

## DEPARTMENT OF VETERINARY PHYSIOLOGY AND BIOCHEMISTRY

### Faculty position:

Sr. No.	Name	Designation	E-mail	Contact	Joining	Qualification	Experience (in Years)	Publications
1	Dr. Arun Kumar Sharma	Associate Professor & Head	drarunvet@kamdhenuuni.edu.in	9727743994	Assistant professor: 2009 Associate professor: 2018	Ph. D. (Vet. Physiology)	17	37
2	Dr. Ramesh J. Padodara	Assistant Professor	rjpadodara@kamdhenuuni.edu.in	9228223162	2009	Ph. D. (Vet. Physiology)	13	40
3	Dr. Vivek Kumar Singh	Assistant Professor	drvksingh@kamdhenuuni.edu.in	8306857587	2012	Ph. D. (Anim. Biochemistry)	10	46
4	Dr. Arjun B. Odedara	Assistant Professor	drabodedara90@kamdhenuuni.edu.in	8128527781	2015	M. V. Sc. (Vet. Biochemistry)	7.5	20
5	Dr. Amrita A. Vasava	Assistant Professor	amritavasava@kamdhenuuni.edu.in	9924454777	2016	M. V. Sc. (Vet. Biochemistry)	6	15

### Department:

**Dept. Name: DEPARTMENT OF VETERINARY PHYSIOLOGY AND BIOCHEMISTRY**

### **About the Department:**

Department of Veterinary Physiology and Biochemistry, started functioning in 2009, has been working in the area of teaching, research and extension education since establishment of College of Veterinary Science & A.H., JAU, Junagadh. The Department along with the college transferred under Kamdhenu University w.e.f. 1/4/2021 with objectives to impart quality education and strengthen research, teaching of under-graduate & post-graduate students and to promote the advancement of learning and research in Veterinary Physiology and Biochemistry. Presently, Department is active in teaching of the U.G. students in the subject of Physiology and Biochemistry with five different courses namely (1) Veterinary Physiology, (2) Veterinary Biochemistry (3) Animal Biotechnology (4) Veterinary Clinical Biochemistry & Laboratory Diagnosis–I Veterinary

Clinical Biochemistry & Laboratory Diagnosis- II. Additionally, arrangement for the visit of students to semen collection centre and meteorology observatory of JAU is also carried out to impart the practical knowledge about various activities carried out in respective units. Department is also engaged in M.V.Sc and Ph.D. teaching offering 24 courses. Analysis of clinical samples from TVCC and other agencies of government are also carried out in the Department. Department is actively involved in Polytechnic in AH teaching conducting one course namely Introductory Animal Physiology. Departmental laboratories are well equipped with latest instruments and audio-visual aids. The department offers specialization in Veterinary Physiology and Veterinary Biochemistry with diagnostics, clinical Biochemistry, Environmental Physiology, Semen Biology, Infertility Profiling, Endocrinology, Ketosis Experimental Physiology, Mastitis Biochemical Studies, Reproductive Physiology, Bubaline/ Caprine stem cell research, Digestive Physiology. Important Instrumental facilities available in Department include ELISA Reader, ELISA Washer, Gradient PCR, Auto Hemato-analyser, Gel Documentation System, Refrigerated high speed centrifuge, Gel Electrophoresis, Double Distillation plant and Laminar Flow cabinet.

**Research area:**

1. Stem Cell Research
2. Reproduction Physiology and Endocrinology
3. Digestive Physiology and Metagenomics
4. Environmental Physiology
5. Metabolic Biochemistry
6. Reproductive Biochemistry

**Research projects:**

Sr. No.	Title of Research Programme	Status
1	Studies of salivary fern pattern during estrous cycle in Gir cows and Jaffrabadi buffaloes	Ongoing
2	Assessment of Blood cells' Immunocompetence around Parturition in Gir cows and Jaffarabadi buffaloes	Completed
3	Hemato-biochemical profiles of Kathiawari horses in and around Junagadh	Completed
4	Hematological and Biochemical aspects associated with hemoprotozoan infection in cows, buffaloes and horses	Completed

**Recommendations (Scientific):**

1. During the peripartum period phagocytic activity and lymphocyte proliferation response are lower in Gir cows compared to Jaffarabadi buffaloes.
2. Major hematological and biochemical indices of Kathiawari breed of Indian horses are comparable with other breeds of horse whereas within Kathiawari breed total granulocyte% and MCHC (g/dl) is found higher in female than male and lymphocyte% found higher in male than the female horse.

3. Hemoprotozoan infection in cows, buffaloes, and horses causes anemia with a significant increase in serum AST & ALT levels as well as a significant change in SOD & MDA levels indicating oxidative stress and oxidative damage.

### Achievements:

Sr. No.	Name of the Students /Faculty	Year	Name of Awards	Place/Institute
1	Dr. V. K. Singh	2018	Gold Medal for best paper	Indian Society for Veterinary Surgery, Navsari, Gujarat
2	Dr. V. K. Singh	2019	Young Scientist Award	SVSBT-2019, Navsari, Gujarat
3	Dr. V. K. Singh	2019	Best Oral presentation award	SVSBT-2019, Navsari, Gujarat

### Programmes Organized:

Sr. No.	Name of the Programme Organized	Date	Sponsoring Agency
1	National Training on “Latest Advancement In Upstream Reproductive Physiological Techniques”	16-18 September 2019	IDP- NAHEP, JAU, Junagadh (Gujarat)
2	West zone SAPI Quiz Competition	30 January 2020	JAU, Junagadh (Gujarat)
3	Online Vocational Training on “Immunological Advancements in Male and Female fertility” in Collaboration with Dept. of Vet. Gynaecology and Obstetrics	1-5 September 2020	IDP- NAHEP, JAU, Junagadh (Gujarat)
4	Online Vocational Training on “Advancements in Physiological Function Tests in Domestic Animals and Pets”	1-5 March 2021	IDP- NAHEP, JAU, Junagadh (Gujarat)
5.	Online Lecture by Dr. Lenin Bhatt (Senior veterinary Officer, State Disease Diagnostic Centre, Department of Animal husbandry, Jaipur (Rajasthan) entitled, “Advance diagnostic techniques & status of important Zoonotic Diseases”	09 April, 2020	IDP- NAHEP, JAU, Junagadh (Gujarat)
6.	Online Lecture by Dr. Motilal Madan (Ex. Vice-chancellor, DUVASU, Mathura (UP) entitled, “Endocrine Control Of Reproductive Cycle”	10 April, 2020	IDP- NAHEP, JAU, Junagadh (Gujarat)
7.	Online Lecture by Dr. A. K. Gahlot (Ex. Vice chancellor, RAJUVAS, Bikaner (Rajasthan) entitled, “Contribution of	11 April, 2020	IDP- NAHEP, JAU, Junagadh

	Veterinary Science and Animal Husbandry to National Economy and Future Scope of Veterinary Science”		(Gujarat)
8.	Online Lecture by Dr. Ninan Jacob (Professor and Head, Department of Veterinary Physiology, Rajiv Gandhi Institute of Veterinary Education and Research, Kurumbapet, Puducherry) entitled, “Effect of Climate on Animal Production”	06 May, 2020	IDP- NAHEP, JAU, Junagadh (Gujarat)
9.	Online Lecture by Dr. Bharti Jain (Practicing Advocate and Patent Agent, Noida, Delhi) entitled, “Role of Intellectual Property Rights in Academic and Research Institutions with Specific Focus on Veterinary Sciences”	21 October, 2020	IDP- NAHEP, JAU, Junagadh (Gujarat)
10.	Online Lecture by Dr. Vaishali Ahuja (German Language Trainer/ Translator CRB Tech, Pune (Maharashtra) entitled, “Introduction of German language and its importance in the Veterinary Profession”	27 October, 2020	IDP- NAHEP, JAU, Junagadh (Gujarat)
11.	Online Lecture by Dr. Varun Ahuja (Senior Scientist, Drug safety Assessment, Novel Drug Discovery & Development, Lupin LTD., Pune) entitled, “Opportunities for Veterinarians in Corporate sector and Abroad”	02 November, 2020	IDP- NAHEP, JAU, Junagadh (Gujarat)

# 1. National Training on “Latest Advancement in Upstream Reproductive Physiological Techniques”

Three Days National Training program on “Latest Advancement in Upstream Reproductive Physiological Techniques” was organized by the Department of Veterinary Physiology & Biochemistry at College of Veterinary Science and Animal Husbandry, Junagadh Agricultural University, Junagadh under the Institutional Development Plan from 16<sup>th</sup> to 18<sup>th</sup> September, 2019. **Dr. A. K. Sharma**, Associate Professor and Head, Department of Veterinary Physiology & Biochemistry, COVSAH, JAU, Junagadh was the organizing secretary. Around 150 delegates and students from the host institute, other colleges of JAU, teachers, and faculty participated in the event which mainly focused on recent advances related to reproductive Physiological techniques in animal sciences. The three days program was divided into three technical sessions and the first two days in afternoon session hands-on training. Speakers were invited from National level institutes and universities to deliver talks on the relevant subject. **Dr. S. K. Dabas**, Principal Scientist, CIRC, Meerut, UP delivered a talk on “Oocyte collection techniques, Induction of ovulation and Embryo Transfer”. **Dr. S. P. Nema**, Professor and Head, Department of Veterinary Gynaecology & Obstetrics, COVSAH, Nanaji Deshmukh Veterinary Science University, Mhow, MP presented his lecture on “Functional Infertility in Bovines”. **Dr. K. B. Vala**, Associate Professor & Head, Department of Veterinary Gynaecology & Obstetrics, COVSAH, JAU, Junagadh demonstrated buffalo genitalia with differences in other species followed by **Dr. K. H. Parmar**, Assistant Professor, Department of Veterinary Gynaecology & Obstetrics, COVSAH, JAU, Junagadh described the various oocyte collection techniques from ovaries. **Dr. A. K. Sharma**, Associate Professor & Head, Department of Veterinary Physiology & Biochemistry, COVSAH, JAU, Junagadh demonstrated In Vitro Maturation (*IVM*) technique from buffalo oocyte with its application in animals. The second day of the training session started with the visit to cattle breeding farm and a practical session at the semen station and how the semen is collected and evaluated taken by **Dr. G. B. Solanki**, Assistant Professor, CBF and **Dr. S. S. Parikh**, Assistant Professor, CBF. **Dr. P. G. Koringa**, Assistant Professor, Department of Animal Biotechnology, College of Veterinary Sci. & A.H., AAU, Anand delivered a lecture on “Semen sexing”. **Dr. Dilip Swain**, Assistant Professor, Department of Veterinary Physiology, COVSAH, DUVASU, Mathura, UP delivered the lecture on “Advanced semen evaluation techniques”. **Dr. A. K. Sharma**, Associate Professor & Head, Department of Veterinary Physiology & Biochemistry, College of Veterinary Science & A.H., JAU, Junagadh delivered the technical presentation on "Recent advancement in In-vitro maturation (IVM) technologies in domestic animals". **Dr. V. S. Chauhan**, Senior Scientist, P & C Division, ICAR-IVRI, Izatnagar, Bareilly, UP put on technical presentation on "Future of reproductive physiological techniques with a focus on India".

## **2. Zonal (West) Level “Veterinary Physiology Quiz Competition - 2020”**

**Zonal (West) Level Veterinary Physiology Quiz Competition - 2020 FOR the EDU-EXCEL Madan trophy** was organized by the Department of Veterinary Physiology & Biochemistry at College of Veterinary Science and Animal Husbandry, Junagadh Agricultural University, Junagadh on **30<sup>th</sup> January 2020**. **Dr. A. K. Sharma**, Associate Professor and Head, Department of Veterinary Physiology & Biochemistry, COVSAH, JAU, Junagadh organized the event along with the faculty members **DR. R. J. Padodara**, **Dr. V. K. Singh**, **Dr. A. B. Odedara** and **Dr. A. A. vasava**. Total nine colleges participated in the quiz competition from different places like Post Graduate Institute of Veterinary Education And Research (PGIVER), Jaipur, Rajasthan; College of Veterinary Science & A.H., Anjora, Durg, Chhattisgarh; Arawali Veterinary College, Sikar, Rajasthan, Krantisinh Nana Patil College of Veterinary Science, Shirwal, Satara, Maharashtra; Nagpur Veterinary College, Nagpur, Maharashtra; College of Veterinary Science & A.H., A.A.U., Anand, Gujarat; Vanbandhu College of Veterinary Science and A.H., N.A.U., Navsari, Gujarat; College of Veterinary Science & A.H, S.D.A.U., SKnagar, Gujarat & College of Veterinary Science & A.H., J.A.U., Junagadh, Gujarat. From each college, two students have participated. Subsequently, after the inaugural function online screening examination was held at the examination hall, JAU, Junagadh at 11.00 a.m. At the end of the examination, the first four teams who got maximum marks were selected to participate in the final quiz.

The college team from Junagadh, Durg, Shirwal & SKnagar were got the highest marks & participated in the final quiz. Final quiz held at Seminar Hall, College of Veterinary Science & A.H., J.A.U., Junagadh at 2:30 p.m. The final quiz had five rounds contain questions from Veterinary Physiology in the form of true-false, MCQ, identify the picture & rapid fire round. All four teams participated with a brave heart & with the spirit of victory. At the end of the quiz, **Ms. Sunita Patel and Shivam Mathur** from College of Veterinary Science & A.H., Anjora, Durg, Chhattisgarh won the final quiz & Veterinary College, Shirwal was runners up. **Dr. J. R. Khan and Dr. A. K. Sharma** gave the trophy & certificates to winner team. All participants were got the certificates.

### **3. Five days Online Vocational Training on “Immunological Advancements in Male and Female Fertility”**

Department of Veterinary Physiology & Biochemistry in collaboration with Department of Veterinary Gynaecology and Obstetrics, College of Veterinary Science & A.H., Junagadh Agricultural University, Junagadh organized five days of Online Vocational Training on “**Immunological Advancements in Male and female Fertility**” from 1<sup>st</sup> to 5<sup>th</sup> September, 2020. The training was organized under the aegis of Institutional Development Plan, Indian Council of Agricultural Research, New Delhi. **Dr. K. B. Vala** Associate Professor and Head, Department of Veterinary Gynaecology and Obstetrics was organizing secretary and **Dr. A. K. Sharma**, Associate Professor and Head, Department of Veterinary Physiology & Biochemistry, COVSAH, JAU, Junagadh was the Co-organizing secretary.

One Thousand one hundred and ninety-one (1191) distinguished speakers and participants from all over the nation including the scientists, teaching faculty and students of various Agricultural University, National Research Institutes including the host Junagadh Agricultural University (JAU) registered in this Online Vocational Training. All the eminent speakers, distinguished faculties and students from all over the nation joined this training program by online Zoom app (licensed version), YouTube, Facebook and JAU live links.

The Online Vocational Training mainly focused on recent advances related to reproductive Immunological Advancements in animal sciences. The program featured demonstrations, videos, problem-solving and panel discussion by experts with students and faculties on various areas of female and male reproductive and Immunological aspects. Eminent speakers from National institutes and Various Agricultural Universities all over the nation viz. **Dr. M. L. Madan** (Ex Vice Chancellor, DUVASU, Mathura, UP), **Dr. A. K. Gahlot** (Ex Vice Chancellor, RAJUVAS, Bikaner, Rajasthan), **Dr. F. S. Kavani** (Retd. Professor & Head, Department of Veterinary Gynaecology & Obstetrics, Veterinary College, AAU, Anand, Gujarat), **Dr. G Taru Sharma** (Principal Scientist& Head, P & C Division, IVRI, Izatnagar), **Dr. G. N. Purohit** (Professor & Head Department of Veterinary Gynaecology & Obstetrics, Veterinary College, RAJUVAS, Bikaner, Rajasthan), **Dr. A. J. Dhami** (Professor & Head, Department of Veterinary Gynaecology & Obstetrics, Veterinary College, AAU, Anand, Gujarat), **Dr. B. N. Suthar** (Professor & Head, Department of Veterinary Gynaecology & Obstetrics, Veterinary College, SDAU, SKnagar, Gujarat), **Dr. S. P. Ghuman** (Professor, TVCC, GADVASU, Ludhiana, Punjab), **Dr. M. T. Panchal** (Professor, Department of Veterinary Gynaecology & Obstetrics, Veterinary College, AAU, Anand, Gujarat), **Dr. Sarita U. Gulwane** (Professor & Head, Department of Veterinary Gynaecology & Obstetrics, Veterinary College, MVC, MAFSU, Parel, Mumbai, Maharashtra) and **Dr. Dilip Swain** (Assistant Professor, Department of Veterinary Physiology, DUVASU, Mathura, UP) thoroughly discussed their relevant topics before the participants.



#### **4. Five days Online Vocational Training on “Advancements in Physiological Function Tests in Domestic Animals and Pets”**

Five Days online vocational training program on “**Advancements in Physiological Function Tests in Domestic Animals & Pets**” was organized by the Department of Veterinary Physiology & Biochemistry at College of Veterinary Science and Animal Husbandry, Junagadh Agricultural University, Junagadh under Institutional Development Plan, Indian Council of Agricultural Research, New Delhi from 1<sup>st</sup> to 5<sup>th</sup> March, 2021. **Dr. A. K. Sharma**, Associate Professor and Head, Department of Veterinary Physiology & Biochemistry, COVSAH, JAU, Junagadh was the organizing secretary. Total six hundred and six (606) participants registered from across the country. The participants were faculties and students belonging to most of the Veterinary Colleges in India. All the eminent speakers, distinguished faculties and students from all over the nation joined this training program by online Zoom app (licensed version), YouTube, Facebook and JAU live links.

The training featured demonstrations, videos, problem-solving and panel discussion by experts with students and faculties on various advancements in physiological function tests in domestic animals and pets. Eminent speakers from National institutes and Various Agricultural Universities all over the nation viz. **Dr. V. P. Vadodaria** (Former Dean & Professor of Physiology, SDAU, SKnagar, Dantiwada), **Dr. N. H. Mohan** (Principal Scientist & ICAR National Fellow, ICAR-National Research Centre on Pig, Rani, Guwahati, Assam), **Dr. Sunil Rastogi** (Prof. & Head, Dept. of Vet. Physiology & Biochemistry, COVS&AH, GBPUA&T, Pantnagar), **Dr. A. Sha. Arun** (Director- Research & Veterinary Operations, Bennerghatta Bear Rescue Centre, Bennerghatta Biological Park, Bengaluru), **Dr. Arunkumar Madan**, (Professor and Head, Department of Veterinary Physiology and Biochemistry, Veterinary College, DUVASU, Mathura, U.P.), **Dr. Ashish Mishra** (ICAR-NIANP, Adugodi, Bengaluru, Karnataka), **Dr. R .J. Padodara** (Assistant Professor, Department of Veterinary Physiology and Biochemistry, Veterinary College, JAU, Junagadh), **Dr. Ninam Jacob** (Professor and head, Department of Veterinary Physiology, Rajiv Gandhi Institute Education and Research, Puducherry), **Dr. Sunita Pareek** (Associate Professor & I/C Head, Department of Veterinary Physiology, CVAS, RAJUVAS, Bikaner, Rajasthan), **Dr. A. K. Shrama** (Associate Professor & Head, Department of Veterinary Physiology & Biochemistry, COVSAH), **Dr. K. S. Roy** (Principal Scientist, Stress Physiology Lab., NIANP-ICAR, Adugodi, Bengaluru, Karnataka), **Dr. S. W. Bonde** (Professor & University Head, Department of Veterinary Biochemistry, Nagpur Veterinary College, MAFSU, Nagpur, Maharashtra) thoroughly discussed their relevant topics before the participants. All the participants received their certificates for participation in the training.

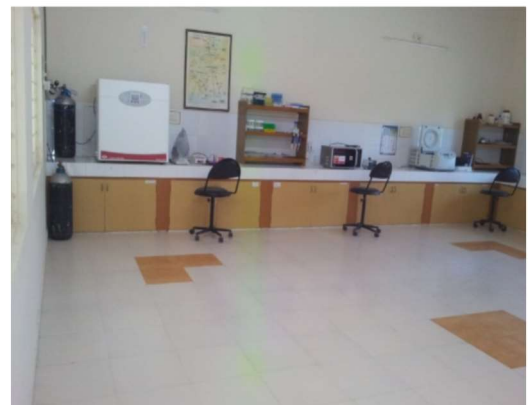


**List of current year publications (2022):**

<b>Sr. No.</b>	<b>Title of Paper</b>	<b>Full Name of Journal</b>
1	Modern approaches to contraception in domestic and wild animals: a review.	Journal of Global Ecology and Environment
2	Caffeine Supplementation in Semen Extender Protects Buffalo Spermatozoa from Cryodamage.	Indian Journal of Veterinary Sciences and Biotechnology
3	Physico-Morphological Characteristics and Oxidative Markers of Fresh Semen of Gir Bulls.	Indian Journal of Veterinary Sciences and Biotechnology
4	Diagnostic and Therapeutic Management of Subclinical Endometritis in Dairy Bovine: A Review.	Animal Reproduction Update
5	Comparative Study of Placental Cotyledons of Gir Cow and Jaffrabadi Buffalo.	Indian Journal of Veterinary Sciences and Biotechnology
6	Protective Effect of Polyherbal Extract on Gentamicin-Induced Renal Injury in Wistar Rats.	Indian Journal of Pharmaceutical Sciences
7	Clinical Management of Equine Piroplasmiasis	Indian Journal of Veterinary Sciences and Biotechnology
8	A Glimpse into Artificial Intelligence in Animal Physiology and Allied Sciences	Animal Reproduction Update
9	Hemato-biochemical studies in Theileriosis infected Gir cows and Jaffrabadi buffaloes	Indian Journal of Veterinary Sciences and Biotechnology

**Media Gallery:**

**Departmental Facilities and Routine Activities:**





**Glimpses of Departmental Activities:**

**1. National Training on “Latest Advancement in Upstream Reproductive Physiological Techniques”**



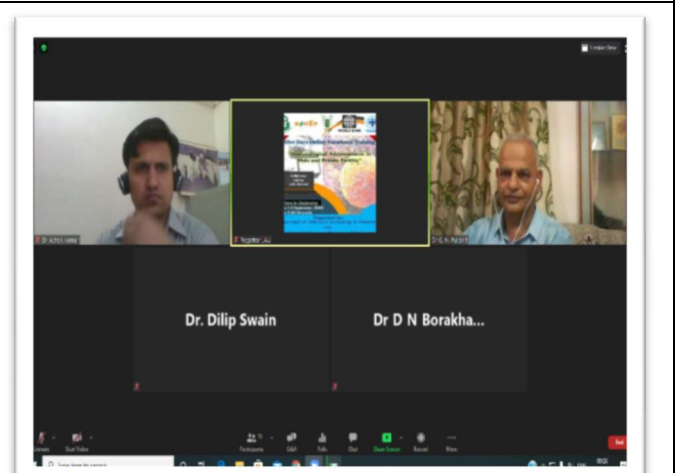




## 2. Zonal (West) Level “Veterinary Physiology Quiz Competition - 2020”

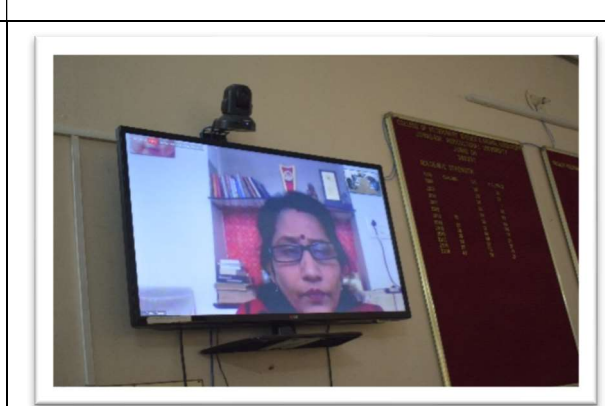
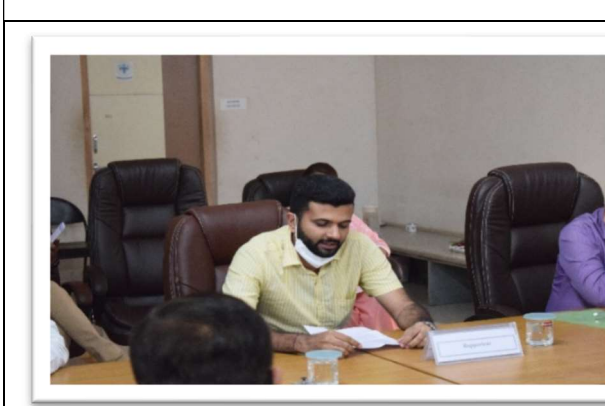
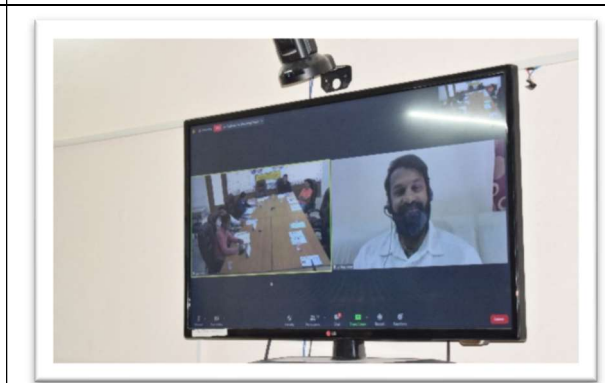


### 3. Five days Online Vocational Training on “Immunological Advancements in Male and Female Fertility”





#### 4. Five days Online Vocational Training on “Advancements in Physiological Function Tests in Domestic Animals and Pets”



**Subject / Courses offered at UG / PG / Polytechnic:****A) No. of UG courses being offered:**

Sr. No.	Subject code	Subject Title	Credit	Year
<b>Veterinary Physiology</b>				
1	VPY	Veterinary Physiology	4+1=5	I year
<b>Veterinary Biochemistry</b>				
1	VBC	Veterinary Biochemistry	2+1=3	II year

**B) No. of PG courses being offered:**

Sr. No.	Course No.	Course Title	Credit
<b>Veterinary Physiology</b>			
1	VPY 601	Physiology of Digestion	2+1
2	VPY 602	Cardiovascular and Respiratory Physiology	2+1
3	VPY 603	Renal Physiology and Body fluid dynamics	2+1
4	VPY 604	Hematology	2+1
5	VPY 605	Vitamins and Minerals in Animal Physiology	2+0
6	VPY 606	Physiology of Animal Reproduction	2+1
7	VPY 607	Clinical Physiology	2+1
8	VPY 608	Neuromuscular Physiology	2+1
9	VPY 609	Chemical Bioregulation in Physiological Functions	3+0
10	VPY 610	Research Techniques in Veterinary Physiology	0+2
11	VPY 691	Master's Seminar	1+0
12	VPY 699	Master's Research	20
13	VPY 701	Applied Physiology of Body Fluids and Electrolytes	2+1
14	VPY 702	Physiology of Animal Behaviour	2+0
15	VPY 703	Comparative Physiology of Ruminant Digestion	2+1
16	VPY 704	Advances in Neuro-endocrinology	2+1
17	VPY 705	Myophysiology and Kinesiology	2+1
18	VPY 706	Avian Physiology	2+1
19	VPY 707	Physiology of Lactation	2+1
20	VPY 708	Advances in Environmental Physiology and Growth	2+1
21	VPY 709	Advances in Rumen Microbiology and Metabolism	2+1
22	VPY 710	Advances in Immunophysiology	2+1

23	VPY 711	Physiology of Stress	2+1
24	VPY 790	Special Problem	0+2
25	VPY 791	Doctoral Seminar I	1+0
26	VPY 792	Doctoral Seminar II	1+0
27	VPY 799	Doctoral Research	45
<b>Veterinary Biochemistry</b>			
1	VBC 601	Chemistry of Animal Cell	2+0
2	VBC 602	Techniques in Biochemistry	0+2
3	VBC 603	Applications of Genomics and Proteomics in Molecular Biology	2+0
4	VBC 604	Biochemistry of Biomolecules: Carbohydrates, Lipids and Membrane's structure	2+0
5	VBC 605	Enzyme Catalysis, Kinetics, Inhibition and Regulation	2+0
6	VBC 606	Metabolism-I: Carbohydrates and Lipids	2+0
7	VBC 607	Metabolism-II: Nucleic acid and Amino acids	2+0
8	VBC 608	Metabolism-III: Integration and Regulation	2+0
9	VBC 609	Central Dogma and Protein function	2+0
10	VBC 610	Clinical Biochemistry of Animals	2+1
11	VBC 611	Biochemical basis of diseases of Domestic animals	2+0
12	VBC 612	Endocrinology and Reproductive Biochemistry	2+0
13	VBC 613	Biochemical basis of animals production	2+1
14	VBC 691	Master's Seminar	1+0
15	VBC 699	Master's Research	20
16	VBC 701	Advances in Biochemistry of Ruminant Disorders	2+0
17	VBC 702	Advances in Enzymology	2+0
18	VBC 703	Advances in Clinical Biochemistry	0+2
19	VBC 704	Membrane Dynamics and Signal Transduction in Animal Cell	2+0
20	VBC 705	Methods in Protein Analysis	2+1
21	VBC 706	Nutritional Biochemistry	2+0
22	VBC 707	Advances in Intermediary Metabolism	2+0
23	VBC 708	Endocrine Control of Fuel Metabolism	2+0
24	VBC 709	Diagnostic Enzymology-I	2+0
25	VBC 710	Diagnostic Enzymology-II	2+0
26	VBC 711	Biochemistry of Development and Differentiation	2+0

27	VBC 712	Advances in Techniques in Biochemistry	1+1
28	VBC 713	Advances in Mineral and Vitamin Metabolism and Related Diseases	2+0
29	VBC 790	Special Problem	0+2
30	VBC 791	Doctoral Seminar I	1+0
31	VBC 792	Doctoral Seminar II	1+0
32	VBC 799	Doctoral Research	45

**C) No. of Polytechnic courses being offered:**

Sr. No.	Course No.	Course Title	Credit	Semester
1	APHY-111	Introductory Animal Physiology	3+1=4	I

**Contact us:**

**Dr. Arun Kumar Sharma**

M.V.Sc., Ph.D. (Veterinary Physiology)

Associate Professor and Head,

Dept. of Veterinary Physiology & Biochemistry,

Kamdhenu University, Junagadh -362001, Gujarat

Mobile No. - 9727743994

E-mail: hodvphyjnd@kamdhenuuni.edu.in