to 0.84 million in census 2012. The indigenous cattle population has increased from 18.59 million in 2003 to 18.76 million in 2012. The percentage changes in number of exotic/crossbred and indigenous cattle population are 77.14% and -12.50% respectively during the inter censuses period (2007-2012). The total number of female cattle in the state is 11.37 million as per census 2012. The number of female cattle has increased from 9.75 million in 2003 to 11.37 million in 2012. However, over the previous census the female cattle population has decreased by 2.12%. The total buffalo population in the state as per the census 2012 is 8.18 million numbers. There is a decrease in number of buffaloes with 10.31% during the inter censuses period (2007-2012). The female buffalo population has decreased by 8.39% during the inter censuses period (2007-2012). The total sheep population in the state as per census 2012 is 0.30 million numbers. There is a 20.75% decrease in number of Sheep during the inter censuses period (2007-2012). The total number of Goat in the state as per Census 2012 is 8.01 million



numbers. There is a 11.09% decline in number of Goat population during the inter censuses period (2007-2012). The total number of female Goat population has decreased from 6.08 million in 2003 to 5.99 million in 2012. The female goat population has decreased by 12.77% over the previous census. The total number of Horses & Ponies in the state as per 2012 census is 0.01 million numbers. There is a 30.85% decrease in number of Horses & Ponies during the inter censuses period (2007-2012). The total number of mules and donkeys in the state as per 2012 census is 0.02 million numbers. The total number of Pigs in the state as per census 2012 is 0.17 million numbers. There is a 9.17% decrease in number of Pigs during the inter censuses period (2007-2012). The Poultry population is mainly contributed by Fowls in the state. The total Poultry population is 11.90 million numbers in 2012. The birds have increased from 11.70 million numbers in 2003 to 11.90 million numbers in 2012. There is an increase of 61.22% in the poultry population during the inter census period (2007-2012).

The indigenous cattle contribute with 40.28% animals in milk in the state. The animals in goat, buffalo and exotic/crossbred cattle are the next contributors of total animals in milk in the state with a share of 25.26%, 31.26% and 3.20% respectively. The total milk production in the state is 13.4 Million ton against national level of 165.4 Million ton (2016-17). The per capita milk availability in the state is 468 g/day against national level of 355 g/day.

**Table 1: Status of livestock and important livestock products Madhya in Pradesh**

Particulars	India	M.P.
Total cattle Population (In Millions) (Livestock Census, 2012)	190.90	19.60
Indigenous cattle (In Millions)	151.17	18.76
Buffalo (In Millions)	108.70	8.18
Total Milk Production (In Million ton) (2016-17)	165.4	13.4
Per capita milk availability (2016-17)	355 g/day	468 g/day
Egg production (In lakh number) (2016-17)	881385.77	16939.63
Per capita egg availability (2016-17)	64 number/annum	22 number/annum
Meat production (In thousand tonnes) (2016-17)	7385.61	78.64
Fish production (In 000 Tonnes) (2016-17)	11409.45	138.69

**Table 2: Livestock Statistics**

Particulars	18th Livestock Census 2007 (in thousands)	19th Livestock Census 2012 (in thousands)	% change
Total Livestock Population	40695.54	36332.63	-10.72
Total Cattle	21915.44	19602.37	-10.55
Buffalo	9129.15	8187.99	-10.31
Goat	9013.69	8013.94	-11.09
Sheep	389.86	308.95	-20.75
Poultry	7384.00	11904.72	61.22



## NDVSU - CURRENT STATUS

### Introduction

The Nanaji Deshmukh Veterinary Science University, Jabalpur was established on 3rd November, 2009 under the Madhya Pradesh Pashuchikitsa Vigyan Vishwavidyalaya Adhiniyam, 2009 and Madhya Pradesh Veterinary Science University (Amendment) Act, 2012 (No. 32 of 2012). The university has three constituent Veterinary colleges located at Jabalpur, Mhow and Rewa, College of Fishery Science located at Jabalpur, Wildlife Health Centre and Animal Biotechnology Centre located at Jabalpur. Beside these colleges and centres offering degree courses, the university also has five Animal Husbandry Diploma Colleges located at Jabalpur, Mhow, Rewa, Bhopal and Morena offering two years Animal Husbandry Diploma course.

### Mission

Promote need based and region specific research, human resource development, technology generation for improving the rural livelihoods.

### Objectives

- To impart education in different branches of veterinary and fisheries and allied sciences as the university may determine
- To provide for 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 concerned.

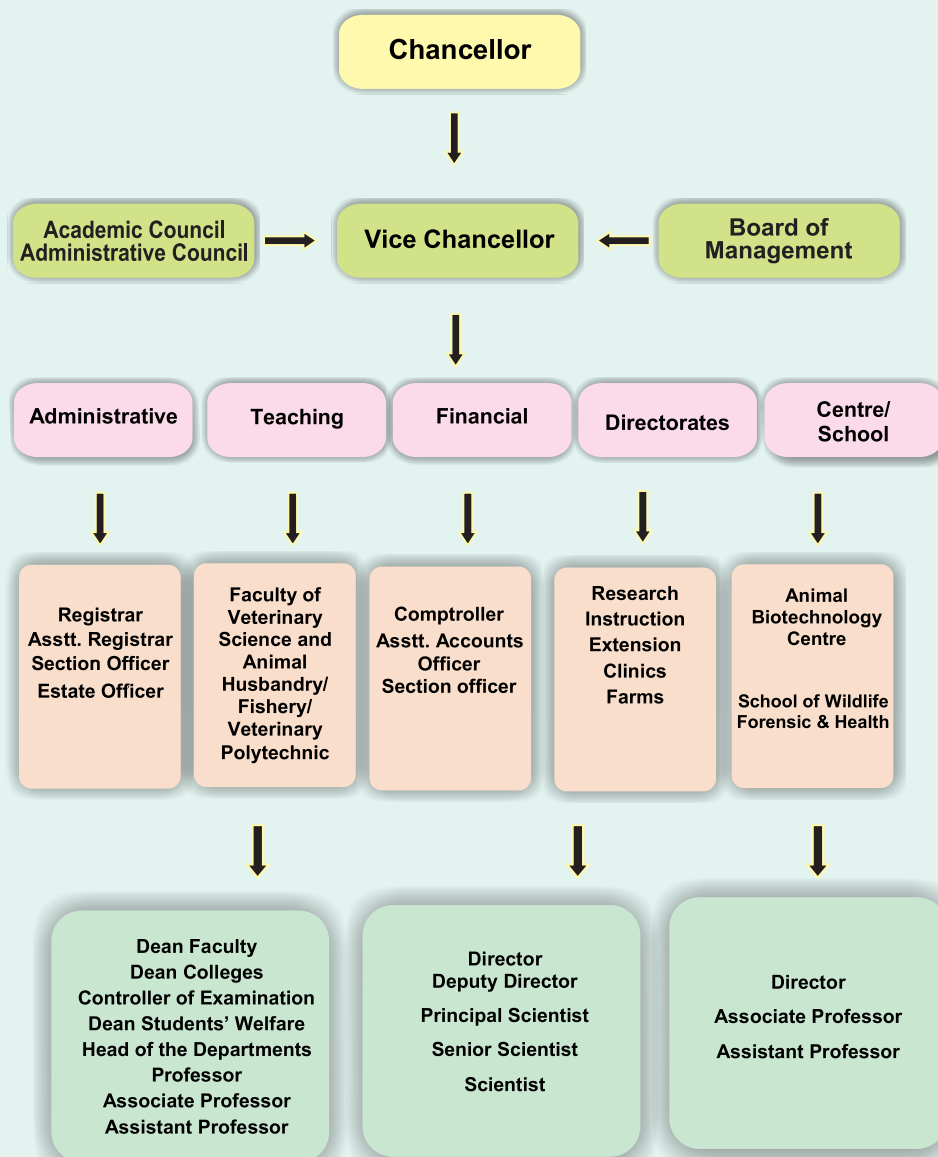
### Statutory Bodies of the University:

1. Board of Management
2. Academic Council
3. Administrative Council
4. Board of Studies
5. Research Advisory Council
6. Extension Education Council
7. Finance Committee





## ORGANIZATIONAL SETUP OF THE UNIVERSITY



## Constituent Colleges

### College of Veterinary Science and Animal Husbandry, Jabalpur (Estd. 1948)

With an humble beginning on July 8, 1948 as Central Provinces and Berar Veterinary College, the College of Veterinary Science and Animal Husbandry, Jabalpur was established as the oldest constituent college of the Madhya Pradesh Pashu Chikitsa Vigyan Viswavidyalaya, Jabalpur.



### College of Veterinary Science and Animal Husbandry, Mhow (Estd. 1955)

The college was established as "College of Veterinary Science & A.H. cum Livestock Research Institute" on 12th July 1955 in the lap of Malwa region bestowed with its distinctive climate and biological resources. The present premise of the college was inaugurated on 12th Nov. 1959 by the then Prime Minister of India Pt. Jawaharlal Nehru.



### College of Veterinary Science and Animal Husbandry, Rewa (Estd. 2007)

The foundation stone of College of Veterinary Science and Animal Husbandry, Rewa was laid by Hon'ble Chief Minister of Madhya Pradesh at Kuthuliya Farm, Rewa on 11th Jan. 2007. The academic session for the year 2007-2008 started on 17th Sept., 2007 in Krishi Vigyan Kendra Building in Kuthuliya Farm, Rewa.



### College of Fishery Science, Jabalpur (Estd. 2012)

A College of Fishery Science has been established on 1st October, 2012. The college offers a four year Bachelor of Fishery Science (B.F.Sc.) degree programme.



## Directorates

### Directorate of Research Services, Jabalpur

The Directorate of Research Services was established as a constituent unit along with the inception of Nanaji Deshmukh Veterinary Science University. 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.

### Directorate of Instruction, Jabalpur

The Directorate of Instruction was established in the year 2009, at the time of establishment of the University. The main function of the Directorate is to



coordinate all the Post Graduate Programmes on going in the University.

#### **Directorate of Extension Education, Jabalpur**

The Directorate of Extension is responsible for planning, organizing and coordinating Extension Education activities with audio-visual and mass media support to the various wings, sections, departments of the University and transfer of latest technologies to livestock farmers for their socio-economic upliftment.

#### **Directorate of Clinics, Jabalpur**

The Directorate is responsible for coordinating the diagnosis, treatment and health related issues of different species of animals of all the constituent units of the University. The Directorate also provides facilities for clinical training to the undergraduate and postgraduate students including research facilities to the staff, students and veterinary practitioners.

#### **Directorate of Farms, Jabalpur**

The Directorate of Farms was established in the year 2009, at the time of establishment of the University. The Directorate of Farms includes the livestock farms/units located at Jabalpur, Mhow & Rewa including University Farm Aamanala, Jabalpur. The main objective of the Directorate of the Farm is to coordinate and improve the productivity at Livestock Farms, Poultry Farm, Fishery Farms, Piggery Farms, Goat Farms & Fodder production Units, located at these Farms & Units.

### **Centres/School**

#### **Animal Biotechnology Centre, Jabalpur (Estd. 2009)**

Under the Madhya Pradesh Biotechnology Policy formulated in 2002-03, the State Government sanctioned a project entitled "Establishment of Biotechnology Centre" at Jawaharlal Nehru Krishi Vishwavidyalaya, Jabalpur, however, after the creation of Madhya Pradesh Pashu Chikitsa Vigyan Viswa-vidyalaya, (M.P.P.C.V.V.) Jabalpur, the Animal Biotechnology Unit has been included under the new Veterinary University as Animal Biotechnology Centre.



#### **School of Wildlife Forensic and Health, Jabalpur (Estd. 2009)**

In the year 2009 an independent Centre for Wildlife Forensic and Health was created within the newly established Veterinary Science University at Jabalpur, and was renamed as School of Wildlife Forensic and Health in 2016. The Department of Wildlife Health Management was also merged with the Centre on 26th April 2010. To meet out the challenges on serious dearth of baseline information, diagnostic tools information and regular research work on disease diagnosis and wildlife forensics, the Centre



for Wildlife Forensic and Health has made composite mandate towards conservation of Wildlife wealth under M.P.V.C.V., Jabalpur The Centre is working in a collaboration and financial support of the Department of Forest of M.P. The State Forest Department has also recognized laboratory of wildlife disease diagnosis and forensic activities.

### Veterinary Polytechnics (Estd. 2012)

In view of vast geographical area of the State having large number of livestock, the state government to produce supporting manpower capable of handling livestock health, production and reproduction established five Veterinary Polytechnics under the university located at Jabalpur, Bhopal, Mhow, Rewa and Morena.

### Livestock, Poultry & Fish Farms

The university has following livestock farm complexes in different campuses

1. Livestock Farm Complex, Adhartal, Jabalpur
2. Livestock Farm, Amanala, Jabalpur
3. Fish Farm, Adhartal, Jabalpur
4. Livestock Farm Complex, Mhow
5. Livestock Farm Complex, Rewa

The farms maintain different species of farms animals viz. buffaloes, cattle, goats, pigs, poultry, and fish.



## Academic Programmes

The University is imparting education and training in different branches of Veterinary and Animal Science. The University offers Bachelor's Degree in Veterinary Science and Animal Husbandry in all the three constituent colleges located at Jabalpur, Mhow and Rewa. Postgraduate courses leading to M.V.Sc./Ph.D offered in Jabalpur, Mhow and Rewa colleges including School of Wildlife Forensic and Health and Animal Biotechnology Centre located at Jabalpur. A College of Fishery Science was also established at Jabalpur in 2012 under the directives of the Govt. of Madhya Pradesh. Besides the colleges, centres and school offering degree courses, the university has also five Veterinary Polytechnics located at Jabalpur, Mhow, Rewa, Bhopal and Morena offering two years Animal Husbandry Diploma course with the objective to fulfil the manpower requirements in the fields of animal husbandry and poultry. .

The University offers Bachelor's Degree in Veterinary Science and Animal Husbandry, Bachelor's Degree in Fishery Science and Diploma in Animal Husbandry. Presently, Post graduate degree courses are offered in 18 disciplines (16 in Animal & Veterinary Science, 1 each in Animal Biotechnology and Wildlife Health Management). Doctoral degree programmes with course work are offered in 11 disciplines at Veterinary College, Jabalpur and in 3 disciplines at Veterinary College, Mhow.

### Degree/ Diploma

Programmes	Degree/ Diploma	Duration
UG	Bachelor of Veterinary Science and Animal Husbandry (B. V. Sc. & A.H.)	5½ Years
PG	Master of Veterinary Science (M.V. Sc.)	2 Years
Doctoral	Ph. D. in different disciplines of Veterinary Sciences and Animal Husbandry	3 Years
UG	Bachelor of Fishery Science (B. F. Sc.)	4 Years
Diploma	Diploma in Animal Husbandry	2 Years

### Academic Programmes offered in Different Colleges

Colleges/Centres	Degree/ Diploma
College of Veterinary Science & Animal Husbandry, Jabalpur	B. V. Sc. & A.H., M.V.Sc., Ph.D
College of Veterinary Science & Animal Husbandry, Mhow	B. V. Sc. & A.H., M.V.Sc., Ph.D
College of Veterinary Science & Animal Husbandry, Rewa	B. V. Sc. & A.H., M.V.Sc
College of Fishery Science, Jabalpur	B. F. Sc.
School of Wildlife Forensic & Health, Jabalpur	M.V.Sc., Ph.D, One year Diploma in Wildlife Forensic & Health and 10 days certificate course
Animal Biotechnology Centre, Jabalpur	M.V.Sc./M.Sc., Ph.D
Veterinary Polytechnic (Jabalpur/Mhow/ Rewa/ Morena/ Bhopal)	Animal Husbandry Diploma



### Admission Procedure

<b>B. V. Sc. &amp; AH / B. F. Sc.</b>	<b>M. V.Sc. / Ph.D</b>	<b>Diploma in Animal Husbandry</b>
Through State Level Entrance Examination (Pre -Veterinary & Fishery Test) conducted by Professional Examination Board, Bhopal, M. P.	Through All India Entrance Examination conducted by University. For PhD on the basis of academic record and interview	Through State Level Entrance Examination (Diploma in Animal Husbandry Entrance Test) conducted by Professional Examination Board, Bhopal M. P.

### Intake capacity (2017-18)

#### A. Veterinary Colleges

<b>S.No.</b>	<b>Name of College/Programme offered</b>	<b>Vety. College Jabalpur</b>	<b>Vety. College Mhow</b>	<b>Vety. College Rewa</b>
1.	Under Graduate. (B.V.Sc & A.H.)	87	87	87
2.	Post Graduate (M.V.Sc )	54	38	28
3.	Ph.D	25	07	-

#### B. School / Centre

<b>S.No.</b>	<b>Programme offered</b>	<b>School of Wildlife Forensic and Health, Jabalpur</b>	<b>Animal Biotechnology Centre, Jabalpur</b>
1.	Post Graduate (M.V.Sc/M.Sc.)	02	06
2.	Ph.D	01	03

#### C. College of Fishery Science

<b>S.No.</b>	<b>Programme offered</b>	<b>Name of college/institution</b>	<b>Intake Capacity</b>
1.	Under Graduate (B.F.Sc.)	College of Fishery Science, Jabalpur	33

#### D. Veterinary Polytechnics

<b>S.No.</b>	<b>Programme offered</b>	<b>Name of college/institution</b>	<b>Intake Capacity</b>
1.	2 year Animal Husbandry Diploma	Veterinary Polytechnic, Jabalpur	61
2.	2 year Animal Husbandry Diploma	Veterinary Polytechnic, Mhow	61
3.	2 year Animal Husbandry Diploma	Veterinary Polytechnic, Rewa	60
4.	2 year Animal Husbandry Diploma	Veterinary Polytechnic, Bhopal	59
5.	2 year Animal Husbandry Diploma	Veterinary Polytechnic, Morena	59





## Students' Facilities

### A. Student counseling & Placement cell:

All the Colleges have well established student counselling and placement cell for the placement of pass out students during campus selection drive. All the pass out undergraduate students are either employed or pursue higher studies. The M.V.Sc. and Ph.D students after completion of degree are almost employed. The status of undergraduate students during the last year is given below:

S.No.	Category	Percent
1	Higher studies	61%
2	Job in NGO/private sector	20%
3	Preparation for competitive exam	19%

### B. National Cadet Corps (NCC)

NCC units have been established in all the three Veterinary Colleges for developing character, comradeship, discipline, secular outlook, the spirit of adventure and ideals of selfless service amongst students.

### C. National Service Scheme (NSS)

National Service Scheme for development of personality of students through community service has also been established.

### D. Hostels

S.No.	Name of College	Name of Hostel	Intake Capacity
1.	College of Veterinary Science & A.H., Jabalpur	Subhash 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

### E. Guest Houses

S.No.	Name of College	No.	Intake Capacity
1.	University Guest House, Jabalpur	1	12
2.	College Guest House, Mhow	1	6
3.	College Guest House, Rewa	1	8

### F. Sports:

(i) **Indoor facilities-** The boys' and girls' hostels are having facilities for indoor games like Badminton, Table Tennis, Chess, and Carom.

(ii) **Outdoor-** Courts, Playgrounds, 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

#### G. Hospital/Dispensary

- Medical dispensary for treatment of staff and students is available in the three colleges with a part-time attending medical specialist.

#### 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.
- Fourth Convocation of the University was held on 6th March, 2017.





### Recipients of Honorary Degree of Doctor of Philosophy by the University

- First Convocation** - Dr. (Miss) Amrita Patel, Chairperson  
National Dairy Development Board
- Second Convocation** - 1. Lt. Gen. Dr. Narayan Mohanty  
President, Veterinary Council of India  
2. Shri Vishwanath Dubey  
Prominent Poultry Entrepreneur of Country
- Third Convocation** - Dr. K.M.L. Pathak,  
Deputy Director General (Animal Science)  
ICAR, New Delhi.
- Fourth Convocation** - Dr. V.K. Taneja,  
Ex-Deputy Director General (Animal Science)  
ICAR, New Delhi and Ex- Vice Chancellor,  
GADVASU, Ludhiana

### Degrees Awarded since Inception of the University

First Convocation	Degrees Awarded
B.V.Sc. & A.H.	111
M.V.Sc & A.H.	37
<b>Total</b>	<b>148</b>
<b>Second Convocation</b>	
B.V.Sc. & A.H.	139
M.V.Sc & A.H.	66
Ph.D	01
<b>Total</b>	<b>206</b>
<b>Third Convocation</b>	
<b>B.V.Sc. &amp; A.H.</b>	141
M.V.Sc & A.H.	38
Ph.D	03
<b>Total</b>	<b>182</b>
<b>Fourth Convocation</b>	
B.V.Sc. & A.H.	403
M.V.Sc	119
Ph.D	32
B.F.Sc.	17
<b>Total</b>	<b>571</b>
<b>Grand total</b>	<b>1107</b>

## Library Services & Information Network

Each college has a well established 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 are also available. Photocopy machine is also operational in the libraries for the students and staff of the colleges. After the creation of university a central library was established at Jabalpur, head quarter, which is the University library providing quality services to the students, teachers and research scholars, supporting teaching research and extension programmes of the University, College of Vety. Sc. & A.H., Jabalpur, College of Fishery Science, School of Wildlife Forensic & Health and Animal Biotechnology Centre. The University library has a collection of 19,799 text books, 1545 reference books, 695 books for SC/ST, 786 theses, 262 journals, 1140 students' seminar and 555 synopsis. In addition the library also has a CD-ROM Database of VETCD from 1973-2008. Veterinary College, Mhow has 24,000 books, 1200 theses, 32 Video CDs on ICAR technologies and data base in the form of VET CD and BEAST CDs (1973 to 1995) are available. Veterinary College, Rewa has 5000 text books and reference books. Her Excellency, the Hon'ble Governor of Madhya Pradesh, Smt. Anandiben Patel inaugurated the newly installed unit of Digital Library having the facility of 50 Computers with high Speed internet.



## Agricultural Research Information Service cell (ARIS cell)

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



## Research

The Directorate of Research Services was established as a constituent unit along with the inception of Nanaji Deshmukh Veterinary Science University. 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 population in the state of Madhya Pradesh. Presently, a total of 40 externally funded research schemes with a financial outlay of Rs. 91.85 crores are under operation in the University.





### Status of Ongoing Research Projects

College of Veterinary Science & A.H., Jabalpur - Ongoing Research Projects					
Department/ College/ Centre name	No. of Proj.	Title of Project	Funding Agency	Principal Investigator	Financial Outlay (Rs. in Lac)
Dept. of Animal Nutrition, CoVSc. & AH., Jabalpur	01	Establishment and notification of Advanced Animal Feed Quality Testing Laboratory in Madhya Pradesh	Rastriya Krishi Vikas Yojna	Dr. Sunil Nayak, Prof. & Head, Dept. of Animal Nutrition, CoVSc. & AH., Jabalpur	329.05
Dept. of Livestock Production & Management , CoVSc. & AH., Jabalpur	01	Dairy Development project under "National Mission for Protein Supplementation"	Rastriya Krishi Vikas Yojna	Dr. G.P. Lakhani, Prof. & Head, Dept. of LPM, CoVSc. & AH., Jabalpur	192.25
Dept. of Veterinary Pathology, CoVSc. & AH., Jabalpur	03	Establishment of disease diagnosis laboratory for birds in Madhya Pradesh	Madhya Pradesh State Agricultural Marketing Board, Bhopal	Dr. (Mrs.) Madhu Swamy, Prof. & Head, Dept. of Veterinary Pathology, CoVSc. & AH., Jabalpur	235.95
		State of the art and CPCSEA compliance laboratory animal house	MANDI Board, Bhopal	Dr. Amita Dubey, Assistant Professor	273.94
		Prevalence and molecular diagnosis of subclinical and clinical paratuberculosis in goat	Madhya Pradesh Council of Science & Technology Bhopal	Dr. Yamini Verma Assoc. Prof.	8.38
Dept. of Veterinary Medicine, CoVSc. & AH., Jabalpur	01	Reference laboratory for monitoring of Caprine mastitis in Madhya Pradesh	MANDI Board, Bhopal	Dr. P.C. Shukla, Jabalpur	48.91
Dept. of Veterinary Microbiology, CoVSc. & AH., Jabalpur	01	Isolation, identification and molecular characterization of Ornithobacterium rhinotracheale in poultry	Madhya Pradesh Council of Science & Technology Bhopal	Dr. Anju Nayak, Jabalpur	4.98



Dept. of Veterinary Surgery, CoVSc. & AH., Jabalpur	01	Establishment of super specialty centre for large animal orthopedics	MANDI Board, Bhopal	Dr. V.P. Chandrapuria, Jabalpur	516.00
Dept. of Veterinary Extension, CoVSc. & AH., Jabalpur	02	Socio-economic upliftment of tribal population of Jabalpur Division of Madhya Pradesh by sustainable livestock production system	ICAR, New Delhi	Dr. Ruchi Singh, Asst. Prof., Dept. of Veterinary Extension, CoVSc. & AH., Jabalpur	200.68
		Improving livelihood of tribal people of Madhya Pradesh through goat farming practices	Madhya Pradesh Council of Sci. & Tech., Bhopal	Dr. A.K. Gour, Asso. Prof., Dept. of Veterinary Extension, CoVSc. & AH., Jabalpur	6.80
Dept. of Poultry Science, CoVSc. & AH., Jabalpur	01	AICRP on Development of suitable colour variety of birds for rural poultry production.	ICAR, New Delhi	Dr. J.K. Bharadwaj, Director Farm, NDVSU, Jabalpur	68.95
Dept. of Veterinary Physiology, CoVSc. & AH., Jabalpur	01	Effect of organic Trace minerals supplementation on expression of some immune regulatory genes and antioxidant defence system in broilers	Madhya Pradesh Council of Sci. & Tech., Bhopal	Dr. Aditya Mishra, Asst. Prof., Dept. of Veterinary Physiology, CoVSc. & AH., Jabalpur	12.84
Dept. of Animal Reproduction, Gynecology & Obstetrics, CoVSc. & AH., Jabalpur	02	Development of therapeutic strategies for the management of anoestrus in dairy buffaloes of Jabalpur district	Madhya Pradesh Council of Sci. & Tech., Bhopal	Dr. S.N. Shukla, Assoc. Prof., Dept. of ARGO, CoVSc. & AH., Jabalpur	9.24
		Evolving potential strategies for non-surgical contraceptions in male dogs	Madhya Pradesh Council of Sci. & Tech., Bhopal	Dr. Manish Kumar Shukla	9.95
Dept. of Animal Genetics & Breeding, CoVSc. & AH., Jabalpur	01	Screening of cattle and buffalo breeding bulls for A1/A2 variant of B casein gene in M.P. State of India	M.P. Council of Science And Technology Bhopal	Dr. Mohan Singh Thakur Assistant Professor	8.60



Dept. of Veterinary Pharmacology, CoVSc. & AH., Jabalpur	03	Establishment of Indigenous Cattle Research Centre for development of Panchgavya products	Rastriya Krishi Vikas Yojna	Dr. Y.P. Sahni, Director Research Services, NDVSU, Jabalpur	100.00
		Outreach Programme on Monitoring of drug residues and environmental Pollutants	ICAR, New Delhi	Dr. Y.P. Sahni, Director Research Services, NDVSU, Jabalpur	6.17
		Outreach Programme on Ethno Veterinary Medicine	ICAR, New Delhi	Dr. Y.P. Sahni, Director Research Services, NDVSU, Jabalpur	4.72
Dean College of Veterinary Science, Jabalpur/ Mhow	01	Strengthening of Instrument and Equipment facilities at College of Veterinary Sc. And A. H., Jabalpur	Rastriya Krishi Vikas Yojna	Dean, CoVSc. & AH. Jabalpur / Mhow	314.00
Dept of Veterinary Public Health CoVSc. & AH., Jabalpur	01	Bacteriological examination of animal origin food products to ascertain the food safety	Madhya Pradesh Council of Science & Technology Bhopal	Dr. R.V. Singh, Jabalpur	6.88
NDVSU	02	Campus development NDVSU	MANDI Board, Bhopal	Executive Engineer	400.00
		Tribal Farmer Hostel	Tribal Welfare Dept., Govt. of M.P.	Executive Engineer	360.88
	<b>22</b>				<b>3,119.17</b>



College of Veterinary Science & A.H., Mhow - Ongoing Research Projects					
College of Veterinary Science & A.H., Mhow	03	Dairy Development project under "National Mission for Protein Supplementation"	Rastriya Krishi Vikas Yojna	Dr. S. Nanavati, Prof., Dept. of LPM, CoVSc. & AH., Mhow	119.84
		Strengthening of Instrument and Equipment facilities at College of Veterinary Sc. And A. H., Mhow	Rastriya Krishi Vikas Yojna	Dean, CoVSc. & AH. Mhow	100.00
		Conservation and scientific evaluation of Kadaknath breed of fowl.	Rastriya Krishi Vikas Yojna	Dr. S.K. Joshi, Prof., Dept. of Animal Genetics & Breeding, CoVSc. & AH., Mhow	96.14
	03				315.98
College of Veterinary Science & A.H., Rewa - Ongoing Research Projects					
College of Veterinary Science & A.H., Rewa	05	Establishment of Veterinary college, Rewa	MANDI Board	Dean, CoVSc. Rewa	2120.00
		Establishment of Pig husbandry training centre for the farmers of Madhya Pradesh	Rastriya Krishi Vikas Yojana	Dr. Anjani Mishra, Assoc. Prof., Dept. of LPM	40.00
		Campus development Rewa	MANDI Board, Bhopal	Executive engineer	1225.00
		Tick control practice and survey of Acaricide Rasistance in cattel tick Rhipicephalus (bhoophilus) microplus and hyalomma anatolicum in selected areas of distt.-Rewa, MP.	M.P. Council of Science and Technology Bhopal	Dr. Rinesh Kumar Asstt. Prof., Dept. of Parasitology	7.38
		Study of Methicillin resistant Staphylococcus Aureus in Bovine-Human Interface	M.P. Council of Science and Technology Bhopal	Dr. Neeraj Shrivastava Asstt. Prof., Dept. of Microbiology	5.25
	05				3397.63




**Animal Biotechnology Centre, NDVSU, Jabalpur - Ongoing Research Projects**

Animal Biotechnology Centre, NDVSU, Jabalpur	02	Strengthening of Animal Biotechnology Centre for improvement of livestock in Madhya Pradesh	Rastriya Krishi Vikas Yojna	Dr. B.C. Sarkhel, Director Animal Biotech Centre, NDVSU, Jabalpur	1034.00
		Production of high quality embryos by OPU-IVS improving productivity and conservation of indigenous breeds of cattle and buffalo	Rastriya Krishi Vikas Yojana	Dr. B.C. Sarkhel, Director Animal Biotech Centre, NDVSU, Jabalpur	217.00
	02				1251.00

**School for Wildlife Forensic & Health, NDVSU, Jbp - Ongoing Research Projects**

School for Wildlife Forensic & Health, NDVSU, Jabalpur	08	Centre for Wildlife Forensic & Health, NDVSU, Jabalpur	MP Forest Department	Dr. Kajal Jadav Assis. Professor SWF&H, NDVSU, Jabalpur	413.24
		Niche Area of Excellence on Wildlife Forensic & Health	ICAR, New Delhi	Dr. K. P. Singh, Asst. Prof., SWF&H, NDVSU, Jabalpur	248.94
		Surveillance of diseases in Native Wild Animals of Panna Tiger Reserve	MP Forest Department	Dr. K. P. Singh, Asst. Prof., SWF&H, NDVSU, Jabalpur	6.42
		Establishment of Advance Tuberculosis Diagnostic Centre for domestic and Wild Animals in M.P.	RKVY	Director, SWF&H, NDVSU, Jabalpur	203.04
		Development of species specific probes for species identification to reduce the reporting time required for forensic samples	Biotechnology council	Dr. Kajal Jadav Assis. Professor SWF&H, NDVSU, Jabalpur	10.50
		Study the prevalence of Canine parvo virus canine distemper virus and canine virus infection in feral dogs of villages at buffer zone of panna tiger reserve	MP Forest Department	Dr. Nidhi Rajput Asst. Prof., SWF&H, NDVSU, Jabalpur	5.00
		Studies on lantana toxicity in small herbivores of Pench Tiger Reserve	MP Forest Department	Dr. Amol Rokde Asst. Prof., SWF&H, NDVSU, Jabalpur	14.00
		Estt of centre for study of wild life health and disease	MP Forest Dept.	Director, SWF&H, NDVSU, Jabalpur	200.00
	08				1101.14

No. of Projects	40	Total amount (Rs. in Lac)	9184.92
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## Extension

The Directorate of Extension Education at Nanaji Deshmukh Veterinary Science University, Jabalpur was created for planning, organizing and coordinating Extension Education activities of the Vishwavidyalaya socioeconomic upliftment of 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, to 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 and integration of information and communication technology with Extension Education. Currently the following activities are undertaken under the directorate of Extension education.

**Publication of extension material :** The staff of the colleges has published extension articles in local news papers, agricultural extension magazines, pamphlets, booklets on different livestock farming practices including a small unit feasibility report on piggery, goatary, poultry, fishery, dairy, computation of ration etc. Besides, these print publications, audio and video DVDs of some



technologies, radio talks and TV talk (Akashvani/ Doordarshan/ Private channels) are also delivered. Touch screen information kiosks provide information to livestock farmers.

**Tribal Sub-plan project :** A Tribal sub-plan project entitled "Socio-economic upliftment of tribal population of Jabalpur Division of Madhya Pradesh by sustainable livestock production systems" sponsored by I.C.A.R., New Delhi is in

operation w.e.f. March, 2013 and is continued.



**Farmer FIRST Project :** Farmer First project entitled "Farmers Empowerment through Improved Integrated Farming Practices" sponsored by ICAR, New Delhi is in operation w.e.f. February 2017 and to be continued till March, 2020.

**Unnat Bharat Abhiyan :** Under the project of Ministry of Human Resource Development, Govt. of India, New Delhi, villages have been identified for Jabalpur, Mhow and Rewa Veterinary Colleges for adoption under the project and the project is in progress.

**Veterinary Emergency Response Unit (VERU):** A Veterinary Emergency Response Unit (VERU) is functioning in the College of Veterinary Science & A.H., Jabalpur sponsored by National Disaster Management Agency (NDMA), Govt. of India, New Delhi and World Animal Protection, New Delhi.

#### **National and International Collaborations**

- The university has expanded its research and academic initiatives through Memorandum of Understandings (MoU) at national and international levels.
- The University has signed following MoUs with Universities/Institutes/ Private Organizations to undertake joint collaborative research projects:
  - Agriculture Skill Council of India, Govt. of India
  - National Dairy Research Institute, Karnal
  - Research for Resurgence Foundation, Nagpur
  - National Bureau of Animal Genetic Resources, Karnal
  - State Veterinary Hospital, Animal Husbandry Department, Govt. of M.P., Bhopal
  - Indian Institute of Technology, Delhi



## GROWTH AND ACCOMPLISHMENTS

### Academics

The university was established in 2009 with three Veterinary Colleges for offering B.V.Sc. & A.H., M.V.Sc and Ph.D. degree programmes. Within one year of establishment two independent centres namely Animal Biotechnology Centre and Centre for Wildlife Forensic and Health were sanctioned by the state government. This was followed by opening of five veterinary polytechnics for producing 300 diploma holders in Animal Husbandry. Further, one college of Fisheries was also established at Jabalpur campus for producing graduate in Fishery Science, available for improvement of fish production of the State.

#### Students enrolment during last six years

Programme	Years					
	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
UG	919	942	1041	1127	1139	1187
PG	119	100	80	60	134	168
Ph.D	38	42	38	11	28	33
Diploma	272	194	288	306	273	283

- New Course Curriculum as per VCI for B.V.Sc, & A.H. and B.F.Sc. as per ICAR 5th Dean's committee has been adopted for UG students. The M.V.Sc and Ph.D. degree programmes has been adopted as per ICAR course curriculum.
- Since inception, a total of 1107 UG and PG degrees have been awarded by the University.

**Modernized Classrooms :** In view of effective and innovative teaching, the University has provided modern class rooms and laboratory facilities to UG and PG students.

**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 of UG and PG students.

#### “State of the Art” Laboratory Facilities

The university has established a number of new laboratories and renovated/ upgraded the existing laboratories/facilities for providing practical teaching to UG and PG students and also conducting post graduate curricular research.

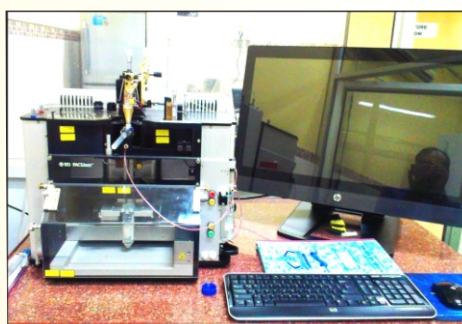
All the departments of the three colleges including research centres are well equipped to carry out basic and applied research in the versatile fields of the Veterinary Sciences, Animal Husbandry, Poultry Science, Animal Biotechnology and Wildlife Health and Forensic. The important facilities available in the various laboratories of the departments are as follows:





S.No	Departments	Laboratories for teaching and research activities
1.	Department of Veterinary Anatomy	<ul style="list-style-type: none"> <li>Osteology and Splanchnology laboratory</li> <li>Dissection hall</li> <li>Embalming Area</li> <li>Museum for specimen.</li> </ul>
2.	Department of Physiology & Biochemistry	<ul style="list-style-type: none"> <li>Demonstration and sample collection lab</li> <li>General Physiology cum ELISA &amp; Endocrinology lab</li> </ul>
3.	Department of Biochemistry	Clinical biochemistry lab
4.	Department of Livestock Production Management	<ul style="list-style-type: none"> <li>Livestock Models lab</li> <li>Milk analyser</li> </ul>
5.	Department of Animal Genetics and Breeding	<ul style="list-style-type: none"> <li>Molecular Genetics lab</li> <li>ARIS cell</li> </ul>
6.	Department of Veterinary and Animal Husbandry Extension Education	Exhibition museum
7.	Department of Veterinary Microbiology	<ul style="list-style-type: none"> <li>Bacteriology and media preparation Lab</li> <li>Immunology lab</li> <li>Virology lab</li> </ul>
8.	Department of Animal Nutrition	<ul style="list-style-type: none"> <li>Feed and fodder analysis lab</li> <li>Metabolic study lab</li> </ul>
9.	Department of Veterinary Public Health and Epidemiology	Zoonosis lab
10.	Department of Veterinary Pathology	<ul style="list-style-type: none"> <li>Clinical pathology lab</li> <li>PM room</li> <li>Histopathology lab</li> </ul>
11.	Department of Veterinary Parasitology	<ul style="list-style-type: none"> <li>Helminthology lab</li> <li>Protozoology lab</li> <li>Molecular Parasitology lab</li> </ul>
12.	Department of Veterinary Pharmacology and Toxicology	<ul style="list-style-type: none"> <li>HPTLC lab</li> <li>Herbal Processing unit</li> <li>Molecular Biology lab</li> <li>Toxicology lab</li> </ul>
13.	Department of Veterinary Gynaecology and Obstetrics	<ul style="list-style-type: none"> <li>Phantom hall</li> <li>USG room</li> <li>AI and semen processing labs at farm</li> <li>Out Patient Department (OPD) for clinical cases</li> </ul>
14.	Department of Veterinary Surgery and Radiology	<ul style="list-style-type: none"> <li>Large animal Operation Theatre</li> <li>Small animal Operation Theatre</li> <li>Ultrasonography room</li> <li>X ray room</li> <li>Ophthalmology Operation Theatre</li> <li>Orthopedic Operation Theatre</li> <li>Laparoscopic Operation Theatre</li> <li>Physiotherapy room</li> <li>OPD for clinical cases</li> </ul>

15.	Department of Veterinary Medicine	<ul style="list-style-type: none"> <li>Clinical Medicine lab</li> <li>Preventive medicine lab</li> </ul>
16.	Department of Livestock Products Technology	<ul style="list-style-type: none"> <li>Meat and Meat products technology lab</li> <li>Milk and Milk products technology lab</li> </ul>
17.	Department of Poultry Science	<ul style="list-style-type: none"> <li>Poultry farm</li> <li>Hatchery unit</li> </ul>
18.	Instructional Livestock Farm Complex	<ul style="list-style-type: none"> <li>Dairy farm</li> <li>Piggery unit</li> <li>Goatery unit</li> <li>Fodder unit</li> </ul>
19.	Teaching Veterinary Clinical Complex	<ul style="list-style-type: none"> <li>Disease Investigation lab</li> <li>Laparoscopic unit</li> <li>Gastroscope unit</li> <li>Physiotherapy room</li> <li>OPD for clinical cases</li> <li>Large animal Operation Theatre</li> <li>Small animal Operation Theatre</li> <li>Ultrasonography room</li> <li>X ray room</li> </ul>
20	Animal Biotechnology Centre	<ul style="list-style-type: none"> <li>Cell culture and diagnostic laboratory</li> <li>Molecular genetics laboratory</li> <li>Embryo biotechnology</li> </ul>
21	School of Wildlife Forensic & Health	<ul style="list-style-type: none"> <li>Wildlife Forensic investigation laboratory</li> <li>Wildlife Health laboratory</li> <li>Wildlife Disease diagnostic laboratory</li> </ul>



Flowcytometer



Fluorescent Microscope



Next Generation Sequencer



Realtime PCR



Micromanipulator



Laparoscope

### STATE OF ART EQUIPMENTS

## Research Accomplishments

### Animal Production

- Institute was selected as one of the five centres for AICRP on Cattle breeding. Under AICRP on cattle breeding a ready reckoner was developed to enable selection of young cross-bred males and females with traits for milk production, based on the records of their pedigree and collateral relatives. A simple method for predicting total milk yield in a lactation, using once-a-month test day lactation was developed. The accuracy of prediction was 97 per cent using 11 test day records. These weights can be used by the farmers to predict total milk.
- Cytogenetics lab was established and karyotypes of 2 exotic breeds (Jersey, HF), 2 indigenous breeds (Gir and Tharparkar) and their half bred and three fourth offspring genotype was established.
- Four ICAR projects on characterization of 3 native cattle (i.e., Malvi, Nimari and Kenkatha) and Kadaknath poultry breeds of Madhya Pradesh have been completed. Survey on demographical, geographical distribution and morphological characterization of three cattle and one poultry breeds was conducted under the indigenous breed conservation programme as per the NBAGR guidelines. Molecular characterization of Nimari was done using PCR-RFLP of IGF-I & II genes and using 10 RAPD primers.
- Molecular characterization of three varieties of Kadaknath breed of poultry (Jet Black, Golden and Pencilled) was done using 25 chicken specific microsatellite primers as recommended in the FAOs, MODAD programme list for chicken microsatellite genotyping. The study concluded that all the three varieties belong to the Kadaknath breed of poultry having similar genetic base.
- Molecular characterization of four indigenous cattle breeds i.e., Malvi, Nimari, Kenkatha and Gaolao of Madhya Pradesh was done using 25 microsatellite DNA markers under DBT funded project. Based on the microsatellite data obtained for 25 loci in all four breeds, the identification software “KAMDHENU” was developed. The software is capable to identify six cattle breeds viz. Gir, Kankrej, Malvi, Nimari, Gaolao and Kenkatha.
- Established nucleus herds of Sirohi and Barbari breeds of goats at Goat Rearing Farm, Amanala, NDVSU, Jabalpur. For this purpose, 8 - 10 females of Sirohi and 3-4 females of Barbari breeds were randomly allotted to each buck. The adult male progenies of these two breeds are used for the improvement local non-descript goat population of the selected goat farmers in Jabalpur and Mandla districts of Madhya Pradesh through upgrading.



- Evaluation of draught power (Hp) and energy values for Malvi and Nimari bullocks were estimated by pneumatic animal cart and CIAE loading car designed by Central Institute of Agricultural Engineering (CIAE, 2000), Bhopal. The associated changes in biochemical (i.e. glucose, lactic acid, creatine kinase) and hormonal parameters (T3, T4 Testosterone, Cortisol) during pre- and post-carting along with pre- and post-ploughing in Malvi and Nimari bullocks were also estimated. The genetic polymorphism of GPx-1 gene was carried out by SSCP method to assess the animal's stability to sustain body's oxidative burden during strenuous exercise.
- The study on association of IL-8 receptor gene polymorphism with sub-clinical and clinical mastitis in dairy cattle was carried out under RKVY funded project. The genetic polymorphism of IL-8 receptor genes and their association with the nature of mastitis has been identified in crossbred cattle populations which may be helpful in carrying out a more efficient breeding programme.
- The study on relationship of MHC genes polymorphism with coccidial resistance in chicken (i.e. Kadaknath, Cobb, Caribro-91, Naked Neck, Hubbard and Jabalpur Dual Coloured) was done under the project funded by M.P. Biotechnology Council, Bhopal. The Cobb genetic group was most susceptible whereas Kadaknath genetic group was most resistant to coccidial infection. These findings suggest that Kadaknath breed of chicken can be used for the development of coccidial resistance commercial lines/strains of birds, thereby increasing the production efficiency of farmers flock.
- Consequent upon fourteen generation selection and diallele crossing using four White leghorn strains (IWM as male line and IWN as female line) a commercial white egg layer strain cross hybrid Jawahar 260 was developed. The bird lays 260 eggs annually (72 weeks) with an average egg wt. of 55 g, age at first egg 138 days, peak production 26-28 weeks and feed consumption 107-110 g/day with 1.77 kg adult body weight.
- A mini white dwarf commercial egg layer was developed by utilizing sex linked recessive dwarfing gene. The bird was developed by crossing superior dwarf male line and White leghorn female line and designated as Narmada-XL. The birds weighed only 1.3 to 1.4 kg. adult body weight and consume feed only 80-85 gm per day and produces 232 eggs of 52 gm. size annually. Due to small body size of Narmada- XL, 7 birds can be housed in place of 5 White leghorn. Bird has got superior power against thermal stress and many infectious diseases.





- By mating of normal broiler sire with dwarf broiler dam commercial broiler chicks designated as “Vindhyachal broilers” were produced, which attained 1.5 kg. body weight just in 6 weeks of age with 1.8 feed efficiency with negligible mortality. These broilers were produced for the first time in India by adopting an alternate breeding technology. At 7th week body weight the ranking of these was 5th out of nine public sector entries in Broiler random sample test at Bangalore 1991-92.
- Jabalpur colour bird, an improved broiler germ plasm was synthesized from randomly bred multicoloured population and continuously improved by selection, under ICAR – DPR project, Hyderabad. Plumage pattern varied from dark brown, black, grey, barred having long shank and single pea and rose comb. Birds matured at 151 days of age, produced more than 250 eggs, on an average egg weight of 60 gm annually with more than 200 settable number of eggs.
- A local native fowl Kadaknath (Kd) procured from tribal villages, was purified and improved by selection and developed as a pure bred Kadaknath population (G7 generation) of similar phenotypic appearance (jet black). Birds produces on an average 130 eggs annually, on an average 48 g egg weight in comparison to Desi bird (45-60 eggs). Chicks and birds of these are very popular amongst tribals of M. P. State.
- A multicoloured dual purpose coloured bird having 25% Kd and 75% JBP Col. inheritance was developed by crossing and backcrossing of Kadaknath and Jabalpur Col. population. These crossbred birds were released by the ICAR – New Delhi and NDVSU, Jabalpur for commercial use backyard poultry in the name of “Narmadanidhi”. Birds produce 75 eggs upto 52 weeks of age and 173 eggs annually in free range condition. Birds are very popular among farmers, have great demand in rural backyard poultry for both table and egg production purposes.
- **Determination of age :** The study of muzzle print characteristics i.e. beads, clustered beads and ridged beads were studied in different age groups of cattle and buffaloes, which was higher in number at the early age as compared to old. They appeared to be genetically determined and fixed at birth. Combining all the characteristics in one, may help in predicting the age in calves. The age determination through teeth mapping was also carried out in different age group of animals.
- **Area Specific Mineral Mixture (ASMM) :** Under AICRP, area specific



mineral mixture (ASMM) based on the micro-nutrient content in water, soil, feed & fodder and biological materials was developed. It avoids antagonistic effects of excess levels of other minerals thereby improving the bioavailability of micronutrients. Technology was tested on animals (buffalo, calves, heifers, pigs) and found to be very useful in improving the reproductive efficiency and general health in dairy animals. The technology is cost-effective, sustainable, easily adoptable and environment friendly.

- **Azolla (*Azolla filicoides*) as a protein source in animal feed:** Azolla, a free floating, rapidly growing aquatic fern having enormous potential as a livestock feed (high content of protein, essential amino acids, vitamins, growth promoter intermediaries and minerals) was recommended for feeding @ 2.0 kg/cow/d and dried azolla powder @ 250 g can also be used as a replacement of conventional protein supplement (cakes). In the research trials it was concluded that azolla feeding increase the margin of profit to the farmers by Rs. 9.35 /cow/day at village level.
- **Nutrient requirements for livestock:** The study on energy requirements in lactating cross-bred cows showed that ME requirement for maintenance on conventional and sani diet was 92 and 102 kcal/ kg W<sup>0.75</sup> , while for production of 1 kg Fat Corrected Milk, was 1435 and 1919 kcal, respectively.
- **Non-conventional feed resources for livestock and poultry:** Under AICRP and NATP projects, kodo, kangni (*Setaria italica*), ramtil cake, sorghum, paddy, ragi, niger cake, sesame cake have been established to hold potential as poultry feed at different levels. Processed mahua seed cake, chandsoor (*Lepidium sativum*), processed linseed cake, azola and processed salseed meal were successfully incorporated in the diet of ruminants. Fallen teak leaves, peepal and gular tree leaves have been evaluated for their nutritional worth and found to be useful as livestock feed.
- **Complete feed technology:** Under ICAR and MPCOST, Bhopal projects complete feed processing unit was developed for the preparation of complete feed pellets incorporating dried fallen different tree leaves. Complete feed pellets and complete feed sani effectively improved growth rate, nutrient intake, nutrient digestibility and productive performance of livestock.
- **Bypass nutrients technology:** Formaldehyde treated ground nut cake as a source of bypass protein was incorporated in the diet of growing kids @ 1.2% which resulted in better growth rate with low cost of raising. Supplementing prill fat in the ration of Murrah buffaloes helped in improving milk yield and fat per cent, which was further enhanced by supplementing the ration with rumen protected choline chloride.
- **Performance enhancers in poultry:** Cinnamon and Thyme essential oils

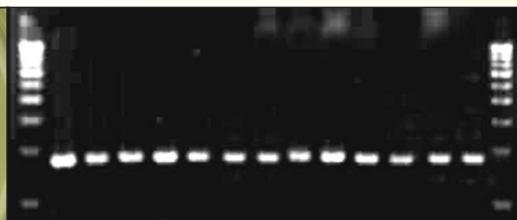
were tested for their nutritional worth as growth promoters instead of antibiotics in broilers diet. Herbal feed additives like tulsi leaf, ashwagandha root, punarnava and amla were incorporated in diet of broilers and resulted in improved immunomodulation and performance with better economic return. Supplementation of enzymes like proteases and carbohydrases (xylanase, mannanase and amylase) improved performance and nutrient utilization in broilers.

## Animal Biotechnology

- Under DBT project virus isolates of infectious bronchitis (IB) from five zones of India for S1 and N gene were characterized by cloning and sequencing.
- A database was established for identification of infectious bronchitis virus from different parts of country.
- Molecular detection of Infectious bursal disease (IBD) was done in MP for the first time.

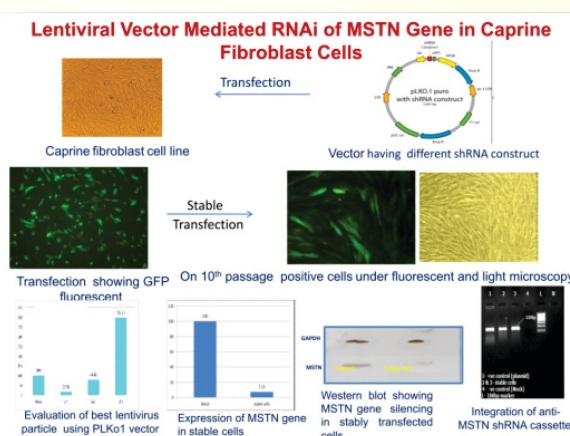


**Diagnosis of IB by Egg inoculation**



**Confirmation of IB by real time N gene expression**

- Under ICAR- NAIP project, New Delhi, stably transfected goat fibroblasts cell lines having knocked down myostatin gene was developed by lentiviral mediated gene transfer and successful integration of MSTN cassette into fibroblasts cell lines for demonstration of MSTN silencing by Western blotting in stably transformed cell lines.



- Under ICAR-NAIP project the expressions of pluripotent, apoptotic (Caspase-3 and Mcl-1) and imprinting marker genes (H19) was analyzed in different

stages of SCNT embryos to assess their developmental potency. The pluripotent marker genes, Nanog Oct 4 gene were analysed in 8-16 and 16-32 cells stage embryo.

- Under the RKVY project a healthy Sahiwal calf was been produced by super ovulation and embryo transfer technology from a non-descript recipient cow.
- Under RKVY, Bhopal project clinical pregnancy by non surgical embryo transfer of blastocyst in Murrah buffalo was successfully established which resulted in conception one buffalo, but, it aborted after 7 months of pregnancy.

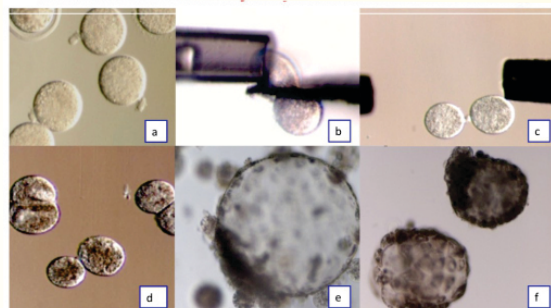


First ETT Sahiwal calf

- **Innovation of modified Handmade cloning technology (mHMC) :** The modified Handmade cloning technology was simplified by

innovation of indigenously designed cost effective microtools for enucleation of in vitro matured oocytes under micromanipulator. Instead of using expensive disposable microsurgical blade under stereo-microscope, developed indigenously designed cost effective bisection blades and aspiration pipettes for aspiration and instant

Production of Cloned Embryos by Innovative Patented Technology

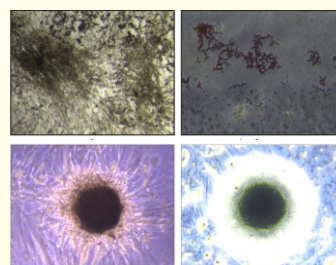


Process of enucleation and embryo production (a) Matured oocytes showing polar body (b) Aspiration of demicytoplast (c) Sandwiched somatic cell (d) Electrofused reconstructed oocytes (e) Blastocyst stage of zona free SCNT embryo (f) Group of zona free SCNT blastocysts

discard of one halve of matured oocyte having polar body and MII chromosomes. These microtools can be used for mass production of high producing cows and bulls by cloning technology.

- **Use of mesenchymal stem cells for treating bone fracture in goat :**

Mesenchymal stem cells were differentiate into various lineages including Osteoblast, Chondroblast and Adipocyte cells. These cells were differentiated into osteoblast by culturing in specific osteogenic differentiation media; into chondroblast by culturing in specific chondrogenic differentiation media and into Adipocyte cells by culturing in specific Adipogenic differentiation media. For characterization of MSCs the expression of cell



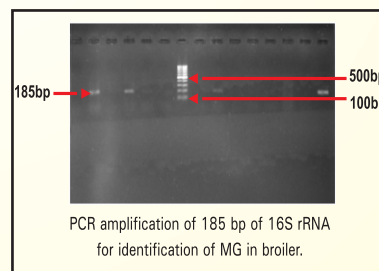
Diffrention of mesenchymal stem cells



surface marker protein positive for MSCs (STRO-1, ENDOGLIN, CD 73 and C-Kit) and one MSCc negative cell surface marker protein (CD34) were taken for immunocytochemistry.

## Animal Health

- **Comparative studies of skeleton** : The comparative studies were made in camel, cat, ox, goat, dog, fowl, tiger and deer skeleton. Observations on bony pelvis of 50 nondescript ox showed that the various factors shaping the bony pelvis were interdependent. Biometrical analysis of acetabulum of dog was studied. Skull of deer was studied and differential structures were recorded. The lachrymal fissure was observed below the orbit.
- **Early diagnosis of ketosis** : An ICAR ad-hoc research project on studies on development of cow-side Metabolic Profile Test for early diagnosis of ketosis in crossbred cows and buffaloes of tribal areas of M.P. was undertaken. The work on various aspects of sub-clinical ketosis indicated that during lactation of bovine ketosis is diagnosed in its sub-clinical stage the tremendous loss in the milk production can be avoided.
- **Vaccine development** : New castle disease is highly contagious disease of avian, primarily affecting chickens causing heavy economic losses to poultry industry. CDF66 vaccine from a lentogenic strain of NDV by comparing many tests like mean death time (MDT), intracerebral pathogenicity test index (ICPI) and intervenous pathogenicity index (IVPI) was developed. A significant feature of the vaccine is that there is no untoward reactions in the birds like lameness etc.
- **Bacterial and fungal diseases** : Detailed microbiological investigation of normal as well as diseased lungs of livestock and poultry were studied by various workers. The study revealed various types of bacteria and fungi from these organs. The most common isolates were coagulase negative and coagulase positive staphylococcus, *Pasteurella multocida*, *Streptococcus species*, *Escherichia coli*, *Salmonella gallinarum*, *Klebsiella pneumoniae*, *Corynebacterium pseudotuberculosis*, *Corynebacterium pyogenes*, *Corynebacterium eui* and *Mycoplasma gallisepticum*.
- **Pioneer studies of inflammation** : For over three decades the pioneering research has been carried out on the basic process of inflammation in the department of Veterinary Pathology. Initially the process was studied exhaustively in avian species followed by research on buffalo inflammation. Over the years several techniques have been evolved and many aspects of inflammation in chicken and buffalo worked out. These have appeared in the







form of original papers in the leading International and National journals and have brought a distinction to this department at an international level. The work has come out with some original findings for example the process of healing in the birds has been reported for the first time in world literature. The investigations have revealed that there are certain fundamental differences of the inflammatory response of birds and mammals. It established that species differences in the mechanism of inflammatory response cause variation in the pathogenesis and outcome of infectious diseases in livestock.

- **Canine neoplasia** : Research work was conducted on canine neoplasia covering the progression and regression of canine tumors with different chemotherapies. The bio-morphological characterisation of tumors as an indicator of prognosis and efficacy of therapeutic intervention has also been attempted.
- **Toxicity of heavy metals** : Toxicity induced by heavy metals has also been studied along with ameliorative effects of indigenous drugs. Infectious causes of calf mortality in both organised as well as unorganised sector are being explored. The host pathogen interaction in chronic diseases of livestock leading to drastic decrease in production is being studied. Heavy metal toxicity like, fluorosis and Lead toxicity in dairy animals is subject of research interest at the Department.
- **Schistosomiasis** : A new method of keeping fresh water snails in polythene bags with addition of mulberry leaves was developed which facilitates easy transport of the snails. In an epidemiological study of schistosomiasis in snails it was observed that 2.75% *Indoplanorbis exustus* and 3.35% *Lymnaea luteola* were positive for mammalian schistosome cercariae. Comparing various parasitological diagnostic methods the prevalence of bovine schistosomiasis was worked out to be 5-10% by faecal egg detection methods, 20% by hatching and 80-90% by serological methods. Triclabendazole and praziquantel were tested effective for the treatment of schistosomiasis.
- **Sarcocystosis**: Detailed work has been carried out on the sarcosystis sp. of cattle, buffalo, goat and pig. Two species of Sarcocystis viz. *S. levinei* and *S. fusiformis* in buffaloes, two species of Sarcocystis viz. *S. hircicanis* *S. capracanis* in goats, three known species of Sarcocystis viz., *S. cruzi*, *S. hominis* and *S. hirsute* in cattle and two species of Sarcocystis viz. *S. miescheriana* and *S. sui hominis* in pig were recorded for this region.
- **Gastrointestinal Parasitism** : District wise mapping of the important GI parasites in Madhya Pradesh was done. Monsoon season had the highest prevalence of GI parasitism and least in summer. Peak intensity of strongyle infection was recorded in the month of July to September. Bioclimatographs were prepared for different agro climatic zones of Madhya Pradesh for future



prediction and to visualize the effect of climatic conditions for development and survival of *Haemonchus contortus* and *Trichostrongylus* sp.

- Antibacterial and immune-modulatory activity of cow urine with wheat grass and aloe vera has been evaluated in poultry and found very effective. Commercialization of combination of cow urine, wheat grass and aloe vera can be done.
- Anti-inflammatory, antibacterial, immune-modulatory and anti-diabetic activity of noni (*Morinda citrifolia*) has been evaluated in experimental animals in collaboration with World Noni Research Foundation, Chennai. The study showed very good results without side effects of noni.
- Aqueous and alcoholic extracts of *Boerhavia diffusa*, *Eclipta alba* and *Withania somnifera* exhibited marked antihepatotoxic activity on paracetamol induced hepatic damage, however alcoholic extracts exhibited more hepatoprotective effect in comparison to the respective aqueous extract.
- The application of AGA and AGT preparations exhibited significant Antidandruff activity in all the clinical cases of dandruff in dogs. Besides antidandruff activity, AGA and AGT also showed antiallergic and anti-inflammatory properties which were clearly evident on the basis of significant reduction in signs of allergic manifestation and inflammation. In few clinical cases, alopecia was also found to be cured.
- **Immunomodulatory efficacy of Panchgavya** : The immunomodulatory efficacy of panchgavya against cyclophosphamide induced immunosuppression was assessed by cell mediated and humoral immune responses. It was found that panchgavya is an effective immunostimulant. The toxicity studies indicated that panchgavya is safe and non toxic as evidenced by gross observations and haemato-biochemical parameters which did not alter significantly on oral administration of panchgavya for 30 consecutive days.
- Dietary supplementation of *Nigella sativa*, *Withania somnifera*, selenium and Vitamin E produced enrichment of egg with increased concentrations of Selenium to 28.65 per cent and Vitamin E to 30.35 per cent and also reduced 15 per cent of cholesterol in comparison to normal egg.

## Clinical Research

- **Herbal drugs for mastitis control** : Various herbal drugs viz. *Tinospora cardifolia*, *Eclipta alba*, *Azadirachta indica* and *Nigella sativa* and aloe vera have been used for the treatment of subclinical mastitis using different routes with various therapeutic efficacies. The use of herbal medicaments in treatment of mastitis is an effort towards clean and organic milk production.
- **ORS for diarrhoea in calves** : To prevent mortality due to calf diarrhoea ORS

has been prepared for treatment of diarrhoea in calves and kids with satisfactory field reports.

- **Ethno veterinary medicines for gastro intestinal parasites :** Research was conducted on G.I. parasites and their remedy in different species using Ethno Veterinary medicines. Herbal drugs like *Alium sativum* , *Musa paradisiacal*, *Nicotiana tobacum* and *Vernonia anthelmintica* was found quite effective in controlling G.I. parasites.
- **Control of hypogalactia herbal galactogogues :** Herbal galactagogue Satavari was found to be highly effective in increasing milk production and fat % in buffaloes while Chandrasur and Satavari in the ratio of 7:3 increased milk production and fat % in cross bred lactating cows.
- **Neem oil for control of dermatitis :** In canine dermatitis, neem oil Demase was found to be highly effective in the treatment of demodicosis in dogs . In Malassezia dermatitis neem oil topically along with neem tablet was found to be highly effective and cost effective .
- **Prognostic Index :** Prognostic index was developed for ascites in dogs for the first time and have been validated and found satisfactory.
- **Clinical evaluation of anaesthesia :** The procedure of epidural anaesthesia was established in pigs, dogs, cattle and sheep and goat. Work has also been done on various combinations of general and inhalation anaesthetics such as xylazine with propofol and ether in dogs xylazine and propofol in calves and isoflurane and sevoflurane for maintenance of soft tissue and orthopaedic patients.
- **Treatment of prostatic hyperplasia :** In dogs, benign prostatic hyperplasia is very common for which procedure of injection of ethanol at various locations was tried with successful outcome. Similarly partial prostatectomy was also tried with more than 75% success rate. Sephanoperitoneal shunting as a palliative treatment for hepatobiliary ascites has been established in canine. Surgical procedure of anal sacculotomy was also performed successfully in dogs.
- **Correction of hard milker condition :** A new technique for correction of hard milker condition by incision was established successfully for contracted teat sphincter in buffalo. Further, laser therapy protocol was also established successfully for the treatment of teat fistula after surgical correction.
- **Radioimaging :** Ultrasonographic protocol for abdominal organs was established successfully in small animal and goats which is continuously transferred to field veterinarians through training. Early pregnancy diagnosis was also done in goats and dogs. Staging of cataract was done by ultrasonography of eye and differential diagnosis of dry, lactating and mastitis affected goat was done by ultrasonography of teat and udder. For the first

time in India the differential diagnosis of anal affection with ultrasonography was done in canine. Color Doppler abdominal ultra sonography was established in small and wild animals. Echocardiography procedure for cardiac evaluation was established successfully in small animals. This technique was used successfully to diagnose various affection of heart and thoracic cavity. Procedure of ultrasound guided tissue core biopsy and fine needle aspiration cytology was established successfully in dogs.



- **Orthopaedics** : Various orthopedic implants such as intramedullary pins DCP and locking compression plates and inter locking nails were used successfully in small animals. Recently exhaustive work has been done on platelet rich plasma and bone marrow derived mesenchymal stem cells with osteoinductive and osteoconductive material for the successful bone healing especially in splinter and segmental fractures in goats and dogs.
- **Dentistry and Ophthalmology** : Various procedures in canine dentistry were established. Canine cataract surgery with and without implantations of intraocular lenses, surgical procedure of dacryocystitis, epiphora and coronial ulcer were successfully established.
- **Minimum and non invasive surgery** : Minimally invasive surgery, laparoscopy has been established for diagnostic and therapeutic purposes. Laparoscopic biopsy and ovariohysterectomy was performed successfully in dogs. Gastrosopic retrieval of foreign body in canine has been successfully attended.
- **Physiotherapy** : Extensive work has been done for the healing of chronic wounds in buffalo calves and dogs. Short wave diathermy, therapeutic ultrasound and nerve muscle electrical stimulator has also been used for physiotherapy of paraplegic dogs of nervine origin.
- **Monitoring of oestrus and early pregnancy** : Serum progesterone was established as a marker for monitoring the functional status of corpus luteum and diagnostic tool for identifying ovarian condition for confirmation of oestrus, sub-oestrus/silent oestrus and true anoestrus in buffaloes. Monitoring of oestrus and early pregnancy based on competitive binding of unlabeled milk progesterone using ELISA kit was done in cattle and buffaloes. The accuracy of oestrus detection was 96.66 and 100%, respectively in cattle and buffaloes. Efficacy of early pregnancy diagnosis at 19 days post service was 94.11% in cattle and 86.66% in buffaloes. Insulin and GnRH were found





as an effective measure for the management of true anoestrus in buffaloes under field conditions in buffaloes having good body condition score.

- **Management of reproductive problems** : Post insemination insulin administration was recorded as an effective measure for improving conception in repeat breeder cow. Administration of Insulin for three consecutive days was found effective for management of delayed puberty in crossbred heifers
- **Ultrasound guided ovum pick up** : The use of transvaginal ultrasound guided ovum pick up (OPU) was standardized for oocyte retrieval for in vitro embryo production. Twice weekly OPU were found to be better in terms of weekly oocyte retrieval and embryo production in buffaloes. Better developmental competence of in vitro produced embryos derived from OPU retrieved embryos was recorded as compared to in vitro produced embryos derived from slaughterhouse ovaries.

### School of Wildlife Forensic and Health

The School since its inception is engaged in wildlife diagnostic activities and developed expertise in traditional and molecular diagnosis of infectious disease of felines e.g., Infectious Canine Distemper, Canine Parvo Infection, Feline Pan leucopenia, Leptospirosis and Tuberculosis in herbivores; Tuberculosis, Hemorrhagic Septicemia and Endotheliotropic Herpes Virus Infection for elephants.



The School has also developed the DNA based molecular methods for identification of wild species. Further, identification of wild animals through trichology technology, using hair of native important species has also been developed. Till date, over 1700 forensic samples reports have been submitted to forest department for producing in the Hon'ble Courts.

A patent of species specific primers of Indian wild pig has been filed to the Govt. of India for grant of patent. Indian Wild pig (*Sus scrofa cristatus*) is a protected species under the 3rd schedule of the Wildlife (Protection) Act, 1972, which is extensively poached for meat. The species specific primer pairs has been developed to differentiate Indian wild pig from domestic pigs and other pig races of the world using the amplification refractory mutation system (ARMS). The species specific primer pair can be applied for forensic investigation to differentiate the meat samples of domestic and wild pigs.

The Indian Council of Agricultural Research has awarded prestigious project of "Niche Area of Excellence on Wildlife Forensic & Health" for the year



2013-2018. Further, about 10 research projects have been successfully completed and presently, there are 7 ongoing projects of different funding agencies.



**Vaginal vestibulotomy  
in Elephant**

V a g i n a l  
vestibulotomy  
was successfully  
performed in

two she elephants by team of faculty members of the school and the college. This typical intervention was 18th and 19th case in the world.



**Ultrasonography in Lion**

## Panchgavya Production Unit

Research Centre has been established for the development, production and marketing of various Panchgavya products prepared from indigenous cow urine and dung. Pilot production of various Panchgavya products viz., Cow Urine Distillate, Herbal Mosquito Coil and Havan tikiya have been initiated for standardization and commercial production. The innovative "Gobar gamla" has been developed using cow dung and other componetes for the first time, which can used as a replacement of plastic bags used in nurseries.



## Fisheries

- **Development of Bucket Hatchery system:** To produce fish seed on scientific lines a Bucket hatchery system was designed and developed, which is convenient and cheaper. It was constructed by ordinary plastic buckets of 20 lit. size with plastic pipe and tapes. Its hatching capacity is 10 lacs fish at a time. It is an ideal hatching system for resource poor fish farmers.
- **Probiotic in fish feed :** Supplementation during nursing of common carp and in Indian major carps with probiotic “Protexin ” (non-antibiotic, freeze dried preparation containing live viable strains of naturally occurring micro-organisms including two yeasts) resulted in better growth and F.C.R





### Patents Sanctioned and Filed

Patent Application No.	Title of Patent	Date of filing	Patenting Agency	Name of Inventors	Status
1762/MUM/2012	Method for occyte enucleation and electrofusion of triplet by using cost effective microtools.	15.6.2012	Intellectual property of India, Govt. of India, Ministry of Commerce and Industry, Mumbai	Dr. B. C. Sarkhel Dr. Dharmendra Kumar	Granted Patent No. 297821
43/MUM/2014	Species Specific ARMS PCR test for identification of Indian Wild Pig ( <i>Sus scrofa cristatus</i> )	16.1.2015	---Do----	Dr. A. B. Shrivastav Dr. B. C. Sarkhel Dr. Kajal K. Jadav Dr. Nidhi Rajput Dr. A. P. Singh	Under public domain
E-101/2403/2018-MUM	Rapid strip based test to detect adulteration in milk.	09.3.2018	---Do----	Dr. Sankuntala Birla Dr. Kanshikar Supriya Satish Dr. Ranvijay Singh and others	Application submitted

### Extension Education

- **Developed Extension Education interface of the university with the Krishi Vigyan Kendras** in ICAR-Zone VII (Madhya Pradesh, Chhatisgarh and Odisha).
- **Implementation of Tribal sub-plan project entitled “Socio-economic upliftment of tribal population** of Jabalpur Division of Madhya Pradesh by sustainable livestock production systems” sponsored by the I.C.A.R., New Delhi w.e.f. March, 2013 and continued.
- **Implementation of Farmer FIRST project** entitled “Farmers Empowerment through Improved Integrated Farming Practices” sponsored by ICAR, New Delhi as - w.e.f. February 2017 to be continued till March 2020
- **Developed linkage of the university as a participating institute with 'Unnat Bharat Abhiyan' project of Ministry of Human Resource Development, Govt. of India, New Delhi:** Identified villages for Jabalpur, Mhow and Rewa Veterinary Colleges for adoption under the project.
- **Developed linkage of the university with National Bank for Agriculture and Rural Development (NABARD), Mumbai:** Organized a Workshop on



'Dairy Entrepreneurship Development Scheme' on 11th September, 2017 which was sponsored by NABARD and telecasted by ETV. One day Seminar (in January 2018) was also been sponsored by NABARD

- **Developed linkage of the university with Agriculture Skill Council of India, Gurgaon under Ministry of Skill Development & Entrepreneurship, Govt. of India, New Delhi.**
- Adoption of villages under Mera Gaon Mera Gaurav project of ICAR, New Delhi: The university adopted villages under the three colleges at Jabalpur, Mhow and Rewa. Baseline information of farmers of the villages was compiled and activities like livestock based farming system awareness programmes, animal health camps and kisan sangoshthis were initiated and are being continued.
- **Developed linkage with National Institute of Agricultural Extension Management (MANAGE), Hyderabad** for training of staff in different disciplines of Extension Education and possible joint projects.
- **Developed Interface between university and State Institute of Agriculture Extension and Training (SIAET- called as SAMETI in other States), Bhopal** for providing experts in the field of Veterinary Science, Animal Husbandry and Fisheries as resource persons in trainings arranged for the veterinarians and para-vets involved in the ATMA project.





## VISION AND STRATEGIES

### Human Resources Development

The University, since its inception in 2009, has made significant progress in the field of education, research and extension. The academic programmes of the University have expanded by establishing one College of Fishery Science and five veterinary polytechnics. Further, the Centre for Wildlife Forensic and Health has been upgraded to School of Wildlife Forensic and Health. The future thrust would be to produce graduate, post graduate and diploma holders having exposed to recent advanced technologies to enable them for entrepreneurship as well as better employment opportunities. The curricular research and other research works will be focused towards region based problems faced by livestock/ fish farmers related to health and production in the State. Efforts will also be made for establishing and strengthening close linkages between the University, Dept. of Animal Husbandry, GoMP and livestock/ fish farmers through different extension programmes. Collaboration will be made with livestock related industries and NGOs to disseminate various recent technologies developed by the university for overall livestock development in the State.

#### Academics and Human Resource Development

- College of Dairy Science & Food Technology will be established.
- Up gradation of School of Wildlife Forensic and Health into National Institute.
- Up gradation of Animal Biotechnology Centre into School of Animal Biotechnology.
- Enhancement of faculty strength and recruitment of best available faculty from across the country, avoiding the academic inbreeding.
- Up gradation of theoretical knowledge and practical skills of the staff in modern cutting edge technologies in molecular biology, Assisted Reproductive Technologies, stem cell research, nanotechnology etc. by exposure to International and National laboratories, seminars, short courses and trainings.
- Linkage with International and National Institutes of repute (ICAR and CSIR labs) will be developed for collaborative research and faculty exchange programmes.
- Library and communication centre will be strengthened by providing facilities like CERA and CD-ROM for getting access to all the national and international journals and books.

#### College of Dairy Science & Food Technology

**Vision:** Human resource generation and advanced research in the field of Dairy Science & Food Technology.

**Mandate:**





- To develop skilled manpower at both undergraduate and postgraduate level to cater the need of dairy industry.
- Curricular research for development of value added dairy products.
- Development of innovative packaging system for increasing the shelf life of dairy products.

#### **Strategic intervention:**

- To start 4 year B.Tech. degree programme in the university as per ICAR 5th Dean's committee recommendation.
- To collaborate with various dairy industries of the country to provide practical knowledge to undergraduate students under student ready programme of ICAR, New Delhi.
- Project will be submitted for award of ICAR experiential learning programme to develop entrepreneurship skills among the graduate students.

### **Up-gradation of School of Wildlife Forensic and Health into National Institute**

**Vision :** Systematic and scientific wildlife health management and forensic research to conserve wildlife wealth of India.

#### **Mandate :**

- Forensic investigations & research for identification of species of various types of biological samples i.e. skin, meat, hair, bone etc.
- Development of genome sequence profile of different wild animals using whole genome and mitogenome sequencing
- Use of bio-technological tools for disease diagnosis and health monitoring of wild animals.
- Training of veterinarians and staff of forest department on immobilization, wildlife forensics and health.
- All types of veterinary support to forest department in its conservation programmes and in emergencies/exigencies.

#### **Strategic intervention :**

- Submission of research projects to external funding agencies at national level for establishment of germplasm repository.
- Development of mobile wildlife clinics for providing emergency services to wild animals.
- Undertake research on development of vaccine for control of fertility of pest wild animals.
- Production of quality manpower in wildlife health and management related fields.

### **Up-gradation of Animal Biotechnology Centre into School**

## of Animal Biotechnology

**Vision:** Human resource generation and advanced research in the field of Animal Biotechnology.

**Mandate :**

- To develop skilled manpower at both undergraduate and postgraduate level to cater the need of upcoming industrial growth of biotechnological in the field of veterinary and animal sciences.
- Curricular research involving cutting edge biotechnology tools like RNAi, cloning, stem cell, nanotechnology etc.
- To conduct applied research for improvement of production, reproduction and disease resistance in livestock and poultry.

**Strategic Intervention:**

- Initiation of 4 year B.Sc. degree programme in Biotechnology as per ICAR 5th Dean's committee recommendations.
- Research on ovum pickup and *in vitro* fertilization (OPU-IVF) for conservation & improvement of indigenous germplasm.
- Genome analysis of rumen micro flora through Next Generation Sequencer to improve the digestibility and food conversion ratio of nutrients.
- Mitogenome analysis for species differentiation in wild life and domestic animals for forensic research.

## Research and Development

### Establishment of Stem Cell Research Unit

**Vision:** Utilization of adult stem cell for regenerative medicine and disease amelioration in livestock.

**Mandate:**

- Collection and cryopreservation of umbilical cord of different livestock species.
- Development and cryopreservation of of different livestock species.
- Differentiation of embryonic and stem cell in different lineages.

**Strategic Intervention:**

- Undertaking advanced research using stem cell for improving productivity and health status of livestock.
- Isolation and characterization of mesenchymal stem cell as per International Society for cellular therapy.
- Use of stem cell for fracture/wound healing in different livestock species.
- Use of stem cell in treatment of mastitis by regenerating mammary tissues for improving milk production.

### Establishment of Nano-biotechnology Laboratory



**Vision:** Exploitation of Nano-biotechnology in drug delivery, regenerative medicine and therapeutics for improving the productivity of livestock and control of pest wild animal population.

**Mandate:**

- To design and create nano-particles for drug and gene delivery system.
- To design and validate the nano-particles for regenerative medicine.
- To develop nano-particle based vaccine to control breeding in pest wild animal

**Strategic intervention :**

- Establishment of Nano-biotechnology laboratory in the university.
- Designing and gold coating of liposome for nano-particle base for targeted gene delivery and drug delivery system.
- Development, production and validation of biological nano-material for regenerative therapy.
- Development of nano-capsules containing hormones and drugs for allowing the slow and constant release of the active substances at targeted site.

## Identification and Conservation of Native Breeds of Livestock in the State

**Vision:** Development of strategies for identification and conservation of native breeds of the State

**Mandate :**

- Identification of new breeds of livestock and poultry in M.P. as per NBAGR guidelines from non-descript population.
- Conservation of the native germplasm using *in situ* and *ex situ* approaches

**Strategies:**

- Extensive survey in different agro-climatic zones of Madhya Pradesh for identification and characterization of new livestock breeds through morphological, physical and molecular techniques from non-descript population.
- Developing strong linkages with State government agencies and non-government organizations and civil societies to motivate the farmers and stakeholders to propagate awareness about the benefit of rearing native germplasm.
- Establishment of "Breed societies" for important and unique breeds of different species for their conservation, and development in coordination with other agencies.
- To Undertaking research on survey, evaluation and characterization for non-descript populations of various livestock species. The promising populations found to possess special attributes will be registered with NBAGR (ICAR) as descript breed (s).
- Field progeny testing programmes under the aegis of NBAGR/Project Directorate on Cattle (ICAR) in collaboration with organized herds (Govt. of

M.P.) and farmers herd will be taken up.

- Programmes for conservation and improvement of Malvi, Nimari and Kenkatha breeds of cattle and Kadaknath breed of poultry will be taken up in collaboration with state Govt. and Central Council of Gosamvardhan, Gokul mission, etc.

### **Establishment of Elite Cattle and Buffalo Nucleus Breeding Herd for improvement of productivity**

**Vision:** Improving the productivity of cattle and buffalo population of the State by establishing elite cattle and buffalo nucleus breeding herd.

**Mandate:**

- Establishment of elite cattle and buffalo nucleus breeding herd.
- Dissemination of improved progenies to the organized farms and farmers for improving the productivity.
- Improving the productivity of native breeds and non-descript population at field level.

**Strategic Intervention:**

- Survey and selection of high producing females and their male progeny of native breeds.
- Collection of sperm from elite male for their cryopreservation.
- Use of Assisted Reproductive Technologies (ETT/OPU-IVF) for production of high quality morula/blastocyst from elite females and males.
- Rearing of superior male and female up to adult stage for future use as semen and oocyte donor.
- Embryo transfer in cattle and buffalo females for large scale production of superior germ plasm in organized farms and farmers' door.
- Grading up programmes to improve the productivity of low productive population into economically viable population as envisaged in state breeding policy.

### **Production of Sex-specific Embryos for modification in Sex Ratio**

**Vision:** Use of sex sorted semen for embryo production to modify sex ratio in cattle and buffalo for improving productivity.

**Mandate:**

- Production of livestock progeny of desired sex in cattle and buffalo from superior germplasm.
- Improvement of the economic efficiency of commercial dairy industry.

**Strategic intervention:**

- Undertaking research on optimization of sorting of presumptive X and Y

bearing sperm by different technologies.

- Validation of the presumptive sex of sperm by PCR sexing of embryos using X or Y specific molecular probes and primers.
- Transfer of sorted embryos in surrogate female for production of progenies of desired sex.
- Establishment of sex sorted sperm and embryo bank of elite cattle and buffalo for dissemination to organized farm and farmers' door.

### **Establishment of Advanced Diagnostic Unit for Improving Reproduction Efficiency in Livestock**

**Vision:** Improvement of fertility in cattle and buffalo using molecular diagnostic tools for improving the reproductive efficiency.

**Mandate:**

- Establishment of advanced diagnostic unit for screening of infertility by genomic and proteomic technologies.
- Screening and collection of biological samples of infertile cattle/buffalo for molecular analysis.
- Development of diagnostic kits for screening of infertility & sub fertility in cattle/buffalo by genomics and proteomic tools.
- Application of ultrasonography and ELISA for early pregnancy and disease diagnosis.

**Strategic intervention:**

- Screening of cattle and buffalo in M.P. and adjoining states for diagnosis of infertility.
- Undertaking research on genomic and proteomic analysis of native and crossbreed cattle in relation to fertility.
- Molecular study on silent heat and subfertility in buffaloes.

### **Germplasm Repository of Livestock and Wild Animals**

**Vision:** Creation of livestock and wild animal germplasm repository for conservation and regenerative biology.

**Mandate:**

- Creation of somatic and gamete bank for endangered livestock and wild animals.
- Long term cryopreservation of germ plasm and cell lines for regeneration of endangered species.

**Strategy:**

- Collection and cryopreservation of gametic and somatic samples of live stock and wild animals for long term storage in liquid nitrogen.
- Isolation of nucleic acids from gametic and somatic samples for creation of DNA repository for future genetic analysis of endangered livestock and wild



animals.

- Generation of primary and secondary cell lines of various livestock and wild animals to be used as somatic cell donor for revival of endangered and extinct livestock and wild animals.

### **Rumen Microflora manipulation to improve Animal Productivity**

**Vision:** Manipulation of rumen microflora to optimize ruminal fermentation for improving nutrient utilization and productivity of animals.

**Mandate:**

- Genetic and non genetic manipulation of rumen microbes for efficient degradation of ligno-cellulosic feed and fodder.
- Increase the quality and quantity of milk by feeding low quality roughages to livestock.

**Strategies**

- Development of genetically engineered rumen microbes by gene transfer/manipulation technique.
- Use of non genetic manipulation like physical methods (dietary manipulation) and using suitable chemicals or feeding microbes (probiotics).

### **Development of effective Ethno-Veterinary Medicines by the use of Indigenous Plants**

**Vision:** Use of indigenous plants for development of effective ethno-veterinary medicines using molecular techniques.

**Mandate:**

- Development of effective alternative system of medicine to allopathic drugs and economize the cost of treatment
- Establishment of herbal garden and processing unit for medicinal plants
- Application of identified medicinal plants for improving the health and productivity of livestock.
- Production of safe and healthy animal products devoid of drug and chemical residues.

**Strategy:**

- Survey for prevalent practices on use of herbal plants from traditional practioners/local people.
- Screening of the plants as per knowledge of traditional practioners for pharmacological activity
- Establishment of herbal garden and large scale farming of identified medicinal plants.
- Estimation of active principles of indigenous plant extracts by HPLC/HPTLC.
- Genomic analysis of active principle of medicinal plants using

biotechnological tools.

- Development of effective and safe indigenous herbal medicine.
- Patenting and commercialization of identified herbal drugs.
- Collaboration with pharmaceutical firms for preparation of herbal medicine for different applications.

## **Epidemiological Studies on Animal and Poultry Diseases**

**Vision:** Surveillance and control of existing/emerging infectious diseases and associated factors.

**Mandate:**

- Development of epidemiological map of diseases at the State Level.
- Development of effective disease forecasting system

**Strategies**

- Surveillance of existing/emerging infectious diseases and associated factors in different pockets of the State.
- Determination of the transmission cycle, host range, niche of existing and emerging diseases and their confirmation by the use of molecular and immunological techniques.
- Control of morbidity and mortality rate by intervening the transmission cycle.
- Effective disease forecasting by developing disease forecasting software by analyzing different factors of disease occurrence.

## **Development of Diagnostic Kits for Livestock and Poultry diseases**

**Vision:** Development of diagnostic kits for livestock and poultry diseases for early disease diagnosis

**Mandate**

- To develop immunodiagnostic kits suitable to local conditions incorporating local variants of the causative agents.
- Evaluation of the efficacy of developed kits over traditional diagnostic methods.

**Strategies**

- Molecular epidemiological studies of microorganisms prevailing in the state.
- Development of facilities in cloning and expression of vectors and other newer technologies and bioinformatics tools.
- Development of pen side test, ELISA and other sensitive tests with incorporation of local variants and their validation.
- Patent of the recently developed diagnostic kits and their commercialisation.

## **Development of Immunoprophylactics**

**Vision:** Development of vaccines against emerging and re-emerging pathogens

of livestock and poultry

**Mandate:**

- To develop vaccines against emerging and re-emerging disease pathogens.
- To develop mixed and recombinant vaccines using traditional and genetic engineering techniques.

**Strategies:**

- Molecular epidemiological studies of the emerging and re emerging disease pathogens, their antigenic determinants and variants.
- Modification of vaccines and vaccination schedule with inclusion of new variants.
- Development of more specific and sensitive new generation recombinant vaccines.
- Patent of the developed vaccines and their commercialization.

## **Development of Alternative Laboratory Animal Models for Biomedical Research**

**Vision:** Development of alternative models for biomedical research

**Mandate:**

- Development of 3D-culture technology and chip based approaches for the replacement of experimental animals.
- Development of alternative laboratory animal simulation models for the study of pathogenicity, pathogenesis, pharmacodynamics and pharmacokinetics.
- Use of above models for assay of vaccine and diagnostics.

**Strategies:**

- Integration of various computer models, bioinformatics tools, *in vitro* cell cultures, enzymatic screens and model organisms for use as an alternative to laboratory animals.
- Computer generated simulations to predict the various possible biological and toxic effects of a chemical or potential drug candidate without animal dissection.
- Use of modern analytical techniques, data acquisition and statistical procedures to analyze the results of alternative protocols.

## **Studies on Molecular Mechanism of Pathogenicity in Livestock and Poultry**

**Vision:** Studies on molecular mechanism of pathogenicity of emerging and re-emerging diseases for their control

**Mandate:**

- To delineate the cascade of molecular mechanism of disease initiation.

- To identify protein and genetic markers to intervene the cascade of pathogenecity.

**Strategies:**

- Development and adoption of novel molecular imaging tools for diagnosis of emerging and reemerging diseases.
- Use of proteomic and genomic signatures for diagnosis, prognosis and prediction of diseases.
- Detailed molecular classification of emergent diseases.
- Development of markers for diagnosis of livestock diseases.

**Control of Disease Vectors using Advanced Molecular Technologies**

**Vision:** Identification and control of vector borne diseases by the use of Integrated pest management and advanced molecular technologies.

**Mandate:**

- Identification of vectors related to occurrence of vector borne diseases (VVBD)
- Development of appropriate technologies for control of vectors and vector borne diseases

**Strategies:**

- Epidemiological and entomological surveillance
- Evaluation of different methods of vector control like biological and chemical techniques and to delineate the most appropriate vector control technique.
- Detection and monitoring of insecticide and acaricide resistance status of the prevalent vectors and to develop resistance management strategies
- Characterization of the key active components of plants and herbs which are known to possess insecticidal and acaricidal properties like growth inhibiting, antimoulting and repellent activities
- Identification and characterization of endosymbionts and devise strategies for their elimination to control the vectors
- Characterization and identification of resistant genes of the tropical cattle breeds for prevention of diseases.
- Identification of broad range of vaccine candidate which are effective against phylogenetically distant species of vectors
- Development of Integrated Pest Management (IPM) strategies by recognizing the local available components and farmer's resources and optimize vector control strategy that fits in those limitations.

**Monitoring and Surveillance through Rapid Diagnostic Assay of Food and Zoonotic Diseases and Environmental Pollutants**



**Vision:** Surveillance and control of food borne zoonotic diseases and chemical residues to safeguard the health of people.

**Mandate:**

- Development of diagnostic tools for rapid identification of food borne zoonotic diseases and chemical residues
- To extend the technique / knowledge to field workers and farmers.

**Strategies:**

- Surveillance of food borne zoonotic diseases in animal and human populations
- Development of diagnostic tools and kits for rapid identification of food borne pathogens in animal and human populations; and also interactions between pathogens and hosts for developing effective preventive measures.
- Surveillance for detection of toxic metals and drugs in different foods and environment and processes through which these residues get entry in our food chain through the intervention of HACCP.
- Creating awareness amongst the people regarding hygiene in food production and zoonotic diseases for prevention and control of diseases.

## **Processing, Value Addition of Livestock Products and Waste Management**

**Vision:** Value addition of livestock products and utilization of byproducts

**Mandate:**

- To develop various novel milk and meat products
- Utilization of byproducts from milk industry and slaughter house for controlling environmental pollution.

**Strategies**

- Development of technologies for quality enhancement of meat from spent animals for effective utilization and for the production of value added products.
- Development of various kits for quick adulteration testing of milk and milk products.
- Development of consumer friendly livestock products low in calorie, cholesterol, salt and high dietary fiber.
- Development of novel technologies for value addition, bio preservation, environment friendly packaging and quality control for improvement in quality as well as shelf life of livestock products
- Development of valuable products from slaughter house byproducts
- Utilization of various dairy by-products for preparation of value added dairy products.

## **Wildlife Crime Control using Advanced DNA based Technologies**

**Vision:** Development of advanced DNA based technologies for rapid detection of forensic samples for wildlife crime control.

**Mandate:**

- Development of nuclear and mitochondrial DNA based probe and primer based detection system for forensic analysis of wild animals.
- Development Microsatellite markers for individual identification within species for association of evidences collected from crime scene.

**Strategies**

- Sequence analysis of whole mitogenome by NGS technology for identification of species and derive its phylogenetic position.
- Sequence analysis of nuclear genes and microsatellite markers for assignment of location of wild animals to a particular region.
- Investigation of elapsed time of death by forensic entomology and using gut antigen.
- Application of forensic entomology in species identification and investigation of elapsed time of death.

### Population Control of Pest Wild Animals by Sterility Vaccine

**Vision:** Development of sterility vaccine for population control of pest wild animals to protect crop damages.

**Mandate:**

- Development of antisera against target protein affecting the fertility of pest wild animals.
- Testing the efficacy of nano particle based vaccine molecule for inhibition of fertility *in-vitro* and *in- vivo*.

**Strategies:**

- Development of recombinant construct against candidate gene (GnRH, ZP gene) related to fertility and evaluation of in-vitro expression of target gene.
- Generation of anti-sera against target proteins and test their efficacy by immune assays and IVF technology for inhibition of fertilizing ability of oocytes.
- Development of suitable nano-particle based drug delivery system to inhibit the fertility by prolonged release of vaccine molecule *in-vivo*.

### Sustainable Development of Fishery Sector in Madhya Pradesh

**Vision:** Sustainable development of fishery sector in Madhya Pradesh

**Mandate:**

- Development of high yielding disease resistant strains of indigenous fish species and freshwater prawn
- Improvement in sustainable fish production with minimum input.
- Surveillance and control of fish disease and fish-borne illnesses.

**Strategies:**

- Application of traditional and biotechnological tools for developing high yielding disease resistant strains of indigenous fish species and freshwater prawn
- Development of strategies on minimum water fish production.
- Technological innovation for development of nutrient concentrates from the unutilized resources by selective isolation of protein/ lipid/carbohydrate.
- Advanced research on diagnostic tools and prevention/control of emerging, exotic and endemic aquatic diseases.
- Creation of integrated disease management database at national, regional and global level.
- Effective implementation of biosecurity measures to minimize the disease occurrence and pollution levels.
- Efficient recycling of aquaculture waste through agri-horticulture and microbe-based technologies for nutrient recycling.

**Development of Innovative Technologies to reduce Post Harvest losses for Value added Fish Products.**

**Vision:** Development of value added fish products and control of post-harvest losses.

**Mandate:**

- Development of value added fish products for human consumption
- Development of innovative technologies to reduce post harvest losses.

**Strategies:**

- Development of novel non-conventional feeds to produce value added products from low cost fishes
- Investigation of physio-chemical composition (viz. peroxide value, iodine value and acid value) and quality of fish waste
- Identification of functional and bioactive molecules and compounds like proteins, FPC, FPH, fish collagen and gelatin, fish oil (EPA & DHA)
- Ensuring authenticity of fish and fish products by the use of molecular tools.
- Develop innovative technologies to reduce post-harvest loss and produce value-added, ready-to-eat fish products.

**Technology Dissemination through Single Window Information Delivery System**

**Vision:** Dissemination of technologies through single window information delivery system to the farmers for livestock development.

**Mandate:**

- To strengthen advisory services for livestock farmers by adopting a



multidisciplinary approach through single window system.

- To act as a centre for resource generation through sale of livestock products developed by constituent colleges of the University.
- To act as a technology park for display of improved livestock, poultry and fish husbandry practices for the benefits of farmers.

#### Strategies:

- Establishment of single window information delivery system in Directorate of Extension Education including in each constituent colleges of the University to function as information depository and advisory unit regarding livestock farming skills and practices.
- Consultancy services for entrepreneurship development in livestock sector.
- Publication and sale of scientific literature developed by University pertaining to livestock farming including poultry and fisheries.
- Distribution and sale of genetically superior germplasm of cattle, buffalo, goat, poultry, fish and value added products developed by the University.

## Capacity Building in Livestock Farming Practices for Higher Income

**Vision:** Capacity building in livestock farming practices for higher income.

#### Mandate:

- To impart training to farmers, youth and para-veterinary personnel regarding scientific livestock, poultry and fish husbandry practices.
- To develop sustainable livestock based integrated farming modules as a means of livelihood.

#### Strategies:

- Establishment of well equipped training centres for providing training to farmers, youth and para-veterinary personnel in all the constituent colleges of the university.
- Development of linkages between farmers and bank functionaries for microfinance.
- Demonstration of value addition of farm produce viz, dairy, meat and fish by products including vermicompost and panchgavya products.
- Enlighten the livestock farmers on marketing channels to get fair price of farm produce and value added products.
- Transfer and intervention of appropriate technologies in livestock based integrated farming system.





### Expected Outcome and Impact

Vision	Expected Outcome	Impact
Human Resource Development in the field of Veterinary & Animal Sci., Dairy Science, Fisheries, and Wildlife	<ul style="list-style-type: none"> <li>• Production of technically skilled human resource for livestock, poultry and fisheries development of the state.</li> <li>• Development of linkages with International and national Institutes of repute</li> <li>• Upgradation of knowledge of faculty through national and international exposure.</li> <li>• Establishment of College of Dairy Science &amp; Food Technology, National Institute of Wildlife Forensic &amp; Health, School of Animal Biotechnology.</li> </ul>	<ul style="list-style-type: none"> <li>• Sustainable livestock production system for improving and production and health status of livestock of the State.</li> <li>• Growth of the dairy and animal health sector related Industries.</li> <li>• Socio economic upliftment of farmers of the State</li> </ul>
Development of strategies for identification and conservation of native breeds of the State	<ul style="list-style-type: none"> <li>• Identification and registration of nondescript population as new breeds of livestock and poultry</li> <li>• Conservation of the native germplasm</li> <li>• Establishment of breed societies of livestock</li> </ul>	<ul style="list-style-type: none"> <li>• Systematic breed improvement for improving productivity of livestock and poultry of the State</li> </ul>
Improving the productivity of cattle and buffalo population of the State by establishing elite cattle and buffalo nucleus breeding herd.	<ul style="list-style-type: none"> <li>• Establishment of elite cattle and buffalo nucleus breeding herd of native breeds</li> <li>• Production of proven bulls through progeny testing</li> <li>• Upgradation of non-descript population of the State</li> </ul>	<ul style="list-style-type: none"> <li>• Enhancement of germplasm of native breeds and non-descript cattle and buffalo population of the State.</li> <li>• Improved productivity of native breeds and non-descript cattle and buffalo population of the State.</li> </ul>
Use of sex sorted semen for embryo production to modify sex ratio in cattle and buffalo for improving productivity.	<ul style="list-style-type: none"> <li>• Production of livestock progeny of desired sex.</li> <li>• Establishment of sex sorted sperm and embryo bank of elite cattle and buffalo</li> </ul>	<ul style="list-style-type: none"> <li>• Improvement of fertility in cattle and buffalo leading to improved productivity</li> </ul>



Improvement of fertility in cattle and buffalo by molecular diagnostic tools for improving reproduction efficiency.	<ul style="list-style-type: none"> <li>• Establishment of Advanced Diagnostic Unit</li> <li>• Development of diagnostic kits for screening of infertility &amp; sub fertility</li> </ul>	Improvement of fertility in cattle and buffalo leading to improved productivity
Creation of livestock and wild animal germplasm repository for conservation and regenerative biology.	<ul style="list-style-type: none"> <li>• Establishment of nucleic acid bank of endangered livestock and wild animals.</li> <li>• Establishment of Cryobank of somatic and gametic cells for regeneration of endangered species</li> </ul>	<ul style="list-style-type: none"> <li>• Conservation of germ plasm of endangered livestock and wild animals.</li> <li>• Revival of endangered and extinct animals.</li> </ul>
Manipulation of rumen microflora to optimize ruminal fermentation for improving nutrient utilization and for improving productivity.	<ul style="list-style-type: none"> <li>• Genetically modified rumen microbe production</li> <li>• Efficient degradation of ligno-cellulosic feed and fodder</li> <li>• Increase the quality and quantity of milk by feeding low quality roughages to livestock</li> </ul>	<ul style="list-style-type: none"> <li>• Economize the cost of production using biotechnology tools.</li> </ul>
Use of indigenous plants for development of effective ethno-veterinary medicines using molecular techniques	<ul style="list-style-type: none"> <li>• Identification of medicinal plants of ethno-veterinary importance</li> <li>• Establishment of Herbal Garden and Processing Unit for Medicinal Plants</li> </ul>	<ul style="list-style-type: none"> <li>• Improving the health and product-ivity of livestock, and production of safe and healthy animal products</li> <li>• Economize the cost of treatment</li> <li>• Patenting and commercialization of identified herbal drugs.</li> </ul>
Utilization of adult stem cell for regenerative medicine development for disease amelioration in livestock.	<ul style="list-style-type: none"> <li>• Banking of umbilical cord and mesenchymal stem cell of different life stock species.</li> <li>• Application of stem for regenerative medicine</li> </ul>	<ul style="list-style-type: none"> <li>• Improvement of health status of livestock using stem cell for improving productivity.</li> </ul>



Surveillance and control of existing/emerging infectious diseases and associated factors	<ul style="list-style-type: none"> <li>Establish and notify the epidemiological distribution of diseases of the state</li> <li>Development of effective disease forecasting system</li> <li>Prevention and control of morbidity and mortality rate</li> </ul>	Enhancement of health status of livestock by efficient disease prevention and control
Development of diagnostic kits for livestock and poultry diseases for early disease diagnosis	<ul style="list-style-type: none"> <li>Development of immuno and molecular diagnostic kits</li> <li>Patenting and commercialisation of the diagnostic kits</li> </ul>	Prompt disease diagnosis and their control for economic livestock production.
Development of vaccines against emerging and re-emerging pathogens of livestock and Poultry	<ul style="list-style-type: none"> <li>Innovation of novel vaccines against emerging and re-emerging disease pathogens</li> <li>Patent and commercialisation of the vaccines</li> </ul>	Effective prevention and control of disease occurrence
Development of alternative models for biomedical research	<ul style="list-style-type: none"> <li>Development of <i>in vitro</i> culture based 3D-culture technology.</li> <li>Development of alternative laboratory animal simulation models</li> </ul>	Replacement of live animals with laboratory animal models for biomedical research.
Studies on molecular mechanism of pathogenicity of emerging and existing diseases for their control	<ul style="list-style-type: none"> <li>Development and adoption of novel molecular imaging tools for diagnosis of disease</li> <li>Development of markers for prediction of livestock diseases</li> </ul>	
Identification and control of vector borne diseases by the use of Integrated pest management (IPM) and advanced molecular technologies	<ul style="list-style-type: none"> <li>Identification of vectors related to vector borne diseases</li> <li>Development of IPM strategies for control of vector borne diseases</li> </ul>	<ul style="list-style-type: none"> <li>Control of vectors and vector borne diseases using recent molecular technologies.</li> </ul>



Surveillance and control of food borne zoonotic diseases and chemical residues to safeguard the health of human being.	<ul style="list-style-type: none"> <li>• Surveillance data of food borne zoonotic diseases</li> <li>• Development of diagnostic tools and kits for rapid identification</li> <li>• Surveillance for detection of toxic metals and drugs in different foods and environment</li> </ul>	<ul style="list-style-type: none"> <li>• Utilization of safe animal products for human consumption</li> <li>• Control of environmental pollution</li> </ul>
Value addition of livestock products and utilization of byproducts	<ul style="list-style-type: none"> <li>• Development of various novel milk and meat products</li> <li>• Development of consumer friendly livestock products</li> <li>• Utilization of various dairy and abattoir by-products</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in economic efficiency of dairy and meat industry</li> </ul>
Development of advanced DNA based technologies for rapid detection of forensic samples to control wildlife crime.	<ul style="list-style-type: none"> <li>• Development of nuclear and mitochondrial DNA based probe and primer for forensic analysis.</li> <li>• Development Microsatellite markers for individual identification</li> <li>• Technology for detection of elapsed time of death.</li> </ul>	Effective crime control of wild animals by applying innovative DNA based technologies.
Development of sterility vaccine for population control of pest wild animals to protect crop damages.	<ul style="list-style-type: none"> <li>• Generation of anti-sera against target proteins affecting the fertility of pest wild animals.</li> <li>• Development of suitable nano-particles based drug delivery system for prolonged release of vaccine molecule for inhibiting the reproduction.</li> </ul>	<ul style="list-style-type: none"> <li>• Population control of pest wild animals</li> <li>• Control of crop damage.</li> </ul>





Sustainable development of fishery sector in Madhya Pradesh	<ul style="list-style-type: none"> <li>• Production of high yielding disease resistant strains of indigenous fish species and freshwater prawn</li> <li>• Fish production using minimum water and other resources.</li> <li>• Establishment of integrated disease management database at national, regional and global level.</li> <li>• Efficient recycling of aquaculture waste for economic fish production with minimum environmental pollution</li> </ul>	<ul style="list-style-type: none"> <li>• Economic fish production by development of high yielding disease resistant strains with minimum impact on environment</li> </ul>
Development of value added fish products and control of post-harvest losses	<ul style="list-style-type: none"> <li>• Production of value added hygienic fish products for human consumption</li> <li>• Development of innovative technologies to reduce post-harvest loss</li> </ul>	<ul style="list-style-type: none"> <li>• Promotion of industrialisation and entrepreneurship development in fishery sector</li> <li>• Maximization of income of fish farmers</li> </ul>
Dissemination of technologies through single window information delivery system to the farmers for livestock development	<ul style="list-style-type: none"> <li>• Consolidation of various information pertaining to livestock sector at one place for dissemination to farmers.</li> <li>• Availability of high quality germplasm (semen and embryo) and value added products.</li> <li>• Promotion of entrepreneurship as a means of livelihood.</li> </ul>	<ul style="list-style-type: none"> <li>• Socio-economic upliftment of farmers</li> <li>• Growth of livestock related industries and employment generation</li> </ul>
Capacity building in livestock farming practices for higher income	<ul style="list-style-type: none"> <li>• Establishment of well equipped Training centres in each constituent college of the university</li> <li>• Capacity building of farmers on economical modern livestock management technologies.</li> </ul>	<ul style="list-style-type: none"> <li>• Socio-economic upliftment of farmers</li> <li>• Growth of livestock related industries and employment generation</li> </ul>

## विश्वविद्यालय परिचय गीत

हृदय स्थली भारत की, ये पशुधन का सेवालय,  
नानाजी देशमुख पशुचिकित्सा, विज्ञान विश्वविद्यालय।

जीवो रक्षति रक्षितः, पशु संवर्धन सहिता,  
मूलमंत्र है रोग निदान, समरथ बने कृषक संतान।

व्यावसायिक शिक्षा पाने का, ये संस्थान है दपर्ण,  
दुग्ध मत्स्य कुक्कुट पालन से निखरेगा जनजीवन।

पर्यावरण प्रकृति संबृद्धी, वन्यजीव संरक्षण  
जैवप्रौद्यौगिकी के बल पर हो, नित्य नये अन्वेषण।

संस्कारधानी का गौरव, सब को राह दिखाये,  
मध्यप्रदेश की खुशहाली का, ये प्रतीक बन जाये।

रचनाकार : डा. केशव प्रताप सिंह

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