ANNUAL REPORT
2021-22

GURU ANGAD DEV VETERINARY AND ANIMAL SCIENCES UNIVERSITY
2005
KNOWLEDGE FOR SERVICE

Guru Angad Dev Veterinary and Animal Sciences University

ANNUAL REPORT

2021-2022

GURU ANGAD DEV VETERINARY AND ANIMAL SCIENCES UNIVERSITY
LUDHIANA-141 004

Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana-141 004
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Patron : **Prof. (Dr) Inderjeet Singh**
Vice Chancellor

Chief Editor(s) :
Dr. Harmanjit Singh Banga
Registrar

Dr. Lachhman Das Singla
Director
Human Resource Management Centre

Editors :
Dr. Rakesh Kumar Sharma
Professor-cum-Head
Department of Veterinary & Animal Husbandry Extension Education

Dr. Kuldip Gupta
Professor
Department of Veterinary Pathology

Dr. Vaneet Inder Kaur
Principal Scientist (Fisheries)
Department of Aquaculture

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Department of Veterinary Parasitology

Dr. Harkirat Singh
Professor
Department of Veterinary Parasitology

Dr. Nittin Dev Singh
Professor
Department of Veterinary Pathology

Dr. Harsh Panwar
Assistant Professor
Dairy Microbiology

Dr B.V. Sunil Kumar
Biochemist
Department of Microbial and Environmental Biotechnology

Inputs for Photographs : **Dr. Harpreet Singh**
Public Relation Officer

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Ludhiana-141 004 (Punjab), INDIA. Tel.: 09354-324-903, 0161-2553320, 2553360, Fax: 0161-2553342,
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PREFACE

It gives me immense pleasure to present before you the Annual Report of Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana for the period 2021-22. This report showcases the university's diverse range of academic, research, extension, and co-curricular activities, including those undertaken by its affiliated colleges. The university has remained steadfast in its commitment to providing sustainable, consistent, and high-quality standards in teaching, research, and extension related to Veterinary & Animal Sciences since its establishment in 2005. As a testament to this commitment, the university was ranked as the second-best among the State Veterinary Universities of India for the year 2020-21.

During the academic year, the university admitted a total of 1723 students to various undergraduate, postgraduate, doctoral, and diploma programs, of which 721 were girls and 1002 were boys. The university has state-of-the-art teaching classrooms equipped with modern facilities, providing an effective learning experience for the students. In terms of research, the university had 86 research and other schemes in operation, funded by various agencies such as ICAR, DST, DBT, SERB, etc. The major research projects included the Canine Research Centre & Networks and Climate Resilient Livestock Production. The university also established the "Instructional Gaushala" under a project, funded by the Department of Rural Development and Panchayats, Government of Punjab, to develop a model Gaushala for taking care of unproductive and abandoned cattle. The university has a well-equipped veterinary hospital with modern equipment and diagnostic laboratories, providing excellent animal welfare, treatment, and diagnostic services to various stakeholders of Veterinary Sciences. During the year, the hospital treated 30,005 clinical cases of livestock and pet animals, and 23,234 clinical samples were tested.

In addition to research and academic activities, the university was also engaged in various collaborations with international institutes, transferred technologies to industry and entrepreneurs, and provided expertise services at the doorsteps of farmers during the Lumpy Skin Disease outbreak in collaboration with the State Animal Husbandry Department. The university also set up a Canine Dialysis Unit at the Multispecialty Veterinary Hospital to cater to cases of renal failure in dogs.

The co-curricular activities included participation in Inter University Sports Tournaments, State Handball and Powerlifting Championships, cultural activities, NCC, and NSS at the university and All India levels, bringing laurels to the university.

At GADVASU, we prioritize a student-ready approach, providing job-oriented quality education, undertaking need and issue-based research projects, and establishing new and strengthening existing linkages with various stakeholders of Veterinary and Animal Sciences. We also develop linkages with relevant industries to increase income through productivity enhancement, value addition, and ensuring quality and safety of animal-based foods, while also ensuring environmental protection through the use of sustainable production systems.

The university's accomplishments would not have been possible without the commitment, expertise, hard work, and passion of our staff. I hope that this Annual Report for 2021-22 serves as a valuable source of information for professionals employed in different organizations and working in the areas of livestock, poultry, dairy, and fishery development, as well as for other institutions of higher learning in the country.

Vice-Chancellor

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ABOUT THE UNIVERSITY

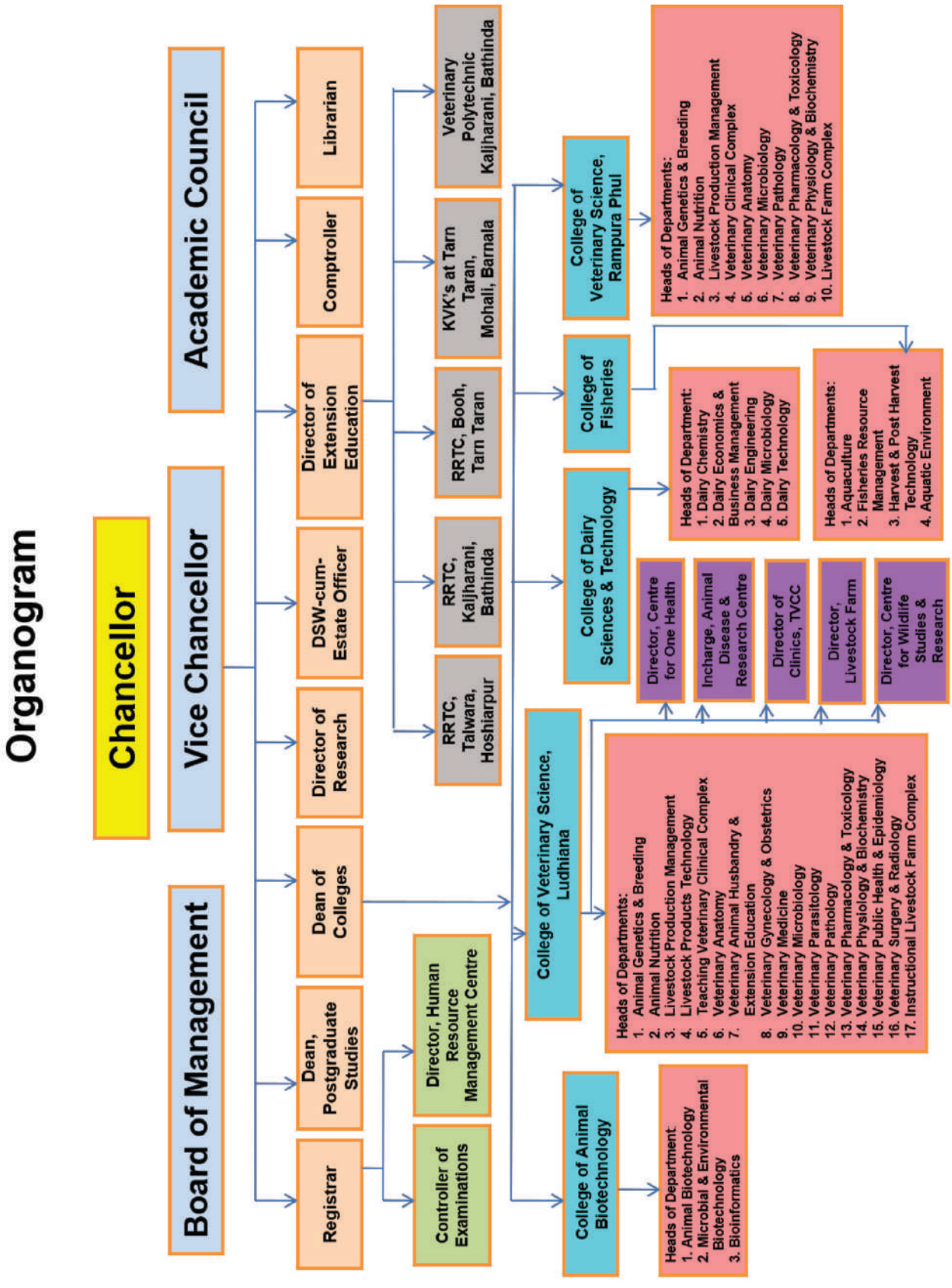
Guru Angad Dev Veterinary and Animal Sciences University (GADVASU) was established on 9th August 2005 through Punjab Act No. 16 of 2005 at Ludhiana and started functioning from 21st April 2006 initially with College of Veterinary Science which was established in the year 1969 and shifted from Punjab Agricultural University to GADVASU. Since inception, the university has grown remarkably and is already amongst the top-ranked Veterinary and Agricultural Universities across of the country. With the objective to produce highly efficient, trained, and skilled human resources with an ultimate aim to give boost to various activities of livestock, poultry and fishery sectors of Punjab, College of Dairy Science and Technology, College of Fisheries, College of Animal Biotechnology and Veterinary Polytechnic for teaching, research and extension in the respective fields were established by the university. One constituent veterinary college at Rampura Phul, Bathinda has also become functional from the academic session 2019-20 to cater for the ever-increasing demands of professionally qualified veterinary graduates in the state. Furthermore, Regional Livestock Research and Training Centres at Kaljharani (Bathinda), Talwara (Hoshiarpur) and Booh (Tarn Taran) were established for catering the region-specific needs of the stakeholders of dairy sector. Three Krishi Vigyan Kendras were established at Tarn Taran, Barnala and Mohali districts of Punjab for the technology assessment, dissemination, refinement and demonstration. Moreover, a first of its kind initiative has been taken by establishing a Multi-Specialty Veterinary Hospital and Regional Research Centre (MSVH&RRC) at village Sappanwali, Abohar, Fazilka with dedicated area specific specialized services, diagnostic facility, surgical suites and a spectrum of technologies to assist clinicians in the diagnosis and treatment of complex disease conditions leading to much needed respite to the farmers.

The University has been recognized by the University Grants Commission (UGC) to receive central assistance under the Section 12(B) of UGC Act, 1956. The vet varsity has also got accreditation from the UGC and Indian Council for Agricultural Research (ICAR) and has been admitted as a regular member of the Association of Indian Agricultural Universities (AIAU) and Association of Indian Universities (AIU). The ICAR has accredited the university and its four constituent colleges *viz*., College of Veterinary Science, College of Dairy Science and Technology, College of Fisheries, and College of Animal Biotechnology for a period of 5 years (up to 31.03.2023) with grade 'A'. The School of Animal Biotechnology was upgraded to College of Animal Biotechnology & School of Public Health and Zoonoses to Centre for One Health in the year 2019 and 2021, respectively. Besides, in the year 2021, the Directorate of Human Resource Management was established, with the aim to process with accelerated emphasis on harnessing of various activities for the continuous growth and development of human resources of the university with greater zeal embarking upon both managerial and operational activities. The ICAR has ranked GADVASU as 2nd among the State Veterinary Universities of India for the year 2020-21.

The University was established with the following goals and objectives:

- ✓ To provide adequate supply of well-trained universally competent veterinary, animal husbandry, dairy and fishery professionals including Master's and Doctorate level specialists capable of handling animal health and production aspects according to the needs of the State.
- ✓ To undertake multi-disciplinary research in priority areas to address the problems of veterinary, animal husbandry, dairy, and fishery sectors.
- ✓ To foster faculty development by providing them opportunities to participate in appropriate training programs, conferences, workshops, seminars, symposia, etc. and avail opportunities in exchange programs.
- ✓ To provide continuing professional education in veterinary, animal, dairy, and fishery sciences.
- ✓ To provide consultancy, expert opinion and specialist services to livestock owners, government, and other agencies for Livestock Policy Formation.
- ✓ To run Multi-specialty Veterinary Hospital for treatment of animals and to provide clinical training to the students.
- ✓ To encourage cooperation and collaboration with other departments, colleges, universities, and industries, both at national and international levels.
- ✓ To undertake extension education activities to extend the knowledge and technology to the end users, i.e., farmers, industry, government, marketing sector, etc.

ORGANIZATIONAL SETUP

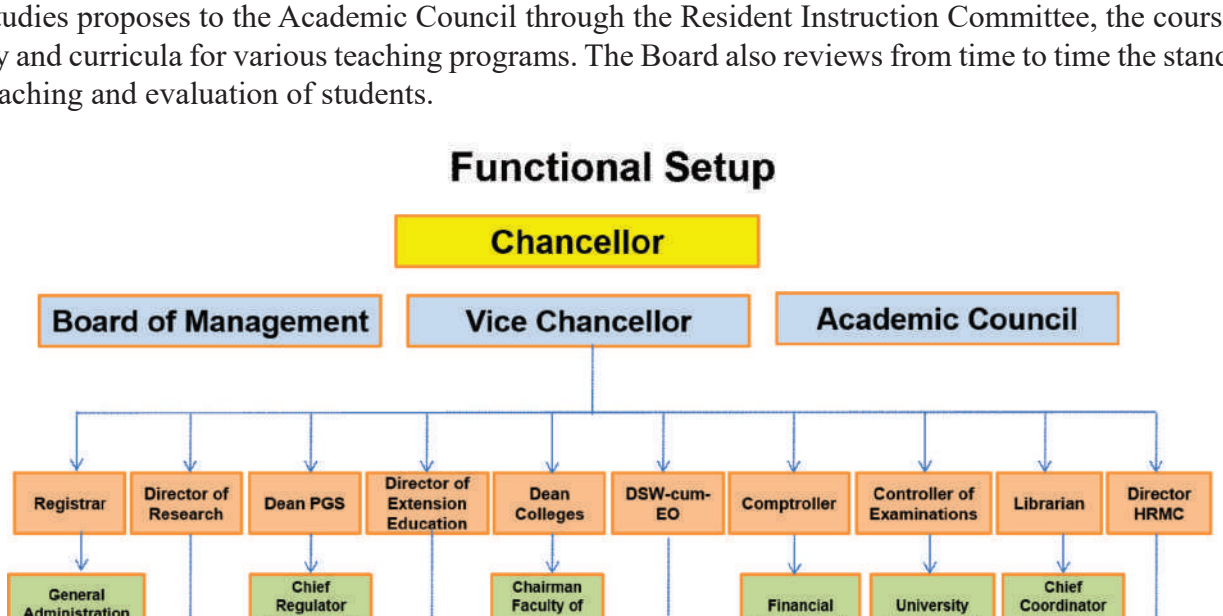


FUNCTIONAL SETUP

The functioning of GADVASU is governed by the following bodies primarily focussing the education, research, and extension activities:

- Board of Management
- Academic Council
- Committee on Students' Welfare
- Research Advisory Committee
- Extension Education Advisory Committee
- Resident Instruction Committee
- Postgraduate Committee
- Board of Studies

The Board of Management is the highest administrative body that controls the finances and assets of the university, appointments of all officers and teachers & provides an overall guidance on running of the university. The Academic Council administers the academic functions of the university and is responsible for maintenance of standards of the institution, education, and examination. Committee on Students' Welfare regulates various activities related to the students. The Research Advisory Committee regulates the allocation of funds for research, conditions for accepting the grants and other matters regarding research programs of the university. The Extension Education Advisory Committee coordinates extension programs of the institute with the state and centre and devises ways and means to implement the extension education programs run by the university. The Resident Instruction Committee makes recommendations to the Academic Council concerning the new curricula and arrangement, alteration, and abolition of existing curricula. The Postgraduate Committee examines the courses and curricula for postgraduate students recommended by the Board of Studies before submission to the Academic Council. The Board of Studies proposes to the Academic Council through the Resident Instruction Committee, the courses of study and curricula for various teaching programs. The Board also reviews from time to time the standards of teaching and evaluation of students.



ADMINISTRATION

BOARD OF MANAGEMENT

S. No.	Member of the Board of Management	Designation
1.	Shri. Banwari Lal Purohit Hon'ble Governor Punjab & Chancellor, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab Raj Bhawan, Chandigarh	Honorary Chairman
2.	Dr. Inderjeet Singh Vice-Chancellor, Guru Angad Dev Veterinary & Animal Sciences University, Ludhiana	Working Chairman
3.	Shri Anirudh Tiwari IAS, Chief Secretary to Government of Punjab, Room No. 26, 6th Floor, Punjab Civil Secretariat, Sector-1, Chandigarh	Ex-officio Member
4.	Smt Ravneet Kaur IAS, Special Chief Secretary, Department of Animal Husbandry, Dairy Development & Fisheries, Punjab, Room No. 327, 3rd Floor, Punjab Civil Secretariat-2, Sector-9, Chandigarh	Ex-officio Member
5.	Shri D.K. Tiwari IAS, Financial Commissioner, Department of Agriculture and Farmers Welfare, Punjab, Room No. 523, 5th Floor, Punjab Civil Secretariat-1, Sector-2, Chandigarh	Ex-officio Member
6.	Shri K.A.P Sinha IAS, Principal Secretary, Department of Finance Punjab, Room no. 10, 8th Floor, Punjab Civil Secretariat-1, Sector-1, Chandigarh	Ex-officio Member
7.	Dr. B.N. Tripathi Deputy Director General (Animal Sciences), Division of Animal Science, Krishi Bhawan, ICAR, New Delhi	Ex-officio Member
8.	Dr. H.S. Kahlon Director of Animal Husbandry, Punjab, Livestock Complex, 2nd Floor, Sector-68, Near Army Law College, SAS Nagar, Mohali	Ex-officio Member
9.	Shri Karnail Singh Director, Dairy Development, Punjab, Livestock Complex, 4th Floor, Sector-68, Near Army Law College, SAS Nagar, Mohali	Ex-officio Member
10.	Dr. Rajinder Kumar Kataria Director and Warden of Fisheries, Punjab, Livestock Complex, 4th Floor, Sector-68, Near Army Law College, SAS Nagar, Mohali 160062	Ex-officio Member
11.	Dr. J.P.S. Gill Director of Research, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana	Ex-officio Member
12.	Shri Kamaldeep Singh Sangha IAS (Retd.), Managing Director, Milkfed, Punjab, SCO No. 153-155, Sector 34-A, Chandigarh	Non-officio Member
13.	Dr. Sarabjit Singh Randhawa Veterinary Officer, Masania, 6-Sant Rasila Avenue, Batala and Deputy Director, Animal Husbandry (Additional Charge), Jalandhar	Non-officio Member

14.	Dr. Harpreet Singh Thind Incharge and Quality, Control Officer, Semen Bank, Nabha	Non-officio Member
15.	Shri Surinder Singh Dhindsa S/o Late Sh. Bhagat Singh Rehpa Buffalo Farm, village Rehpa, PO Hakimpur, district SBS Nagar, Punjab	Non-officio Member
16.	Shri Kanwardeep Singh S/o Sh. Charnjeet Singh Randhawa Fresh Dairy, village Bassarpura, near Batala, district Gurdaspur	Non-officio Member
17.	Shri Baljinder Singh Boparai 8530, 241 Street Bellerose, New York, NY 11426, USA (4, Urban Estate, Batala, Distt. Gurdaspur)	Non-officio Member
18.	Mrs. Karamjeet Kaur Danewalia W/o Sh. Jasbir Singh Danewalia VPO Danewalia, Satkoshi, tehsil Abohar, district Fazilka (Mailing Adress: H. No. 25-A, Bollywood Green City, Sector-113, Landran Raod, SAS Nagar, Mohali)	Non-officio Member
19.	Dr. Baljit Singh, FCAHS, BVSC&AH, PhD 3M National Teaching Fellow, Vice-President, Research University of Saskatchewan, Canada, S7N5A2	Non-officio Member
20.	Shri D.K. Tiwari IAS, Vice-Chancellor (Additional Charge) PAU, Ludhiana	Special Invitee
21.	Dr. Harmanjit Singh Banga Registrar, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana	Secretary

OFFICERS OF THE UNIVERSITY

S. No.	Name	Designation
1.	Dr. Inderjeet Singh	Vice-Chancellor
2.	Dr. Harmanjit Singh Banga	Registrar
3.	Dr. Jatinder Paul Singh Gill	Director of Research
4.	Dr. Sanjeev Kumar Uppal	Dean Postgraduate Studies
5.	Dr. Parkash Singh Brar	Director of Extension Education
6.	Dr. Satyavan Rampal	Director Student Welfare-cum-Estate Officer
7.	Dr. Sarvpreet Singh Ghuman	Dean, College of Veterinary Science, Ludhiana
8.	Dr. Manish Kumar Chatli	Dean, College of Veterinary Science, Rampura Phul
9.	Dr. Meera D. Ansal	Dean, College of Fisheries
10.	Dr. Ramneek Verma	Dean, College of Dairy Science and Technology
11.	Dr. Yashpal Singh Malik	Dean, College of Animal Biotechnology
12.	Dr. Digvijay Singh	University Librarian
13.	Dr. Amarjit Singh	Comptroller
14.	Dr. Anil Kumar Arora	Controller of Examinations
15.	Dr. L.D. Singla	Director, Human Resource Management Centre

ACADEMIC COUNCIL

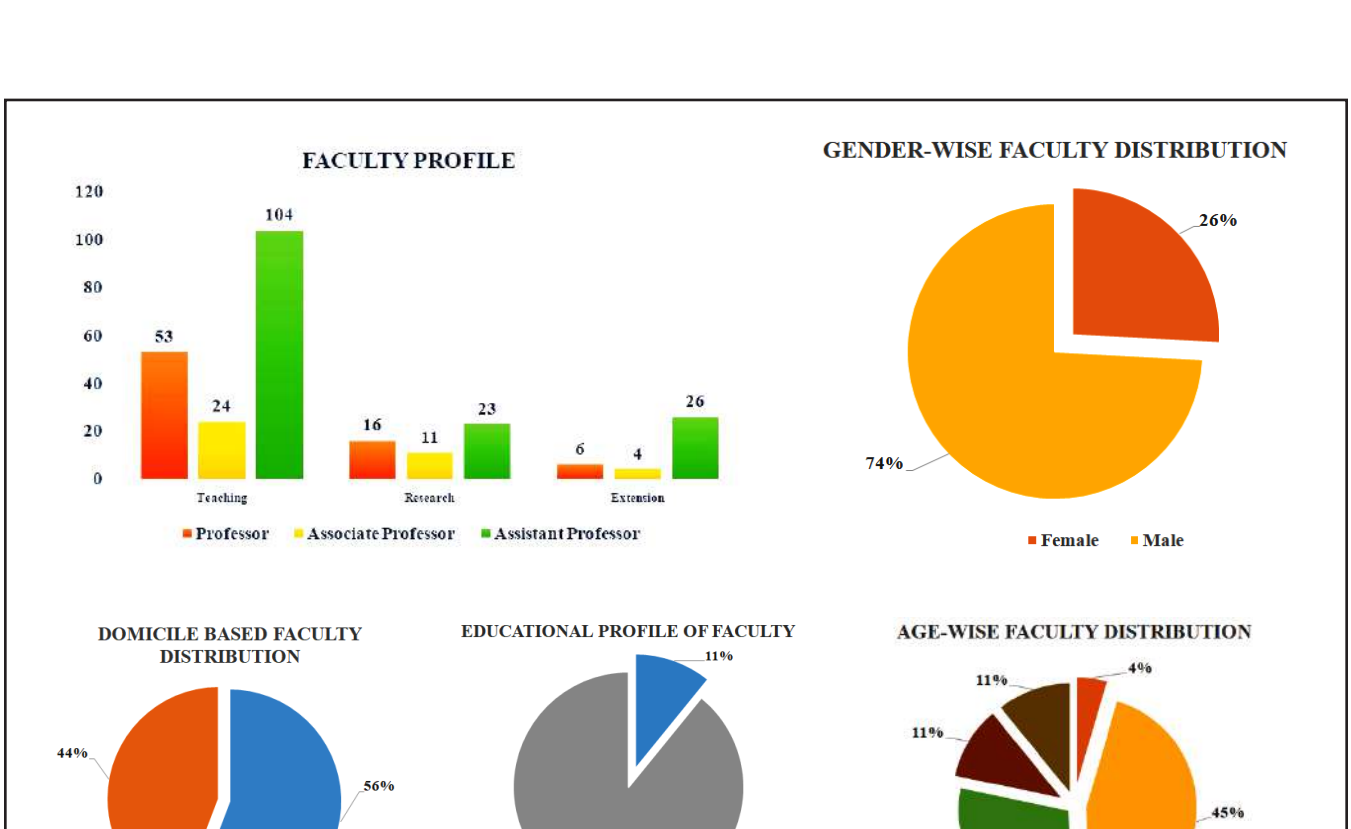
S. No.	Member of Academic Council	Designation
1.	Dr. Inderjeet Singh Vice-Chancellor	Chairman
2.	Dr. J.P.S. Gill Director of Research	Member
3.	Dr. Sanjeev Kumar Uppal Dean, Postgraduate Studies	Member
4.	Dr. Parkash Singh Brar Director of Extension Education	Member
5.	Dr. Sarvpreet Singh Ghuman Dean, College of Veterinary Science, Ludhiana	Member
6.	Dr. Ramneek Verma Dean, College of Dairy Science & Technology	Member
7.	Dr. Meera D. Ansal Dean, College of Fisheries	Member
8.	Dr. Yashpal Singh Malik Dean, College of Animal Biotechnology	Member
9.	Dr. Manish K. Chatli Dean, College of Veterinary Science, Rampura Phul, Bathinda	Member
10.	Dr. Vaneet Inder Kaur Principal Scientist (Fisheries), Department of Aquaculture	Member
11.	Dr. Charanjit Singh Randhawa Professor-cum-Head, Department of Veterinary Medicine	Member
12.	Dr. (Mrs.) Varinder Pal Uppal Professor-cum-Head, Department of Veterinary Anatomy	Member
13.	Dr. Sandeep Sodhi Kakkar Sr. Biochemist-cum-Head, Department of Dairy Biochemistry	Member
14.	Dr. R.S. Sethi Professor-cum-Head, Department of Animal Biotechnology	Member
15.	Dr. Satyavan Rampal Director of Student Welfare-cum-Estate Officer	Special Invitee
16.	Dr. A.K. Arora Controller of Examinations	Special Invitee
17.	Dr. Harmanjit Singh Banga Registrar	Secretary

FACULTY PROFILE

There are a total of 267 faculty members on the rolls of the university. Among them 75 are Professors or equivalent (two on contract), 39 Associate Professors or equivalent (one on contract) and 153 Assistant Professors or equivalent. One hundred and eighty-one faculty members (three on contract) are working in teaching schemes, 50 in research schemes and 36 in extension schemes. Approximately, one–fourth of the faculty members are females, 89% hold doctoral degree and 44% are of Punjab domicile. The university had 49% faculty below 40 years of age.

FACULTY STRENGTH

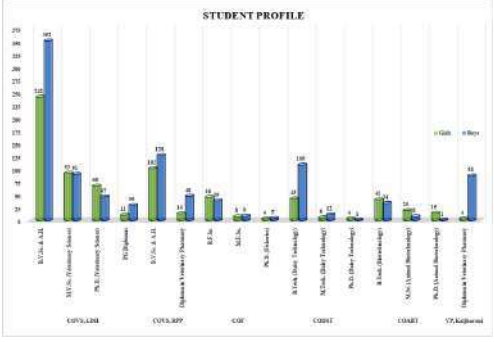
Scheme	Professor	Associate Professor	Assistant Professor	Total
Teaching	53	24	104	181
Research	16	11	23	50
Extension	06	04	26	36
Total	75	39	153	267

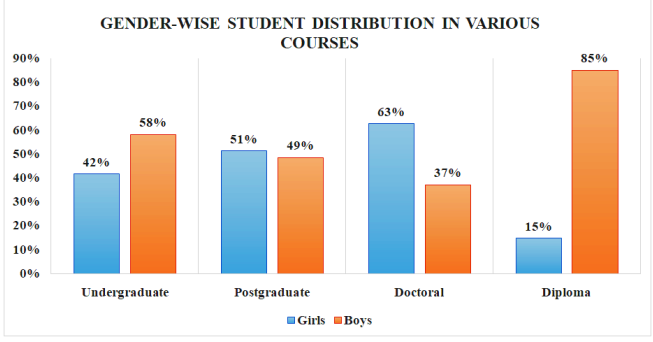


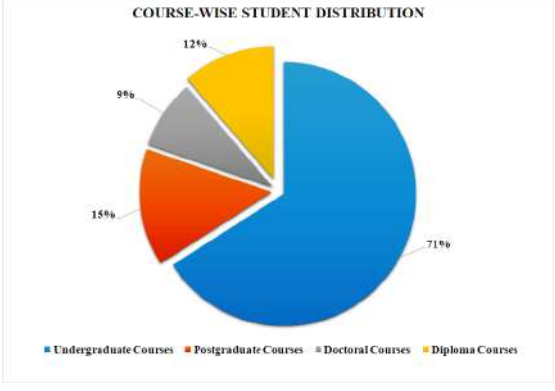
STUDENTS' PROFILE

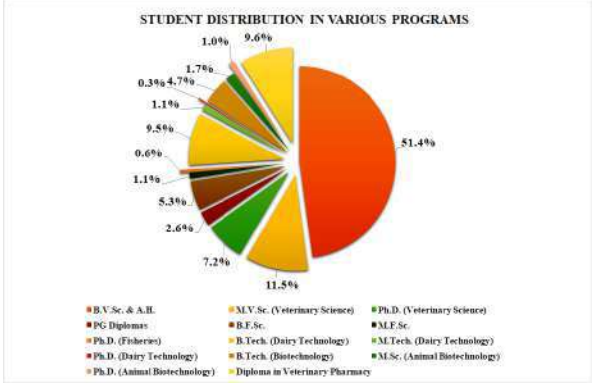
The total strength of students for the year 2021-22 and their gender wise distribution in various degree/diploma programs offered by various colleges of the university is as under:

College	Degree/Diploma Programs	Girls	Boys	Total
COVS, Ludhiana	B.V.Sc. & A.H.	242	352	594
	M.V.Sc. (Veterinary Science)	93	91	184
	Ph.D. (Veterinary Science)	68	47	115
	PG Diplomas	11	30	41
COVS, Rampura Phul	B.V.Sc. & A.H.	102	128	230
	Diploma in Veterinary Pharmacy	14	48	62
COF	B.F.Sc.	46	39	85
	M.F.Sc.	08	09	17
	Ph.D. (Fisheries)	04	05	09
CODST	B.Tech. (Dairy Technology)	43	109	152
	M.Tech. (Dairy Technology)	06	12	18
	Ph.D. (Dairy Technology)	04	01	05
COABT	B.Tech. (Biotechnology)	41	34	75
	M.Sc. (Animal Biotechnology)	20	08	28
	Ph.D. (Animal Biotechnology)	15	01	16
VP, Kaljharani	Diploma in Veterinary Science & Animal Health Technology	04	88	92
TOTAL		721	1002	1723









FINANCIAL REPORT

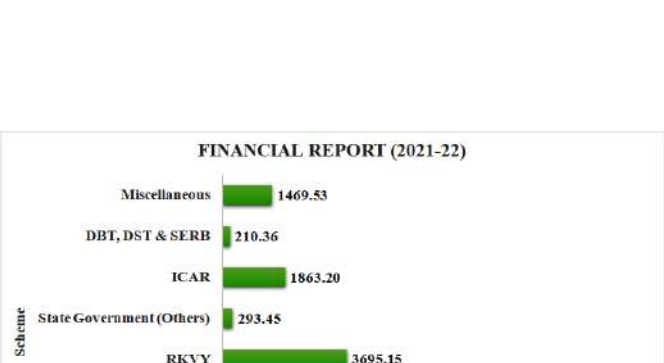
In the financial year 2021-22, the university was allocated a total grant of Rs. 17936.33 lakhs comprising Rs. 9646.51 lakhs under State Non-Plan Veterinary Schemes, Rs. 758.14 lakhs under Plan Schemes, Rs. 3695.15 lakhs under RKVY Schemes and Rs. 293.45 lakhs under Other State Government Schemes. In addition, the university also received Rs. 1863.20 lakhs under ICAR Schemes/ Projects, Rs. 210.36 lakhs from DBT, DST & SERB Schemes and Rs. 1469.53 lakhs from Miscellaneous funding agencies.

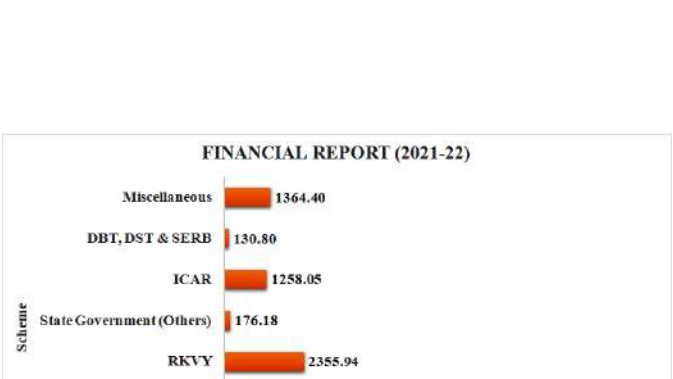
The total expenditure of the university for the year 2021-22 was Rs. 14959.15 lakhs, which included Rs. 9198.79 lakhs under State Non-Plan Veterinary Schemes, Rs. 475.00 lakhs under Plan Schemes, Rs. 2355.94 lakhs under RKVY schemes, Rs. 176.18 lakhs under Other State Government Schemes, Rs. 1258.05 lakhs under ICAR Schemes/Projects and Rs. 130.80 lakhs under DBT, DST & SERB schemes and Rs. 1364.40 lakhs under Miscellaneous schemes.

Financial statement indicating budget allocated and amount spent (rupees in lakhs) under various schemes/projects during financial year 2021-22

S. No.	Scheme	Total Budget Allocated*	Expenditure
1.	State Non- Plan Veterinary	9646.51	9198.79
2.	Plan	758.14	475.00
3.	RKVY	3695.15	2355.94
4.	State Government (Others)	293.45	176.18
5.	ICAR	1863.20	1258.05
6.	DBT, DST & SERB	210.36	130.80
7.	Miscellaneous	1469.53	1364.40
TOTAL		17936.33	14959.15

*Allocated budget includes the budget revalidated, grant received, and income generated





ACADEMIC UNITS

There are Six constituent colleges of Guru Angad Dev Veterinary and Animal Sciences University *viz*. College of Veterinary Science, Ludhiana; College of Dairy Science & Technology; College of Fisheries; College of Animal Biotechnology; College of Veterinary Science, Rampura Phul; and Veterinary Polytechnic College, Kaljharani (Bathinda). Besides, the University has also established 'Centre for One Health' for carrying out multi-disciplinary research at the national and international arena. Four Regional Livestock Research & Training Centres at Kaljharani (Bathinda), Talwara (Hoshiarpur), Booh (Taran Taran) and Sappanwali (Fazilka), as well as three Krishi Vigyan Kendras at Booh (Taran Taran), Handiya (Barnala) and Majri (SAS Nagar, Mohali) cater the area specific requirements of the livestock owners. Apart from that, the university also has two affiliated colleges *viz*. Khalsa College of Veterinary & Animal Sciences, Amritsar, and Baba Hira Das Ji College of Veterinary Pharmacy, Badal, Sri Muktsar Sahib.

College of Veterinary Science, Ludhiana

The mission of the college is to produce quality veterinary graduates, scientists and extension workers for promoting livestock health, by prevention of diseases, increasing production and reproduction; thereby, improving the quality of rural life in Punjab. Under the mission, the college carries out undergraduate and postgraduate teaching, research and extension education programs in various disciplines pertaining to livestock production and health. It is recognized by the Veterinary Council of India (VCI) and has been accredited by the Indian Council of Agricultural Research (ICAR) with an overall score of five. The College is an epicentre of regional, national and international excellence in research and learning in animal health and production. It caters to the needs of not only Punjab but its adjoining states as well by carrying out teaching, research and extension education programs pertaining to livestock production and health and has been instrumental in ushering an era of 'White Revolution' in the state.

The college has 17 departments with excellent teaching and research laboratory facilities and adequate infrastructure for the undergraduate and postgraduate teaching and research, along with a well-equipped Veterinary Teaching Hospital to cater to the demands of large and small animal health care. The college also has an Animal Disease Research Centre to provide quick and reliable disease diagnosis and advise treatment to the livestock owners, and Directorate Livestock Farms that has an elite dairy herd and poultry farm which provides adequate facilities for teaching and research. In addition, the college also has the first Collaborative Research Centre of India for Veterinary Ayurveda, established in the year 2017 by the Central Council of Research in Ayurvedic Sciences (CCRAS), Ministry of AYUSH, Government of India. In 2018, an intramural research project with a budget of Rs. 40 lakhs was awarded by the Ministry of AYUSH to establish a Medicinal Plant Garden at GADVASU for demonstration and to create awareness among farmers and general public about the use and application of medicinal plants. The college was also granted a DBT-GADVASU Canine Research Centre and Networks project in the year 2018 in collaboration with TANUVAS with a Project Monitoring Unit at GADVASU with a budget of approx. Rs. 1.38 crores.

An ICAR and World Bank sponsored prestigious project, under the National Agricultural Higher Education Project (NAHEP), entitled "Institutional Development Plan for Improved Learning Outcome, Skill and Entrepreneurship at GADVASU" is operational in the university. The project is on 50:50 cost sharing basis between the World Bank and Government of India. The project was formulated with a total budget of Rs. 1100 crores for five years, starting from 2017-2018. The university has bagged a share worth of Rs. 2447.48 lakhs starting from August 2019.

College of Veterinary Science, GADVASU, Ludhiana is the only veterinary college in India having

three ICAR Centres of Advanced Faculty Training (CAFT) in the Departments of Veterinary Surgery and Radiology, Veterinary Gynecology and Obstetrics, and Veterinary Pathology. In addition, the departments of Teaching Veterinary Clinical Complex, Veterinary Medicine, Livestock Products Technology and Livestock Production Management have experiential learning projects.

The college offers following programs of veterinary education:

- B.V.Sc. & A.H. (5½ years)
- M.V.Sc. (2 years) in 15 disciplines
- Ph.D. (3 years) in 15 disciplines

The program leading to the award of the B.V.Sc. & A.H. degree is designed to equip the graduates with the knowledge and skills essential for a veterinary career. The program is as per the Minimum Standards of Veterinary Education 2016 (MSVE-2016) of VCI and the degree is of 5.5 years with one year internship. The successful completion of B.V.Sc. & A.H. program entitles the graduates for registration with the Punjab State Veterinary Council/Veterinary Council of India as registered veterinary practitioners.

Student intake capacity

Program of Study	Number of Seats
B.V.Sc & A.H (5½ years)	60 – For residents of Punjab State and Union Territory of Chandigarh through merit of NEET (UG) 12 - Candidates nominated by the VCI 08 - Self financed seats 15 - NRI seats 01 – Kashmiri migrants
M.V.Sc. (2 years)	47 - For residents of Punjab State and Union Territory of Chandigarh 31 - ICAR nominees 10 - NRI seats 02 - Self-financed seats (two in each discipline) 01 - Kashmiri migrants
Ph.D. (3 years)	22 - For residents of Punjab State and Union Territory of Chandigarh. 16 - ICAR nominees 05 - NRI seats 02 - Self-financed seats in each discipline

Further, the College of Veterinary Science, Ludhiana also offers Post Graduate Diploma and Short & Certificate Courses, as per the details given below:

Name of Postgraduate Diploma (PGD)	No. of seats	Eligibility Qualifications*	Course Duration
PGD in Large Animal Reproduction	05	B.V.Sc. & A.H	01 year (02 Semesters)
PGD in Small Animal Clinical Practice	06	B.V.Sc. & A.H	01 year (02 Semesters)
PGD in One Health (Distance Learning Program)	20	Graduate/ Post Graduate in any science, preferably health sciences (Veterinary, Medicine, Dentistry, Alternative Medicine, Nursing, Pharmacy) and Forestry and Environmental Science	01 year (02 Semesters)

PGD in Bovine Clinical Practice	06	B.V.Sc. & A.H	01 year (02 Semesters)
PGD in Equine Clinical Practice	06	B.V.Sc. & A.H	01 year (02 Semesters)

Short and Certificate Courses

Name of Certificate Course (CC)/ Short Course (SC)	No. of Seats	Eligibility Qualifications	Course Duration
SC in Veterinary Diagnostic Imaging	3	B.V.Sc. & A.H	6 Weeks
SC in Small Animal Anaesthesia	3	B.V.Sc. & A.H	6 Weeks
CC in Veterinary Diagnostic Imaging (Part-Time, On- campus requirement 1 week/ month)	3	B.V.Sc. & A.H	6 Months
CC in Small Animal Anaesthesia (Part-Time, On- campus requirement 1 week/ month)	3	B.V.Sc. & A.H	6 Months
CC in Embryo Transfer Technology in Farm Animals	7	B.V.Sc. & A.H	6 Months
CC in Semen Handling and Artificial Insemination	7	B.V.Sc. & A.H	6 Months
CC in Veterinary Forensic Science	10	B.V.Sc. & A.H	6 Months
CC in Laboratory Diagnostics	10	Graduate	6 Months
Online SC in Extension and Entrepreneurship Management	20	B.V.Sc. & A.H./ B.F.Sc. /B.Sc. (Agric/Med/ Zool/ Fisheries/Home Science)/B.Tech. (Bio Technology/ Dairy Technology/ Food Technology)	6 Weeks
Online SC in Feed and Fodder Technology	20	Any Graduate	6 Weeks
Online SC in Poultry Science	20	Any Graduate	6 Weeks
Online Course in Ethnoveterinary Practices	30	Veterinary graduates/ Veterinary Diploma holder or farmers with minimum matriculation qualification	2 Weeks
Advance Training Course on Important Veterinary Clinical Procedures	6	B.V.Sc. & A.H. or equivalent	3 Weeks
Please refer prospectus for additional details			

College of Veterinary Science, Rampura Phul, Bathinda

The College of Veterinary Science, Rampura Phul started functioning from the year 2019 as one of the constituent colleges of the Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (Punjab). The college has the requisite facilities as prescribed by VCI for the first & second professional B.V.Sc. & A.H. degree program. The college offers B.V.Sc & A.H (5½ years) program of veterinary education.

Student intake capacity

Program of Study	Number of seats
B.V.Sc & A.H (5½ years)	68- For residents of Punjab State and Union Territory of Chandigarh through merit of NEET 12- Self financed seats 01 - Kashmiri migrants
Diploma in Veterinary Science & Animal Health Technology (2 years)	40-For residents of Punjab State and Chandigarh 40 -self financed

Further, the College of Veterinary Science, Rampura Phul also offers certificate and short courses, as per the details given below:

Name of Certificate Course (CC)/ Short Course	**No. of Seats**	**Eligibility Qualifications***	**Course Duration**
CC in Artificial Insemination Technician	20	10+2 with Science stream	3 Months
SC in Scientific Dairy Farming	20	Minimum 10th Standard	6 Weeks
SC in Backyard Poultry Farming	20		6 Weeks
SC in Veterinary Laboratory Techniques	20	Diploma in Veterinary Science & Animal Health Technology	6 Weeks
SC in Health Care and Management of Dogs	20		6 Weeks
Short Course in Feed Processing Technology	10		6 Weeks
Please refer prospectus for additional details			

Centre for One Health

The prime mandate(s) of the Centre are: teaching, research and extension activities in the field of zoonoses, milk and meat hygiene, food safety, environmental hygiene and epidemiology. The Centre is working with many prestigious research agencies, including, DBT, UGC, Gates Foundation, ICAR, ICMR in projects on Zoonoses, Food Safety and Environmental Health. The Centre has many past and ongoing collaboration(s) with reputed foreign institutes like Royal Veterinary College, London; University of Sydney, Australia; University of Saskatchewan, Canada. There are also active ongoing collaborations with medical colleges and hospital(s) to generate evidence-based data for endemic zoonoses and food safety related issues. The Centre is associated with epidemiological research and awareness drives on many important zoonoses, including brucellosis, tuberculosis, rabies, cysticercosis, hydatidosis, food safety organisms, environment contaminants etc. The Centre for One Health also offers one-year Post-graduate Diploma program in 'One Health' for capacity building amongst the professional(s) of various health sector(s).

College of Dairy Science and Technology, Ludhiana

College of Dairy Science & Technology, Ludhiana is one of the leading institutions of dairy education and research at national level. It was established in the year 2008 as one of the constituent colleges of GADVASU, to meet the trained manpower requirements of dairy and food processing industries, government departments and R&D organizations. To impart the quality education and training of students, it is equipped with excellent infrastructure in terms of state-of-the-art classrooms and laboratories with advanced analytical instruments facilities. Moreover, the college also has an Experimental Dairy Plant which is working round the year and facilitates hand-on-training of students. Development of new technologies in the field of milk processing and dairy products development as well as their transfer to end users is another important objective of the college. Besides physical infrastructures, college is also blessed with a pool of young and dynamic faculty with an exposure of working at premier institutes of international repute. Accreditation of our academic programs by ICAR, New Delhi with 'A' grade in itself reflects the quality of education and training imparted at this college. Job oriented undergraduate program of B.Tech. (Dairy Technology) is one of the most sought after and flagship program of the college. It is a four-year degree program during which students are trained in such way so that they fit in for both technical and managerial jobs in dairy and food industry. The college also offers Masters degree in five disciplines i.e Dairy Technology, Dairy Engineering, Dairy Chemistry, Dairy Microbiology and Agricultural Economics. The college also offers Ph.D program in these disciplines except Dairy Chemistry. During their degree program, Masters and PhD students are supposed to conduct theme specific research, generate data and documentation in the form of thesis, research papers, patents etc. The college has a number of active collaborations with industry and a academic/research institutes at national and international level which gives our students an opportunity to work and learn under dynamic research environment. Besides working in different dairy and food industries in India our students are also spread across the world in countries like USA, New Zealand, Canada, Australia etc. for their higher education and jobs. The courses offered at the college ensure overall development of students as highly professional dairy specialists through modern education, research and training in dairy science and technology. The college also provides facility of Campus Placement and most of our students get jobs through campus placements. Industries like Verka, Amul, Nestle, Baani etc. have previously visited our campus to hire our students through campus placement.

Student intake capacity

Program	Available seats
B.Tech. (Dairy Technology) (4 years)	35 - For residents of Punjab State and Union Territory of Chandigarh
	07 - Nominees of the ICAR
	03 - Self Financed seats
	02 - NRI candidates
	05- Candidates from other states 01 – Kashmiri migrants
M.Tech. (Dairy Technology, Dairy Engineering, Dairy Microbiology and Dairy Chemistry)	08- For residents of Punjab State and Chandigarh 04 - Nominees of the ICAR
M.Sc. Agricultural Economics (Animal Husbandry)	02- For residents of Punjab State and Chandigarh 01-Nominees of the ICAR

Ph.D. (Dairy Technology, Dairy Engineering, Dairy Microbiology)	03- For residents of Punjab State and Chandigarh 03- Nominees of the ICAR
Ph.D. Agricultural Economics (Animal Husbandry)	01- For residents of Punjab State and Chandigarh 01- Nominees of the ICAR

College of Fisheries, Ludhiana

To provide an effective technical and outreach backup to the fisheries sector of the state for further expansion and development in terms of productivity and sustainability, College of Fisheries, GADVASU, spread over 6 ha area, was established in April, 2008 to develop qualified human resource in fisheries, to carry out basic, applied and adaptive research for higher fish productivity and to disseminate the developed technologies to farmers and entrepreneurs for commercial adoption. The College of Fisheries has five departments, namely Aquaculture, Fisheries Resource Management, Aquatic Environment, Fish Processing Technology and Fish Engineering. College has competent and experienced faculty and is well equipped with both laboratory and farm facilities, including instructional cum research farm for experiential learning, trainings and demonstrations, to carry out teaching, research and extension activities efficiently. The college offers the following academic programs:

Student intake capacity

Program	Available seats
B.F.Sc. (4 years)	22 - For residents of Punjab and Chandigarh 06 - Nominees of the ICAR 02 - Self financed seats 01 - NRI seats 10 - Candidates from other states 01 - Kashmiri Migrants
M.F.Sc. (Aquaculture, Fisheries Resource Management, Aquatic Environment Management, Fish Processing Technology)	09 - For Residents of Punjab and Chandigarh 04 - Nominees of the ICAR
Ph.D. (Aquaculture, Fisheries Resource Management, Aquatic Environment Management)	06 - For Residents of Punjab and Chandigarh 03 - Nominees of the ICAR

The curriculum of the four year UG degree program (B.F.Sc.) has been adopted as per recommendations of the 5th Deans' Committee of the Indian Council of Agricultural Research (ICAR) from academic session 2016-17 and is divided into eight semesters. During the first six semesters, courses (theory and practical) cover taxonomy, anatomy, physiology, biology, biochemistry, culture techniques, nutrition, breeding, disease management, aquatic ecology, genetics, biotechnology, culture and capture fisheries resources and their management, post-harvest technology/fish processing, marketing and trading, economics and statistical methods and extension education. Under STUDENT READY PROGRAM, the students take up 'In-Plant Training Program' during the 7th semester, which includes practical training at aqua-farms, hatcheries, feed industry, fish markets and processing/value addition units etc., while during the 8th semester students undergo on-campus 'Experiential Learning, Skill Development and Project Development Programs'. The curriculum of M.F.Sc (Aquaculture, Fisheries Resource Management, Aquatic Environment Management and Fish Processing Technology) and Ph.D. (Aquaculture, Fisheries Resource Management and Aquatic Environment management) is also based on ICAR regulations covering both theory and research in the field of advanced technologies.

One year Diploma: One year Diploma in Inland Fisheries is offered to the sponsored in-service candidates of the State Fisheries Department.

Certificate Courses: Further, College of Fisheries provides certificate courses in following areas:

Name of Certificate Course	No. of Seats	Eligibility Qualifications*	Course Duration
CC in Fish Hatchery Management	05	Graduate in any Science Discipline	6 Months
CC in Aquarium Sciences	05	Graduate in any Science Discipline	6 Months
CC in Fish Processing Technology	05	Graduate in any Science Discipline	6 Months
CC in Aqua- Clinics	05	Graduate in any Science Discipline	6 Months

Tailor-made six-month certificate courses had also been initiated by the college during academic year 2020-21 in industry-oriented fields, to instill entrepreneurial skills among fishery and other aspiring graduates/youth/stakeholders, so as to promote fisheries as a potential sector for entrepreneurship/ career advancement at regional, national and international levels. Fishery professionals i.e., graduates (B.F.Sc.) and postgraduates (M.F.Sc. and Ph.D) and certificate holders are eligible to seek promising job opportunities in public /private sector in India i.e., State Fisheries Department, Fish Farmers Development Agencies (FFDAs), Colleges, Agricultural/Veterinary/Central Universities, Krishi Vigyan Kendra's (KVKs), Fisheries Institutes/Agencies, Banking Sector, Hatcheries, Aquaculture Farms, Feed Mills, Pharmaceuticals, Processing Plants, Trading, Export etc. Further, fishery professionals also possess great scope for higher studies and placement overseas. Nevertheless, there are vast opportunities for self-employment/entrepreneurship development in fisheries sector.

Over a short span of 14 years, since its establishment in 2008, the College of Fisheries, GADVASU has registered commendable academic growth and has made significant contributions in the development of the fisheries sector of the state through producing quality skilled fisheries graduates and postgraduates, generating need based technologies for vertical as well as horizontal expansion of aquaculture sector and transfer of technologies to the farmers through an efficient 'Lab to Land' extension program.

College of Animal Biotechnology, Ludhiana

During the last three decades, molecular biology and biotechnology have emerged with extensive applications in animal husbandry, medicine, industry and environmental sciences. Recognizing the immense potential of biotechnology in animal sector, the Guru Angad Dev Veterinary and Animal Sciences University established the Department of Animal Biotechnology in 2008. It was designated as School of Animal Biotechnology in 2010 and upgraded to College of Animal Biotechnology in 2019. The mandate of the college is to generate scientific expertise, human resource in various facets of animal biotechnology and to develop specialized facilities for research in cutting-edge fields of biotechnology. The college is also involved in basic and applied research spanning a wide-spectrum of areas like genomics, molecular diagnostics, vaccinology, stem cell biology, cancer biology, proteomics, and bioinformatics. To cater the needs of undergraduate and postgraduate teaching and research, three departments viz., Animal Biotechnology, Microbial & Environmental Biotechnology and Bioinformatics have been created with excellent infrastructure and laboratory facilities. For the UG and PG teaching, the college is following the course curriculum commended by the ICAR. The college has been accredited by the ICAR with 'A' grade. Presently the college is offering B. Tech. (Biotechnology), M.V.Sc./ M.Sc. (Animal Biotechnology) and Ph.D. (Animal Biotechnology). The M.V.Sc./M.Sc. and Ph.D. programs in Animal Biotechnology follow the course curriculum as recommended by the Indian Council of Agricultural Research for the Animal Biotechnology group.

Student intake capacity

Program	Available Seats
B. Tech. (Biotechnology)	25 - For residents of Punjab State and Union Territory of Chandigarh 02 - NRI seats 05 - Residents from other states 01 - Kashmiri migrants
M.V.Sc./M.Sc. (2 years) Animal Biotechnology (for veterinarians)/ Biotechnology (for non-veterinarians)	01 - For veterinary graduates 02 - Nominee of the ICAR 04 - For non-veterinarians 10 – Under DBT postgraduate teaching program
Ph.D. (3 years)	02 - Preference to candidates with master's in Veterinary/ Animal Biotechnology 02 - Nominated by ICAR

Veterinary Polytechnic, Kaljharani (Bathinda)

The university established a Veterinary Polytechnic at Kaljharani, Bathinda in the year 2010 for imparting Diploma in Veterinary Science & Animal Health Technology with an aim to produce trained supporting manpower capable of handling livestock health and production. The diploma has been designed for the training of Veterinary Pharmacists to support and complement the Veterinary Practitioners in a better way, in order to provide better care and guided treatment to animals within Veterinary hospitals, Veterinary colleges, Research institutes, etc.

Student intake capacity

Program	Available Seats
Diploma in Veterinary Science & Animal Health Technology (2 years)	70-For residents of Punjab State and Chandigarh 10 -Self Financed 10- Other State Residents 02-For residents of Kaljharani, Bathinda

Placement Cell Information for the year 2021-22

During the period under report, Placement Cell organized three campus and one online placement for undergraduate and postgraduate students of College of Veterinary Science, College of Dairy Science and Technology and College of Fisheries. The recruiting agencies participated were Amul, Baani Milk, IDBI Bank. In addition, various vacancies advertised by recruiting agencies were circulated among the eligible candidates using university website and social media. The detail of placements of passed out students during 2021-22 is as below:

Placement of Undergraduate and Postgraduate Students

SN	Name of the University/ College/ Faculty	Location & District	Number of students passed out	CAU/ SAU	Central Govt.	State Govt./ Corpo-rate	PDF/ Foreign	Pvt/ Oth-ers*
1.	College of Veterinary Science	Ludhiana	152	5	0	17	13	117

2.	College of Fisheries	Ludhiana	37	4	0	13	0	12
3.	College of Dairy Science & Technology	Ludhiana	72	-	0	4	4	47
4.	College of Animal Biotechnology	Ludhiana	08	04	--	--	4	0
5.	Veterinary Polytechnic	Kaljharani, Bathinda	89	-	-	48		41
Total			358	13	0	82	21	217

*includes students joined higher studies or preparing for higher studies, joined private institutions and self-employment or providing consultancy services

IPR cell

The IPR Cell is the entity within GADVASU that provides the day-to-day management of the University owned intellectual property and implementation of these regulations with tasks such as but not limited to receiving and maintaining disclosure if invention files, interfacing with the external agency in the patent application process, and encouraging the faculty to file disclosures of invention. Additionally, the IPR Cell is the entity primarily responsible for technology transfer tasks, such as' negotiating license agreements with prospective commercialization partners. The objectives of the IPR Cell are:

- To access and facilitate the inventive work for creation of intellectual property.
- To generate awareness among the faculty, students, creator/group of creators and societies regarding the value of their ideas/IPK/Genetic wealth.
- To help such group/groups for submission of proposals for creation and protection of IP.

Nodal Cell, ICAR

The university has established a Nodal Cell to coordinate various activities of the Education Division of the ICAR and the university under the scheme "Strengthening and Development of Higher Education in India." The ICAR Nodal Cell functions as a Single Window System and provides all the requisite information to the Agricultural Education Division of ICAR. The Dean, Postgraduate Studies, Dr. Sanjeev Kumar Uppal has been designated as the Nodal Officer.

Human Resource Management Centre

Human Resource Management Centre was established in 2021. Human Resource Management Centre at Guru Angad Dev Veterinary and Animal Sciences University (GADVASU) came into existence after the approval of the recommendations of the academic council made in 61st meeting and during the 49th meeting of Board of management held on 19.02.2021. The main motive of setting up of HRM centre is to process with accelerated emphasis on harnessing of various activities with greater zeal embarking upon both Managerial and Operational activities

TEACHING

Admissions in undergraduate and postgraduate programs in academic session 2021-22

Program	Boys	Girls	Total
B.V.Sc. & A.H. (COVS, Ludhiana)	62	46	108
B.V.Sc. & A.H. (COVS, Rampura Phul)	40	34	74
B.F.Sc.	17	10	27
B.Tech.(Dairy Tech)	18	06	24
B. Tech. (Biotechnology)	02	05	07
M.V.Sc./M.F.Sc./M.Sc./M. Tech.	53	60	113
Ph.D.	15	22	37
Diploma in Veterinary Science & Animal Health Technology (Veterinary Polytechnic, Kaljharani)	88	04	92
Diploma in Veterinary Science & Animal Health Technology, Rampura Phul	48	14	62
Any other Degree/Diploma	14	07	21
Total	357	208	565

Passed out students in academic session 2021-22

Program	Boys	Girls	Total
B.V.Sc. & A.H. (COVS, Ludhiana)	47	38	85
B.F.Sc.	10	09	19
B.Tech.(Dairy Tech)	25	13	38
B. Tech. (Biotechnology)	11	08	19
M.V.Sc./M.F.Sc./M.Sc./M.Tech.	78	56	134
Ph.D.	12	03	15
Diploma in Veterinary Science & Animal Health Technology (Veterinary Polytechnic, Kaljharani)	87	02	89
Any other Degree/Diploma	15	04	19
Total	285	133	418

College of Veterinary Science, Ludhiana

Academics and Teaching:

The total number of students admitted in the College of Veterinary Science for the session 2021-22 was 219 which included 108 in B.V.Sc. and A.H., 84 in M.V.Sc. and 27 in Ph.D. program. During the period under report, 202 students passed out from the college which included 85 undergraduate students, 105 M.V.Sc. students and 12 Ph. D. scholars.

Courses taught

The students graduating for B.V.Sc. & A.H. program were offered courses as per Minimum Standards of Veterinary Education Degree Course (B.V.Sc & A.H.) Regulations 2016 of Veterinary Council of India. Postgraduate students were offered courses in their respective major, minor and supporting fields as approved by the Dean, Post Graduate Studies.

Scholarships / Fellowships

Scholarship	Undergraduate Students	Postgraduate Students	Doctorate Students
University Merit Scholarship	50	40	28
National Talent Scholarship	14	51	-
Dr G S Khush Foundation Scholarship	08	-	-
ICAR- Junior Research Fellowship	-	05	-
ICAR-Senior Research Fellowship	-	-	04
ICMR-JRF	-	-	03
India Afghanistan Fellowship	-	01	
India- Africa Fellowship	-	-	03

Internship Program

There are currently 103 internship students (Male 65 & Female 38) undergoing one year internship program in the Department of Teaching Veterinary Clinical Complex. The interns are posted at various departments of the college such as Veterinary Medicine, Veterinary Surgery Radiology, Veterinary Gynecology & Obstetrics, Animal Disease Research Centre, Directorate Livestock Farms and Teaching Veterinary Clinical Complex. In addition students are also getting hands-on-training in the field of Dairy Technology, Fisheries, Poultry, NCC and Punjab Veterinary Vaccination Institute. Students are also posted at Veterinary Colleges of other states and at Govt. Veterinary Hospitals of Punjab. Exposure visits are also made to the Punjab Home Guard Canine Training & Breeding Institute, Dera Bassi and Punjab Police Academy *(Equestrian wing)*, Phillaur.

Teaching Veterinary Clinical Complex

The college has a well-established Teaching Veterinary Hospital Complex. The hospital complex has a Primary Unit and a Specialized Unit to treat animals. A new Multispecialty Veterinary Hospital has been established for small animals with state-of-the-art facilities. The hospital has the facility for indoor wards for small and large animals and separate rooms for the attendants. The hospital is being supported by clinical diagnostic laboratory and radiographic unit. There is also advance diagnostic treatment facilities such as endoscopy, echocardiography, dermatology unit, dialysis unit and blood bank present in the hospital.

The number of clinical cases registered for treatment and clinical samples examined in the Hospital during the year 2021 have been depicted in following table:

Clinical Cases Presented from January to December 2021	
Small Animals	23083
Large Animals	6922
Total	30005

Clinical Samples Examined from January to December 2021	
Total	**23234**

Thesis/Dissertation awarded to Postgraduate students (2021-22)

	College of Veterinary Science		College of Fisheries		College of Dairy Science & Technology		College of Animal Biotechnology	
Degree	Ph.D	M.V.Sc	Ph.D	M.F.Sc	Ph.D	M.Tech	Ph.D	M.Sc/M.Tech
No.	12	105	01	08	-	13	02	08
Total	117		09		13		10	

Theses / Dissertations

Department (Year)	Name of the Student (Major Advisor)	Thesis/Dissertation Title
Ph.D. Program		
Veterinary Anatomy (2021)	Amit Poonia (Dr. Anuradha Gupta)	Histomorphochemical and ultrastructural variations in thyroid gland of buffalo, sheep and goat.
Veterinary & Animal Husbandry Extension Education (2021)	Deshmukh Dhananjay Sahebrao (Dr. Parminder Singh)	A study on interlinkage of credit availability vis-à-vis dairy farming in Punjab.
Veterinary Pharmacology & Toxicology (2021)	Dinesh Kumar Sharma (Dr. S. K. Sharma)	Evaluation of pharmacological activities of *Cassia fistula*.
Veterinary Surgery & Radiology (2021)	Harmanpreet Singh Sodhi (Dr. Ashwani Kumar)	Evaluation of titanium elastic nails for the management of radius-ulna and femoral fractures in dogs.
Veterinary Medicine (2021)	Iqra Shafi (Dr. Shukriti Sharma)	Transfusion of blood and its components in dogs with haematological disorders.
	Rajneesh (Dr. Ashwani Kumar)	Clinico-pathological studies on haemorrhagic septicaemia in cattle and buffaloes.
Livestock Products Technology (2021)	Goswami Mayank Manigiri (Dr. Nitin Mehta)	Biodegradable films loaded with essential oil nanoemulsions for storage stability of functional pork nuggets.
Veterinary Public Health & Epidemiology (2022)	Deepthi Vijay (Dr. J. S. Bedi)	Study on antimicrobial usage, resistance and residues in dairy herds of Punjab using a 'One Health' approach.
Veterinary Medicine (2022)	Rajneesh (Dr. Ashwani Kumar)	Clinico-pathological studies on haemorrhagic septicaemia in cattle and buffaloes.
Veterinary Physiology & Biochemistry (2022)	Himalaya Bhardwaj (Dr. Chanchal Singh)	Evaluation of heat shock protein 90α as a biomarker in canine mammary tumor.
	Jadhav Sameer Niwas (Dr. Shashi Nayyar)	Effect of *mucunapruriens* on physiological adaptability and molecular response to seasonal stress in beetal goats.
Veterinary Pathology (2022)	Vikas Jaiswal (Dr. B. S. Sandhu)	Biomolecular detection of cryptosporidium and associated etiological agents from faecal samples of diarrheic bovine calves.
Veterinary Parasitology (2022)	Kebonyemodisa Ntesang (Dr. L. D. Singla)	Molecular detection of haematozoa from ticks infesting bovines in relation to their epidemiology in the host from Punjab.

Master's Program (M.V.Sc.)		
Animal Genetics & Breeding (2021)	Sehajpal Singh Dhillon (Dr. Simarjeet Kaur)	Association of polymorphism vis-à-vis differential expression profiling of MAP4K4 gene with mastitis susceptibility in Nili Ravi buffaloes.
	Shubhankar Sharma (Dr. S.K. Sahoo)	Evaluation of genetic parameters for growth and production traits in Japanese quail.
	Sumeet Patil (Dr. S.K. Dash)	Discriminant analysis and study of polymorphism in myostatin (GDF-8) gene in native poultry.
	Vikas Diwakar (Dr. Bharti Deshmukh)	Genetic study on seminal attributes of murrah buffalo bulls as determinant of fertility.
	Sylvia Lalhmingmwii (Dr. Neeraj Kashyap)	Study on abnormal lactation length in murrah buffaloes.
	Olympica Sarma (Dr. P. P. Dubey)	Principal component analysis and association of growth differentiation gene polymorphism for economic traits in layer chicken.
Animal Nutrition (2021)	Harneet Kour (Dr. R. S. Grewal)	Effect of feeding varying levels of dietary cation-anion difference (DCAD) on performance of transition buffaloes.
	Siliveru Srinath (Dr. Jasmine Kaur)	Effect of cottonseed meal on nutrient utilization and blood biochemical profile of male buffalo calves.
	Snehdeep Singh (Dr. J. S. Hundal)	Effect of composite herbal feed additive on growth and immunity of growing male buffaloes.
	Shilwant Sandip Surendra (Dr. J. S. Hundal)	Impact of supplementing composite herbal feed additive on the production and immune status of lactating goats.
	Gursimran Singh (Dr. J. S. Lamba)	Nutritional evaluation of *Moringaoleifera* leaf meal as alternate protein source in lactating goats.
	Inderpal Singh (Dr. J. S. Lamba)	Nutritional evaluation of Duckweed as an alternate protein source in Broilers.
	Jashandeep Singh (Dr. Udeybir Singh)	Evaluation of potato meal as energy source with or without enzyme supplementation for swine feeding.
	Prabhank Pathak (Dr. Udeybir Singh)	Nutritional evaluation of potato meal with and without enzyme supplementation in broilers.
	Ayushi (Dr. Amit Sharma)	Effect of supplementation of organic and inorganic salts of cerium on nutrient utilization, immune status and growth performance of murrah male buffaloes.
	Chakkaravarthi C R (Dr. Jasmine Kaur)	Nutritional evaluation of malt sprouts in the diet of goat kids.
Animal Nutrition (2022)	Pratik Sudan (Dr. Amit Sharma)	Effect of supplementation of lemongrass oil on nutrient utilization immune status and growth performance of goat kids.
	Bhosale Sanjay Ratan (Dr. R. S. Grewal)	Effect of ensiling paddy straw with or without bacterial culture, urea and molasses on it's nutritive value.

Livestock Products Technology (2021)	Tejinder Pal Singh (Dr. O. P. Malav)	Development of dog food by utilizing meat, egg and dairy industry by products.
	G Sushanth Kumar Reddy (Dr. M. K. Chatli)	Bacterial exopolysaccharide extraction and utilization for the development of extended shell life low-fat chevon patties.
	Ishani Parmar (Dr. Wagh R.Vishwanath)	Development and storage stability of low-fat pork patties using different fat replacers.
	Jamadar Deepika (Dr. Wagh R.Vishwanath)	Development and quality evaluation of pasta fortified with whole egg and skim milk powder.
	Shilviya Bhat (Dr. Wagh R. Vishwanath)	Studies on *Spirulina platensis* and *Garciniaindica* extracts as natural preservative in chicken patties.
Livestock Products Technology (2022)	Patil Dheeraj Sunil (Dr. Nitin Mehta)	Encapsulation of blended essential oils and its incorporation for storage stability of chevon patties.
Livestock Production Management (2021)	Naveen Prasath P (Dr. Mandeep Singla)	Comparative performance and welfare status of Beetal goats at linear-partitioned bilevel vs. hexagonal feeders.
	Donthu Saipranathi (Dr. Yashpal Singh)	Influence of extruded and coarse feed on growth performance and gastrointestinal tract development in broilers.
Livestock Production Management (2022)	Happleraj Singh (Dr. D.S Malik)	Influence of *pearl millet* based extruded feed on the performance of broiler.
Veterinary Anatomy (2022)	Kaveesh Chahal (Dr. Devendra Pathak)	Morphological characterization and expression of hormonal receptors in canine uterus.
Veterinary Physiology & Biochemistry (2021)	Lalhmangaihzuali (Dr. Chanchal Singh)	Effect of Vitamin E on molecular and hematological parameters pertinent to seasonal variation in fattener pigs.
	Manpreet Singh Bhinder (Dr. Shashi Nayyar)	Metabolic profile, growth and milk production of goats reared under stall fed versus free range grazing system.
	Amritpal Singh Gill (Dr. Chanchal Singh)	Molecular and biochemical studies to assess the effect of feeding milk replacer in weaned pigs.
Veterinary Physiology & Biochemistry (2022)	Anirudh Mittal (Dr. Digvijay Singh)	A study on alterations in physiopathological parameters of ascites in dogs.

Veterinary Microbiology (2021)	Vishnu Kumar Garg (Dr. Paviter Kaur)	Studies on prevalence, risk factors and antibiotic resistance of bacteria isolated from goat milk with special emphasis on *Escherichia coli*.
	Qurban Ali Juya (Dr. Paviter Kaur)	Molecular detection of antibiotic resistance genes in *staphylococcus aureus* from mastitic goat milk and farm premises.
	Moon Moon Satpathy (Dr. N. S. Sharma)	Studies on antimicrobial resistance genes in *Klebsiella* spp. isolated from goat milk.
	Poloju Deepa (Dr. G. Filia)	Detection of drug resistance in mycobacterial isolates in cattle and buffaloes.
	Juhi Gupta (Dr. A. K. Arora)	Prevalence and characterization of extended-spectrum cephalosporin-resistant enterobacteriaceae in pet animals.
	Preetinder Singh (Dr. T. S. Rai)	Studies on antibiotic resistance of *Staphylococcus aureus* from poultry and their molecular characterization.
	Shilpa B (Dr. T. S. Rai)	Molecular typing of methicillin resistant *Staphylococcus aureus* (MRSA) from livestock and farm environmental samples.
	Aishvarya Borkar (Dr. Mudit Chandra)	Study on prevalence and antimicrobial resistance of bacteria from mastitis milk with special emphasis on *Enterococcus* spp. and *Pseudomonas*spp.
	Sudhir Kumar Prajapati (Dr. Deepti Narang)	Detection of tuberculous Mycobacteria (*M. orygis*) and non tuberculous Mycobacteria (*M. smegmatis*&*M. kansasii*) in cattle and buffaloes.
	Koppu Vasavi (Dr. Gurpreet Kaur)	Studies on antigenic relationship among CPV types and vaccine strain.
Veterinary Microbiology (2022)	Pathireddy Shruthi Reddy (Dr. Deepti Narang)	Detection of humoral immune response against pathogenic *Mycobacterium* by fluorescence polarization assay.
	Anurag Gupta (Dr. Mudit Chandra)	Evaluation of DNA extraction method to isolate bacterial DNA from bovine milk.
Veterinary Parasitology (2021)	Harpreet Kaur (Dr. Paramjit Kaur)	Prevalence and molecular characterization of *Cryptosporidium* species in dairy calves of central plain zone of Punjab.
	Aparna Mariyam Thomas (Dr. N. K. Singh)	Multiplex real-time PCR and molecular characterization of canine tick transmitted haematozoan parasites in central plain zone of Punjab.
	M. Padmaja (Dr. Harkirat Singh)	Development of real-time multiplex PCR assay for detection of tick borne haemoparasites of dogs from south western Punjab.

Veterinary Pathology (2021)	Manveen Banga (Dr. B. S. Sandhu)	Studies on effect of putrefaction on diagnosis of rabies in animals.
	Mandeep Kaur (Dr. Kuldip Gupta)	Pathological evaluation on cutaneous and subcutaneous neoplasms in clinically presented dogs.
	Sonam Sarita Bal (Dr. Amarjit Singh)	Pathology of fipronil induced acute liver injury in mice and its amelioration with p-coumaric acid.
	Harshit Sethi (Dr. Sidharth Deshmukh)	Studies on localization of humoral immune cells and antimicrobial peptide in chicken reproductive tract (uterus and vagina) in induced *Salmonella gallinarum* infection
	Diksha Gupta (Dr. A.P.S. Brar)	Evaluation of neutrophil kinetics and morphology vis-à-vis diagnosis and prognosis of cattle diseases.
	Udhayakuar. C (Dr. Vishal Mahajan)	Pathological and serological studies for diagnosis of neosporosis in bovine abortions.
Veterinary Pathology (2022)	Komalpreet Kaur (Dr. C. K. Singh)	Study of alterations in connective tissue fibers in response to pathological lesions in bovine tissues.
Veterinary Pharmacology & Toxicology (2021)	Dishant Aggarwal (Dr. V. K. Dumka)	Evaluation of *Aeglemarmelos* and *justiciazeylanica* leaf extracts for Antibacterial, Antioxidant and Neurobehavioral properties.
	Gurleen Kaur (Dr. Saloni Singla)	Evaluation of efficacy of polyherbalformulation for augmentation of milk production in buffaloes.
	Zarzoliani (Dr. S. K. Sharma)	*In vitro* toxicological evaluation of Indoxacarb and its amelioration with *Cassia Fistula*.
	Manmeet Malpotra (Dr. S. P. S. Saini)	Physico-chemical characterization and evaluation of therapeutic efficacy of thiotepa loaded nanoparticles.
Veterinary Public Health & Epidemiology (2021)	Othman Juma Othman (Dr. Rajnish Sharma)	Prevalence, molecular characterization and control strategies for *Echinococcus* spp.
Veterinary Public Health & Epidemiology (2022)	Varinder Kaur Saini (Dr. Simranpreet Kaur)	Prevalence and genetic diversity of *Listeria* spp. from aquatic food and environment.
	Manmeet Singh (Dr. Pankaj Dhaka)	Studies on biosecurity management practices on dairy farms of Punjab.
	Arpan Khehra (Dr. Randhir Singh)	Prevalence and characterization of antimicriobial resistance in *Klebsiella pneumoniae* and *Enterococcus* species from farmed poultry eggs, environment and farm handlers.
	Avni Sharma (Dr. J. S. Bedi)	Study on microbiological assessment of poultry slaughtering units in Punjab.
	Sakshi (Dr. Pankaj Dhaka)	Prioritization of zoonotic disease and bio-risk mitigation strategies on dairy farms of Punjab, India.

Veterinary Medicine (2021)	Sukhdeep Singh Sidhu (Dr. Ashwani K. Sharma)	Studies on lower respiratory tract affections and pharmacokinetics of ceftiofur in affected buffaloes.
	Habbu Aishwarya Sunder (Dr. D. K. Gupta)	Ultrasonographic evaluation for early detection mastitis and use of infrared thermography in bovine mastitis.
	Reema Rani (Dr. Sushma Chhabra)	Studies on prevalence and diagnosis of epistaxis in dogs.
	Sahil Kumar (Dr. Ashwani K. Sharma)	Studies on the common neurological disorders in cattle and buffaloes.
	Bava Fakhrudeen. S (Dr. Shukriti Sharma)	Studies on anaemia and whole blood transfusion in cattle.
	Rashmi Verma (Dr. Sujata Turkar)	Study on lameness associated with obesity and its therapeutic management in dogs.
	Jasnit Singh (Dr. Raj Sukhbir Singh)	Retrospective and clinico-therapeutic studies on canine monocytic ehrilichiosis.
	Sameer Sachdeva (Dr. Ashwani K. Sharma)	Diagnostic studies on clinical ketosis in dairy animals.
	Tejini M Kumar (Dr. Neetu Saini)	Studies on pulmonary arterial hypertension in dogs with cardiac dysfunctions.
Veterinary Medicine (2022)	Anish Garg (Dr. B. K. Bansal)	Study of precision dairy farming system in evaluation and management of dairy cow herd health.
	Kuljeet Singh Dhaliwal (Dr. S. K. Uppal)	A study on early diagnosis of acute kidney disease and its therapeutic management in dogs.
	Ravnit Singh (Dr. S. S. Randhawa)	Characteristics of hoof resiliency in relation to diagnosis and treatment of foot lameness in sahiwal cows.
	Gurwinder Singh (Dr. S. K. Uppal)	Studies on infectious etiology and diagnostic markers of renal failure in dogs.
	Avtar Singh (Dr. C. S. Randhawa)	A study of ocular changes and cytology in diagnosis of eye diseases in dogs.
	Himanshu Gupta (Dr. Shukriti Sharma)	Studies on blood typing and transfusion reactions in dogs.

Veterinary Gynaecology& Obstetrics (2021)	Fiza Jan (Dr. Shahbaz Singh Dhindsa)	Influence of blood metabolites on superovulatory response and embryo quality in sahiwal cows.
	Uday Singh Khinda (Dr. Shahbaz Singh Dhindsa)	Presynchronization strategies to enhance fertility in sahiwal cattle.
	Chandeep Singh Bajwa (Dr. Narinder Singh)	Evaluation of peritoneal lavage and drainage on post caesarean survivability in cattle.
	Jaspreet Kaur (Dr. Ashwani K. Singh)	Evaluation of boar semen stored between 16-20°C using lactose-egg yolk, glucose-sodium citrate dihydrate and modena diluents.
	Nakul (Dr. M. Honparkhe)	Effect of proteolytic enzymes on uterine involution and ovarian cyclicity in dystocia affected buffaloes.
	Prabhleen Singh (Dr. Ashwani K. Singh)	Tocodynamic evaluation of dystocia affected canines in response to uterotonic drugs.
	Rajvinder Grover (Dr. Narinder Singh)	Evaluation of cardiorespiratory response to two different anaesthetic agents during ovariohystrectomy in pyometritic bitches.
	Ashu Arora (Dr. Prahlad Singh)	Effect of positive dietary cation anion difference feeding and ovsynch regime on postpartum fertility in buffaloes.
	Sandeep Kumar (Dr. Ashwani K. Singh)	Effect of tris-egg yolk, beltsville thawing solution and safe cell extenders on preservation of boar semen.
Veterinary Gynaecology& Obstetrics (2022)	Ajayveer Singh Sekhon (Dr. S.P.S Ghuman)	Effectiveness of melatonin to improve postpartum fertility in dystocia affected buffaloes.
Veterinary Surgery & Radiology (2021)	Tenzin Wangchuk (Dr. Jasmeet Singh Khosa)	Clinical studies on application of pin-plate combination for surgical management of femur fracture in dogs.
	Gurjap Singh (Dr. S. K. Mahajan)	Clinical studies on outcomes of cataract surgery in diabetic and non diabetic dogs.
	Anjan Kour (Dr. S. K. Mahajan)	Clinical studies on evaluation of oxidative status and surgical intervention in cataractous dogs.
	Manoj Kumar (Dr. J. Mohindroo)	Evaluation of focused abdominal ultrasound for assessment of canine trauma patients.
	Mehak Mahant (Dr. Arun Anand)	Study on metal based 3D printed crowns of strategic teeth in canine.
	Anmol Singh (Dr. N. Umeshwori Devi)	Studies on the efficacy of Sub-Tenon's Anaesthesia as an adjunct to general anaesthesia for ocular surgery in dogs.

	Gurkirat Singh (Dr. Tarunbir Singh)	Comparative evaluation of titanium and stainless steel plates for the repair of radius fractures in dogs.
	Kush Karan (Dr. Ashwani Kumar)	Diagnostic and therapeutic studies on equine lameness at University Veterinary Hospital.
	Vardan (Dr. Vandana Sangwan)	Diagnostic utility of standing reticulography for diaphragmatic hernia in bovines.
	Anand V M (Dr. Navdeep Singh)	Clinical studies on echocardiographic indices in equine.
	Rajasekaran T. M (Dr. S. K. Mahajan)	Clinical studies on surgical management of pigmentary keratitis in pugs.
	Ravneet (Dr. Pallavi Verma)	Studies on diagnostics approaches and minimally invasive techniques for management of milk flow disorders in bovine.
	Gurinder Singh (Dr. S. K. Mahajan)	Comparative evaluation of dexmedetomidine and acepromazine as an adjunct to Ketamine-isoflurane general anesthesia in cats.
Veterinary & Animal Husbandry Ext. Education (2021)	Jaspreet Kaur (Dr. Y. S. Jadoun)	Assessment of animal welfare practices followed by dairy farmers' of Punjab.
	Kritika Verma (Dr. S. K. Kansal)	Study on self-medication practices in peri-urban dairy farms of Punjab.
Veterinary & Animal Husbandry Ext. Education (2022)	Naman Khurana (Dr. Rajesh Kasrija)	Designing need based video instructional material for dairy farmers of Punjab regarding common zoonotic diseases.

College of Dairy Science and Technology

During the session 2021-22, the total numbers of students admitted in various programs were 35 that included 24 in B. Tech. (Dairy Technology), 09 in M. Tech. (Dairy Technology) and 02 in Ph.D. Among all the students, male and females were 25 and 10, respectively. During this period 38 students successfully completed their graduation and eight students passed the post graduation program.

Courses Taught

The undergraduate students were offered courses as per the recommendations of 5th Deans' Committee constituted by ICAR, New Delhi. The B. Tech. students were offered 137 credits of teaching courses and 35 credits of Practical training/ Field work. Postgraduate students were offered courses in their respective major, minor and supporting fields as approved by the Dean, Post Graduate Studies.

Scholarships/Fellowships

Scholarship	Undergraduate Students	Postgraduate Students	Doctorate Students
University Merit Scholarship	-	06	03
National Talent Scholarship	04	06	-
Dr G S Khush Foundation Scholarship	04	-	-
Post Matric Scholarship	11	01	-

Merit-cum-Means Scholarship for Professional and Technical Courses	06	-	-
Inspire Fellowship	-	-	01
IIT Ropar Ph.D. Fellowship under DST-AWaDH	-	-	02

Theses / Dissertations

Department (Year)	Name of the student (Major Advisor	Thesis Title
Master's Program (M.Tech)		
Dairy Technology (2021)	Gurpreet Singh (Dr. S. Siva Kumar)	Development and characterization of composite biodegradable film incorporated with nanoparticles for enhancing the shelf life of mozzarella cheese.
	Kusum Lata (Dr. Rekha Chawla)	Development of fiber fortified reduced calorie probiotic smoothie.
	Arun Bansal (Dr. Sunil Kumar)	Technology development for milk solids and turmeric based ready to use healthy paste.
	Gurinderjit Singh Bhatti (Dr. Nitika Goel)	Technology development of probiotic ricotta cheese with antimicrobial activity.
	Rajan (Dr. Rekha Chawla)	Preparation of composite beverage utilizing blend of juices and ricotta cheese whey.
	Kiranpreet Singh Sidhu (Dr. P. K. Singh)	Effect of microfluidization on the functionality of buffalo milk protein concentrate manufactured from buffalo milk.
	Kuldeep Dudi (Dr. Sunil Kumar)	Study on the effect of modification on the functional properties of buffalo milk protein concentrate
	Lonkar Shubham Arjun (Dr. Sunil Kumar)	Study on the quality attributes of whey protein concentrate (wpc-35) derived from buffalo milk
	Avni Sharma (Dr. S. Siva Kumar)	Impact of accelerated cheese ripening on quality characteristics of cheddar cheese powder.
	Baljit Singh (Dr. S. Siva Kumar)	Technology development and characterisation of functional dairy based beverage powder.
Dairy Chemistry (2021)	Gurinder Kaur (Dr. Sandeep Kaur Sodhi)	Studies on antioxidant and biocolorant potential of beetroot fortified yoghurt.
Dairy Engineering (2021)	Ankit Kumar Deshmukh (Dr. Gopika Talwar)	Effect of ultrasonication on properties of composite biodegradable cup for food packaging.
	Robin Kaura (Dr. Amandeep Sharma)	Prediction modelling for quality of paneer using engineering properties, physico-chemical properties and sensory evaluation

College of Fisheries

Academics and Teaching

During the academic session 2021-22, thirty nine students were enrolled to the degree programs included twenty seven students in B.F.Sc., nine students in M.F.Sc. and three students in Ph.D. During this

period nineteen undergraduate students and nine postgraduate students successfully attained their degrees.

Courses Taught

The undergraduate students were offered courses as per the recommendations of 5th Deans Committee constituted by ICAR, New Delhi. A total of 70 courses were offered to B. F. Sc. students. Postgraduate students were offered courses in their respective major, minor and supporting fields as approved by the Dean, Post Graduate Studies.

New/Revised Courses, if any

Short course on 'Fish Feed Formulation and Manufacturing' for the academic year 2021-22 from October 18 to November 24, 2021 (online and offline module) – First batch (03 students) completed successfully.

Scholarships / Fellowships

Scholarship	Undergraduate Students	Postgraduate Students	Doctorate Students
University Merit Scholarship	16	02	01
National Talent Scholarship	03	03	-
Dr G S Khush Foundation Scholarship	03	-	-
Mata Ind Kaur Award	03	-	-

All India Study Tour: Due to prevailing national lockdown owing to Covid-19 pandemic, no study tour was possible. Accordingly, the students were exempted.

Theses / Dissertations

Department (Year)	Name of the student (Major Advisor	Thesis Title
Ph.D. Program		
Aquaculture (2021)	Priya Rawat (Dr. Vaneet Inder Kaur)	To investigate the nutraceutical properties of ginger in aquaculture feed formulation.
Master's Program (M.F.Sc.)		
Aquaculture (2021)	Khushwant Singh Brar (Dr. Meera D. Ansal)	Socio-economic and quality analysis of shrimp (*Litopenaeus vannamei*) farming in inland salt affected areas of Punjab.
Aquaculture (2022)	Gurtinder Kaur (Dr. Vaneet Inder Kaur)	Optimizing stocking density for rearing ornamental koi carp (*Cyprinus carpio* Linn.) in pond cage aquaculture system.
Fisheries Resource Management (2021)	Baljot Singh Maan (Dr. S. S. Hassan)	Ecological evaluation of the river Beas stretch from Talwara to Harike Pattan in Punjab (India).
Fisheries Resource Management (2022)	Vedika Masram (Dr. Prabjeet Singh)	Stock variability among riverine and domesticated population of Indian major carps using morphometric, meristic and genomic characters.
	Shikha (Dr. S. N. Datta)	Study on biometrics, population dynamics and genetic diversity of family channidae from selected stretches of river Sutlej in Punjab.

	Supreet Kaur (Dr. Grishma Tewari)	Population dynamics and stock characterization of giant river catfish, *Sperata seenghala* from river Sutlej in Punjab
Aquatic Environment (2022)	Prapti Sudan (Dr. Anuj Tyagi)	Detection and control of antimicrobial resistance in inland saline shrimp culture areas with special reference to *Vibrio parahaemolyticus*.
	Arvind Verma (Dr. Shanthanagouda Admane Holeyappa)	Efficacy of quercetin in ameliorating hypoxia induced molecular, biochemical and histological alterations in rohu, *Labeo rohita* (Ham).

College of Animal Biotechnology

Academics and Teaching

Total number of students enrolled for the session 2021-22 was 17 which included 07 students in B. Tech (Biotechnology), 09 students in M.V.Sc. / M.Sc. and 01 in Ph.D. programs. During this academic year under consideration, 19 students graduated in B. Tech while 09 students successfully completed their Master's program. A total of 62 courses were offered during the year which included 50 courses for undergraduates, eight courses for postgraduates and four courses for doctorate students.

Scholarships / Fellowships

Scholarship	Undergraduate Students	Postgraduate Students	Doctorate Students
University Merit Scholarship	08	03	-
DBT-Postgraduate Teaching Program Scholarship	-	09	-
Post Matric Scholarship	12	-	-

Theses / Dissertations

Department (Year)	Name of the student (Major Advisor)	Thesis Title
Ph.D. Programme		
Animal Biotechnology (2021)	Kirtypal Singh (Dr. C. S. Mukhopadhyay)	Identification of microsatellite and SNP markers for parentage determination in bovines.
	Shaikh Nasrul Islam (Dr. R. S. Sethi)	A study on pulmonary expression of genes in response to chlorpyriphos cypermethrin and their mixture.
Master's Programme (M.V.Sc/ M.Sc)		
Animal Biotechnology (2021)	Paramvir Singh (Dr. C. S. Mukhopadhyay)	Identification of host-pathogen interaction for Newcastle disease in chicken.
	Amanpreet Kaur (Dr. S. S. Sodhi)	Comparative expression analysis of liver associated metabolic and immune response genes of Large White Yorkshire (LWY) and indigenous pigs.
	Sumedha Dabral (Dr. Ramneek)	Molecular characterization of *Porcine circovirus*-2 (PCV)-2 field isolates

Animal Biotechnology (2022)	Ananya Aeri (Dr. B. V. Sunil Kumar)	Expression of BCL2 associated athanogene-1 (BAG-1) in canine mammary tumors.
	Dhvani Aggarwal (Dr. Ramneek)	Relative expression of genes associated with cumulus-oocyte complex (COC) health in Sahiwal cattle.
	Gurpreet Kaur (Dr. B. V. Sunil Kumar)	Expression of heat shock protein D1 (HSP60) in canine mammary tumors.
	Kriti Jain (Dr. Satparkash Singh)	Diagnosis of leptospirosis in canines and bovines by microscopic agglutination test and PCR.
	Ramandeep Kaur (Dr. J. S. Arora)	Sequencing and biocomputational characterization of coding region of major fecundity genes (GDF9, BMP15 and BMPR1B) in Beetal goat.

College of Veterinary Science, Rampura Phul

It is a newly established, constituent college of GADVASU, Ludhiana, started functioning from October 1, 2019.

Academics and Teaching:

The total number of students admitted in the College of Veterinary Science, Rampura Phul for the session 2021-22 was 136 including 74 in B.V.Sc and A.H. program and 62 in Diploma in Veterinary Science & Animal Health Technology (D.V.Sc & A.H.T). Total 88 male and 48 female students were admitted in B.V.Sc & A.H. and diploma program of the college.

Courses taught

The students graduating for B.V.Sc. & A.H. program were offered courses as per Minimum Standards of Veterinary Education Degree Course (B.V.Sc & A.H.) Regulations, 2016 of Veterinary Council of India. To the 1st, 2nd and 3rd professional year of B.V.Sc. & A.H. students, total 15 courses of 60 credit hours were offered. In D.V.Sc & A.H.T (first year) total 10 courses of 29 credit hours were offered.

Veterinary Polytechnic, Kaljharani, Bathinda

GADVASU established Veterinary Polytechnic & Regional Research and Training Centre (VP & RRTC) at Village Kaljharani, District Bathinda in the year 2010. Veterinary Polytechnic was established to impart education in Diploma in Veterinary Science and Animal Health Technology to support the veterinary services through trained para-veterinary staff. The trainees after completing diploma course become eligible to coordinate and work under the supervision of registered veterinary practitioners to provide better healthcare to animals in Veterinary Hospitals, Veterinary Colleges, Research and Training Institutes, Cooperative Sector and Non-Government Organizations. Majority of pass out students have been appointed in the Department of Animal Husbandry. The remaining are absorbed in Cooperative Sector, GADVASU, Private sector and some Non-Government Organizations.

Academics and Teaching: During the session 2021-22, a total of 92 students (88 male and 04 female) admitted in Diploma in Veterinary Science and Animal Health Technology and 89 students (87 male & 02 female) got passed out.

Courses Taught: A total of 19 courses with 47 credit hours of theory and 15 non credit hours of practical training were offered in diploma program.

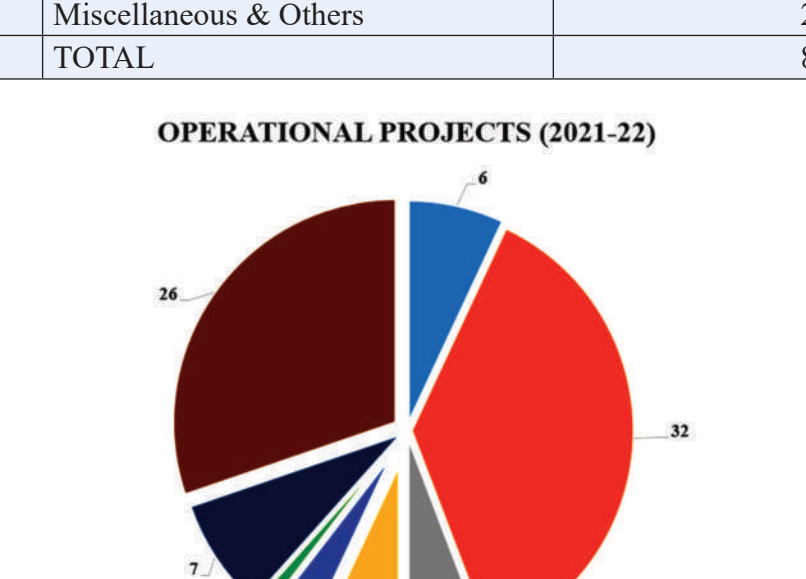
Scholarships / Fellowships:

Scholarship	Diploma Student
Post Matric Scholarship	26 : SC

RESEARCH

The institute carries out research on the issues/aspects predominantly related to health and production of various species of livestock, poultry, companion animals and fisheries as per the research mandate. During the year 2021-22, a total of **59** research project proposals were submitted to various funding agencies, like Department of Biotechnology, Department of Science and Technology including SERB & TIH-AWaDH, Indian Council of Agricultural Research, Indian Council of Medical Research, Central Council for Research in Ayurvedic Sciences, National Bank for Agriculture and Rural Development, Department of Animal Husbandry, Dairying & Fisheries including NLM, and many other state, national and international agencies. During the year 2021-22, a total of **86** research schemes were operational in the university as detailed below:

S. No.	Funding agency	Number
1.	State Non-Plan	06
2.	ICAR	32
3.	DBT	05
4.	DST	06
5.	SERB	03
6.	RF	01
7.	RKVY	07
8.	Miscellaneous & Others	26
	TOTAL	86



Research Highlights

A. College of Veterinary Science

I. Animal Disease Research Centre (ADRC)

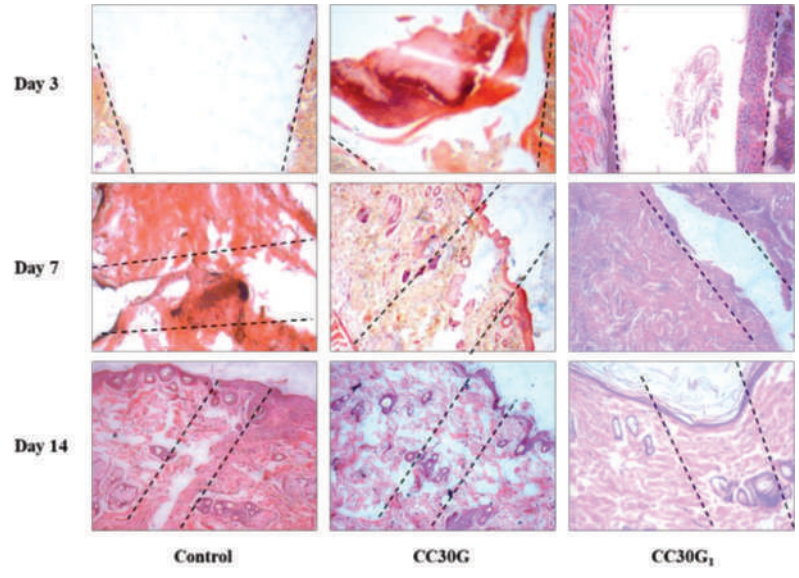
- During 2021-22, 549 farm animals were screened for brucellosis, tuberculosis and paratuberculosis.
- In the clinical diagnostic lab, 10098 samples were processed for hematological, 1399 samples for

cytological, 920 samples for urine analysis, 6133 for biochemical analysis and 5700 samples for parasitological examination.

- In the clinical microbiology lab of the department, 674 samples were tested for brucellosis by RBPT, 77 fecal samples for Johne Disease by acid fast staining, 102 samples for culture sensitivity testing and 108 samples for dermatophytes/ fungal examination during last year.
- A total of 15 outbreaks of different bacterial, viral, parasitic diseases and toxicities were attended and successfully controlled during 2021-2022.
- Random blood samples (n=375) were collected from buffaloes of 15 villages for screening of infectious diseases as per plan submitted by NIVEDI. Images from various livestock diseases were captured and uploaded on National Image Base for Livestock Production Diseases (NIBLD) App (Artificial Intelligence based App).

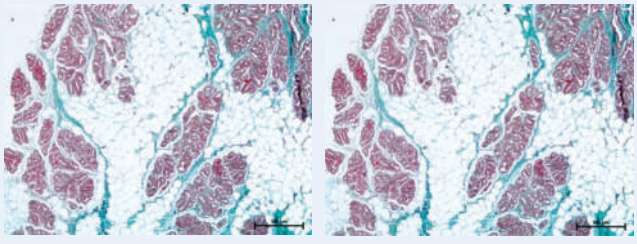
II. Veterinary Anatomy

- **Fast clotting clinical grade hemostatic agent for emergency care:** All polyelectrolyte complex (PEC)-based gauze samples were found to have better blood clotting ability than Celox. The clotting time of the gauze samples was chitosan-casein [CC]30G & 30G$_1$ [gauge with silver nanoparticles] (27 seconds), CC50G (32 seconds) whereas CC70G (78 seconds) with 20 mg of sample. No skin abnormalities or corrosiveness was observed in rat skin. The subcutaneously implanted CC30G in the rat skin led to complete wound healing activity of a 1 cm incision

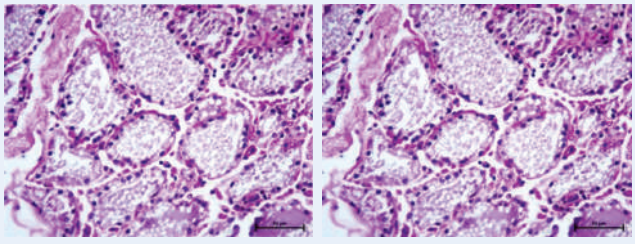


H&E staining of skin tissue during wound healing of control, CC30G and CC30G$_1$

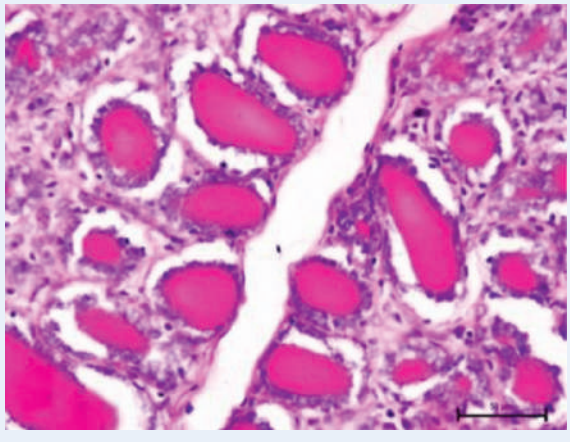
- **Histomorphochemical and ultrastructural studies on mammary gland of prepubertal, lactating and non-lactating buffalo:** The age-related studies (pre-pubertal & pubertal) conducted on mammary gland of buffalo showed that the glands had extensive duct system with patches of glandular tissue in pre-pubertal animals and the glandular tissue increased with the age of buffalo. The enzyme activities in glandular parenchyma, teat sinus, streak canal and skin were highest in lactating animals followed by non-lactating and pre-pubertal animals respectively. The ultrastructural study revealed that the lactating gland showed more euchromatic nuclei and surrounding cellular organelles.



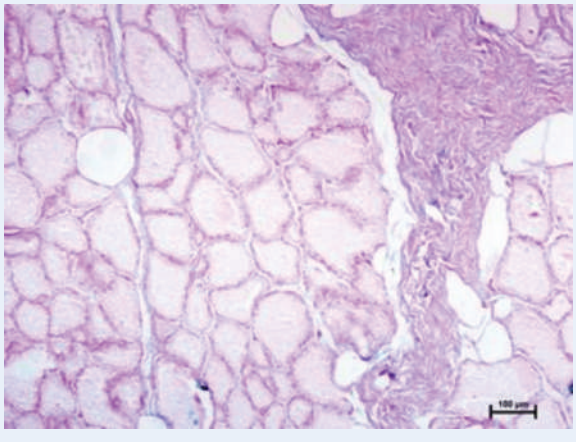
Mammary gland of prepubertal buffalo showing very less glandular tissue. Masson's trichrome stain X40



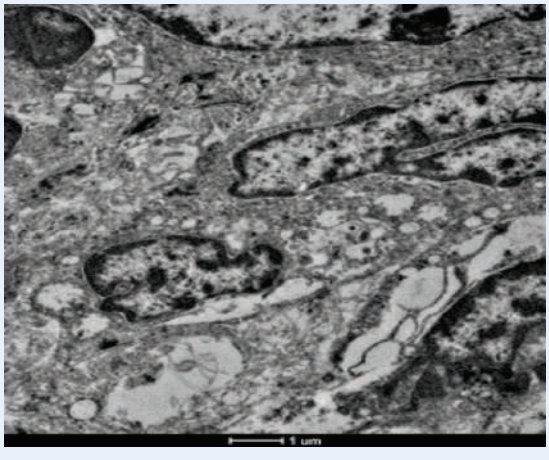
Mammary gland of lactating buffalo showing well developed alveoli lined by simple cuboidal epithelium. H & E stain X 400



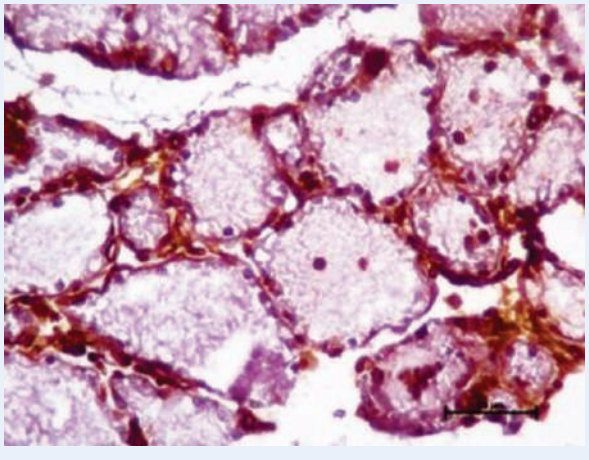
Mammary gland of non-lactating buffalo showing corpora amylacea in alveolar lumen. H & E stain X 400



Mammary gland of lactating buffalo showing PAS activity in the alveolar epithelium and connective tissue stroma. PAS stain X 100

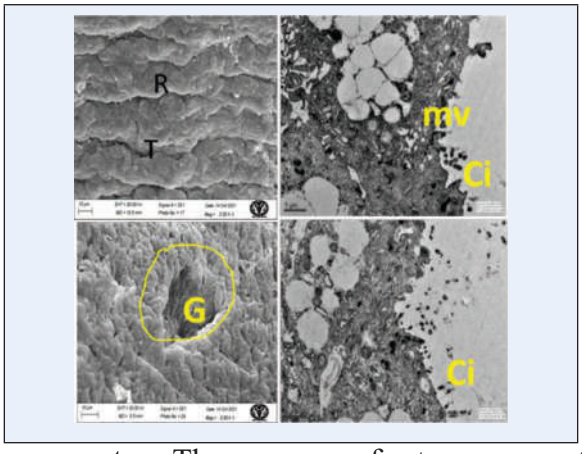


Mammary gland of lactating buffalo showing well developed organelle x1000

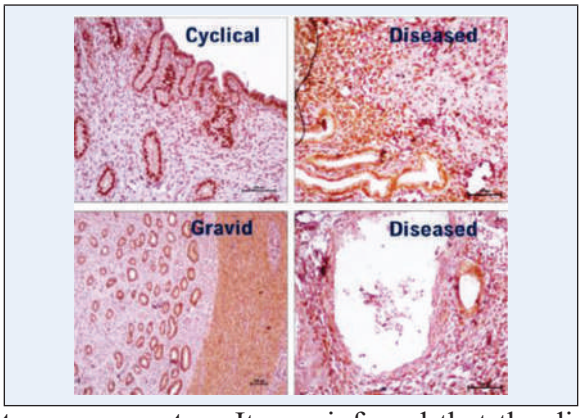


Mammary gland of lactating buffalo showing expression of vimentin in the alveolar epithelium and myoepithelial cells. Vimentin X 400

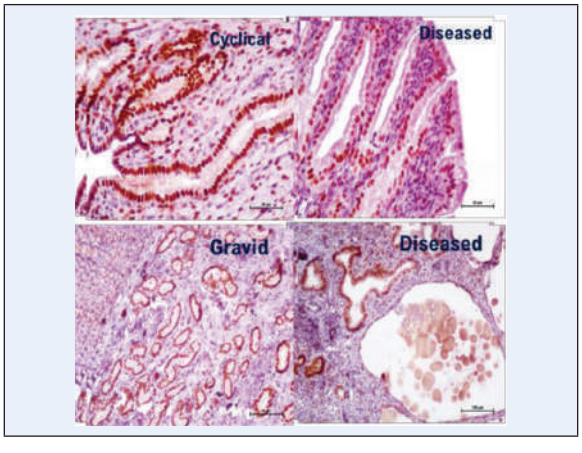
- **Morphological characterization and expression of hormonal receptors in the canine uterus:** Electron microscopy revealed very small ridges and shallower troughs with very few glandular openings in between these ridges. The surface ultrastructure of the uterus that suffered from pyometra showed a mucous-coated surface and surface morphology was not visible being coated by mucous secretions.



- **Localization of Estrogen receptor:** The presence of estrogen receptor-α (ERα) in the endothelial cells of the blood capillaries in the endometrium and myometrium and larger vessels in the stratum vasculare layer of the myometrium inferred that the estrogen hormone was also controlling the active flow of hormone during the estrous cycle.



- **Localization of Progesterone receptor:** It was inferred that the diseases related to the uterus in canines were mostly dependent on progesterone hormone and the distribution of their receptors based on its expression pattern.



III. Centre for One Health

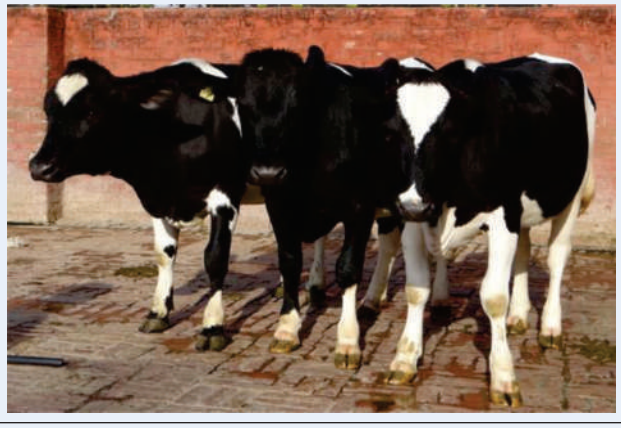
- **Farm biosecurity survey in Punjab:** A cross-sectional survey among 327 dairy farms of Punjab revealed inadequate overall knowledge on the concepts of basic biosecurity, animal quarantine and herd immunity among the dairy farmers.
- **Prioritization of zoonotic diseases in Punjab:** The focus group discussions (FGDs) and interviews among relevant stakeholders (i.e., veterinary academicians, medical officers, field veterinarian and farmers) to develop the zoonoses prioritization tool revealed the rankings of the zoonoses as: Brucellosis > Rabies > Anthrax > Leptospirosis=Toxoplasmosis=H5N1 > Bovine tuberculosis > Q fever > Cysticercosis > Listeriosis > CCHF > JE=Echinococcosis > Dermatophytosis > Scrub typhus.
- **Epidemiological Study on aflatoxin M1(AFM_1) in milk samples:** A total of 402 milk samples (cattle milk-266 and buffalo milk-136) analyzed by ELISA revealed 13.43% of milk samples exceeded the maximum permissible limits (MPL) of Food Safety Standards Authority of India for AFM_1 in milk. Furthermore, the milk from commercial dairy farms (65.67%) was found to be more contaminated than household dairy establishments (48.26%). On analysis of risk factors, 'above average milk yield/day' (Odds Ratio (OR): 2.43) and 'poor animal hygiene' (OR: 1.94) were identified as animal-level and 'intensive dairy farming' (OR: 3.12) and 'animal feed without aflatoxin binder' (OR: 4.67) to be farm level risk factors for AFM_1 excretion above EC-MPL in milk.
- **Study on antimicrobial usage, resistance and residues in dairy herds of Punjab using a 'One-Health' approach:** The present study revealed the widely prevalent quackery and self-treatment practices by farmers, over-the-counter availability of antibiotics, low veterinarians/animal ratio, lack of awareness among stakeholders about the potential public health effects of antimicrobial resistance. The widespread use of the highest priority critically important antimicrobials (HPCIA) in animals, particularly quinolones and third generation cephalosporins was reported in the dairy herds. Out of 405 milk samples screened for antibiotic residues, 2.77%, 1.9%, 1.1%, 0.5% and 1.1%, respectively were positive for penicillin, enrofloxacin, oxytetracycline, gentamicin, and cephalosporins above MPL established by Codex Alimentarius commission.
- **Study on microbiological assessment of poultry slaughtering units in Punjab:** Out of 421 (96 chicken meat samples, 55 faecal and 270 environmental swab samples) collected from three different regions of Punjab, 158 isolates were confirmed for *E. coli* (37.53%), 171 for *S. aureus* (40.62%) and only 5 isolates were confirmed for *Salmonella* spp. (0.95%). The isolation rate of *E. coli* was highest from the faecal samples 60% (33/55), followed by environmental swab samples 34.4% (93/270) and meat samples 33.3% (32/96). The prevalence of *S. aureus* in chicken meat samples was 43.75% (42/96), in faecal samples 32.72% (18/55) and in environmental swab samples was 41.11% (111/270). *Salmonella* spp. was detected only in 3 faecal and 2 meat samples. The virulence genes profiles indicated that gene *fimA* and *eae* were detected in 93.04% (147/158) and 2.53% (4/158) of the *E. coli* isolates, respectively. Among the 171 *S. aureus* isolates the gene *coa* was detected in 81.29% (139/171) isolates. Among the *E. coli* isolates 68.35% (108/158) were multi-drug resistant, showing resistance to three or more classes of antibiotics.
- **Prevalence and genetic diversity of *Listeria* spp. from aquatic food and environment:** The overall prevalence of *Listeria* spp. was observed as 1.44%, 5.17% and 1.01% from aquatic food, water and swab samples, respectively. Out of 11 *Listeria* isolates, 0.48% (2/416) were identified as *L. monocytogenes* from fish samples, 5.17% (3/58) from water samples and 1.01% (2/197) from swab samples. Geno-serotyping of *L. monocytogenes* isolates was recorded as 4b, 4d, 4e (57%),

1/2b, 3b, 4b, 4d and 4e (28%) and 1/2c, 3c serogroup (14%).

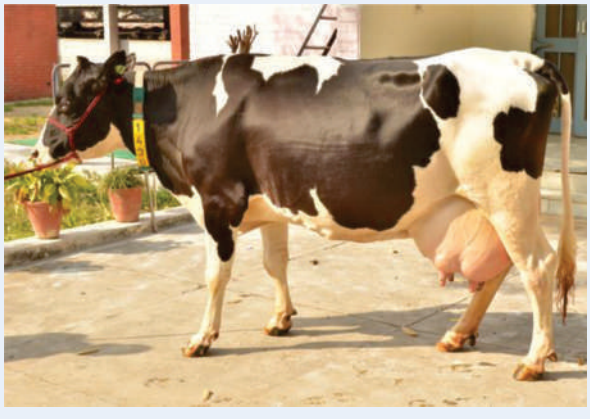
- **Prevalence and characterization of antimicrobial resistance in *Klebsiella pneumoniae* and *Enterococcus* species from farmed poultry eggs, environment and farm handlers:** The overall occurrence of *K. pneumoniae* and *Enterococcus* spp. in poultry farm was 4.12% and 24.37%, respectively. The eggs from deep litter system were found to be contaminated more with *K. pneumoniae* (4.58%) and *Enterococcus* spp. (25.00%) than the eggs from cage system.
- **Echinococcosis: A neglected zoonoses:** A total of 1689 slaughtered animals (577 sheep, 709 goats and 403 pigs) were examined for presence of hydatid cysts from slaughter houses and butcher shops. Overall prevalence was 6.8% (115/1689).
- **Towards climate resilient livestock production system in Punjab:** Environmental stress (THI=temperature humidity index) on the animals kept in climate resilient was reduced by 9.80% in comparison to the animals kept under traditional sheds. A total of 37.91% lower prevalence of haemoprotozoan infection was observed in households with climate resilient sheds. A total of 41.35 % lower prevalence of gastrointestinal parasitic infections was observed in households with climate resilient sheds. Milk production was higher (22.01 %) in climate resilient sheds as compared to traditional sheds. Prevalence of ticks in the climate resilient sheds was reduced by 69.98 % as compare to the animals kept under traditional system of housing. Temperature Humidity Index (THI) (72.7±.94) was significantly associated with disease outbreak data. Temperature humidity index of 70.94±0 was significantly associated with haemoprotozoan infections.

IV. Directorate of Livestock Farms (DLF)

- **Cattle Breeding:** The average 305-day milk yield and average peak yield were 4561.73 kg and 22.40 kg, respectively, whereas the average total lactation yield of two crossbred cattle was 5744.5 kg. The maximum lactation milk yield of a crossbred cow was found to be 10373 kg. The average age at first calving in crossbred cattle was 27.6 months. The 39972 doses of crossbred cattle semen (frozen and liquid) semen were supplied to the Gaushalas, farmers and other dairy development agencies of the state during last year for breeding purposes.



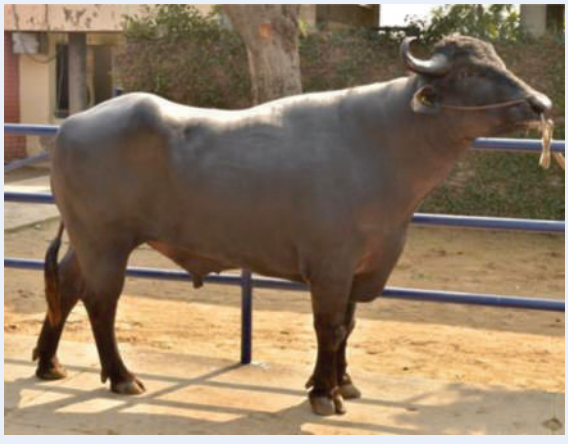
Progeny of elite crossbred animals produced from nominating mating



FC1430 with Peak Yield: 43.7kg
305 day milk yield: 6407.5kg

- **Murrah Buffalo Breeding:** The average 305 day, complete lactation milk yield and average peak yield of the university herd were recorded as 2672.29 kg, 2759.12 kg and 14.94 kg, respectively. Similarly, the average 305 day milk yield, complete lactation milk yield and average peak yield of the elite herd, which is used for the production of future sires, was found as 3608 kg, 3791 kg and

20.25 kg, respectively. The highest peak yield record set by an elite buffalo is 28.70 kg in a day. The average age at first calving of the herd was 40.9 months. Bull No. M2459 from this centre ranked 3rd at the National level among all the progeny tested bulls in the Set No.15th and seven bulls have been selected from this centre for 20th set to be progeny tested. The project has supplied 992 bulls/male calves and 10.17 lakhs doses of high genetic merit semen to farmers and other dairy development agencies to date. Semen doses of 24 progeny tested and 22 under various stages of progeny testing Murrah buffalo bulls are available for supply to farmers and Dairy Development agencies. Last year, 48 Murrah bull/bull calves and 57730 frozen semen doses were supplied to the farmers for breeding purposes.



Test Murrah bull of XIIIth set of Network Project

Buffalo number 2897 produced record milk of 28.70 kg

- **Nili Ravi Buffalo Breeding:** The average 305-day milk yield and complete lactation yield of the herd were recorded as 2485 kg and 2552 kg, respectively. The highest milk production in Nili Ravi buffalo was recorded as 3530 kg milk in 305d lactation length with a peak yield of 18.8 kg. The dissemination of superior germplasm is one of the foremost priorities of the project. Last year, 21 breeding bull/bull calves and 8724 semen doses of Nili Ravi were supplied to the dairy farmers.

Bull number 507 with Dam's best lactation yield of 4268 kg and Peak yield 21.5 kg

NR2835 with peak Yield of 18.8 kg, 305 day milk yield 3530.6 kg

- **AICRP on Poultry Breeding (Broiler):** Under the project, the coloured broiler (IBL-80) had been developed at the University. It has the potential to attain average 6-week body weight of 1700g with a feed efficiency of 1.8 and the mortality of less than five percent. During the year under report, 85999 number of broiler germplasm had been supplied, benefitting 444 farmers from across the Punjab state. Presently, AICRP-Ludhiana is the third largest germplasm supplying AICRP Poultry

Breeding centre in the country. As per guidelines of ICAR, the centre has collected Punjab Brown local germplasm from different pockets of state covering their native place and is focusing on conservation and improvement through genetic selection. Since there is raised demand for native poultry germplasm, the centre has also started the supply of improved Punjab Brown germplasm to farmers.

PB2 Male

PB2 Female

Punjab Brown

- **Layer Breeding:** At the Poultry Research Farm, two colored layer breeds, namely Rhode Island Red and Punjab Red have been maintained as parent stock. A further Punjab Red layer poultry stock for the production of brown shelled eggs has been developed. During the year (2021-22), a total of 62372 Nos. of layer germplasm had been supplied which included day old chicks, hatching eggs and adult breeding birds. Under the layer breeding project indigenous poultry breeds like Kadaknath, Desi cross are maintained for the desi egg production and crossbreeding program to enhance immunity and hardiness of commercial birds. University has started rearing of turkey germplasm and demonstration unit has also been started.

Desi cross (Punjab Gold)

Kadaknath

- **Quail Breeding:** A strain of quails with white plumage has also been developed under the name "Punjab White Quail". The average egg weight is about 13g and these eggs are used for preparation of pickles. During the year, 1935 chicks and 2250 adult birds were supplied by the University.
- **Cattle- Field Progeny Testing:** A total of 138 villages have been covered by 32 artificial insemination centres in Ludhiana district of Punjab in the project. During the year (2021-22) a total of 5120 AI has been done using 28 test bulls, and conception rate was

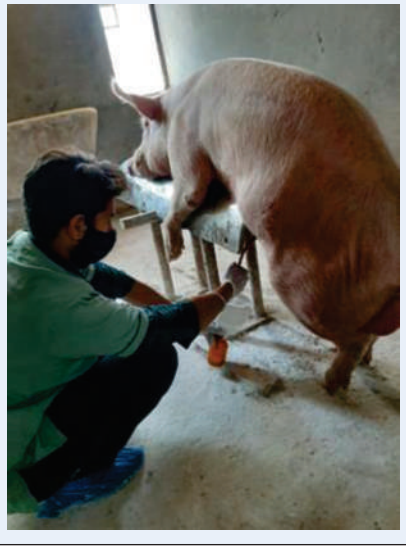
Punjab White Quail

49.60%. Under the project 2918 Nos. of successful calvings were recorded out of which 1380 female progenies were registered in the database for future performance recording. The average first lactation 305 days milk yields of the crossbred progenies in the adopted villages increased from about 3000 Kg in the year 2006 to 3819 kg in 2021 by supplying high-quality semen of test bulls (about 27% improvement). The project has helped to improve tremendously lowering the age at first calving of the crossbred animal in the area from 1191days to 824 days (30% improvement since inception). The supply of high pedigreed male calves, semen of high genetic potential test bulls and progeny tested bulls to the farmers in the villages adopted under the Field Progeny Testing Project has helped in improving their economic level. The improvement in both milk production as well as age at first calving is found to be highest in the field operational area of GADVASU among all Field Progeny Testing centres in the country for crossbred cattle. Under SCSP head of the projects, 210 farmers have been benefitted so far.

Lactating field progenies under data recording

V. Veterinary Gynaecology & Obstetrics

- **Effect of Tris-Egg Yolk, Beltsville Thawing Solution and Safe Cell extenders on preservation of boar semen:** The effect of three extenders on liquid preservation of boar semen at 17°C was evaluated. A total of 30 ejaculates were collected from three boars (10 ejaculates from each boar) using dummy sow. Only ejaculates having ≥70% initial progressive motility were extended in Beltsville Thawing Solution (BTS), Safe Cell (SFC) and Tris-Egg Yolk (TEY) extenders in the ratio 1:4 and preserved in a BOD incubator at 17°C for 120 h. The semen was evaluated for different sperm attributes and lipid peroxidation (MDA) at 0, 24, 48, 72, 96 and 120 h of preservation.



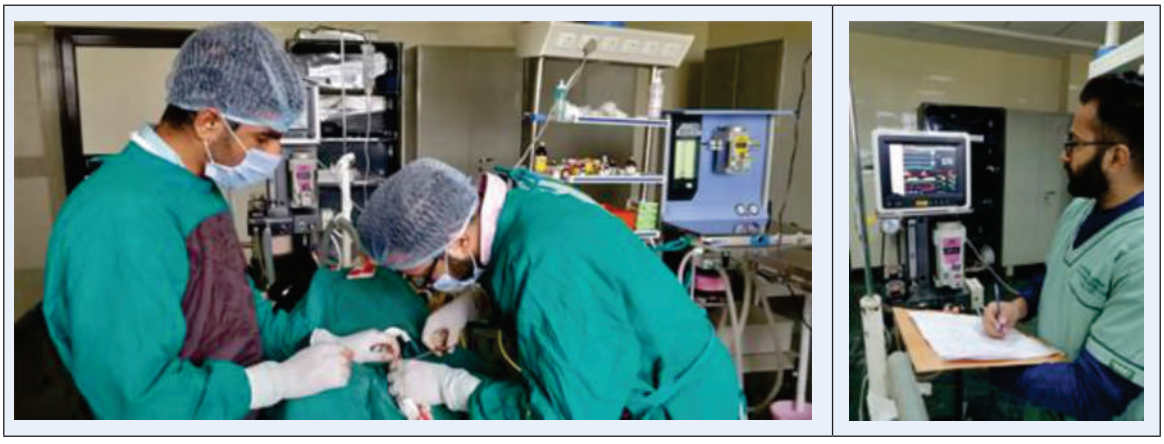
The mean percentage of sperm motility, viability, plasma membrane integrity and acrosome integrity were significantly ($P<0.05$) higher in BTS as compared to SFC and TEY at different hours of storage period. It was concluded that BTS was better than SFC and TEY in liquid preservation of boar semen at 17°C owing to improved sperm characteristics and reduced oxidative stress.

- **Tocodynamic evaluation of dystocia affected canines in response to uterotonic drugs:** Study was undertaken to evaluate uterine contractions using cardiotocomonitor in dystocia affected canines following administration of uterotonic drugs. Thirty dogs presented for treatment of dystocia were randomly divided into three groups. The dogs of group 1 were administered 5% dextrose and 10% calcium gluconate. In group 2, in addition to the treatment given in group 1, oxytocin was infused twenty minutes after administration of calcium gluconate. The dogs of group 3 were administered a total dose of 20 mg nitroglycerine in addition to treatment given in groups 1 and 2. It was concluded that nitroglycerine could be used as an alternative for cervical dilatation and subsequent whelping in dogs.

- **Evaluation of peritoneal lavage and drainage on post caesarean survivability in cattle:** Twenty four cows affected with dystocia requiring caesarean section for successful foetus delivery were included in this study. Cows were randomly divided into 4 groups based upon the use of peritoneal lavage and drain. In group I (treatment group, n=6), peritoneal lavage with NSS was done during CS. In group II (treatment group, n=6), peritoneal lavage with NSS and drainage was done with Foley's catheter (18 gauze). In group III (treatment group, n=6), peritoneal lavage with NSS and drainage was done with silicone tube catheter (28 gauze). In group IV (control group, n=6), no peritoneal lavage was done. Blood samples were taken when animal was presented at the clinics (pre-caesarean, day 0) and then at interval of 24 hrs (post-caesarean, day 1 and 2).

It was observed that plasma and peritoneal fibrinogen increased survival and fertility rate post caesarean were higher in treatment groups as compared to the control group. Severity of post CS adhesion formation was lesser in treatment group as compared to the control group.

- **Effect of propofol vs ketofol on cardiorespiratory functions during ovariohysterectomy in healthy dogs:** Twelve bitches were divided into two groups and were injected intravenously with propofol and ketofol (1:1) as an induction agent prior to the elective surgery.



The comparison between the drugs was done by employing statistical analysis techniques which were based on cardiorespiratory parameters, induction and recovery time following drug treatment. Better hemodynamic stability in animals were seen following ketofol administration as an induction agent when compared to propofol. Similarly, more stable and non-fluctuating respiration rate and heart rate was maintained during surgery in ketofol group. Moreover, less recovery time is needed for animal after surgery.

- **Evaluation of boar semen stored between 16-20°C using Lactose-egg yolk, Glucose-sodium citrate dihydrate and Modena diluents:** Significantly ($P<0.05$) higher percentage of sperm motility, viability, plasma membrane integrity and acrosome integrity in semen extended with Modena (MOD) than in glucose sodium salt of EDTA-potassium sodium tartrate-sodium citrate dihydrate (GEPS) and lactose-sodium salt of EDTA-Egg yolk (LSEEY) at different preservation times. It was concluded that MOD has significantly ($P<0.05$) higher percentage of sperm motility, sperm viability, plasma membrane integrity, acrosome integrity and *in vitro* capacitation/acrosome reaction than GEPS and LSEEY extenders. The malondialdehyde concentration was significantly ($P<0.05$) lower in MOD as compared to other extenders. This suggested that preservation of boar semen in Modena at 16-20°C exhibited better sperm characteristics as well as reduced oxidative stress.

VI. Livestock Production and Management

- Extruded vs coarse feed particle broiler diet indicated significant differences in feed intake, body weight and weight gain. FCR- live weight and FCR- cumulative gain was not affected by either of extruded and coarse feed.
- Broiler chicks fed with pearl millet based diet (75% unprocessed and 25% processed), chicks fed with diet in a ratio of 50% unprocessed and 50% processed pearl millet, performed superior in terms of FCR.
- Comparative performance and welfare status of beetal goats fed on linear partitioned bilevel and hexagonal indicated significantly higher feed intake lower feed wastage in lpb feeders compared to hexagonal feeders. Beetal goats had much improved welfare indicators with better feed management at lpb feeder than hexagonal feeder.

VII. Livestock Product Technology

- **Developed process protocol for the preparation of protein fortified pasta using skim milk and whole egg powder:** Protein rich fortified pasta was developed using 10% Skim milk protein and

5% whole egg powder level of incorporation. The fortified pasta made with skim milk powder (10%) and whole egg powder (5%) may be stored for 60 days at storage (20-30±5°C) under ambient temperature conditions without any significant changes in physicochemical, colour, or textural, microbiological and sensory qualities. The cost of production of developed pasta was 127.30 Rs/Kg as compared to less nutritious control pasta with production cost of 72.00 Rs/Kg, Hence, it can be recommended as a profitable start up business venture.

Photograph of developed protein-rich pasta

- The process protocol for spray drying encapsulation of blended rosemary and oregano essential oil using Maltodextrin and Gum Arabic as wall materials was standardized. The powder so developed was used in model meat system and possessed superior antimicrobial and antioxidant properties.
- Biodegradable bioactive films using whey protein concentrate and zein in combination incorporated with cumin and lemon oil nanoemulsion were developed and used for wrapping around functional pork nuggets. It was observed that these bioactive films were able to limit the microbial growth and exerted antioxidant action in meat products as evident by lower rate of lipid peroxidation.
- **Development of dog food by utilizing meat, egg and dairy industry byproducts:** Among different cooking methodologies, extrusion was found to be most suitable processing technique for dog food. Ghee residue can be incorporated at 2.5% level in the extruded dog foods without affecting the digestibility of the nutrients. Liver powder can be incorporated at 2.5% level in the extruded dog foods without affecting the digestibility of the nutrients.

Dog feed prepared from meat, egg and dairy industry byproducts

VIII. Veterinary Medicine

- **Current culture sensitivity pattern of clinical mastitis in State:** A total of 1533 quarter foremilk samples from 559 dairy animals (1099 from 392 cows and 434 from 167 buffaloes) were subjected to culture sensitivity testing for rational therapy of mastitis. The organisms isolated from the affected quarters comprised, in overall for cows and buffaloes, coagulase-negative staphylococci 52.89%, *Staphylococcus aureus* 33.21%, *Pseudomonas* & Gram negative spp. 6.52% and *Streptococcus* spp. 3.57%. Testing of isolated bacteria for drug sensitivity revealed, in overall, ceftrioxone-tazobactum (89.75%) as the most effective drug followed by ceftrioxone-sulbactum (83.75%) and enrofloxacin (78.51%). On the other hand, least effective drugs were penicillin (38.04%) and ampicillin (39.13%).

In addition to these, 28 milk samples from 19 bitches were also subjected to bacteriological examination. Out of which 12 samples revealed positive for bacteriological examination comprising of 50% each of coagulase-negative staphylococci and *Staphylococcus aureus*.

- **Evaluating the efficiency of ultrasonographic examination of teats and supramammary lymph nodes in sublinical bovine mastitis:** A total 104 supramammary lymph node of apparently healthy cows were scanned. On ultrasonography, the left length and depth, right depth was found to be significantly ($p<0.05$) increased in subclinically infected quarters when compared to the healthy quarters.
- **Use of infrared thermography in bovine mastitis:** The present study revealed that healthy quarters had the lowest udder temperatures with a mean udder skin surface temperature (USST) of 36.59 ±0.087°C (range 34.9-38.0 °C), the nonclinical quarters had a visibly increased temperature of 36.83±0.09 °C (range 35.1-38.1 °C). The clinically affected quarters had a mean temperature of 37.5±0.14°C (range 36.6 – 38.9 °C). The group with the highest somatic cell count (SCC) (>4 lakh cells/ml) had the highest USST (36.86 ± 0.14 °C), followed by the group having SCC of 2-4 lakh cells/ml (36.85 ± 0.13). The CMT score >1 had a significantly ($p<0.05$) higher USST as compared to the group with CMT score <1.
- **Use of alternative medicines in bovine mastitis:** In recurrent clinical mastitis cases, homeopathy therapy showed bacteriological cure rate of 18.18, 57.14 and 75 percent on d7, d15 and d30, respectively. The herbal therapy in such cases could eliminate 25, 57.14 and 66.66% of intra-mammary infections on d7, d15 and d30, respectively. The mean recovery days in phytolacca treated group was 17.64d, with recovery percentage of 73.35% and there was moderate increase in milk yield in these cows. The mean recovery days in Giloy treated animals were 18.17d with recovery percentage of 68.25 percent, and there was moderate increase in milk yield in these cows.
- **Blood grouping unit in dogs:** A total of 561 dog samples were screened during the study period with commercial blood typing kits (KABB) revealed 73.62% samples of DEA-1.1 type, 6.42% samples of DEA 1.2 type, while 19.96% were negative for DEA-1 system.
- **Canine renal diseases:** Annual hospital prevalence of renal diseases was 4.94% and renal insufficiency/failure was 4.63%. Serum Renal biomarkers (SDMA and Cystatin C) and Urine Renal Markers (Urine microalbumin, creatinine, UP:UC and SDMA) identified as good diagnostic indicators of renal failure.
- **Obesity associated disorders in canines:** Hind limb lameness is more prevalent than forelimb lameness in overweight/obese dogs. The most common causes of lameness associated with obesity are hip dysplasia and osteoarthritis. A high protein and low-fat weight loss diet along with conservative therapy is effective in management of lameness in overweight/obese dogs.

IX. Veterinary Microbiology

- **Canine parvovirus (CPV)**: Rectal swabs were collected from dogs suspected of CPV revealed 73.45% (202/275) in Punjab, 80.55% (29/36) in Assam, 54.54% (6/11) in M.P., 93.75% (15/16) in Haryana, 66.66% (4/6) in Chandigarh, 74.28% (26/35) in Delhi and 16.66% (1/6) in Jammu per cent positivity by Nested PCR. The per cent positivity in vaccinated dogs was 33.09% (94/284). The sequence analysis and phylogenetic analysis of positive samples revealed that samples formed similar clad with CPV 2a isolates and separate clad when compared with CPV 2b and CPV 2c sequences. The titre of serum 2a at which it can neutralize virus CPV 2b was 4096 and the titre of the serum 2b at which it can neutralize virus CPV 2a was 2048. The titre of both the serum for the homologous virus type is higher i.e., 8192.

- **Prevalence and antimicrobial resistance of bacteria from mastitis milk :** From the 110 milk samples collected from animals affected with clinical and subclinical mastitis initially tested positive by using sodium lauryl sulphate (SLS) test, were processed further for isolation and identification of the bacteria. The presence of antibiotic resistance genes in *Enterococcus faecalis* isolates were *vanA* (50%), *tetL* (83.33%), and *mrsA/B* (100%) and for *Pseudomonas P. aeruginosa* isolates *aadA, DHAM* (100%)*, sulI, sulII* (100%)*, gyrA, gyrB* 100%) and *tetC* (50%). Thus, overall, it could be concluded that the prevalence of *E. faecalis* was 7.05% and *P. aeruginosa* was 4.70% in mastitis milk samples tested.
- **Evaluation of DNA extraction methods for isolation of bacterial DNA:** Two DNA extraction methods i.e. SDS-Triton and PowerFood® Microbial Kit were performed from the bovine milk to evaluate their efficacy. It was concluded from the study that SDS-Triton method of DNA extraction could be used for routine isolation of bacterial DNA from the milk as it had better sensitivity and specificity compared with the PowerFood® Microbial Kit.
- **Detection of humoral immune response against pathogenic *Mycobacterium*:** A fluorescence polarization assay (FPA) was developed using defined antigens ESAT-6+CFP-10, Rv3615c and MPB83, 70 at concentrations of 20µg & 50µg each, to detect antibodies against pathogenic *Mycobacterium* in sera of cattle and buffaloes. FPA gave better sensitivity for all the proteins when the results were compared with IDEXX kit than when compared with CITT. The protein MPB83,70 (20µg) has better diagnostic potential based upon the analysis of FPA results with IDEXX kit as it gave an excellent AUC of 0.968. This study emphasizes the ability of FPA to detect the humoral immunity as a back up to the idea of employing serological tests to diagnose bTB.
- **Detection of *Mycobacterium orygis* in lung tissues and lymph nodes:** The study's goal was to use PCR to detect mycobacterial organisms in cattle and buffaloes with respiratory distress. Molecular detection of *M. orygis* from lungs tissue and lymph nodes was successful and is being reported using conventional PCR and RT-PCR for the first time in Punjab.

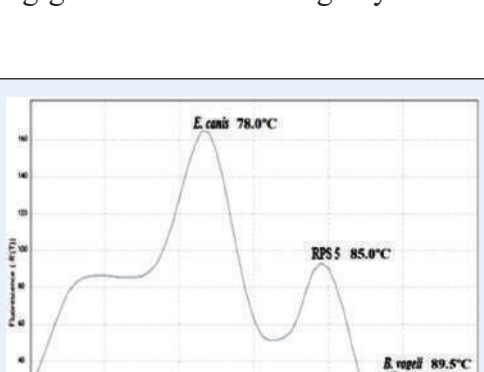
X. Animal Nutrition:

- Feeding of composite herbal extract at 2% of DM intake improved fermentation characteristics, milk production and immunity in lactating goats
- All growth parameters of birds improved due to supplementation of duckweed in both un-processed 2% and extruded dietary groups. (4 & 6%).
- Supplementation of composite herbal feed additive at 20 g/kg diet improved growth performance, ruminal fermentation, and immunity in buffalo calves.
- Protein content of maize can be replaced up to 25 percent with potato meal in pig ration during the glut period, which will not only spare the precious cereal for human consumption but will improve the environment's health also.
- Cottonseed meal can economically replace soybean meal completely in the concentrate mixture of buffalo calves
- Malt sprouts can be incorporated upto 10% in the concentrate of Beetal goat kids
- Supplementation of inorganic salts of cerium at a rate 300 ppm resulted in 18 % higher relative proportion of propionate and lower production of methane production along with improved cell mediated immune response, whereas supplementation of cerium in organic form had no further beneficial effect

- Supplementation of lemongrass oil at 1 % in diet of goat kids improved immune status of the kids without any adverse effect on intake, digestibility of nutrients and nitrogen balance.
- The use of urea, molasses, and bacterial culture (*Lactobacillus plantarum*) in combination as an additive during ensiling of paddy straw improves nutritive quality as well as fermentation. *In vivo* study of ensiled paddy straw revealed that utilization of 1% U+ 50% moisture + 6% molasses with bacterial culture can be used in animal feeding
- High negative DCAD (-100 mEq/100 gm of DM) level was better for prepartum stage and Low Positive (+200 mEq/100 gm of DM) DCAD level was better in postpartum stage for buffaloes and thus this combination had better performance than other groups in transition period in buffaloes
- The gain in body weight and digestibility of nutrients decreased with the increase in supplementation of potato meal in broiler diet which improved with addition of enzyme. Looking to the economics point of view potato meal can be incorporated during glut period up to 25% levels replacing protein content of maize in broilers ration.
- On the basis of milk yield and economics, it can be concluded that MLM can replace 30% CP of soybean meal of concentrate mixture in the ration of lactating goats without causing any harmful effect.

XI. Veterinary Parasitology

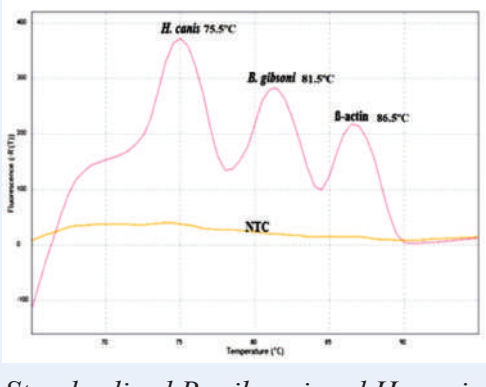
- **Development and application of SYBR Green based *Babesia vogeli* and *Ehrlichia canis* real-time multiplex PCR assay**: The developed assay revealed the T_m values for *B. vogeli*, *E. canis* and RPS5 as 89.5ºC, 78.0ºC and 85.0ºC, respectively, and no melt in no-template control. The sensitivity for *B. vogeli* & *E. canis* was 8.59 x 10^5 & 9.9 x 10^6 copies of dsDNA, respectively with C_T value of 25 set as the cut-off point for positivity.



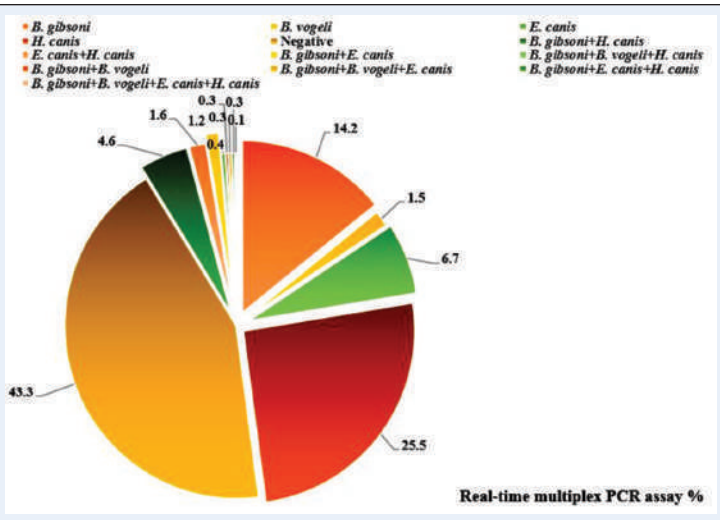
Standardized B. vogeli and E. canis multiplex real-time PCR assay

- **Development and application of SYBR Green based *Babesia gibsoni* and *Hepatozoon canis* real-time multiplex PCR assay:** The developed assay revealed the T_m values for *B. gibsoni*, *H. canis* and β-actin as 81.5ºC, 75.5ºC and 86.5ºC, respectively, and no melt in no-template control. The sensitivity for *B. gibsoni* & *H. canis* was 1.15 x 10^6 & 3.41 x 10^5 copies of dsDNA, respectively with C_T value of 25 set as the cut-off point for positivity.

  The field evaluation on 671 blood samples of dogs of Punjab revealed the prevalence of *B. gibsoni*, *B. vogeli*, *E. canis* and *H. canis* as 14.2%, 1.5%, 6.7% and 25.5% along with concurrent infection of *B. gibsoni* & *H. canis* (4.6%), *B. gibsoni* & *E. canis* (1.2%), *E. canis* & *H. canis* (1.6%) *B. gibsoni* & *B. vogeli* (0.3%), *B. gibsoni*, *B. vogeli* & *H. canis* (0.4%), *B. gibsoni*, *B. vogeli* & *E. canis* (0.3%), *B. gibsoni*, *E. canis* & *H. canis* (0.3%) and *B. gibsoni*, *B. vogeli*, *E. canis* & *H. canis* (0.1%).



Standardized B. gibsoni and H. canis multiplex real-time PCR assay



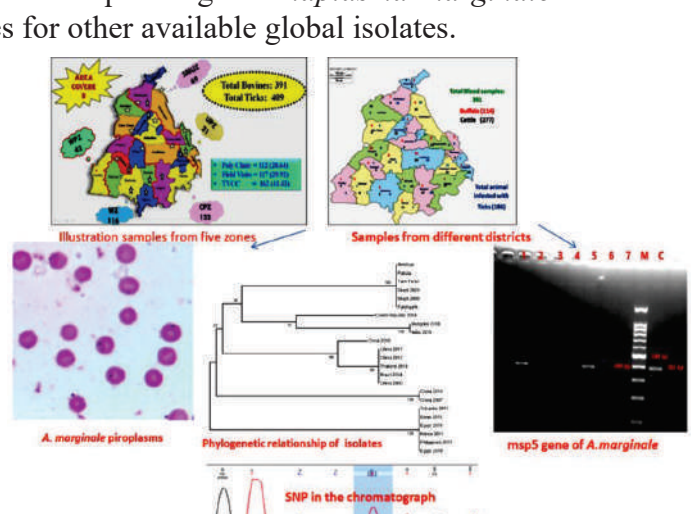
Prevalence of haemoparasitic infections by standardized SYBR Green based real-time multiplex PCR assays

- **Molecular epidemiology, risk factors and phylogenetic analysis of haematozoa in tick vectors and bovines of Punjab by multiplex PCR assay:** A study on 391 bovines from 23 districts of five agro-climatic zones in Punjab state with aim to compare the prevalence of haematozoa by conventional and molecular methods, risk factor assessment and to correlate the occurrence of haemoparasitic infection with haemato-biochemical alterations revealed prevalence of *T. annulata, A. marginale, B. bigemina* and mixed infection in bovines as 9.21, 8.44, 1.02 and 3.32 by microscopy and 32.99, 32.48 and 4.60%, by uniplex PCR assay. Multiplex PCR detected overall 50.12% haematozoa comprising of *T. annulata (*17.14%), *A. marginale* (18.16%), *B. bigemina* (1.02%) and 13.81% mixed infection. The sensitivity and specificity of multiplex PCR was 100% and 94.9% as compare to microscopy. A total of 19.33% ticks were positive for haematozoa including *T. annulata* (16.66%), *A. marginale* (16.50%), *B. bigemina* (2.00%) and mixed infection of *A. marginale* and *B. bigemina* (1.00%) by PCR assay.

Gel electrophoresis (2%) showing the result of amplification by multiplex PCR targeting Tams1 of T. annulata, Msp5 of A. marginale and AMA-1 of B. bigemina.

Lane M1: Molecular marker 100bp, Lane 2 : T. annulata 156 bp, Lane 3 : A. marginale 382 bp, Lane 4 : B. bigemina 448 bp, Lane 5 : Non-template (negative control), Lane 6 : Multiplex, Lane M2: Molecular ruler 50b

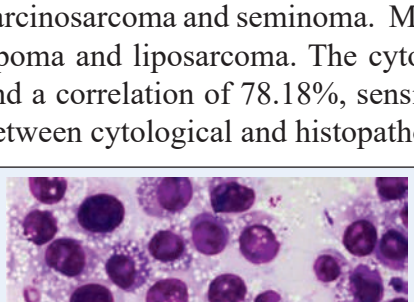
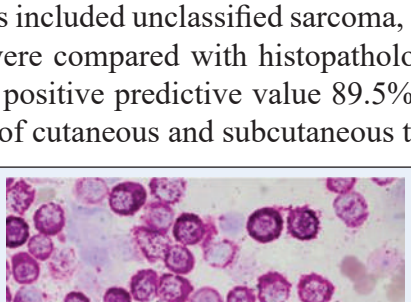
- **Molecular epidemiology, phylogenetic analysis and risk assessment of *Anaplasma marginale* from naturally infected bovines of Punjab (India)**
  A cross sectional comprehensive molecular epidemiological study of anaplasmosis on 391 (277 cattle and 114 buffalo) bovines from different districts of five agro climatic zones of Punjab state. Risk factors analysis revealed young, female cattle at unorganized farms were more prone to anaplasmosis. Custome sequencing of *Anaplasma marginale* revealed 98-99 % homology with published sequences for other available global isolates.

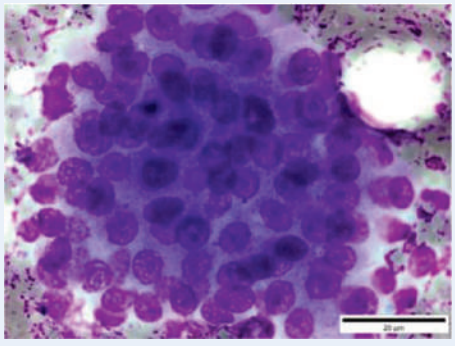


Multi-single nucleotide polymorphisms were observed in the sequence of two samples when aligned with the reference sequence from the NCBI database

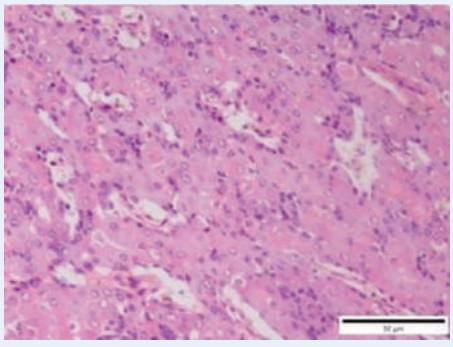
XII. Veterinary Pathology

- **Pathological evaluation on cutaneous and subcutaneous neoplasms in clinically presented dogs:** A study was conducted on 114 cases of cutaneous and subcutaneous neoplasms in dogs. On the basis of cytology, the neoplasms were classified into round cell, epithelial, mesenchymal and melanocytic tumors. Round cell tumors included lymphoma, TVT, mast cell tumors and histiocytic tumor. Epithelial tumors included squamous cell carcinoma, hepatoid gland carcinoma, carcinosarcoma and seminoma. Mesenchymal tumors included unclassified sarcoma, osteosarcoma, lipoma and liposarcoma. The cytological findings were compared with histopathological findings and a correlation of 78.18%, sensitivity of 86% and positive predictive value 89.5% was obtained between cytological and histopathological diagnosis of cutaneous and subcutaneous tumors.

	
Cytological smear from a case of cutaneous TVT. Leishman Stain x 100 X	*Cytological smear from a case of mast cell tumour. Leishman Stain x 100 X*

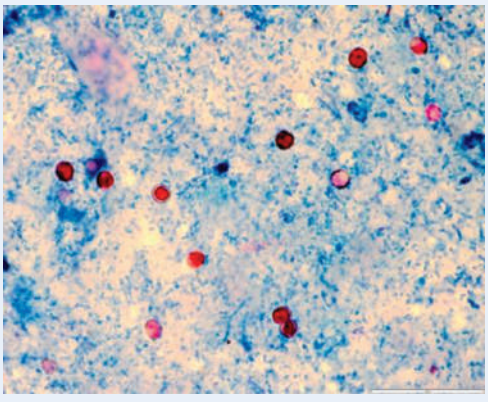


Cytological smear from a case of hepatoid cell carcinoma. Leishman Stain x 100 X



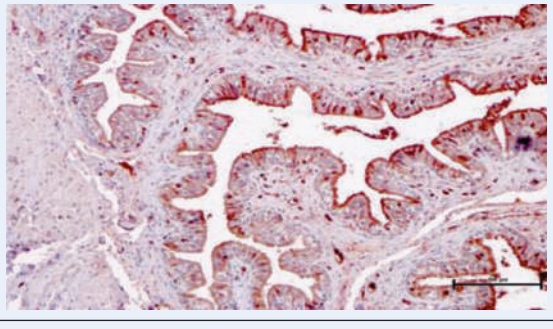
Hepatoid gland carcinoma showing sheet of epithelial cells not arranged in distinct lobules. H & E x 40 X

- **Pathological studies on bovine diarrhea:** This study elaborated the incidence and prevalence of Cryptosporidium parvum in young calves and identified it as an endemic infection in and around Ludhiana and needs to be investigated for human and animal health hazards.

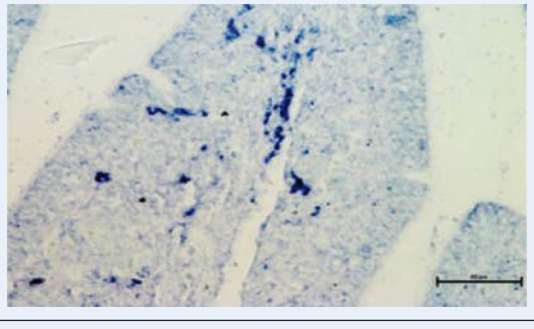


Cryptosporidium parvum from calf faecal sample

- **Studies on localization of humoral immune cells and antimicrobial peptide in chicken reproductive tract (uterus and vagina) in induced *Salmonella gallinarum* infection:** The study indicated increased local antibodies (IgA, IgY) generation against impending *S. gallinarum* infections, repressed anti-microbial peptide (ß defensin-10) expressions in all stages of infection and increased lysozyme activity with effective generation local innate immunity in intra-vaginally inoculated birds.



IHC of chicken vagina showing immunopositivity for Salmonella gallinarum infection at 14dpi



Chicken, Uterus showing m **RNA** *expression for ß defensin 10 (Blue black granular deposits) in middle connective tissue stroma especially near central blood vessels x40, ISH*

XIII. Veterinary Pharmacology & Toxicology

- **Ethnopharmacological studies:**
  - ❖ Supplementation of polyherbal formulation helped lactating animals maintain health even during stressful phase of production. Formulation also helped animals cope with production stress in better way indicated by change in antioxidant enzymes.
  - ❖ The use of another polyherbal formulation (AYUSH-V-24) in treating simple indigestion in buffalos was found to be comparable with that of standard commercial non-Ayurvedic preparation indicating its therapeutic potency without significant alteration of hematobiochemical parameters and ruminal profile.
  - ❖ The investigation was also conducted to evaluate the antioxidant, antibacterial and neurobehavioral properties of hydro-alcoholic leaf extracts of Aegle marmelos and Justicia zeylanica and they showed a hepatoprotective and renal protective effects.
- ***In-vitro* toxicological studies**

  The inquisition was also undertaken to assess the toxic potential of an oxadiazine insecticide, indoxacarb in Madin-Darby Bovine Kidney (MDBK) cell line. Correspondingly, the effect of *Cassia fistula* was evaluated against toxic damage produced by indoxacarb. Indoxacarb induced genotoxicity was evident by the formation of comet and micronuclei. *Cassia fistula* was only able to produce mild ameliorative effect on the genotoxicity induced by indoxacarb on MDBK cells, which occurred at lower concentrations only.
- **Nanotechnology studies**

  A study was conducted for the process optimization of different method for preparation of Thiotepa loaded nanoparticles by Ionic gelation method of chitosan nanoparticle. It was concluded that thiotepa loaded chitosan nanoparticles are suitable nano preparations. Also, the pharmacodynamic studies indicated a decrease in the drug dose thus increasing the anti-neoplastic efficacy.

XIV. Veterinary Physiology and Biochemistry

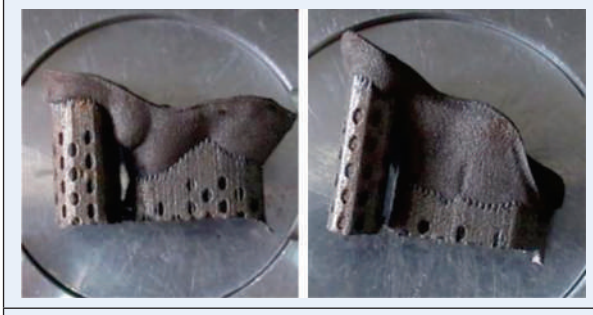
- **Evaluation of heat shock protein 90α as a biomarker in canine mammary tumor:** Serum Hsp90α concentration was significantly elevated in all canine mammary tumor subjects irrespective of the tumor histotypes compared to healthy dogs.
- **Effect of *Mucuna pruriens*** on physiological adaptability and molecular response to seasonal stress in beetal goats: Enhanced growth rate in goat kids, improved overall hematological and metabolic profile as well as increased antioxidant and immunoglobulin levels were observed. Expression of HSP-70 and HSP-90 decreased indicating improvement of overall adaptive capacity of goats to seasonal stress.
- **Metabolic profile, growth and milk production of goats reared under stall fed versus free range grazing system:** There was no difference in milk yield of lactating goats under stall fed and free-range system, however, stall fed goats exhibited significantly ($p<0.05$) higher milk lactose % and lower milk protein% during summer season, while, significantly ($p<0.05$) lower milk solids-not-fat % and milk lactose % during winter season.
- **Molecular and Biochemical studies to assess the effect of feeding milk replacer in weaned pigs:** The level of Acid Glycoprotein (AGP) was found to be significantly increased ten days post weaning while significant drop was observed in the level of IL-2 in early weaned group. Early weaning of piglets reduced the growth of the animals and feeding Milk Replacer had the positive effect on the

growth performance of early weaned piglets which was comparable to the nursing piglets.

- **Effect of Vitamin E on molecular and hematological parameters pertinent to seasonal variation in fattener pigs:** The relative expression of HSP70 and Nrf-2 showed significantly higher expression during summer. Supplementation with Vitamin E had ameliorating effect on heat stress.
- **A study on alterations in physiopathological parameters of ascites in dogs:** High creatinine and BUN value along with clinical signs was helpful in differentiating the ascites of renal origin from that of hepatic, cardiac and peritonitis origin. Furthermore, prognosis was concluded to be poor in ascites whereas grave in ascites of renal origin.

XV. Veterinary Surgery and Radiology

- **Development and clinical application of biomaterials for root canal treatment and crown therapy in dogs:** Fabrication of metal printed crowns was done by CAD/CAM technology with stainless steel 17-4-PH SS, an alloy of various metals. This metal was considered corrosion resistant with higher strength and mechanical properties. Morphological analysis illustrated that porosity and surface roughness in case of metal printed prototypes was less and controlled in comparison to natural tooth. Compressive property testing revealed that fracture resistance point in case of metal printed crown was significantly more in comparison to natural tooth.



Crowns after Metal 3D printing with honey comb like support material

Finishing of Maxillary PM4 and Mandibular M1

Dental crowns with stainless steel for canine teeth fabricated using CAM/CAD technology

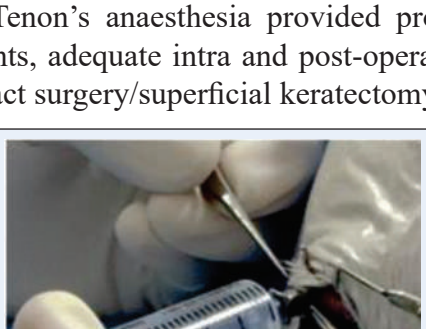
- **Development of novel suture materials and implants for canine arthropathies:** Indigenously collected suture materials viz. Nylon Fish line monofilament, Nylon fish line braided, and commercially available sutures like polyamide and polyester were tested on the basis of their physical and mechanical parameters and were used clinically after sterilization with ethylene oxide. Toggle pin implant, TPLO plates, TTA cages, SOP plates, Suture screws, sleeves, angled plates have been developed locally. These materials are in clinical use for animals suffering from arthropathies.
- **Designing and evaluation of various configurations of threaded intramedullary pins for canine long bone fractures:** The study reports the first of its kind indigenously designed double threaded pin for canine long bone fracture fixation with superior biomechanical stability to axial compression

and pull out loads as compared to end threaded and simple Steinman pin. Indigenously designed double threaded intramedullary pins (Stainless steel and titanium) which are being used clinically for the long bone fracture fixation in dogs. Double threaded pins (titanium and stainless steel) were found to provide rigid stability in a variety of fracture configurations of canines with long bone fracture. It is simple, cost effective and biological implant.

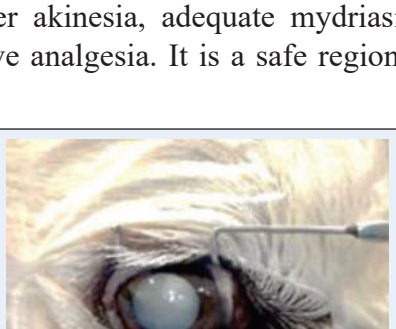
Indigenously designed double threaded (Titanium and Stainless Steel) intramedullary pin implants for canine long bone fracture fixation. (a) Configuration I and (b) Configuration II.

- **Studies on the efficacy of Sub-tenon's anesthesia as an adjunct to general anesthesia for ocular surgery in dogs:** The Sub-Tenon's anaesthesia provided proper akinesia, adequate mydriasis, reduced isoflurane requirements, adequate intra and post-operative analgesia. It is a safe regional anesthetic technique for cataract surgery/superficial keratectomy.

Tunneling in Subtenon's capsule



Injecting Lignocaine 2% in Subtenon's space



Mydiasis and akinesia after the Subtenon's anesthesia

- **Diagnostic utility of standing reticulography for diaphragmatic hernia in bovines:** Standing reticulography was less reliable as compared to the recumbent position for the diagnosis of diaphragmatic hernia in bovines. Among various standing reticulography positions, left standing with both forelimbs pulled forward is most reliable for diaphragmatic hernia in bovines; but, insufficient pulling of both forelimbs is a major limitation. Ultrasonography can fairly predict the severity of adhesions in herniated reticulum based on motility amplitude and is a good tool to ascertain the left or right sided reticular herniation.

Photograph showing a wooden scale for the measurement of Body girth at the site of radiographic exposure and its application on a buffalo.

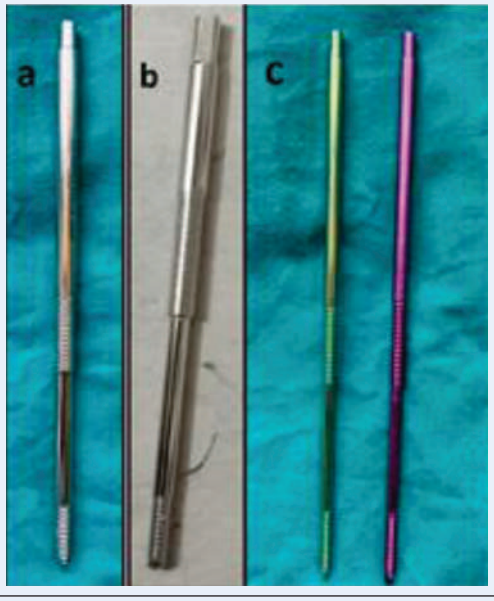
Photograph showing radiographic positioning

- **Clinical study on the occurrence pattern of equine lameness at Referral Veterinary Hospital:** The study included 67 clinical cases of equine lameness presented during 12 months of the study. Detailed signalment (age, sex and breed, history (onset and progression of lameness, purpose of keeping equine, any recent history of injury/trauma and duration of illness) were recorded. The study recommends to initiate awareness program on equine lameness to educate poor farmer.

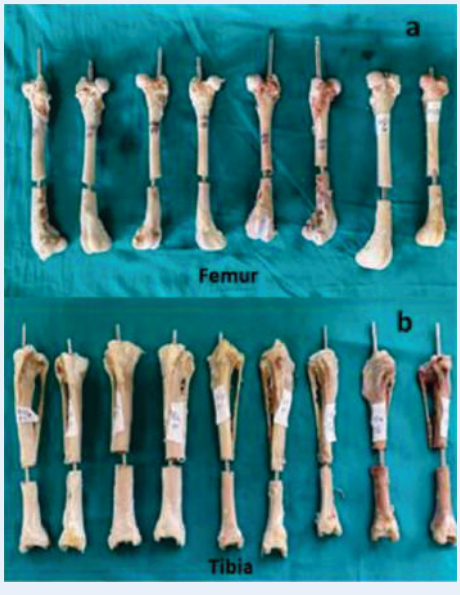
Photographs showing gross examination of hoof (a), fetlock swelling (solid blue arrow) (b), carpus (c), tarsus (d).

Sequential photographs of bilateral patellar luxation. Pre-operative presentation (a), radiograph (b), Intraoperative (c), follow up at 45 days (d).

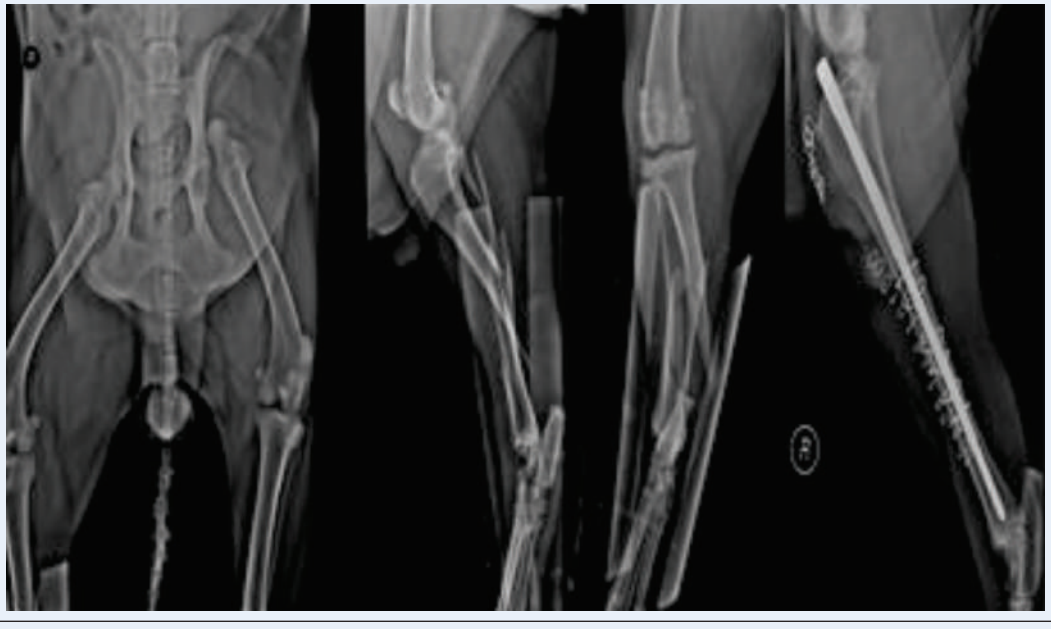
- **Biomechanical and clinical evaluation of indigenously designed double threaded intramedullary pin for the stabilization of canine tibial and femoral fractures:** Double threaded intramedullary pin (Stainless steel and titanium) was designed indigenously (first report of its kind) that was tested biomechanically for axial compression and pull-out loads and proved superior as compared to end threaded and simple Steinman pin. Intramedullary double end threaded pin designed provide better stability thus preventing implant related complications for canine tibial and femoral fractures but appeared painful. Implant design (double threaded vs. end threaded), irrespective of implant material (stainless steel vs titanium) influences the postoperative serum levels of BSP and PINP.



Photograph of the various bone design for double threaded pin



The photograph showing bone-pin construct for a fracture gap model in femur (a) and tibia (b)



Radiographs of Group B2 dog showing midshaft spiral fracture of tibia with sharp fragments. No collapse of pin migration is evident.

- **Comparative evaluation of dexmedetomidine and acepromazine as an adjunct to ketamine-isoflurane general anesthesia in cats:** Both dexmedetomidine and acepromazine had comparable effects in terms of clinico-physiological, haemodynamic and haemato-biochemical parameters when used as adjunct to ketamine- isoflurane general anesthesia in cats.

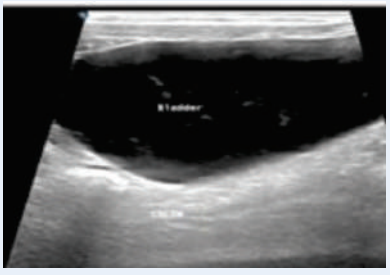
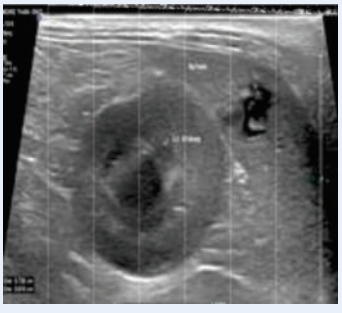
Endotracheal intubation in a cat

Rectal probe for temperature monitoring in a cat

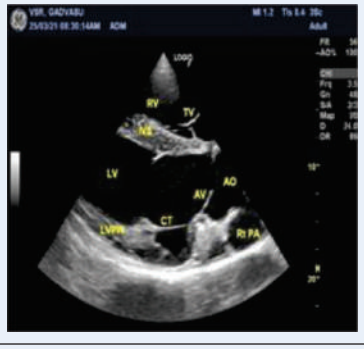
- **Comparative evaluation of titanium and stainless steel plates for the repair of radius bone fractures in dogs:** It was concluded that both titanium and stainless steel plates were not having any effect on the haemato-biochemical values. Initial weight bearing was early in animals operated by only by titanium implants. Although both titanium and stainless steel implants were having satisfactory recovery, the light weight titanium bone plate and screw combination was found better in terms of early weight bearing and less tissue reaction.

Serial Photographs and radiographs of a Hound operated for proximal radius and ulna fracture using plate on radius and pin in ulna.

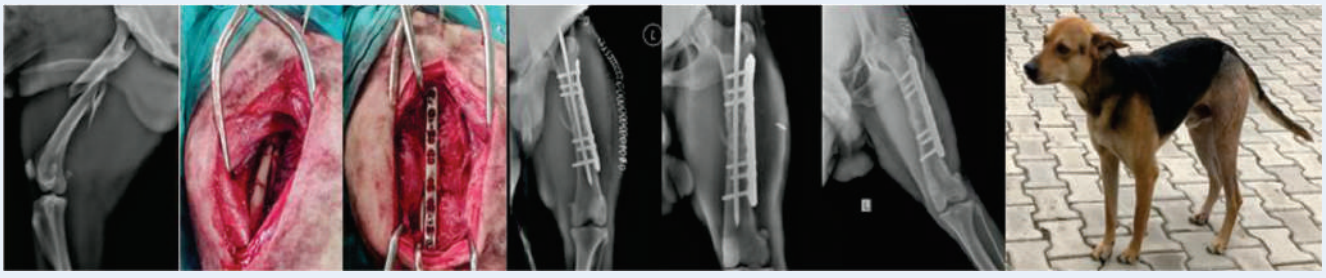
- **Evaluation of focused abdominal ultrasound for assessment of canine trauma patients:** It was concluded that AFAST technique had a sensitivity of 91.30 %, specificity of 100%, positive predictive value of 100% and negative predictive value of 83 .78% in evaluation of presence of free fluid. Detailed scanning of abdomen in trauma cases with a positive AFAST provided vital information about the status of visceral organs. The AFAST was found to be 12.81 times faster than the detailed ultrasound scan for assessing free fluid in abdomen in trauma patients. Mid ventral window can be incorporated in standard AFAST procedure to increase the sensitivity and negative predictive value of the technique.

		
Free fluid in SR window (N=7) in animals with spinal trauma (Gr. 2)	*Echogenic debris in gall bladder (DH window (Free fluid N=2)*	*Blood clots in urinary bladder (CC window (Free fluid N=1)*
		
Free fluid in HR window (N=5) in animals with spinal trauma (Gr. 2)	*Free fluid in thoracic cavity through DH window (N=1) in animals with spinal trauma (Gr. 2)*	*Hematoma in spleen (N=2) in animals with spinal trauma (Gr. 2)*

- **Clinical Studies on echocardiographic indices in equine**: Age had a significant ($P < 0.05$) effect on aortic root diameter at end diastole with age ≥ 8 years having higher value. Gender had a significant ($P < 0.05$) influence on EPSS with males having higher EPSS values than females. LVIDd, LVIDs, EDV, ESV and EF were significantly correlated with body weight. LVIDd, EDV, SV and EPSS were significantly correlated with age.

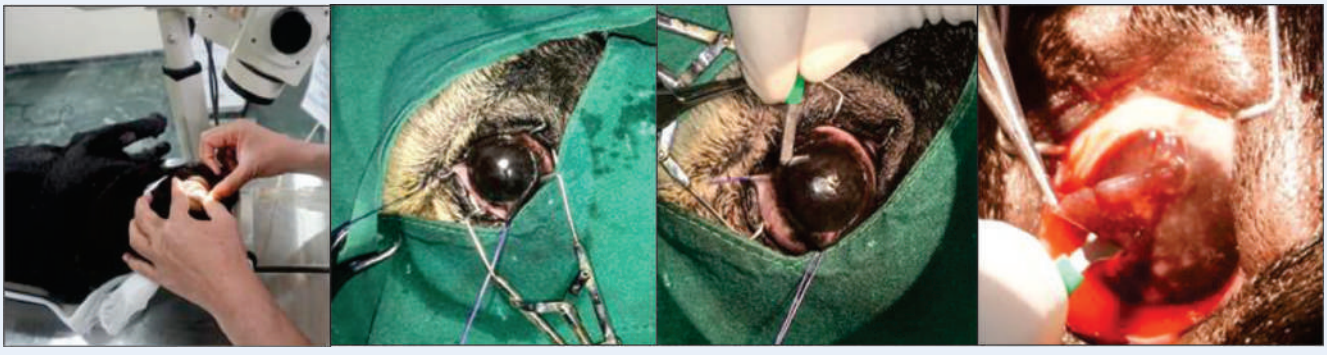
		
Showing right parasternal long axis left ventricular outflow view	*Showing right parasternal long axis aortic root*	*Showing right parasternal long axis four chamber view.*

- **Surgical management of humerus fractures and elbow joint arthropathies in canines:** The study concluded that interlocking nailing and intramedullary pinning are the useful techniques for stabilization of the humeral diaphyseal fractures. Lateral approach without opening the joint was excellent in managing the intercondylar fractures. Implant stabilization led to better joint mobilization as indicated by increased range of motion during postoperative period. The technique of transcondylar screw fixation with or without cross pinning was found effective for distal condylar humeral fractures.
- **Clinical studies on application of pin plate combination for surgical management of femur fracture in dogs:** The pin plate combination can be used successfully for diaphyseal comminuted femur fracture repair with good implant stability and satisfactory bone healing. The pin diameter of 32%-42% of the medullary cavity provides sufficient space for bicortical screw placement without any hindrance and post-operative implant failure



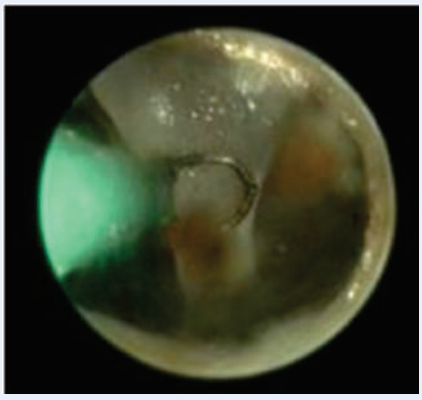
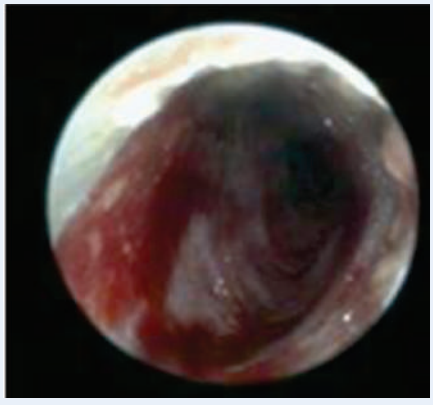
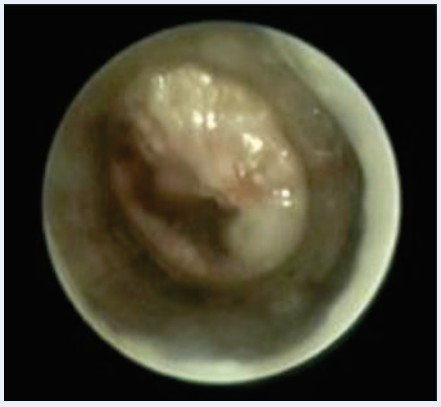
Serial photograph and radiographs of a femur operated using pin-plate combination

- **Clinical studies on surgical management of pigmentary keratitis in pugs:** Cryotherapy performed along with Medial Canthoplasty was a better technique compared to Superficial keratectomy performed along with Medial Canthoplasty in effective surgical management of PK in pugs.

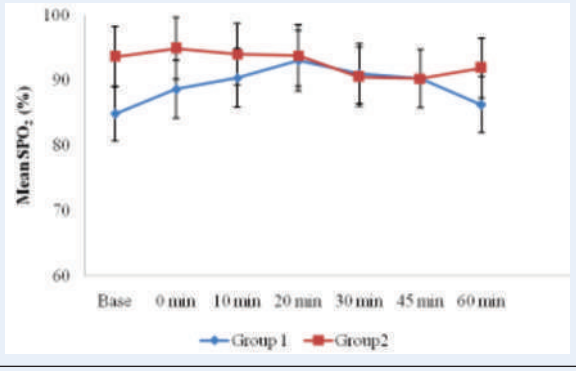
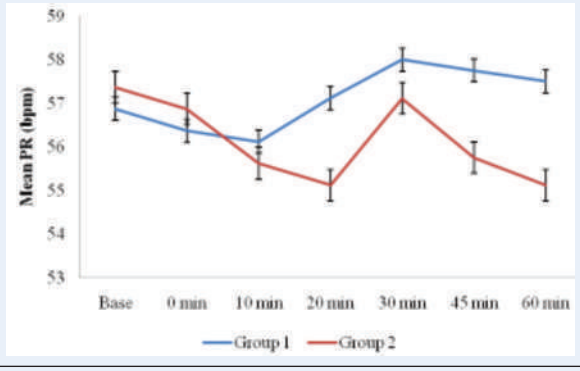


Serial photographs on the examination and surgery for the removal of pigmentary keratitis in a Pug dog

- **Studies on diagnostic approaches and minimally invasive techniques for management of milk flow disorders in bovine:** Cows were found to be more prone to milk flow disorders as compared to buffaloes. Ultrasonography in water bath using 6-12 MHz linear transducer in standing animals was reliable for diagnosis of extent and location of the lesion in cases of teat obstructions. Theloscopy is reliable for diagnosis of the internal lesions in cases of teat canal obstructions and to detect the presence of foreign body but was not applicable in cases of full teat fibrosis, Imperforated teat and Supernumerary teat, open teat injuries. Theloscopic electro resection aided in restoring the functional capacity and anatomical structure of the teat with milk flow disorders.

	
Theloscopy revealed presence of teat spider in group IIa3	*Theloscopy revealed presence of proliferation at the area of rosette of Furstenberg in case of obstruction at tip of the teat in group IIb1i*
	
Hyperaemic areas with teat tip laceration in case of obstruction at tip of the teat in group IIb1i	*Obstruction in the middle of the teat cistern in case of the mid teat obstruction in group IIb1ii*

- **Evaluation of guaifenesin as an adjunct to midazolam preanaesthesia for general anaesthesia in buffaloes undergoing diaphragmatic herniorrhaphy:** Midazolam+Propofol, as well as Guaifenesin+Midazolam+ Propofol, were shown to be safe and effective.

	
Mean±SE values of SPO_2 (%) in different Groups at different intervals Effect of Group with respect to their baseline value and overall effects of Group 1 and Group 2 on SPO2	*Mean±SE values of PR (bpm) in different Groups at different intervals Effect of Group with respect to their baseline value and overall effects of Group 1 and Group 2 on PR*

- **Clinical studies on laparoscopic aided diagnostic and surgical interventions for abdominal affections in canine with special reference to ovariectomy**: It was concluded that exploratory laparoscopy of the abdominal cavity and splenic tumors delineates the extent of lesion, presence or absence of metastasis to other organs, directly affecting the clinical outcome. Laparoscopic surgical interventions including splenic biopsy, laparoscopic-assisted cryptorchidectomy and laparoscopic ovariectomy were found to be feasible techniques in canine patients permitting magnified visualization, improved diagnosis and minimal surgical trauma. Ergonomically designed framework and pertinent training for performing laparoscopic surgery is critical for overall success of the procedure.

Straight table top

Table tilt to achieve Reverse Trendelenburg position

Left wedge lift to achieve semi lateral position of the dog

Right wedge lift to achieve semi lateral position of the dog

- **Arthroscopic and surgical management of hip and stifle arthropathies in dogs**: The study concluded that Chronic Hip Dysplasia was the most common arthropathy. Femoral head and neck ostectomy were effective in treating hip arthropathies. Toggle pinning had high reluxation rates due to suture breakage. Trochleoplasty was reliable in surgical management of patellar luxation. Rehabilitation was critical in recovery of dogs. Questionnaire aided subjective evaluation of dogs postoperatively.

- **Clinical studies on evaluation of oxidative status and surgical intervention in cataractous dogs:** The oxidative stress was found to be higher in cataractous dogs compared with apparently healthy dogs. The success rate of phacoemulsification was about 60% which was manifested as restoration of vision. Corneal opacity was reported as the most common post-operative complication.

XVI. Teaching Veterinary Clinical Complex

- **Chronic gastrointestinal disorders in dogs:** Diarrhoea of dietary origin/Food responsive diarrhoea and chronic gastritis are the leading aetiologies of primary chronic gastroenteropathies followed rectal adenocarcinoma, IBD, Protothecosis, foreign body, lymphoma and rectal hyperplasia. Hypoallergenic diet with 2:1 ratio of boiled potatoes and boiled chicken/cheese has been found very effective in management of diarrhoea of dietary origin whereas a combination of metoclopramide and ranitidine twice/thrice a day parenterally caused 94.73 per cent recovery in canine chronic gastritis. Rectal brush cytology is an easy and prompt method for diagnosis of rectal adenocarcinoma and almost equally reliable as fine needle aspiration cytology (FNAC). Protothecosis has been diagnosed as a cause of chronic enteropathy for first time in India. Arsenic album a homeopathy drug may be used as an alternative medicine for treatment of protothecosis.
- **Foot lameness and its relationship with udder health in Sahiwal dairy cows:** Clinical lameness is less in Sahiwal cows as compared to crossbred cows. Rear leg view does not change in Sahiwal cows irrespective of lameness score and presence of lesions. Under run sole is the most common lesion in Sahiwal cows followed by white line lesions, overgrown soles, cork screw hooves, sole avulsions, heel erosions and double soles. At least one claw lesion is present in 73 per cent of Sahiwal cows. Odds of mastitis increases with increase in lameness score.

B. College of Animal Biotechnology

- **Canine parentage determination:** The parentage determination work was done in canines using 10 breeds (Labrador, German Shepherd, Pug, Beagle, Pointer, Belgian Malinois, Cane Corso, Gaddi, Tibetan Mastiff, and Mudhol Hound) representing trios and duos. The Shannon's index of the markers varied between 0.474 to 1.000 indicating the goodness of the markers. Twelve 5'-fluorescent-labeled forward and unlabeled 3 reverse primers were identified as informative SSR-based markers for parentage determination in dogs.

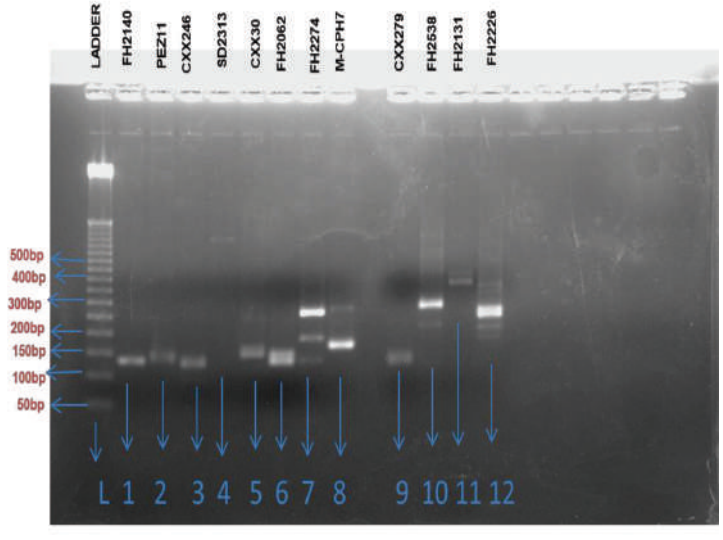


Fig: Gel image depicting bands of various SSR markers used in parentage verification study (against ladder).

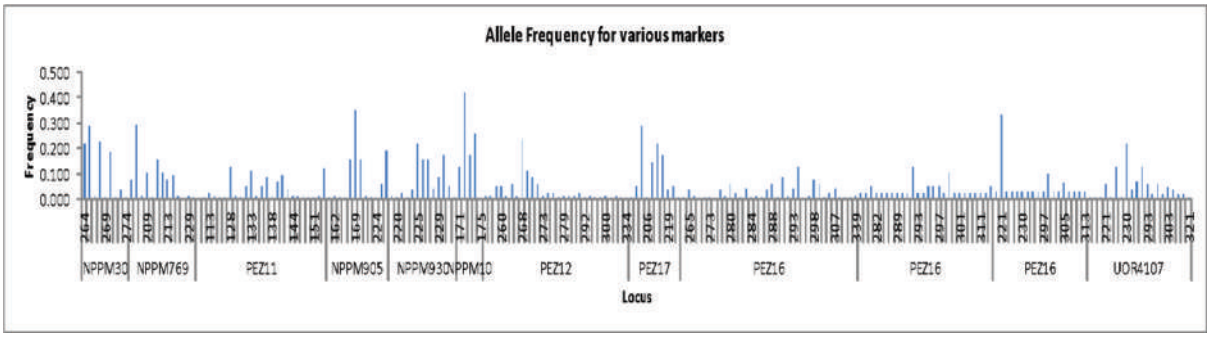


Fig: Graphical representation of allelic frequencies for various markers used for parentage determination

Maiden report on Gaddi whole genome sequence: The whole genome sequencing of Gaddi dogs was done and number of reads of 5 samples varied between 596.2 M to 700.7 M with the Q30 rate varying between 90.5% and 93.3%. The data analyzed was submitted to the National Centre for Biotechnology Information (NCBI) after analysis with SRA-Id: SUB11545263.

Genome-wide miRNA prediction in Gaddi breed of dog: The genome sequences subjected to biocomputational analyses for detailed annotation including prediction of protein-coding and non-coding RNA-specific genes predicted 22 miRNAs. The similarity analysis revealed that the identified miRNAs had similarities with cfa-mir582, cfa-mir8890, cja-mir582, ppy-mir4484 and cli-mir122. In contrast, the miRNA prediction in 5 exotic breeds revealed the maximum number of predicted miRNAs as 20 for the Great Dane (Zoey) while the minimum number of predicted miRNAs was of the Basenji (with 3 miRNAs).

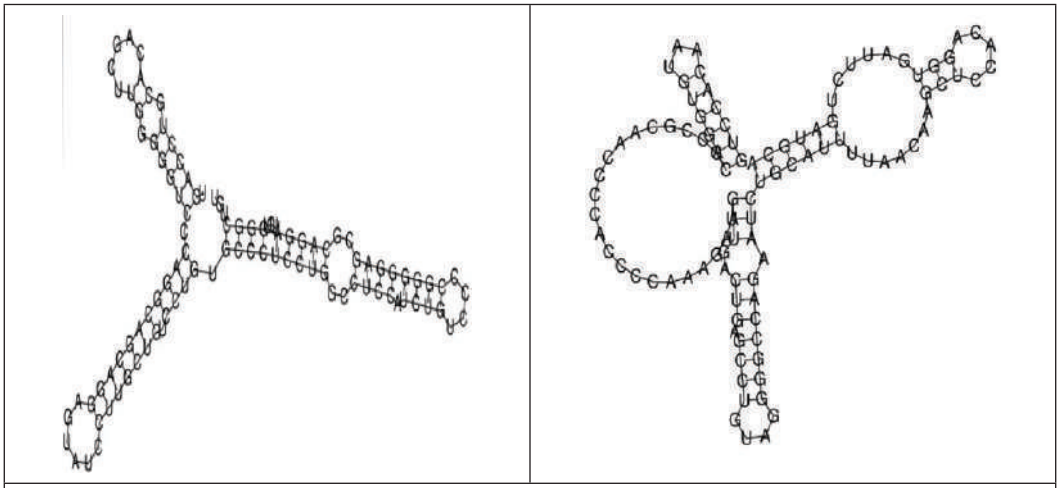
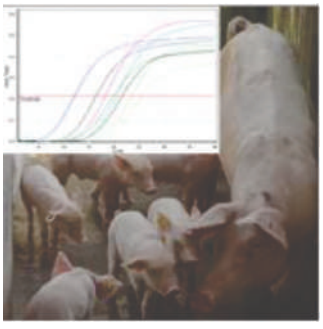


Fig: Secondary structure of a predicted miRNA

PCR-based diagnostics for detection of canine distemper: The college has developed L gene-specific PCR and quantitative (q)PCR for detection of the canine distemper virus in the clinical samples.



Singleplex and duplex qPCR-based assays for African Swine Fever: The college developed probe-based diagnostics assays (singleplex & duplex) for detection of African Swine Fever (ASF) virus targeting RNAP1 and the capsid gene p72 gene from blood/swab/tissues.

Diagnostic laboratory for leptospirosis: A facility has been developed in the

laboratory for isolation, serological diagnosis of leptospirosis by microscopic agglutination test (MAT) as well as for molecular detection by PCR assay. Of 778 serum samples tested using MAT, the overall percentage was 8.43%. Species-wise positivity was 9.87% (dogs), 10.43% (bovine), 10% (horses) and 0.78% (human). Standardization of the PCR assays 16S and lipL32 gene (singleplex & duplex), revealed 1.93% samples positive for the presence of pathogenic leptospires.

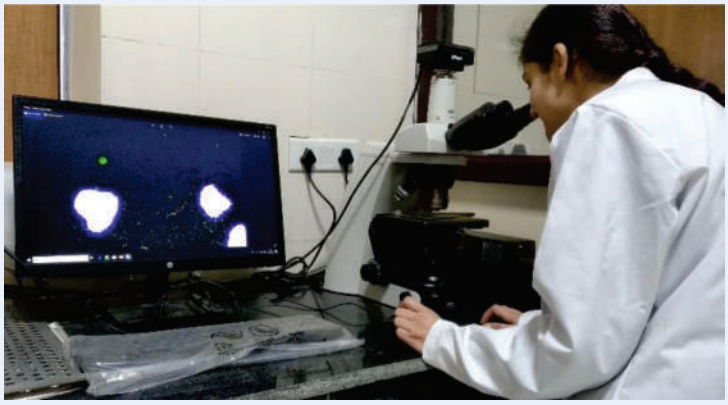


Fig: Dark Field microscopy facility for leptospirosis (MAT)

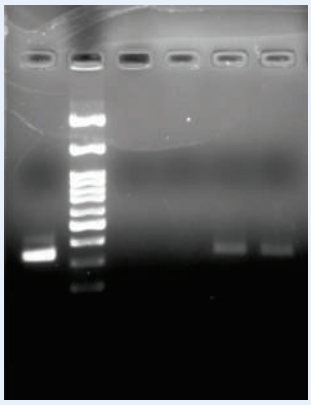


Fig: PCR on samples for leptospirosis

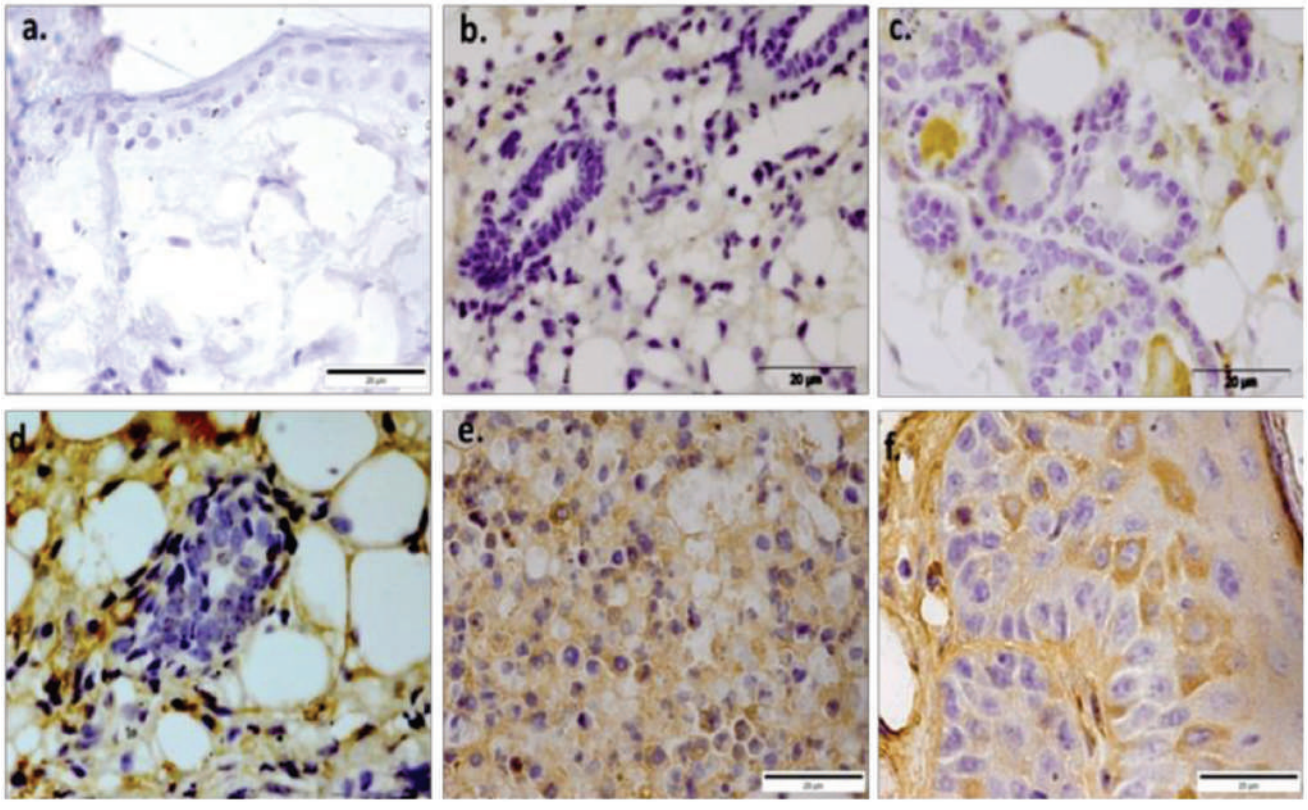


Fig. Immunostaining (IHC) of murine mammary tumor tissue: Representative images showing tumor-associated antigen (name concealed due to IPR issue) expression in the negative control (a), group of mice post 15th day (b), 45th (c), of immunization with the vaccine construct and in control animals [empty vector (d), IL-2 injected (e), PBS injected (f)]. Reduced expression of tumor-associated antigen expression in treatment group animals as compared to control animals suggests regression of tumor after immunization with the vaccine construct

Xenogenic DNA vaccine against mice model of mammary tumor: A biomarker(s) based therapeutic xenogenic DNA vaccine against mammary tumors in mice models was developed and two vaccine constructs firstly in the bicistronic vector pIRES expressing canine mammary tumor-associated genes along with mice IL-2 (an endogenous adjuvant), followed by their sub-cloning in pVAX-1 were checked for their efficacy against mammary tumor. One of the two constructs showed tumor regression and, the group of mice injected also showed enhanced cell-mediated immune response.

C. College of Diary Science and Technology

1. Dairy Technology

- **A zinc oxide based nano-biocomposite film packaging application in mozzarella cheese** increased its shelf life up to 18 days as compared to other samples (15 days). It had better physiochemical, mechanical and antibacterial properties than composite film (control film).
- **A cheddar cheese powder** manufactured from indigenous Sahiwal cow was comparable with Nili Ravi buffalo breed in terms of flavour and ripening. The powder prepared from Sahiwal cow milk and Nili Ravi buffalo milk using vacuum dryer took less time and had acceptable quality characteristics for incorporation in food and dairy products**.**
- **A technology for preparation of dairy-based functional beverage powder** with the addition of natural sweeteners like brown sugar, jaggery, date syrup and sugar along with addition of resveratrol emulsion was optimized to provide the potential health benefits to the consumers.
- The yield of **probiotic Ricotta cheese** was reported as 5-6 % and had 11-12% proteins with a shelf life of 10-12 days. The survivability of the probiotics throughout the storage period in probiotic ricotta cheese was more than 10^9 cfu/ ml. The estimated cost of manufacturing was Rs. 50 for Ricotta and Rs. 140 for Probiotic ricotta cheese.
- A **healthy beverage** using a blend of juices (pineapple) after enzymatic treatment and ricotta cheese whey was developed to give thirst-quenching and wholesome nutritious drink.
- A **probiotic smoothie** with the goodness of fiber and with zero-calorie variant was developed to meet contemporary consumer demands.
- A healthy **counterpart to conventional pizza cheese** was developed, enriched with fiber and omega fatty acids.
- A **buffalo milk protein concentrate (MPC 70) was developed** with more than 97% solubility and higher functionality.
- A quality **casinate with improved functionality was developed** as fat replacer for food and dairy products.
- **A ready to use milk solids and turmeric based healthy paste** was developed to impart benefits of turmeric to the milk.
- A **buffalo whey protein concentrate-35** was developed which can act as an excellent replacer for skim milk powder.
- A **ready to use milk tea concoction** with excellent mouthfeel, colour and flavour was developed.
- Micro-fluidization treatment of ultrafiltration retentate had a positive effect on improving the **functionality of Buffalo milk protein concentrate.**

2. Dairy Engineering

- **Solar driven technological interventional in manufacturing of ice bank tank (IBT) for milk cooling at dairy farms:** It utilizes thermal fluids to harness solar energy and helps in fabrication of hydidized ice bank tank to generate cold water for dairy industry with a refrigeration capacity of 2-3 tonnes.

- **Engineering intervention for mechanization of mozzarella cheese manufacture at cottage scale:** The unit was conceptualized and designed for a capacity of 125 litres of milk with maximum yield of 13 kg mozzarella. The system was designed with following components:
  - ◊ Milk Chiller capacity = 300 litre of water
  - ◊ Compressor capacity = 1.5 tonnes of refrigeration
  - ◊ Milk storage tank capacity = 150 litres
  - ◊ Cheese vat capacity = 125 litres of milk
  - ◊ Stretching and moulding unit
  - ◊ All units and pipelines will be fabricated from SS304.

3. Dairy Chemistry

- A study was undertaken to evaluate the antioxidant and bio-colorant potential of beetroot fortified yoghurt and was concluded that the beetroot juice is rich in antioxidants that helps to quench free radicals and prevent there adverse health effects.

4. Dairy Microbiology

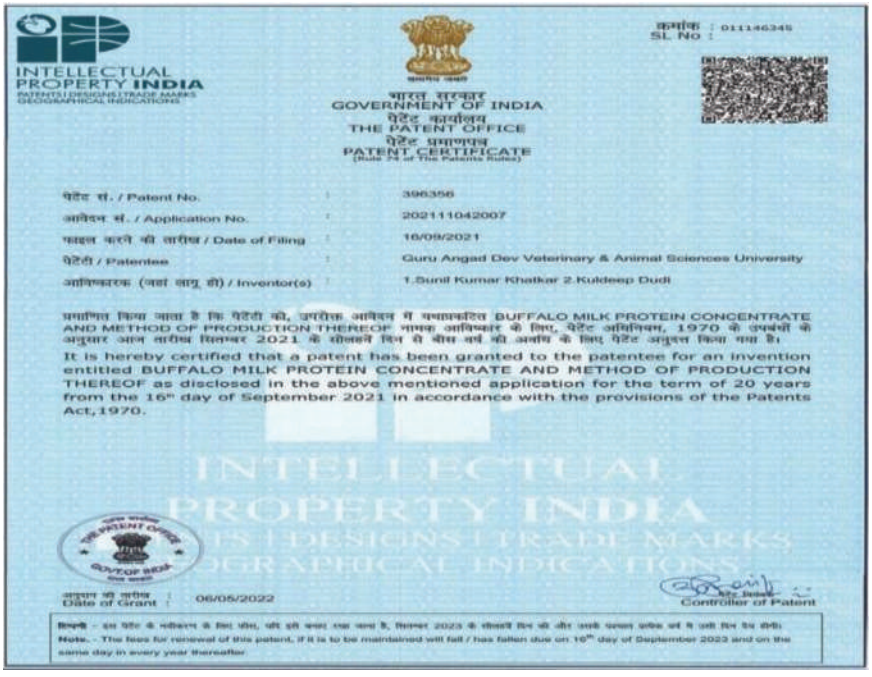
- **Designer food for management of type-2 diabetes: Targeting gut hormone modulatory potential of probiotics:** The study aimed to apply research involving gut microbiota to address the diabetic catastrophe with a novel, safe and cost-effective dietary intervention. An indigenous probiotic *Lactobacillus* strains *viz*. *L. paracasei* HM-1 (CP072915), *L. rhamnosus* IF9, and *L. gasseri* GM18 having gut hormone stimulatory potential were found.

5. Dairy Economics and Business Management

- The most important thing for dairy sector profitability is to identify constraints that will affect the farm production and ultimately profitability. Value addition of milk will lead to increase in farmer income.
- It was proposed that dairy farmer should sell their milk directly to consumer by direct marketing channel as compared to indirect marketing channel to get benefitted.

- Livestock based integrated model system have greater returns to the farmers and help in generation of additional income by productive recycling of farm wastes.

6. Obtained a patent for the technology of *Buffalo Milk Protein Concentrate.*



INTELLECTUAL PROPERTY INDIA
PATENTS | DESIGNS | TRADE MARKS
GEOGRAPHICAL INDICATIONS

कमांक : 011146345
SL No :

भारत सरकार
GOVERNMENT OF INDIA
पेटेंट कार्यालय
THE PATENT OFFICE
पेटेंट प्रमाणपत्र
PATENT CERTIFICATE
(Rule 74 of The Patents Rules)

पेटेंट सं. / Patent No.	:	396356
आवेदन सं. / Application No.	:	202111042007
फाइल करने की तारीख / Date of Filing	:	16/09/2021
पेटेंटी / Patentee	:	Guru Angad Dev Veterinary & Animal Sciences University
आविष्कारक (कों) / Inventor(s)	:	1.Sunil Kumar Khatkar 2.Kuldeep Dudi

प्रमाणित किया जाता है कि पेटेंटी को, उपरोक्त आवेदन में यथाकथित BUFFALO MILK PROTEIN CONCENTRATE AND METHOD OF PRODUCTION THEREOF नामक आविष्कार के लिए, पेटेंट अधिनियम, 1970 के उपबंधों के अनुसार आज सत्रहवें सितम्बर 2021 के सोलहवें दिन से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled BUFFALO MILK PROTEIN CONCENTRATE AND METHOD OF PRODUCTION THEREOF as disclosed in the above mentioned application for the term of 20 years from the 16th day of September 2021 in accordance with the provisions of the Patents Act,1970.

INTELLECTUAL PROPERTY INDIA
PATENTS | DESIGNS | TRADE MARKS
GEOGRAPHICAL INDICATIONS

THE PATENT OFFICE GOVT OF INDIA

अनुदान की तारीख / Date of Grant : 06/05/2022

Controller of Patent

Note. - The fees for renewal of this patent, if it is to be maintained will fall / has fallen due on 16th day of September 2022 and on the same day in every year thereafter.

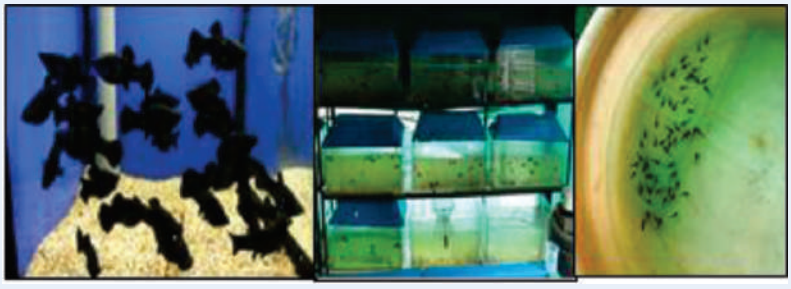
D. College of Fisheries

I. Inland Saline Water Aquaculture

i) **Economic utilization of inland salt affected degraded lands in 4 south west districts of Punjab (Fazilka, Sri Muktsar Sahib, Mansa and Bhathinda) through shrimp farming (Horizontal expansion) -** Expansion in area – From 1 acre in 2014 to 835 acre in 2021 with an estimated increase to about 1200 acres in 2022 and employment generation to about 12000 people (including the backward and forward supply chain) and significant improvement in the socio-economic condition of farming community through net income generation in the tune of 3-5 lakh/acre per crop of 100-120 days.

Map showing utilization of inland salt in south west districts of Punjab through shrimp farming (Horizontal expansion)

ii) **Suitability of fresh water ornamental fish species in inland saline water Eco-physiological responses of black molly, *Poecilia sphenops* in inland saline waters:** The results revealed that molly could tolerate salinity up to 16 ppt for short duration of salinity exposure with 88.89% survival, whereas during longer salinity exposure fish adapted to ≤ 10 ppt. Fish growth and reproductive performances were significantly affected at the higher salinity treatments (12-16 ppt), while best values were recorded at intermediate salinity treatments (6-10 ppt). Overall results in terms of survival, growth, reproductive performances, stress responses and coloration studies on black molly revealed that, although fish was capable of adapting and growing under salinity conditions up to 12 ppt in inland saline water, but 8 ppt salinity can be considered safe with respect to overall performance of fish.



Eco-physiological responses of black molly, Poecilia sphenops in inland saline waters

II. Aquaculture Nutrition

Effect of Duckweed, Spirodela polyrhiza as a binder for pellet fish food

1. **Nutritionally rich organic binder for pellet fish feed:** Protein rich Duckweed, *Spirodela polyrhiza* was tested to produce water stable pellet feed and its effect on fish growth, health and quality was studied. Six experimental feeds viz., control feed without binder (CF), cane molasses (5%) binder feed (MF5), corn starch (5%) binder feed (CSF5) and three duckweed (DW) binder feeds containing DW paste @ 5% (DWF5), 7.5% (DWF7.5) and 10% (DWF10), were prepared and evaluated in terms of proximate composition, water stability, sinking time, microbial load and aflatoxin levels over a storage period 240 days. The DW paste appeared as a more potent binder, with enhanced water stability i.e., 42.99, 43.66 & 28.57% higher (Max. DWF7.5) and sinking time i.e., 1.56, 1.61 and 2.34 times higher (Max. DWF10) as compared to CF, MF5 and CSF5 feeds, respectively. Microbial contamination and aflatoxin level in all the DW binder reduced significantly during the storage period, indicating antimicrobial/antifungal properties of duckweed. Fish productivity increased by 32.19%, with significant increase in thyroid hormone (T3/T4) and immunological parameters ($P \leq 0.05$) of fish. Flesh protein content increased significantly ($P \leq 0.05$) up to 13.02, 8.17 and 8.02% in rohu (DWF7.5) and 19.21, 15.27 and 14.50% in common carp (DWF10) as compared to CF, MF5 and CSF5 feeds, indicating multiple economic utility of duckweeds in aquaculture nutrition.

2. **Fish feed formulation with herbal supplements and fruit wastes:** With an objective to develop eco-friendly fish feeds for enhanced productivity and disease resistance, efficacy of growth promoting immuno-stimulating organic supplements (ginger extract and kinnow peel powder) was evaluated in different fish species.

i) **Ginger extract:** Prophylactic effect of ginger extract (GE) against *Vibrio parahaemolyticus* was determined in gnotobiotic *Artemia* as a model system. The results showed that pre-treatment of *Artemia* larvae with GE @ 250 ug ml^{-1} led to a significant protection of the larvae upon challenge with *V. parahaemolyticus*. The results revealed that ginger extract (pure form) can be used for the enrichment of *Artemia* to be used it further as nutraceutical food for fish/shrimp larvae.

ii) **Shatavari root powder:** Shatavari (*Asparagus racemosus*) root powder (SRP) was tested as growth promoting, immunomodulatory and as an asaphrodisiac feed additive in common carp, *Cyprinus carpio* (Linn.). At 4% incorporation level resulted in enhanced growth of fingerlings (50.85%), immunity (Relative percent survival - 69.24%) against *A. hydrophila* and flesh protein – 12.31%, along with improved female brood stock reproductive potential in terms of GSI - 41.23%, relative fecundity – 45.00%, reproductive hormones (Estradiol - 53.36%, Progesterone – 130%), egg quality (Protein – 6.65% and Lipid – 25.56%) but with no improvement in male reproductive potential.

Shatavari (Asparagus racemosus) root powder (SRP)

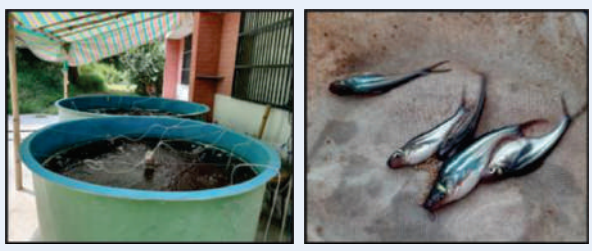
iii) **Kinnow peel powder (KPP):** KPP was incorporated in feed to investigate its effect on the growth, flesh quality and immunity of common carp (*Cyprinus carpio*). Fish fed with KPP incorporated feed (1.5%) resulted in enhanced growth (33.76%), flesh protein (16.25%) and immunity (serum TP – 32.53%, Globulin – 44.89%)

Kinnow peels *Kinnow peel powder*

III. Intensive Aquaculture Technologies

1. Biofloc Aquaculture System (BFAS)

i) **Production performance of high value Pangas catfish (*Pangasius hypopthalmus*) in BFAS at different stocking densities:** A biofloc based aquaculture trial was conducted to evaluate the production performance of high value pangas catfish at different stocking densities. At stocking density of 50/m^3, enhanced fish growth (41.41%) was achieved with 40.41% increase in total yield.

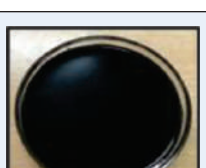


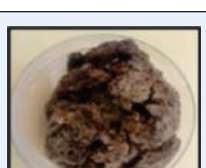
Biofloc culture tank *Biofloc raised Pangas*

ii) **Efficacy of different carbohydrate sources for development of biofloc in an aquaculture system:** Of the 03 carbohydrate sources tested (Molasses, Tapioca flour and Jaggery) – Jaggery was found to be one of the best carbohydrate sources with following major findings

- ◊ Bioloc volume increment: 14 – 45%
- ◊ Heterotrophic bacterial population enhancement: 9 – 30%
- ◊ Total plankton population enhancement: 7-16%

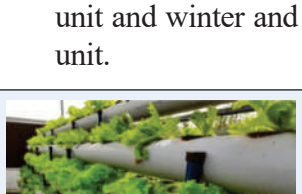

Tapioca flour


Molasses

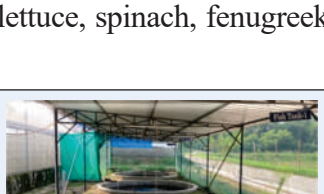

Jaggery

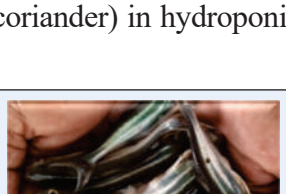

Jaggery based biofloc

2. **Aquaponics System:** An ***automated aquaponics system*** for vertical farming was established in collaboration with Centre for Development of Advanced Computing (C-DAC), Mohali, Ministry of Electronics and Information Technology (MeitY), Government of India (GOI), for developing regionally viable package of practices for optimized economic output. Successful trials were conducted by integrating food and ornamental fish species (pangas catfish and koi carp) in aquaculture unit and winter and summer season vegetables (lettuce, spinach, fenugreek, coriander) in hydroponics unit.


Lettuce grown in hydroponic unit

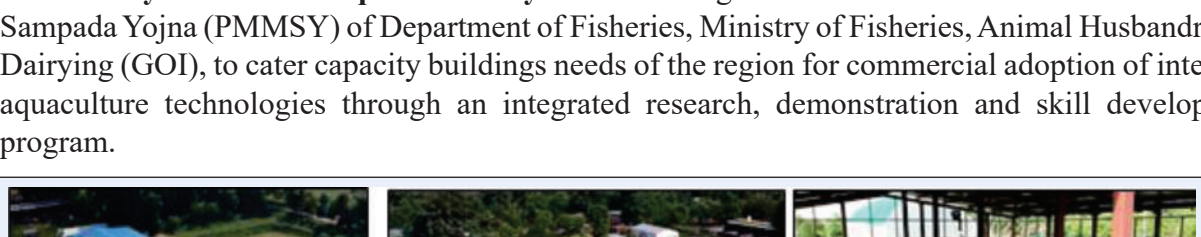

Automated Aquaponics System


Aquaculture Unit


Pangas grown in aquaponic unit

Season	Fish in Aquaculture Unit	Vegetable Crop in Hydroponic Unit	Increase in per unit Production	Sensory Evaluation All Vegetable Crops (1-9 Scale)
Winter	Koi Carp (Ornamental Fish)	Lettuce and Spinach	Lettuce- 3.3 times	7-9
Summer	Pangas (Food Fish)	Mint and Tomato	Pangas – 6.4 times	

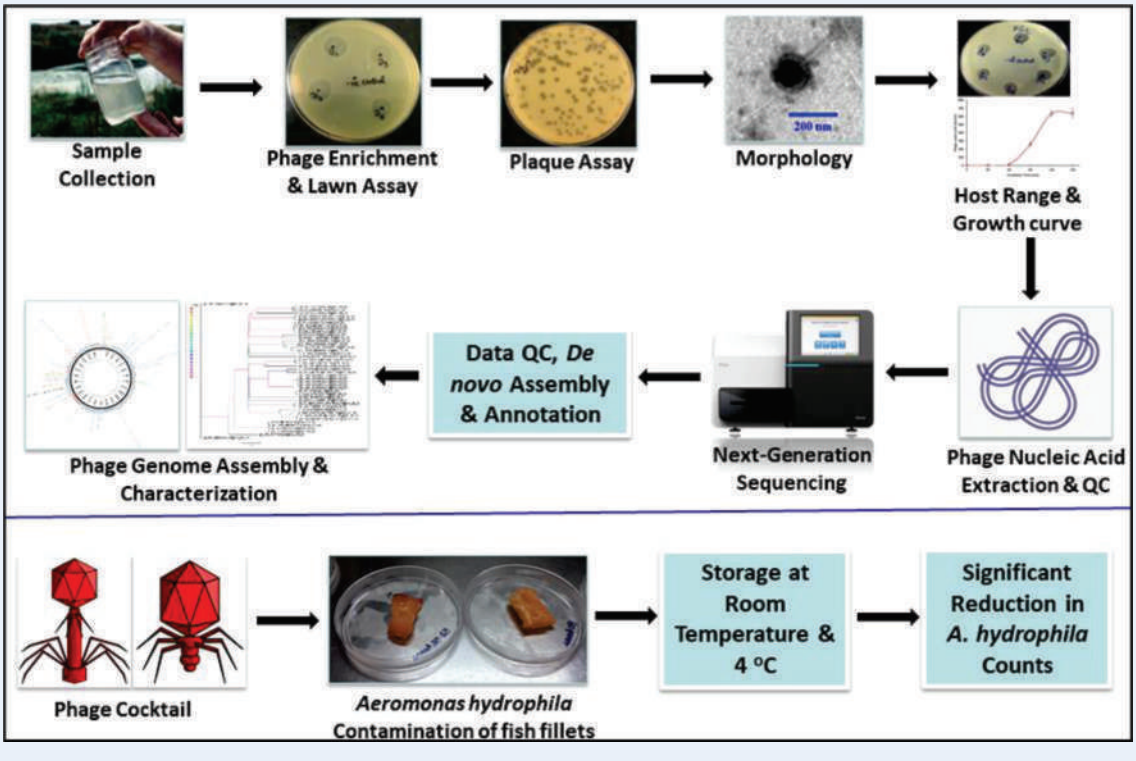
3. **Capacity Building Resource Centre for Intensive Aquaculture Technologies in Punjab: Re-Circulatory and Biofloc Aquaculture Systems'** is being established under Pradhan Mantri Matsya Sampada Yojna (PMMSY) of Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying (GOI), to cater capacity buildings needs of the region for commercial adoption of intensive aquaculture technologies through an integrated research, demonstration and skill development program.


Re-Circulatory and Biofloc Aquaculture Systems

IV. Aquatic Environment and Health Management

A. Isolation and characterization of *Aeromonas hydrophila* lytic phage, and evaluation of a phage cocktail against *A. hydrophila* contamination in fish fillet

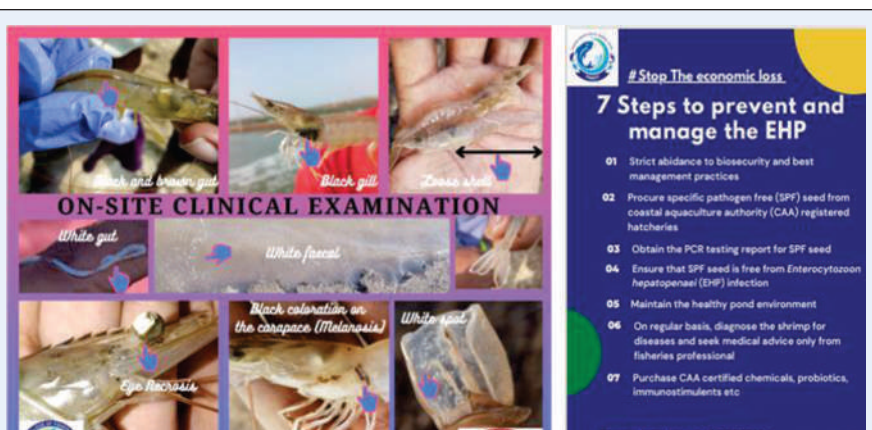
- An *A. hydrophila* lytic phage (named D6) was isolated, characterized and subjected to whole-genome sequencing. The phage belonged to order *Caudovirales* and family *Myoviridae* was able to lyse 95% of *A. hydrophila* isolates. The genome of D6 also contained several genes essential for the phage life cycle.
- A two-phage cocktail of D6 and CF7 reduced the *A. hydrophila* counts by >95% in fish fillets at room temperature as well as at 4 °C. It was found that both phage D6 and CF7 were able to propagate within the *A. hydrophila* host on the fillet matrix. The broad range phage cocktail from the present study could be used to ensure the safety of fishery products against *A. hydrophila* contamination.



Workflow of isolation and characterization of A. hydrophila phage D6 and evaluation of efficacy of phage cocktail against A. hydrophila contamination in fish fillet

B. Fish/Shellfish Disease Surveillance

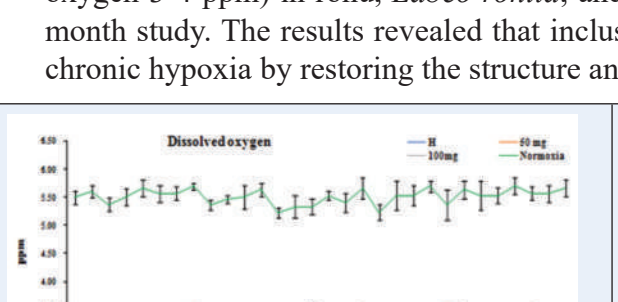
- Under the ICAR-PMMSY funded project, Non-infectious shrimp diseases and *Enterocytozoon hepatopenaei* (EHP) has been reported in the shrimp farms of Punjab and bacterial (*Aeromonas hydrohipla)* and parasitic (*Larnae* and *Argulus*) disease were reported in the finfish culture of Punjab.
- Under the DST-SYST funded project, developed the recombinant cum oral vaccine against the *Aeromonas hydrohipla* in fish - Fish health and *Aeromonas hydrophila* disease resistance were found to be positively impacted by chitosan nanoparticles at 1g/kg diet of fish. Additionally, recombinant protein (outer membrane protein) was produced using a bacterial expression system.

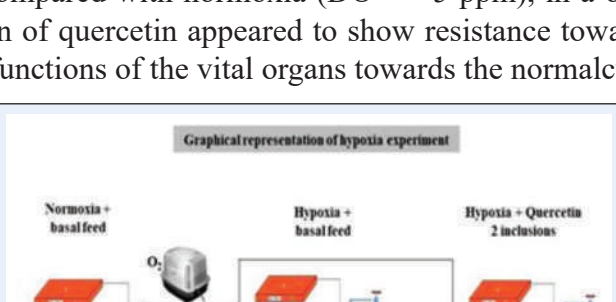


Field guide like Leaflets: On-site clinical examination of shrimp and 7 steps to prevent and manage the EHP in shrimp culture

C. Disease amelioration & management through herbal therapy

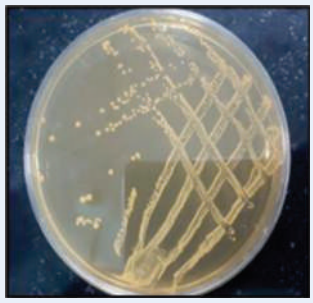
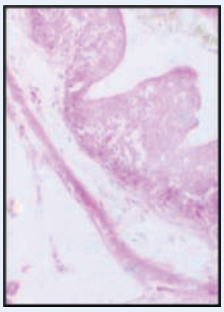
- **Quercetin for amelioration of hypoxia:** Quercetin was tested to ameliorate hypoxia (Dissolved oxygen 3-4 ppm) in rohu, *Labeo rohita*, and compared with normoxia (DO - > 5 ppm), in a one-month study. The results revealed that inclusion of quercetin appeared to show resistance towards chronic hypoxia by restoring the structure and functions of the vital organs towards the normalcy.





The daily variation of dissolved oxygen in the hypoxia amelioration experiment
A schematic showing the hypoxia generation during the experiment and conditions maintained

- **Potential putative probiotic bacteria in fish feed:** Putative (isolated from fish gut) probiotic bacteria was tested in carps at different levels to study its effect on growth and health of fish. Feed supplemented with probiotic *Lactobacillus plantarum* @10^9 CFU/g feed improved survival (15.56%), growth (27%), health, flesh quality (increased protein content), in Indian Major Carp, mrigal, *Cirrhinus mrigala.* Challenge study with pathogenic bacteria, *Aeromonas veronii* indicated reduced mortality with 15.38, 15.38, 23.07 and 34.61% RPS (relative percent survival) as compared to control fish at 10^6, 10^7, 10^8 and 10^9 CFU/g feed inclusion levels, respectively. Histomorphological changes in the intestine of the probiotic supplemented diets also confirmed the findings by increased villi height and surface area for better feed absorption and in turn improved growth and health status of the fish.

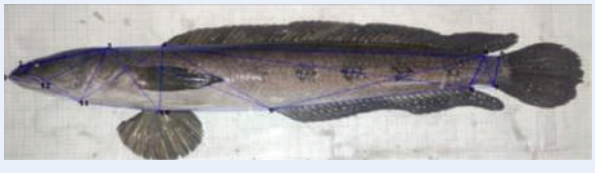
<table>
<tr><td>  </td><td>  </td><td colspan="2">   </td></tr>
<tr><td>Isolated L. plantarum culture</td><td>L. plantarum supplemented pelleted feed</td><td colspan="2">Histomicrograph of fish gut after 120 days feeding L. plantarum</td></tr>
<tr><td></td><td></td><td>No probiotic</td><td>@109CFU/g of feed</td></tr>
</table>

V. Fisheries Management in Natural Resources

A. Population dynamics and genetic diversity of commercially important fishes (catfish and murrel) from selected stretches of river Sutlej in Punjab

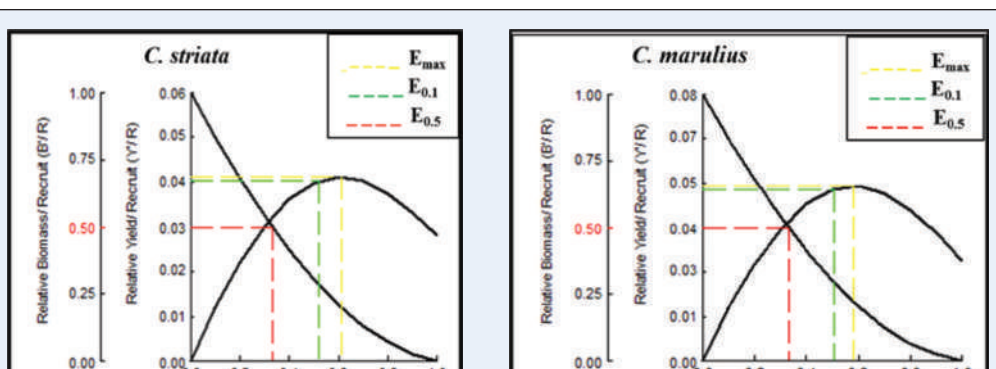
- The study was carried out to evaluate the population dynamics and genetic diversity of commercially important catfish, *Sperata seenghala* (Seenghara) and murrels, C*hanna marulius* and *C. striata* (Saul) from selected stretches of River Sutlej in Punjab. A total of 300 specimens (biometric and population dynamics) and 30 caudal fin tissue samples (genetic diversity) of each species were considered for the study**.** Length-weight relationship established negative allometric growth pattern in all the three studied species; Condition Factor (K) and relative condition factor (Kn) revealed optimum well-being of fish.
- **Population dynamics study of murrels:** Asymptotic length (L∞), growth coefficient (K) and age at zero length (t_o) were recorded to be 63 cm, 0.77 yr^{-1} and 0.02 yr. in *C. striata* and 99.75 cm, 0.880 yr^{-1} and 0.013 yr in *C. marulius*, respectively. The higher recruitment peaks were detected during June and July in both the species indicating monsoon is the breeding season for *Channa* species in Punjab waters. Total mortality (Z), fishing mortality (F) and natural mortality (M) were estimated to be 2.51 yr^{-1}, 1.27 yr^{-1} and 1.24 yr^{-1} in *C. striata* and 1.19 yr^{-1}, 1.27 yr^{-1} and 2.46 yr^{-1} in *C. marulius*, respectively. The exploitation ratio of 0.51 in *C. striata* and 0.52 in *C. marulius* indicated that the both the stocks are overexploited.
- **Population dynamics study of catfish:** For pooled samples of *S. seenghala* from river Sutlej (Punjab), the values of growth parameters were estimated as asymptotic length (L∞= 110.25 cm), growth coefficient / curvature parameter (K= 0.520 /year, growth performance index (ϕ' = 3) indicated optimum growth of fish in Sutlej ecosystem. The fishing mortality coefficient was lower than natural mortality, indicating optimal exploitation rate. Further, the current exploitation ratio of *S. seenghala* from Sutlej was estimated to be as $E_{current}$ = 0.45, indicating optimum exploitation of stock.

  The outcome of this study could be used as baseline to formulate a strategic action plan for the management and conservation of commercially important species in Sutlej River.

Channa striata *Channa marulius*

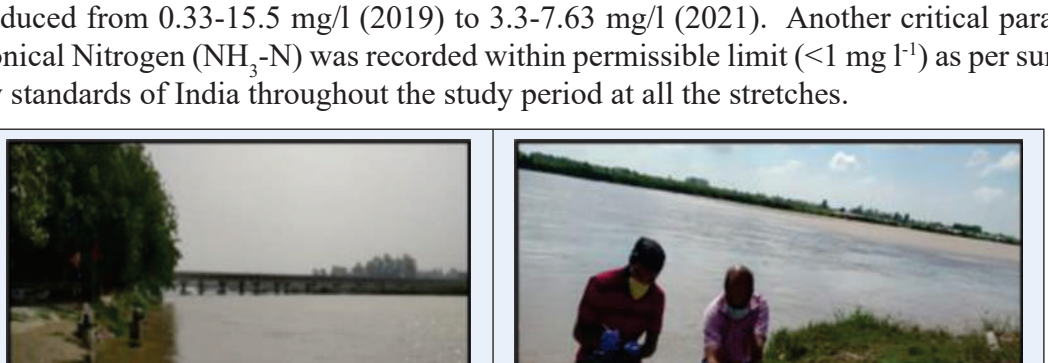
Consensus of Truss Morphometric Network (TMN) of C. striata and C. marulius



Stock structure analysis of C. striata C. marulius using Beverton and Holt's Relative yield per recruit and biomass per model from River Sutlej

B. Health monitoring of River Beas:

- Under PPCB funded project, ecological monitoring of river Beas in stretch of Punjab was conducted to evaluate pollution status and potential threats requiring remedial action. Water quality parameters (pH, D.O., BOD, COD, total alkalinity, total hardness, conductivity, turbidity, free carbon dioxide, nitrate-N, Ammonical-N, soluble phosphates, ionic composition), plankton diversity (phytoplankton and Zooplankton) and presence of potential contaminants (heavy metals, pesticides and microbial load). Three years data was compared to find the changes in vital ecological health parameters over time period after spillage of molasses in May, 2018 at Kiri Afgana (Gurdaspur) that caused death of thousands of fish and changes in vital parameters. Year wise data revealed higher BOD levels (0.57-4.01 mg/l) in 2019 in river reduced to 0.89-1.35 mg/l in 2021. Similarly higher COD levels were also reduced from 0.33-15.5 mg/l (2019) to 3.3-7.63 mg/l (2021). Another critical parameter i. e. Ammonical Nitrogen (NH_3-N) was recorded within permissible limit (<1 mg l^{-1}) as per surface water quality standards of India throughout the study period at all the stretches.

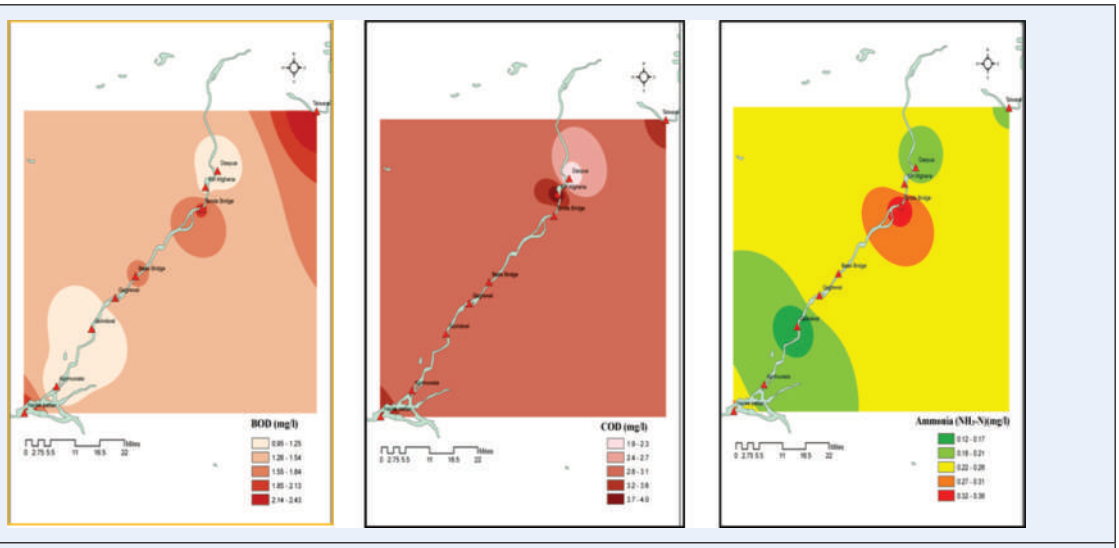


Sampling site and Collection of water samples from the river Beas

- Among the phytoplankton, Chlorophyceae was found to be the dominant phytoplankton group followed by Cyanophyceae, Bacillariophyceae, Dinophyceae and Euglenophyceae with maximum seasonal abundance in pre-monsoon and post-monsoon period as compare to monsoon.
- Concentration of all the metals/ elements (mg/L) tested was within the permissible levels as per BIS 10500 (2012). However, among all sites (1-9) concentration of sodium, magnesium, potassium and calcium recorded slightly elevated in Talwara, Beas Bridge, Tanda Bridge, Harike Pattan.

- Further, above permissible limit residues of three pesticides α-HCH, ß-HCH and Permethrin (BIS 10500 2012) in the river water at Dasuya, Kiri Afgana, Beas bridge, Karmuwala and Harike Pattan (pre-monsoon, monsoon and post-monsoon period) was also a serious concern in context to its biomagnifications within the aquatic food web and consumer food safety (fish) as well. However, in 2020 and 2021 all these pesticides were not detected from the designated sites.
- Fecal coliform number was found to be above permissible levels (> 100 MPN/100ml) at Dasuya and Tanda spots. Stretch from Tanda to Harike Patan (6 sites- Tanda Bridge, Beas Bridge, Gagrewal. Goindwal, Karmuwala and Harike Pattan) total coliform count was very high (210->1100 MPN/100 ml) as compared to permissible levels of Sewage discharge (CPCB), Fecal coliform levels in river Beas at Gagrewal. Goindwal, Karmuwala villages (the "Dolphin hotspot") needs to be carefully monitored.

Spots (09) selected on river Beas



GIS mapping of vital water quality parameters at different sites during the study period

It was concluded that at present, the overall ecological health of river Beas, including the stretch affected by the molasses spillage in 2018, has been significantly improved fairly good to support the aquatic life.

C. **Stock variability among riverine and domesticated population of Indian major carps using morphometric, meristic and genomic characters:** Negative allometric growth in *Labeo rohita* and *Cirrhinus mrigala* (b<3) while as positive allometric growth was found in *Catla catla* individuals (b>3). Fin formula and other meristic characters showed moderate variations among the stock of domesticated and natural habitats.

RESEARCH PROJECTS

1. Schemes Operational during 2021-22

Sr No	Funding Agency - Name of the Scheme [Budget in INR]
1	ICAR - Network project on buffalo improvement (Main Unit) (C: AGB-1) [81,20,000]
2	ICAR - Network project on buffalo improvement (Field Unit). (C:AGB-2) [50,00,000]
3	ICAR - Project directorate on cattle field progeny testing project ICAR 76/4 [73,45,334]
4	ICAR - All India Coordinated Research Project(AICRP) on Poultry breeding.(C: AGB-4) [91,86,667]
5	ICAR - All India Coordinated research projects (AICRP) on cattle sahiwal (Data Recording Unit) [28,81,333]
6	ICAR - All India Coordinated Research Project (AICRP) on Nutritional and physiological approaches for enhancing reproductive performance in animals (Enhancing reproductive performance) 75:25 [10,58,667]
7	ICAR - All India Network Programme on Diagnostic imaging and management of surgical conditions in animals [16,00,333]
8	ICAR - Outreach Programme on Monitoring of drug residues and environmental pollutants [6,75,000]
9	ICAR - Integrated approaches for livestock development: Farmers context [19,50,000]
10	ICAR - Network Project on Buffalo improvement centre at GADVASU (Nili Ravi) 75:25 [32,00,000]
11	ICAR - All India Coordinated Research Project (AICRP) on Pig (75:25) [30,57,042]
12	ICAR - National Surveillance Programme for Aquatic animal diseases" [10,51,745]
13	ICAR - Institutional Development plan (IDP) for improved learning outcome, skill and entrepreneurship at GADVASU [3,87,32,722]
14	ICAR - National Animal Disease Epidemiology Network (NADEN) [3,50,000]
15	ICAR - All India Co-coordinating research Project (AICRP) on Animal disease monitoring & surveillance (ADMAS) [3,50,000]
16	ICAR - Establishment of a new KVK at PanchayatBooh, Tarn Taran ICAR-14
17	ICAR - In-situ crop residue management
18	ICAR - Parampragat Krishi Vikas Yojna (PKVY)
19	ICAR - Centrally Sponsored Scheme on Soil Health Card
20	ICAR - Cluster Frontline Demonstration on Oilseeds
21	ICAR - Attracting and Retaining of Youth in Agriculture (ARYA) [3,51,314]
22	ICAR - *In-situ* Crop Residue Management [15,75,000]
23	ICAR - Cluster Frontline Demonstration on Oilseeds [54,000]
24	ICAR - Establishment of a new KVK at village Majra, S.A.S. Nagar (Mohali) [2,35,80000]
25	ICAR - Cluster Frontline Demonstration on Oilseed (Rabi) under KVK S.A.S. Nagar (Mohali) [52,082]
26	ICAR - Promotion of Agricultural Mechanization for *In-Situ* Management of Crop Residue in the state of Punjab under KVK, S.A.S. Nagar (Mohali) [12,46,745]
27	ICAR - Capacity Building of farmers through training programme on profitable dairying farming and livestock management by KVK, S.A.S. Nagar [2,00,000]
28	ICAR - Farmers Outreach Programme on Natural farming [14,104]
29	ICAR - Investment in ICAR leadership in Agricultural Higher Education (IILAHE): NAHEP Component 2 Project) NIBLD (National Image base for Livestock Diseases) [2,50,000]
30	ICAR - Funds for Infrastructure in Science and Technology (FIST) [11,58,000]
31	ICAR - Strengthening and development of agricultural education in agricultural universities [61,200]
32	ICAR - Organisation of Capacity Building program for farmers and other stakeholders to strengthen export oriented agri supply chain under KVK, S.A.S Nagar [1,000,00]

33	Pb. Govt. NPV-04 Animal Genetics & Breeding [4020000]
34	Pb. Govt. NPV-16 Research facilities for dairy cattle & buffalo breeding [50,50,000]
35	Pb. Govt. NPV-19 Additional facilities for the modernization of dairy operations [17,50,000]
36	Pb. Govt. NPV18 Advanced Research Centre for Dairy animal reproduction [14,000,00]
37	Pb. Govt. NPV-17 Genetics improvement in Poultry stocks [23,80,000]
38	Pb. Govt. NPV 22 : Facilities for rearing of meat animals and small animal colony at GADVASU [2,95,000]
39	DBT - GADVASU Canine Research Centre and Networks [66,18,931]
40	DBT - Multiplex-polymerase chain reaction based detection of tick borne canine haematozoan diseases [3,59,403]
41	DBT - To evaluate antigenic relationship among the canine parvovirus types and vaccine strains using in-vitro cross neutralization test [95,511]
42	DBT - Modelling of indigenous diagnostics and immuno potent vaccine candidates to combat African swine fever in India [23,24,521]
43	DBT - Establishment of a Consortium for One Health to address zoonotic and transboundary diseases in Indian including the North East Region [44,83,240]
44	DST - Synergistic effect of Modified Atmosphere Packaging (MAP) and antimicrobial edible packaging on shelf life enhancement of composite dairy foods (dodaburfi and bottle gourd burfi) [2,15,760]
45	DST - Solar driven technological interventional in manufacturing of ice bank tank (IBT) for milk cooling at dairy farms [12,82,189]
46	DST - Engineering interventions for mechanisation of mozzerella cheese manufacture at cottage scale [18,47,502]
47	DST - Funds for Improvement of Science and Technology Infrastructure in Higher Educational Institutions [49,000,00]
48	DST FIST - To strengthen the research facilities in the Deptt. of Veterinary Pathology [6,50,000]
49	DST - Nanoparticle based novel oral biofilm recombinant vaccine model for aquaculture [32,78,000]
50	SERB - Immunopathological and molecular studies on bovine cryptosporidial diarrhoea and associated etiologies [7,17,464]
51	SERB - Fast clotting clinical grade hemostatic agent for emergency care [2,64,000]
52	SERB - Designing and evaluation of various configurations of threaded intramedullary pins for canine long fractures [12,26,678]
53	The International Atomic Energy Agency - Genome wide association studies for the improvement of productivity in dairy buffalo in cattle in India [16,57,003]
54	CCRAS - Development of medicine & plant garden for veterinary ayurvedaresearch at GADVASU Ludhiana [3,61,600]
55	Wellcon Animal Health Pvt. Ltd. - Efficacy of long acting ceftiofur(Wouter-CF for treatment of respiratory infections in cattle and buffaloes [43,112]
56	MOFPI - Development of good quality and healthy ready to drink concoction of milk tea [1,69,016]
57	CCRAS - Clinical evaluation of efficacy of AYUSH V-24 (a coded Ayurvedic Formulation) in the management of selected gastro intestinal illness in ruminants [12,53,760]
58	CCRAS - Clinical evaluation of efficacy ofayurvedic formulation for the augmentation of milk production in ruminants [14,70,656]
59	CCRAS - Clinical Evaluation of the Efficacy of Padmakanta Yoga, an *Ayurveda* formulation in the management of mastitis in bovines [28,55,000]

60	Bill & Melinda Gates Foundation - Modelling exposure to biological hazards in the dairy chain of Andhra Pradesh to inform food safety policy [7,28,234]
61	Bill & Melinda Gates Foundation - Modelling exposure to biological hazards in the dairy chain of Andhra Pradesh to inform food safety policy [4,61,488]
62	BASF, India Limited, Mumbai - Studies on effect of feeding organic trace minerals on production,reproduction, immune response and metabolic profile in dairy cows [9,47,177]
63	World Health Organization, Malaysia - To conduct a situationanalysis of antibiotic use in animal production and agriculture sector and its impact on food safety and anti-microbial resistance (AMR) for member states in South -East Asia Region [2,10,684]
64	BCL Industries Limited, Bathinda - Study on utilization of DDGS as livestock and poultry feed [15,92,976]
65	PMMSY, MFAHD - Establishment of Capacity Building Resource Centre for intensive aquaculture technologies in Punjab Re-circulatory and Bio-Flocaquaculture systems [1,39,05,000]
66	Virbac Animal Health India Private Limited - Effects of supplementing Chelated Agrimin Forte on the performance of dairy animals [10,00,000]
67	CCRAS - Clinical evaluation of efficacy of Padmakanta Yoga, an Ayurveda formulation in the management of mastitis in bovines [8,27,200]
68	Swaraj Engines Limited, Mohali - Creation and strengthening of self-help groups of district S.A.S.Nagar for Livelihood security [4,90,000]
69	Department of Atomic Energy, Board of Research in Nuclear Sciences (BFNS) - Development of phage-based strategies for biocontrol of antibiotic resistant *Aeromanas*species in fishery products [13,24,400]
70	PLDB - Creation of state of art institute for sahiwal breeding farm at RRTC, Kaljharani, Bathinda [47,02,396]
71	PLDB - Implementation of EMBYRO transfer &invitro fertilisation technology for bovine breeding [49,95,742]
72	PSCST - Towards climate resilient livestock production system in Punjab [49,64,881]
73	PPCB - Establishment of dedicated river health monitoring cell at GADVASU for conservation and restoration of the River Beas [27,50,000]
74	NABARD - Promoting organic kitchen gardening for sustainable production nutritional security & income enhancement during COVID-19 pandemic in S. A. S. Nagar (Mohali) [1,40,141]
75	NABARD - Development of low cost fruit fly traps for cucurbit vegetables and its demonstrationat farmer's field in border area of district Tarn Taran
76	IMD, New Delhi - Establishment of District Agro-Meteorology Unit (DAMU) [6,00,000]
77	Department of Rural Development and Panchayats, Govt. of Punjab - Establishment of instructional Gaushala at Guru Angad Dev Veterinary and Animal Sciences University [1,07,31,000]
78	ATMA - MISC 116: Assessment of bypass fat and area specific mineral mixture supplementation on production performance of milch Buffalo [2,00,000]
79	RKVY - Enhancement of production and productivity potential of livestock, poultry and fisheries sector for socio-economic upliftment of the farmers of Punjab (2018-20) [15,40,07566]
80	RKVY - Push to the livestock sector and its sustainability during the current challenging scenario through the implementation of novel practices (2020-21) [10,39,51,000]
81	RKVY - Diversification through animal husbandry and fisheries for livelihood and nutritional security for different strata of PunjabFarmers (2021-22) [2,15,00,000]
82	RF-7 Processing & distribution of livestock farm produce [314,88,300]

2. New Research Projects Allocated during 2021-22

Sr No	Funding Agency - Name of the Scheme [Budget in INR]
1	DBT - Modelling of indigenous diagnostics and immuno potent vaccine candidates to combat African swine fever in India [23,24,521]
2	DBT - Establishment of a Consortium for One Health to address zoonotic and transboundary diseases in Indian including the North East Region [44,83,240]
3	Virbac Animal Health India Private Limited - Effects of supplementing chelated agrimin forte on the performance of dairy animals [10,00,000]
4	CCRAS - Clinical evaluation of efficacy of Padmakanta Yoga, an ayurveda formulation in the management of mastitis in bovines [8,27,200]
5	Swaraj Engines Limited, Mohali - Creation and strengthening of self-help groups of district S.A.S.Nagar for Livelihood security [4,90,000]
6	Department of Atomic Energy, Board of Research in Nuclear Sciences (BFNS) - Development of phage-based strategies for biocontrol of antibiotic resistant *Aeromanas* species in fishery products [13,24,400]
7	Department of Rural Development and Panchayats, Govt. of Punjab - Establishment of Instructional gaushala at Guru AngadDev Veterinary and Animal Sciences University [1,07,31,000]
8	RKVY - Enhancement of production and productivity potential of livestock, poultry and fisheries sector for socio-economic upliftment of the farmers of Punjab (2018-20) [15,40,00000]
9	RKVY - Push to the livestock sector and its sustainability during the current challenging scenario through the implementation of novel practices (2020-21) [7,50,00,000] [2,89,51,000]
10	RKVY - Diversification through animal husbandry and fisheries for livelihood and nutritional security for different strata of Punjab farmers (2021-22) [2,15,00,000]

3. Research Projects Completed during 2021-22

Sr No	Funding Agency - Name of the Scheme [Budget in INR]
1	ICAR - National surveillance programme for aquatic animal diseases [41,00,000]
2	DBT - Multiplex-polymerase chain reaction based detection of tick borne canine haematozoan diseases [29,00,000]
3	DBT - To evaluate antigenic relationship among the canine parvovirus types and vaccine strains using in-vitro cross neutralization test [24,50,000]
4	SERB - Immunopathological and molecular studies on bovine cryptosporidial diarrhoea and associated etiologies [27,00,000]
5	MOFPI - Development of good quality and healthy ready to drink concoction of milk tea [38,22,067]
6	CCRAS - Clinical evaluation of efficacy of AYUSH V-24 (a coded ayurvedic formulation) in the management of selected gastro intestinal illness in ruminants [39,00,000]
7	WHO Malaysia - To conduct a situationanalysis of antibiotic use in animal production and agriculture sector and its impact on food safety and anti-microbial resistance (AMR) for member states in South -East Asia Region [4,58,688]
8	NABARD - Promoting organic kitchen gardening for sustainable production nutritional security & income enhancement during COVID-19 pandemic in SAS Nagar (Mohali) [5,25,000]

EXTENSION

Human resource development through professional teaching and development of newer technologies and package of practices for different livestock enterprises are the prime objectives of this university. Transfer of newer technologies and package of practices to end users is another goal this university is engaged with since its inception. It is a collaborative effort that allows scientific findings, technical knowledge and intellectual property to flow from researchers to public and private users. To achieve this goal, our university has adopted a well designed Extension Model to reach to the livestock, poultry and fish farmers, field functionaries, subject matter specialists, industry people and other related communities. This model includes following activities:

A. Transfer of technologies to the livestock farmers and their feedback for reorienting the ongoing research programs

The new technologies developed in different areas of Veterinary, Animal Sciences, Poultry and Fisheries are effectively communicated to the livestock farmers who are the ultimate beneficiaries of such technologies. The extension services also help in identifying the researchable problems faced by the livestock farmers and provide new research issues to the scientists. During period under consideration the technologies were effectively transferred through the following activities:

1. Pashu Palan Mela and Regional Kisan Melas:

Pashu Palan Mela is one of the best approaches for transferring the technologies generated at the University to the livestock farmers of the State. It is usually a two day affair, however, because of covid-19 outbreak, it was celebrated in virtual mode alongside PAU Kisan Mela. It was organized on September 17-18, 2021 and March 24-25, 2022.

KVK, Booh organized CRM Kisan Mela on 02.11.2021 at village Amarkot in Tarn Taran district while KVK, Mohali organized it at MIA, Mohali. The later also organized Kisan Mela at village Fatehgarh.

KVK, Barnala organized Mahila Kisan Diwas on 15.10.2021 and Kisan Mela on in situ Management of Crop Residues on 24.03.2022

Glimpses of Pashu Palan Mela -September, 2021 and March, 2022

2. Special Awareness Weeks/Special Days

Specific *Awareness Weeks* were celebrated in the university in order to promote certain products and package of practices. College of Dairy Science and Technology celebrated *Milk Adultration Testing Week* from May 26-June 01, 2021. About 100 milk samples of 95 beneficiaries were tested for adultration, free of cost and the results were reported in various newspapers.


02 JUN 2021
ਪੰਜਾਬੀ ਟ੍ਰਿਬਿਊਨ
ਦੁੱਧ ਦੇ 14 ਫ਼ੀਸਦੀ ਨਮੂਨਿਆਂ 'ਚ ਮਿਲਾਵਟ

Directorate of Extension Education and Department of Veterinary Parasitology celebrated *Animal Parasite Awareness Week* during Aug 23-29, 2021. Inagural workshop was organized in the campus while Animal Welfare Camp and another Awareness Camp was organized in the field at villages Khwajke, district Ludhiana and Ichhewal, district Patiala, respectively.

Inaugural workshop

Animal welfare camp and awareness camp

Centre for One Health organized fortnight program to mark World Zoonoses Day during July 6-20, 2021, World Antimicrobial Awareness Week during Nov 18-24, 2021 and World Food Day Awareness Week on Oct 11-17, 2021. The later was funded by ICAR-NAHEP IDP.

KVK, Barnala organized *Parthenium Awareness Week* during August 16-22, 2021 while KVK, Mohali celebrated *World Breastfeeding Week* during August 01-08, 2021. The month of September, 2021 was observed as National Nutrition Month.

KVKs of the university also celebrated World Veterinary Day (24.04.2021), World Bee Day (20.05.2021), World Milk Day (01.06.2021), ICAR Foundation Day (16.07.2021), Nutrition and Tribal Agriculture under *Azadi ka Amrut Mahotsav* (20.08.2021), National Level Campaign with the theme *Food*

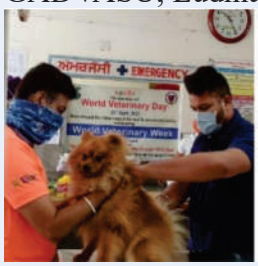

and Nutrition for Farmers (26.08.2021), National Campaign on *Poshan Abhiyan and Tree Plantation* (17.09.2021), Rabies: Facts, not Fear under *INDIA@75: Azadi Ka Amrit Mahotsav* (28.09.2021), Swachhta Campaign marking birth anniversary of Mahatma Gandhi (02.10.2021), Special Swachhta campaign on *waste to wealth* (12.10.2021), World Food Day (16.10.2021), Vigilance Awareness Week under the theme *Independent India @75: Self Reliance with Integrity* (26.10.2021-01.11.2021), World Fisheries Day (21.11.2021), World Soil Day (05.12.2021), National Campaign on "Jai Jawan Jai Kisan" with the theme *Uttam: Kheti-Unnat Kisan* (23.12.2021-25.12.2021), Kisan Divas (23.12.2021), PM Kisan Samman Nidhi Fund Release Program (01.01.2022), National Girl Child Day (24.01.2022), World Pulses Day (10.02.2022), International Women's Day (08.03.2022), World Canola Day (09.03.2022) and National Poultry Day.



3. **Fisheries Officers' Workshop:** Directorate of Extension Education in collaboration with College of Fisheries organized Fisheries Officers' Workshop on 09.10.2021. About 180 officers participated in this workshop.


4. **Animal Health Camps, Animal Welfare Camps etc.**

Animal Welfare/Health Camps are being organized by various departments and outstations of the University under the aegis of Directorate of Extension Education. These are usually a one day affair. Repeat breeding, anoestrus and mastitis are the major problems encountered in the rural dairy animals. Owing to major chunk of the cases belonging to reproductive disorders, these camps are also known as Infertility Camps. Poor and marginal farmers also get benefitted through participation in these camps.

S. No	Particulars of Animal Welfare/Health Camps	Date	Participants
College of Veterinary Science, Ludhiana			
1	Free-antirabies vaccination, animal welfare and brucellosis camp on occasion of World Veterinary Day at MSVH, GADVASU, Ludhiana  	23.04.2021	52
2	Goat welfare camp organized at village Kalala, district Barnala  	01.10.2021	14 Farm Families; 284 goats
College of Veterinary Science, Rampura Phul			
1	Free antirabies vaccination camp at VCC, COVS, Rampura Phul	28.09.2021	63 Farmers; 87 Animals

KVKs and RRTCs			
1	Vaccination and health camp for goats by KVK, Barnala 	02.06.2021	09
2	Animal welfare camp at village Balleyanwala, Tarn Taran	17.11.2021	105
3	Vaccination Camp for Enterotoxaemia disease in goats at village Bhatoli, district Hoshiarpur	30.11.2021	25
4	Vaccination Camp for Enterotoxaemia disease in goats at village Nathuwal, Hoshiarpur	01.12.2021	20
5	Vaccination Camp for Enterotoxaemia disease in goats at villages Bhatoli and Nathuwal, Hoshiarpur	23.12.2021	45

5. Awareness Camps, Training Camps, Field Days:

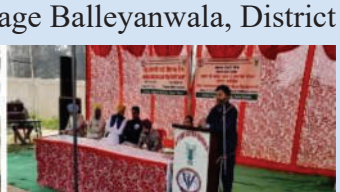
The organization of Awareness Camps and Field Days is helpful in disseminating information on a particular subject related to livestock, fishery and agriculture production. Various subject matter specialists deliver their lectures on specific topics in these camps. When the awareness camp is restricted to one theme only, then, it is termed as Field Day. These were organized almost every week by KVKs/ RRTCs of the university. The list of such camps has been given below:

S. No	Particulars of Awareness Camps/ Field Days	Date	Participants
College of Veterinary Science, GADVASU, Ludhiana			
1	Food Safety Awareness Camp at Police DAV Public School, Ludhiana 	12.10.2021	250
2	Brucellosis Awareness and Testing Camp at Veterinary Polyclinics, Ludhiana 	13.10.2021	30

College of Veterinary Science, RampuraPhul			
1	Awareness Camp on Hygienic and Wholesome Milk Production at campus	01.06.2021	10
2	Awareness Camp on Paddy straw management at Burj Mansia, Bathinda	06.10.2021	30
3	Awareness camp on urea treatment of wheat straw at Khokhar Kalan, Bathinda	28.10.2021	25
4	Awareness camp on CRM at Kauloke, Bathinda	30.10.2021	50
5	Awareness camp on CRM at Sandhu Khurd, Bathinda	31.10.2021	20
6	Farmer Field School at village Phul	02.11.2021	30
7	Awareness camp on 'antimicrobial resistance' at Govt. School, Mandi Phul	24.11.2021	28
8	National Milk Day at village Phul	26.11.2021	40
9	Awareness program on Stall-fed Management of Goats for SC farmers at campus	02.03.2022	50
10	Free milk adulteration testing camp at campus	09.03.2022	77
KVKs and RRTCs			
1	Awareness on Management of Young Orchards at village Rattangarh, district Mohali	01.04.2021	13
2	Awareness Camp on DSR at village Thath Garh, district Tarn Taran	05.04.2021	37
3	Awareness Camp for Dairy Farmers at village Ludhiari, district Hoshiarpur	06.04.2021	09
4	Awareness Camp for Dairy Farmers at village Morula, district Hoshiarpur	07.04.2021	13
5	Awareness on Pest management in summer moong at village Naggal Salempur, district Mohali	16.04.2021	14
6	Awareness Camp on fly control in cucurbit crops at village Kalia Skantra, district Tarn Taran	30.04.2021	26
7	Awareness on water management and plant protection measures in vegetable kitchen gardens at KVK, Mohali	10.05.2021	18
8	Awareness on Scientific vegetable cultivation and pest management at KVK, Mohali	12.05.2021	27
9	Awareness on Beekeeping and Value Addition of Honey at KVK, Mohali	20.05.2021	21
10	Awareness Camp on efficient utilization of irrigation water at village Harike, district Tarn Taran	21.05.2021	15
11	Awareness Camp on DSR at village Durgapur, district Tarn Taran	25.05.2021	10
12	Awareness on Nutritional importance of milk and its value addition at KVK, Mohali	27.05.2021	25

13	Awareness program on animal health and productivity at KVK, Booh	03.06.2021	25
14	Awareness on Scientific Fish Farming at KVK, Mohali	03.06.2021	07
15	Field Day on Fruit cultivation at Naglian, Mohali	09.06.2021	10
16	Awareness campaign on balanced use of fertilizers at village-Rureke Kalan by KVK, Barnala	18.06.2021	20
17	Awareness Camp on fly control in cucurbit crops at village Kuttiwala, district Tarn Taran	01.07.2021	30
18	Field Day on Planting of fruit trees at Chanalon, Mohali	07.07.2021	10
19	Training camp on value added milk products at village Gharyala, district Tarn Taran	08.07.2021	10
20	Field Day on Marigold cultivation at Bhupnagar, Mohali	14.07.2021	16
21	Awarenes on Preservation of mangoes at Kharar, district Mohali	15.07.2021	10
22	Awareness camp for Dairy Farmers at village Dhamian, district Hoshiarpur	26.07.2021	12
23	Awareness program on vermicomposting at Naushehra Pannuan, district Tarn Taran	28.07.2021	04
24	Awareness program on silage making at Bhuchar, district Tarn Taran	28.07.2021	10
25	Awareness Camp for Dairy Farmers at village Nowshehra Simbli, district Hoshiarpur	02.08.2021	12
26	Awareness Camp for Dairy Farmers at village Kanjupir, district Hoshiarpur	04.08.2021	10
27	Field Day on fly control in cucurbit crops at village Kasel, district Tarn Taran	04.08.2021	30
28	Awareness on Benefits of breastfeeding at Kurali, district Mohali	04.08.2021	12
29	Awareness Camp for Dairy Farmers at village Behbowal Chanian, district Hoshiarpur	09.08.2021	09
30	Awareness program on parthenium control at RRTC, Booh	19.08.2021	36
31	Awareness on Tulsi cultivation technology at village Baraundi, district Mohali	19.08.2021	10
32	Awareness program on CRM at KVK, Booh	25.08.2021	40
33	Awareness on Management of dairy animals during transitional period at Morinda, Mohali	26.08.2021	46
34	Awareness program on CRM at village Sukhpura Maur by KVK, Barnala	27.08.2021	26
35	Awareness on Backyard Poultry Farming at KVK, Mohali	27.08.2021	21
36	Awareness program on CRM at village Bhathal Bhaike, district Tarn Taran	01.09.2021	25

37	Awareness Camp for Dairy Farmers at village Behbowal Kalan, district Hoshiarpur	01.09.2021	14
38	Awareness on Importance of underutilized greens at Kurali, district Mohali	03.09.2021	12
39	Awareness program on vermicomposting at village Khalra, district Tarn Taran	07.09.2021	12
40	Awareness on Guava production at KVK, Mohali	08.09.2021	16
41	Awareness on Clean milk production and its value addition at village Bhupnagar, district Mohali	09.09.2021	22
42	Awareness on Citrus Farming at KVK, Mohali	09.09.2021	15
43	Awareness program on combating environmental pollution at KVK, Tarn Taran	14.09.2021	300
44	Awareness Camp for Dairy Farmers at village Rouli , district Hoshiarpur	17.09.2021	20
45	Awareness on Importance of millets at village Dussarna, district Mohali	17.09.2021	43
46	Awareness on Terrace Gardening of vegetables at Kurali, Mohali	24.09.2021	12
47	Awareness among farmers regarding *Climate Resilient Agriculture* at KVK, Barnala	28.09.2021	72
48	Awareness Camp for Dairy Farmers at village Sehora Kandi, district Hoshiarpur	29.09.2021	19
49	Awareness Camp for Dairy Farmers at village Ulaha, district Hoshiarpur	30.09.2021	13
50	Awarenss on Garlic cultivation management at KVK, Mohali	01.10.2021	29
51	Awareness on Health and hygiene among rural household at village Suharan, district Mohali	02.10.2021	14
52	Awareness program on CRM at village Jallewal, district Tarn Taran	04.10.2021	25
53	Awareness program on CRM at KVK, Tarn Taran	12.10.2021	200
54	Awareness on Segregation of degradable and bio-degradable waste at village Suharan, district Mohali	19.10.2021	12
55	Awareness program on CRM at KVK, Barnala	27.10.2021	46
56	Awareness on Role of Trace Minerals and Vitamins in Poultry at KVK, Mohali	27.10.2021	15
57	Awareness program on CRM at village Nathuchak, district Tarn Taran	28.10.2021	65
58	Block Level Awareness Camp on CRM at Kubaheri, Mohali	12.11.2021	74
59	Awareness program on CRM at Govt. School, Handiaya by KVK, Barnala	16.11.2021	456

60	Awareness Camp for Dairy Farmers at village Sandhwal, district Hoshiarpur	17.11.2021	11
61	Awareness Camp at village Balleyanwala, District Tarn Taran  	17.11.2021	105
62	Awareness on area specific mineral mixture and uromin lick for dairy animals at Tira Naglian, district Mohali	22.11.2021	47
63	Awareness on Rooftop vegetable farming at Dusarna, Mohali	25.11.2021	15
64	Awareness Camp for Dairy Farmers at village Dohar, district Hoshiarpur	26.11.2021	18
65	National campaign on agriculture and environment : the citizen face at SBS School, Surjitpura, Barnala	26.11.2021	188
66	Awareness camp for dairy farmers at village Dharmpur, district Hoshiarpur	07.12.2021	09
67	National campaign on Agriculture & Environment: Face of change at KVK, Booh	26.11.2021	38
68	Awareness on preservation of carrot at Bhago Majra, district Mohali	07.12.2021	37
69	Awareness-cum-training camp under RKVY at Ghudda, Bathinda	17.12.2021	36
70	Awareness on Winter management of vegetable crops at Suharan, district Mohali	21.12.2021	14
71	Awareness camp on Kitchen gardening at KVK, Booh	28.12.2021	11
72	Awareness-cum-Training Camp under RKVY at Chak Atar Singh Wala, Bathinda	28.12.2021	38
73	Awareness-cum-Training Camp under RKVY at Rai Ke Kalan, Bathinda	30.12.2021	38
74	Awareness on Cultivation practices of green leafy vegetables at Khizrabad, Mohali	31.12.2021	12
75	Awareness on IPM in Gobhi Sarson at Mundhon Mastana, Mohali	06.01.2022	35
76	Awareness program on use of thiourea and GA in Barseem crop at Booh Havelian, district Tarn Taran	17.01.2022	11
77	Awareness on IPM in Wheat at Mundhon at Chanalon, Mohali	17.01.2022	27
78	Field day on development of low cost fruit fly traps for cucurbit vegetables at village Kot Budha, district Tarn Taran	18.01.2022	40
79	Awareness on Soilless vegetable cultivation at Tajpura, Mohali	18.01.2022	13

80	Awareness on insect pest and disease management in Gobhi Saron at Mehmoodpura, district Tarn Taran	19.01.2022	13
81	Awareness Campaign on Control *Phalaris minor* at village Mehal Kalan	27.01.2022	36
82	Awareness on scientific dairy farming at Chandpur, Mohali	27.01.2022	28
83	Awareness program on dairy animals frozen semen bank at village Wara Sher Singh, district Tarn Taran	09.02.2022	40
84	Awareness on Role of SHGs in enhancing income for livelihood security at Giga Majra, Mohali	10.02.2022	09
85	Awareness on Cultivation of pulses and leguminous vegetables at Radiala, Mohali	10.02.2022	14
86	Awareness camp on in-situ management of crop residue at G.S.S.S. School, Katcha Pakka, Tarn Taran	15.02.2022	125
87	Awareness program on in-situ management of crop residue at Government School, Naushehra Pannua, Tarn Taran	17.02.2022	225
88	Awareness Camp to Rectify problems faced by SHGs at Baraundi, Mohali	21.02.2022	14
89	Awareness program on in-situ management of crop residue at Guru Arjan Dev College, Tarn Taran	22.02.2022	150
90	Awareness Camp for Dairy Farmers at village Behbowal Chanian, district Hoshiarpur	24.02.2022	18
91	Awareness program on Crop Residue Management at SBS School, Hamisi, Barnala	25.02.2022	50
92	Awareness on Ticks control measures in dairy animals at Khizrabad, Mohali	25.02.2022	20
93	Awareness on Layout and Management of orchards at Bhago Majra, Mohali	03.03.2022	15
94	Awareness on Processing techniques for fruits and vegetables at Chandpur, Mohali	04.03.2022	15
95	Field Day on Canola Gobhi serson at village Mehdipur, district Tarn Taran	08.03.2022	17
96	Awareness on Role of SHG's in women empowerment at KVK, Mohali	08.03.2022	14
97	Field Day on Canola serson at village Dadehar Sahib, district Tarn Taran	09.03.2022	100
98	Field Day on Happy Seeder at villages Booh Havelian, Kot Budha and Bangla Rai, district Tarn Taran	09.03.2022	56
99	Awareness on pruning in fruit crops at Suharan, Mohali	14.03.2022	20
100	Awareness camp for combating environmental pollution caused by biomass burning by KVK, Barnala	30.03.2022	66

Glimpses of Awareness Camps organized by colleges, RRTC and KVK of the University

6. Farmer Scientist Interactions:

KVK Tarn Taran organized three Farmer-Scientist interactions on direct seeded rice (DSR) in village Toot (03.06.2021), conservation agriculture at village Wara Sher Singh (09.02.2022) and backyard poultry farming at village Asal Uttar (17.03.2022).

B. Capacity Building of Livestock Farmers and other Related Personnel

1. Trainings Organized:

Training is a specialized kind of education, which is mostly skill oriented. It is education for a very specific purpose, where the end product is pre-determined based on performance. The concern here is enhancing the ability of an individual to accomplish a set of tasks by providing an opportunity which results in acquiring the new and upgraded ability in performing the skill.

University organized basic training courses for dairy, poultry, piggery, and fish farming and value addition of livestock products for the farmers, army personnel to transfer new technologies evolved by the university. Trainings were also organized sponsored by other animal welfare agencies. Following is the list of these trainings.

S. No.	Name of Training Program	Month of Training	No. of Trainings × Duration (No. of Trainees)
College of Veterinary Sciences, Ludhiana			
1	Basic Animal Husbandry Trainings	Aug, Oct, 2021 Feb, Mar, 2022	5 × 05 days (91)
2	Basic Animal Husbandry Trainings	May, July, Aug, 2021 Mar, 2022	6 × 10 days (98)
3	Specialized Animal Husbandry Trainings	Feb, 2022	1 × 03 days (20)
4	Trainings for SC Beneficiaries under ICAR Schemes	Mar, 2022	6 × 01 day (139)
5		Dec, 2021 Feb, 2022	2 × 03 days (28)
6	Trainings for SC Beneficiaries under RKVY Schemes	Feb 2022	2 × 01 day (40)
7	Trainings Organized in Collaboration with MANAGE	Aug, Oct, 2021	2 × 03 days (65)
8	Trainings Conducted under DBT-Canine Research Centre	Sept, 2021	1 × 03 days (20)
College of Dairy Science and Technology			
1	Specialized Trainings on Milk Products	Feb, 2022	1 × 01 day (20)
College of Fisheries			
1	Trainings on Fish/Shrimp Farming	Aug, 2021	1 × 03 days (18)
		May, 2021 Jan, Mar, 2022	3 × 05 days (193)
		Jun, 2021	1 × 08 days (61)
KVK, Booh (Tarn Taran)			
1	Trainings on Bee Keeping	April, 2021	1 × 03 days (25)
2		Feb, Mar, 2022	2 × 05 days (50)
3		April, 2021 Feb, 2022	2 × 08 days (50)
4	Training on Fruits, Vegetables and Flowers	July, 2021 Jan, Feb, 2022	4 × 01 day (88)
5			
6		Nov, 2021	1 × 05 days (35)
7	Basic Animal Husbandry Trainings	Jan, 2022	1 × 03 days (20)
8		July, Aug, Sept, 2021 Feb, Mar, 2022	5 × 05 days (120)
9	Specialized Animal Husbandry Trainings	July, Aug, 2021 Mar, 2022	3 × 01 days (70)
10		Mar, 2022	1 × 03 days (40)
11	Trainings on Human Nutrition	July, Aug, Nov, 2021	6 × 01 days (73)
12		Aug, 2021	1 × 05 days (20)

13	Trainings on Mushroom Cultivation	Aug, 2021	1 × 05 days (25)
14	Trainings on Resource Conservation	Aug, 2021	1 × 01 day (40)
15	Trainings on *In-Situ* CRM	Mar, 2022	1 × 03 days (40)
16		Sept, Oct, 2021	2 × 05 days (50)
17	Trainings on Value Addition of Milk, Meat and Fish	Oct, 2021 Jan, 2022	2 × 03 days (60)
18	Trainings on Value Addition of Agricultural Produce	Mar, 2022	1 × 03 days (30)
19	Trainings on Fabric Painting	Nov, 2021	1 × 01 day (27)
20	Trainings on Vermi-composting	Feb, 2022	1 × 01 day (08)
21	Training on Soils	Mar, 2022	1 × 01 day (37)
KVK, Barnala			
1	Trainings on Stitching , Tailoring and Embroidery	Jun, 2021	1 × 30 days (32)
2	Trainings on Crop Production	May, 2021	1 × 03 days (29)
3	Basic Animal Husbandry Trainings	Aug, 2021 Jan, Feb, Mar, 2022	5 × 05 days (128)
4	Specialized Animal Husbandry Trainings	Feb, Mar, 2022	4 × 03 days (116)
5	Trainings on Mushroom Cultivation	Aug, 2021 Mar, 2022	2 × 05 days (32)
6	Trainings on Value Addition of Milk, Meat	Aug, 2021 Mar, 2022	3 × 05 days (74)
7	Trainings on Bee Keeping	Sept, 2021 Feb, 2022	2 × 05 days (79)
8	Trainings on Fish Farming	Feb, 2022	1 × 03 days (14)
9		Oct, Nov, Dec, 2021 Mar, 2022	4 × 05 days (46)
10	Training on Organic Farming	Oct, 2021	1 × 05 days (25)
11	Trainings on Value Addition of Agricultural Produce	Oct, Nov, 2021	2 × 05 days (16)
12	Refresher training for AI Technicians	Nov, 2021	1 × 02 days (24)
KVK, Mohali			
1	Trainings on Fish Farming	Jun, 2021	1 × 05 days (09)
2	Trainings on Value Addition of Agricultural Produce	Jun, Nov, 2021	2 × 08 days (35)
3	Training on *The Insecticide Act*	July, 2021	1 × 01 day (28)
4	Training on Vegetables	July, 2021	1 × 03 days (20)
5		July, Sept, 2021	2 × 07 days (30)
6	Trainings on *In-Situ* CRM	Sept, 2021	1 × 07 days (25)
7	Basic Animal Husbandry Trainings	Sept, 2021	1 × 07 days (25)
8	Trainings on Value Addition of Fish, Milk and Meat	Dec, 2021 Jan, 2022	2 × 03 days (46)

Glimpses of training programs organized by KVK, Tarn Taran

Glimpses of vocational training programs organized by KVK, Barnala

Glimpses of trainings organized by KVK, Mohali

9	Specialized Animal Husbandry Trainings	Mar, 2022	1 × 07 days (40)
RRTC, Talwara			
1	Specialized Animal Husbandry Trainings	Nov, Dec, 2021 Feb, 2022	3 × 01 day (81)

2. Webinars Organized:

S No	Title of the Webinar	Date	Name of the Speaker
1	Cow Conservation and Revenue Generation	21.05.2021	Shri Sunil Mansinghka Chief Coordinator, Go Vigyan Anusandhan Kendra, Deolapar, Nagpur
2	An overview on Q-fever: Indian Perspectives	16.07.2021	Dr. Deepak Rawool, Sr. Scientist, ICAR-NRCM, Hyderabad
3	One Health Approach to tackle Brucellosis	20.07.2021	Dr. DK Singh, Principal Scientist, ICAR-IVRI, Izatnagar.
4	Zoonoses and Brucellosis awareness webinar for UG and PG students, Farmers etc.	06.07.2021 to 20.07.2021	Dr. JS Bedi, Dr, RS Aulkah, Dr. Randhir Singh, Dr. BB Singh, Dr. Simranpreet Kaur, Dr. Rajnish Sharma and Dr. Pankaj Dhaka
5	"EthnoVeterinary Practices: An Approach To Combat Antimicrobial Resistance and Residue Problem	24.09.2021	Dr. Gaurav Charaya, Assistant Professor Department Of Veterinary Medicine COVS, LUVAS, HISAR
6	Risk and mitigation actions of residues in fresh raw milk with respect to food safety and public health perspective	11.10.2021	Dr. Rajiv Pal Singh Thakur Head, Fresh Milk Sourcing and Dairy Development, Nestle India Ltd., Moga
7	Intuitive eating and its principles	11.10.2021	Dr. Kiran Kang Bains, Head, Food and Nutrition, College of Community Science, PAU, Ludhiana)
8	1. The Art and Science of Personality Development 2. Exercises for introspection and self development	28.10.2021	Dr. Deepika Vij
9	When the going gets tough	08.11.2021	Dr. Sarabjeet Singh, Professor-cum-Head, Department of Agri Journ, Lang and Culture, PAU, Ludhiana
10	Reproductive management of laboratory animals	08.11.2021	Dr. Neeraj Khatri Principal Scientist, IMTEC, Chandigarh
11	Amelioration of embryonic survival and increasing the pregnancy rates through antiluteolytic strategies in bovines-A practical approach	09.11.2021	Dr. Anand Kumar Pandey, Associate Professor & Head, VGO, LUVAS, Hisar
12	Approaches to obstetrical problems in cattle and buffaloes	10.11.2021	Dr. Harpreet Singh, Scientist Veterinary Unit Substation TVCC, Uchani, Karnal

13	Current concepts in diagnosis and management of repeat breeding due to subclinical endometritis in bovines	11.11.2021	Dr. Nitin Kumar Bajaj Assistant Professor, COVS&AH, Jabalpur
14	Extra-gonadal life of bovine spermatozoa: from ejaculation to fertilization	11.11.2021	Dr. Neeraj Srivastava PI, In-Charge. Quality Control GPC, Division of Animal Reproduction, IVRI, Izatnagar, Bareilly
15	Behaviour of captive animals and management	12.11.2021	Dr. Aarti B.Chavda Zoo Biologist Mahendra Chaudhary Zoological Park
16	Values and ethics in professional carrier	14.11.2021	Mr. Inderjit Mittal Master Trainer (Retd.) GoI
17	Biostimulation in reproductive management of farm animals: Its significance and prospects	15.11.2021	Dr. P P Gokuldas Scientist (AR) ICAR-CCARI, Old Goa
18	Communication skills	16.11.2021	Dr Ashoo Toor Asstt. Prof. English Department of Agric Journal, Languages and Culture, PAU, Ludhiana
19	Microbe, Man and AMR	18.11.2021	Dr. Pallab Ray Prof. , Internal Med, PGIMER, Chandigarh
20	Basics on Infection Control and Prevention	18.11.2021	Dr. Manisha Biswal Prof. Internal Med, PGIMER, Chandigarh
21	ESBL Classification, Types Detection and Clinical Significance	23.11.2021	Dr. Neelam Taneja Prof. Internal Med, PGIMER, Chandigarh
22	Motivational talk on *Memory, Time Table and Personality*	02.11.2021	Dr Bhupinder Kaur, Assistant Professor, Government College, Hoshiarpur
23	Animal Nutrition skills: A package for self-dependency	04.01.2022	Dr Rahul Srivastava Program Manager One Health Support Unit, DAHD GOI
24	Designing food at farm to improve human health	04.01.2022	Dr. Srobana Sarkar Scientist, CSWRI, Avikanagar
25	Global climate in relation to productivity and livestock production systems	04.01.2022	Dr. Avijit Dey Principle Scientist CIRB Hisar
26	Quality control of feed ingredients	05.01.2022	Dr. Jyotsana Assistant Professor LUVAS, Hisar
27	Principal of Zoo nutrition and Indian Prospective	05.01.2022	Dr. Asit Dass Principal Scientist IVRI, Izzat Nagar

28	Principal of equine nutrition	05.01.2022	Dr. Rajesh Nehra Assistant Professor RAJUVAS, Bikaner
29	Silage- an opportunity in the era civilization	06.01.2022	Dr. Shalini Vaswani, Assistant Professor, Deptt of Animal Nutrition, COVS, DUVAS, Mathura
30	Entrepreneurship: opportunities in food chain sector	06.01.2022	Dr. Ibne Ali Founder Ali's Veterinary Wisdom and Freelance Consultant
31	Mastering the skills of public speaking	06.01.2022	Dr. RS Sahota Former DEE, GADVASU, Ludhiana
32	Building your strengths	07.01.2022	Dr. HK Verma, Former DEE, GADVASU, Ludhiana
33	Haemoprotozoa diseases in canines	11.02.2022	Dr. J.P. Vashney Senior Consultant (Medicine) at Nandini Veterinary Hospital, Surat
34	Emerging problems of youth: Adaptation and mitigation strategies	12.02.2022	Dr. Shalini, Professor Department of Sociology, PAU, Ludhiana
35	Lumpy Skin Disease: Diagnostic approach and prevention	14.02.2022	Dr. R. K. Jhadav, Assistant Professor, Department of Veterinary Clinical Medicine, Ethics and Jurisprudence, COVAS, Udgir, Maharashtra
36	Iodine deficiency in goats	15.02.2022	Dr. R Bhardwaj, Assistant Professor, Department of Veterinary Medicine, SKUAST, Jammu
37	Management of renal diseases in canines	17.02.2022	Dr. Ajay Katoch, Assistant Professor, Department of Veterinary Medicine, DGCN COVAS, CSKHPKV, Palampur
38	Clinical examination of Cardiovascular system	18.02.2022	Dr. S.R. Upadhayay, Assistant Professor, Department of Veterinary Medicine, SKUAST, Jammu
39	Understanding cats and its diseases	18.02.2022	Dr. J P Vashney, Senior Consultant (Medicine) at Nandini Veterinary Hospital, Surat
40	Production diseases of animals	20.02.2022	Dr. Kafil Hussain, Associate Professor, Department of Veterinary Medicine, SKUAST, Jammu
41	Haemprotozoa and Ricketssial diseases of cattle and its management	21.02.2022	Dr. R Bhardwaj, Assistant Professor, Department of Veterinary Medicine, SKUAST, Jammu

42	Canine seizures and its management	25.02.2022	Dr. J.P. Vashney, Senior Consultant (Medicine) at Nandini Veterinary Hospital, Surat
43	*Clinical approach to the diagnosis of skin diseases in Veterinary patients* for PG students	25.03. 2022	Dr Sushma Chhabra, Professor Medicine, GADVASU
44	Mental Health Management in COVID- 19 crisis	18.08.2021	Dr. Poonam Bharti, Professor, Department of Psychiatry, Mullana Medical College, Mullana
45	Rabies: Facts, Not Fear	28.09.2021	Dr Omesh K. Bharti Dr. Naresh Rakha
46	AMR: Emergence and Prevention	24.11.2021	Dr. Manish Kumar Chatli, Dean COVS, Rampura Phul
47	Spread Awareness, Stop Resistance		
48	Gender Equality Today for a Sustainable Tomorrow	08.03.2022	Dr. Rupasi Tiwari and Dr. Barinder Kaur
49	Zoonotic Tuberculosis in India: Current Status, Challenges and Opportunities	24.03.2022	Dr Ajay Vir Singh, Scientist E, ICMR-JALMA, Agra, Uttar Pradesh
50	Invest to end TB-Save Life	24.03.2022	Dr. Ajay Vir Singh
51	Communication skills for entrepreneurship development	16.06.2021	Dr Harpreet singh
52	Fishprenurial development skills for aatmanirbhar Bharat	01.07.2021	Dr Harpreet singh
53	Tik-Tok: How to Manage Time Effectively	23.08.2021	Mr. Anshuman Khullar
54	Scientific vegetable cultivation and pest management	10.05.2021	Dr. Munish Sharma Dr. Harmeet Kaur
55	Water management and plant protection measures in kitchen garden	12.05.2021	Dr. Munish Sharma Dr. Harmeet Kaur
56	Importance of quality milk production	31.05.2021	Dr. Parul Gupta Dr. Parminder Singh Dr. Shashipal
57	Brucellosis Awareness Camp	13.07.2021	Dr. Parminder Singh Dr. Shashipal
58	Polyhouse farming	05.07.2021	Dr. Munish Sharma
59	Empowering girl child	24.01.2022	Drs. P. S. Tanwar and Suryendra Singh

3. Lectures delivered at off-campus trainings

Subject Matter Specialists of the University also delivered expert lectures in trainings organized by outstations of GADVASU or various other agencies.

S No	Date	Topic	Organized by
College of Veterinary Science, Ludhiana			
1	03.06.2021	Care of milch animals in summer season	PAU Kisan Club
2	14.09.2021	Use of paddy straw in animal production	KVK, Booh
3	18.09.2021 and 23.02.2022	Value addition of meat and eggs for entrepreneurship development	Extn. Edu. Institute, Min. of Agriculture and Farmer's Welfare, Nilokheri
4	22.09.2021	Effect of climate change in livestock and climate resilient management strategies with special reference to heat stress	PAMETI, Ludhiana
5	05.10.2021	1. Goat meat processing and value addition 2. Metabolic diseases, mastitis, vaccination and deworming	PAMETI, Ludhiana in Collaboration with ATMA, Ferozepur
6	12.10.2021	Urea and molasses treatment of rice straw	AHD, Moga
7	22.11.2021	Delivered lectures to rural youth on biosecurity and vaccination of dairy animals organized by	PAMETI, Ludhiana in Collaboration with ATMA,Ferozepur
8	24.11.2021	Artificial insemination for technician	KVK, Barnala
9	29.11.2021	1. Status and scope of meat processing in India; 2. Efficient utilization of meat industry byproducts; 3. Value addition and processing of Meat	PAMETI, Ludhiana
10	24.12.2021	Processing of meats and eggs for doubling farmers income	Extn. Edu. Institute, Min. of Agriculture and Farmer's Welfare, Nilokheri
11	17.01.2022	Value Addition of meat and eggs for entrepreneurship development	Village Adoption Cell NIFTEM, Kundli
12	26.02.2022	Pork product processing for entrepreneurship development	KVK, ICAR-CIPHET, Abohar, Punjab
13	03.03.2022	Silage for dairy animals	PAMETI, Ludhiana
14	17.03.2022	Value addition	PAMETI, Ludhiana in Collaboration with ATMA,Faridkot
15	23.03.2022	Skill training for rural youth	PAMETI, PAU, Ludhiana
16	24.03.2022	Pashuan de pramukh rog	Pashu Mela at KVK, Handiyaya
College of Veterinary Science, RampuraPhul			
17	16.08.2021	Improved goat management	CARE India at Bathinda
18	17.08.2021	Poultry faming	

19	06.10.2021	Utilization of paddy straw for various livestock-based operations	CARE INDIA at Burj Mansa, Bathinda
20	14.01.2022	Nutritional requirements and feeding management practices in backyard poultry farming	KVK, Barnala
21	25.02.2022	Selection of breeding stock for profitable pig farming	KVK (ICAR-CIPHET), Abohar
22	24.03.2022	Management of stall-fed goats and general health care practices	Awareness-cum-Clinical Camp at Gill Kalan, Bathinda
College of Fisheries			
23	27.08.2021	Paddy-cum-fish integration	B.R. Ambedkar Institute of Panchayats and Rural Development, West Bengal
24	05.10.2021	Biosecurity in Shrimp Farming and Health Management and Disease Diagnosis	DFTC Enakhera, Malout, Sri Muktsar Sahib
25	12.10.2021	Integrated fish-cum-Duck Farming	Fish Farmer's Development Agency (FFDA), Sangrur
26	13.10.2021	1. Fish Feed Formulation & Manufacturing 2. Importance and Inclusion of Fish Food in Diet	FFDA, Mohi (Ludhiana)
27	13.10.2021	Disease and health management, water quality management and glimpse of new technology in aquaculture	FFDA, Sangrur
28	26.10.2021	1. Health Management Practices in Carp Farming 2. Fish Processing and Value Addition	KVK, Barnala
29	27.10.2021	Various Aspects of Fish Processing and Value Addition	KVK Tarn Taran
30	29.10.2021	Fish Processing and Value Addition	KVK, Tarn Taran
31	02.11.2021	BMP's for Shrimp Farming	Extension Education Institute, CCS, HAU, Nilokheri
32	25.11.2021	1. Health Management Practices in Carp farming 2. Ornamental Fish Farming	KVK, Barnala
33	01.12.2021	Fish Processing and Value Addition	KVK Mohali
34	03.12.2021	Various Aspects of Fish Processing and Value Addition	KVK Tarn Taran
35	17.12.2021	Mobile Apps and Government Schemes for Fisheries Marketing	Extension Education Institute, PJSTAU, Hyderabad
36	25.12.2021	Fish Processing and Value Addition	KVK, Barnala

37	11.03.2022	Cold Chain Technologies and Fish Post-harvest Processing Technologies	LINAC. NCDC Fisheries Business Incubation Centre (LlFlC), Gurgaon
38	15.03.2022	1. Shrimp Farming 2. Shrimp Health Management	DFTC, Enna Khera, Shri Muktsar Sahib
39	17.03.2022	1. Pangas Culture 2. Ornamental Fish Culture in Reference to Punjab 3. Fish Value Addition	Department of Fisheries, Sangrur
40	24.03.2022	Integrated Fish Farming	KVK, Barnala
41	25.03.2022	Recent Advances in Ornamental Fish Culture	Virtual conference
42	28.03.2022	Value Added Fish Products	Pohle Majra, (Khamano), Fatehgarh Sahib
43	29.03.2022	1. Latest Techniques in Culture of Freshwater Fishes 2. Present Status and Prospects of Modern Intensive Aquaculture Techniques like RAS and Biofloc Technology in Freshwater Aquaculture	FFDA, Kapurthala
44	31.03.2022	Mobile applications & Fisheries Marketing	Faculty of Fisheries, SKUAST-K, Srinagar
KVKs and RRTCs			
45	15.03.2021	Pesticide residue management in poultry (Skill development training course om small poultry farmers) (240 hrs)	ASCII
46	27.07.2021	Pest management in direct seeded rice	Department of Agriculture and Farmers Welfare, SAS Nagar
47	05.08.2021	Processing of lemon and bottle gourd	
48	30.11.2021	Processing and preservation of vegetables	
49	07.03.2022	Nutritional Importance of fruits and vegetables and its value addition	
50	09.02.2022 and 11.02.2022	Government Schemes and policies for the upliftment of SCs	Department of Human Development and Family Studies, PAU, Ludhiana
51	10.09.2021	Management of dairy animals and prevention of diseases.	ATMA and Department of Agriculture, Mohali
52	22.10.2021	1. Digestive systems and importance of digestion in dairy animals 2. Prevention and treatment of mastitis in dairy animals	DDTC, Chatamli

C. Meetings of Livestock and Fishery Farmers Associations

Name of the Association	Date of Meeting	Title of Lecture(s) and name of Speaker(s)	No. of Participants
Innovative Fish Farmer's Association (IFFA)	19.08.2021	1. BMP for enhanced productivity and profitability in fish farming- Mr. Debtanu Barman, Director Aquaone Centre, Kolkata and CEO, Aqua Doctor Solutions, Kolkata	65
	30.12.2021	1. BMP's for aquaculture, integrated farming systems and intensive aquaculture technologies- Mr. Debtanu Barman, Director Aquaone Centre, Kolkata and CEO, Aqua Doctor Solutions, Kolkata	30
Progressive Livestock Farmers Association (PLFA)	11.11.2021	1. Strategies for controlling LSD-Dr Dhiraj Gupta 2. Misuse of antibiotics at field level-Dr R K Sharma	22
	04.02.2022	1. Abortions in dairy animals- Dr R K Sharma 2. Strategies for controlling infectious diseases- Dr S S Randhawa	47
	16.03.2022	1. Compounding balanced ration for dairy animals-Dr Parminder Singh 2. Strategies for silage making-Dr R S Grewal	34
Progressive Goat Farmers Association (PGFA)	08.10.2021	1. Health management of goats- Dr Sukriti Sharma 2. Reproductive management of goats-Dr Rajesh Kasrija	29

D. Extension Publications

1. Books/Booklets/Bulletins published

i. Bedi, J. S., Dhaka, P., Deepthi, V. and Singh, R. (2021). Field Epidemiology for Veterinarian, pp 1-32.

ii. Bedi, J. S., Dhaka, P., Singh, R., Vijay, D., Singh, J. and Arora, A. K. (2021). Awareness Guide on Antimicrobial Resistance, pp 1-32

iii. Brar, P. S., Singh, J., Singh, A. & Phand, S. (2021). Health and Feed Management of Dairy Animals (eBook). Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana and MANAGE, Hyderabad.

iv. Dhaka, P., Bedi, J. S., Vijay, D., Kaur, S., Singh, B. B. and Aulakh, R. S. (2021). Awareness Guide on Dairy Farm Biosecurity, pp 1-32..

v. Kaur, S., Singh, R., Bedi, J. S. and Dhaka, P. (2021). Handbook on Food safety and Hygiene. (Developed under National Agricultural Higher Education Project, Indian Council of Agricultural Research.), pp 1-32.

vi. Sharma, M. & Singh, P. (2021). Crop Residue Management. KVK, Mohali. Pp. 1-33.

vii. Sharma, R., Bedi, J. S., Kalambhe, D. and Singh, S. (2021). Handbook on Laboratory Safety, pp 1-32

viii. Singh, P. K., Verma, H. K., Kaur, S., Singh, J., Pundir, R. K., Mishra, A. K. and Sharma, S. (2021). Livestock Development of Punjab State. ICAR-NBAGR, Karnal, pp 1-67.

ix. Singh, R., Kaur, S., Kaur, R., Dhaka, P. and Bedi, J. S. (2021). Handbook on Zoonoses, pp 1-32.

2. Pamphlets/Folders published

i. BhanuPrakash, C. & Kumar, B. (2021). Ralwan (Composite) Carp macchi palan". KVK, Tarn Taran.

ii. Dhillon, P. K. & Kumar, B. (2021). Dudh pdarathan di mull vardhakta de suchajje tarike. KVK, Tarn Taran.

iii. Gupta, P., Kaur, H. & Singh, P. (2021). Shahad de gunvatta bharpur mulvardhak utpadh. KVK, Mohali.

iv. Gupta, P., Kaur, H. & Singh, P. (2021). Khumban da parbandh, mul vaade de sang. KVK, Mohali.

v. Gupta, P. & Singh, P. (2021). Chhe mahene tak stanpan maa ate bache dona layi vardan (e-folder). KVK, Mohali.

vi. Kaur, H., Pal, S. & Singh, P. (2021). Kanak de khetan vich chuhian da parbandh. KVK, Mohali.

vii. Kumar, S. & Kumar, B. (2021). Nili Ravi buffalo: Pride of Majha belt. KVK, Tarn Taran.

viii. Pal, S., Kaur, H. & Sharma, M. (2021). Pro treya vich sabjiyan di paneeri tiyar karan di taknik. KVK, Mohali.

ix. Sharma, M. (2021). Sabjiyan di tat bharpur ghar bageechi da namuna. KVK, Mohali.

x. Sharma, M. (2021). Portable polytunnel rahi sabjiyan di paneeri utpadan di taknik. KVK, Mohali.

xi. Sharma M. (2021). Sabjiyan di ghar bageechi vich paneeri ugaun de nukte. KVK, Mohali.

xii. Sharma, M. (2021). Ghar di chhat te sabjiyan di bageechi karan de tarike. KVK, Mohali.

xiii. Sharma M. (2021). Gharan vich tulsi ugao, bimarian nu dur bhajao. KVK, Mohali.

xiv. Sharma M. (2021). Gainde di vigianak kashat di taknik. KVK, Mohali.

xv. Sharma, M. & Singh, P. (2021). Chhat bageechi vich sabjiyan di kashat. KVK, Mohali.

xvi. Sharma M. & Singh, P. (2021). Phalan da bag lagaun di yojna, taknik ate mukh pranaliyan. KVK, Mohali.

xvii. Singh, A.K., Sharma, A., Chahal, U., Mahajan, V., Sodhi, S.S., Bansal, B.K. & Singh, P. (2021). Surian vich prajnan sambandhi samasyawaan. Department of Veterinary Gynaecology and Obstetrics, GADVASU, Ludhiana.

xviii. Singh, A.K., Sharma, A., Chahal, U., Kaur, P., Mahajan, V., Sodhi, S.S., Bansal, B.K. & Singh, P. (2021). Soor palan: Ik lahewand kitta. Department of Veterinary Gynaecology and Obstetrics, GADVASU, Ludhiana.

xix. Singh, A.K., Sharma, A., Chahal, U., Kaur, P., Mahajan, V., Sodhi, S.S., Bansal, B.K. & Singh, P. (2021). Suran ton viraj ikkatha kar ke masnui garabhdaan lai tiaar karna. Department of Veterinary Gynecology and Obstetrics, GADVASU, Ludhiana.

xx. Singh, N. (2021). Fruit fly trap rahin phal makkhi (kaddu jaati) dee rokthaam. KVK, Tarn Taran.

xxi. Singh, P. (2021). Dairy farm te parali di suchaji varton. KVK, Mohali.

xxii. Singh, R. S., Singh, S. & Singh, K. (2021). Instructions of pet owners. Teaching Veterinary Clinical Complex, GADVASU, Ludhiana.

xxiii. Tanwar, P. S., Matharu, K. S. & Singh, S. (2021). Sarsoan di fasal vich paye jaan wale pramukh mittar keede. KVK, Barnala.

xxiv. Tanwar, P. S., Matharu, K. S. & Sohi, H. S. (2021). Phal makhi de sarv pakhi keet praband. KVK, Barnala.

3. Leaflets/ Calendars published

i. Arora, A. K., Bedi, J. S., Singh, J. & Singh, R. (2021). Janvaran vich antibiotics de durvarto de nuksan and is di roktham. Centre for One Health.

ii. Bedi, J. S., Dhaka, P., Singh, B., Tarfain, N. U., Kaur, P., Kaur, S., Kalambhe, D., Singh, R. & Lokesh, K.M. (2021). Brucellosis: An endemic disease of human and animal health importance. Centre for One Health.

iii. Bedi, J. S., Dhaka, P., Singh, B., Tarfain, N. U., Kaur, P., Kaur, S., Kalambhe, D., Singh, R. & Lokesh, K.M. (2021). Bovine tuberculosis: A neglected and underreported zoonosis. Centre for One Health.

iv. Bedi, J. S., Dhaka, P., Singh, B., Tarfain, N. U., Kaur, P., Kaur, S., Kalambhe, D., Singh, R. & Lokesh, K.M. (2021). Coxiellosis (Q- Fever): A hidden menace. Centre for One Health.

v. Bedi, J. S., Dhaka, P., Singh, B., Tarfain, N. U., Kaur, P., Kaur, S., Kalambhe, D., Singh, R. & Lokesh, K.M. (2021). Leptospirosis: Zoonosis of ubiquitous distribution. Centre for One Health.

vi. Bedi, J. S., Dhaka, P., Singh, B., Tarfain, N. U., Kaur, P., Kaur, S., Kalambhe, D., Singh, R. & Lokesh, K.M. (2021). Listeriosis: circling disease in livestock. Centre for One Health.

vii. Bedi, J. S., Dhaka, P., Singh, B., Tarfain, N. U., Kaur, P., Kaur, S., Kalambhe, D., Singh, R. & Lokesh, K.M. (2021). Cryptosporidiosis: Characterized by severe watery mucoid diarrhoea. Centre for One Health.

viii. Bedi, J. S., Dhaka, P., Singh, B., Tarfain, N. U., Kaur, P., Kaur, S., Kalambhe, D., Singh, R. &

Lokesh, K.M. (2021). Cysticercosis: A 'biological marker' for social and economic development of the community. Centre for One Health.

ix. Bedi, J. S., Dhaka, P., Singh, B., Tarfain, N. U., Kaur, P., Kaur, S., Kalambhe, D., Singh, R. & Lokesh, K.M. (2021). Toxoplasmosis: An emerging but underreported zoonoses. Centre for One Health.

x. Bedi, J. S., Dhaka, P., Singh, B., Tarfain, N. U., Kaur, P., Kaur, S., Kalambhe, D., Singh, R. & Lokesh, K.M. (2021). Japanese Encephalitis: Cause of epidemic encephalitis worldwide. Centre for One Health.

xi. Bedi, J. S., Dhaka, P., Singh, B., Tarfain, N. U., Kaur, P., Kaur, S., Kalambhe, D., Singh, R. & Lokesh, K.M. (2021). Scrub typhus: An emerging zoonosis expanding its horizons. Centre for One Health.

xii. Bedi, J. S., Dhaka, P., Singh, B., Tarfain, N. U., Kaur, P., Kaur, S., Kalambhe, D., Singh, R. & Lokesh, K.M. (2021). Swine influenza: Highly contagious viral infection of pigs. Centre for One Health.

xiii. Bedi, J. S., Dhaka, P., Singh, B., Tarfain, N. U., Kaur, P., Kaur, S., Kalambhe, D., Singh, R. & Lokesh, K.M. (2021). Crimean-Congo haemorrhagic Fever: Viral Hemorrhagic fever. Centre for One Health.

xiv. Bedi, J. S., Singh, J. Singh, R. & Arora, A.K. (2021). Janvaran vich antibiotics avsheh de sambavit asar. Centre for One Health.

xv. Kaur, S., Singh, R., Kaur, R., Bedi, J. S. & Dhaka, P. (2021). Saaf Suthra dudh utpadan. Centre for One Health.

xvi. Sharma, R., Bedi, J. S., Aulakh, R. S. & Singh, B. B. (2021). Jekar Paltu Sehatmand Tan Tusi Vi Sehatmand. Centre for One Health.

xvii. Sharma, R., Bedi, J. S., Aulakh, R. S. & Singh, B. B. (2021). Aao kare is gal te vichar, ki hunda hai Q bukh. Centre for One Health.

xviii. Sharma, R., Bedi, J. S., Aulakh, R. S. & Singh, B. B. (2021). Jekar pashu too jan ehna gallan da rakhea dheyan. Centre for One Health.

xix. Sharma, R., Bedi, J. S., Aulakh, R. S. & Singh, B. B. (2021). Zoonotic bimarian to krlo bachao, apni te pashuan di sehat changi bnao. Centre for One Health.

xx. Sharma, R., Singh, S. & Bedi, J. S. (2021). Handling chemicals in laboratory. Centre for One Health.

xxi. Singh, A.K., Mahajan, V., Sharma, A., Kaur, P., Chahal, U., Sodhi, S.S., Bansal, B.K. & Singh, P. (2021). Sooran da sehat calendar. Department of Veterinary Gynaecology and Obstetrics, GADVASU, Ludhiana.

xxii. Singh, A.K., Sharma, A., Mahajan, V., Kaur, P., Chahal, U., Sodhi, S.S., Bansal, B.K. & Singh, P. (2021). Sooran da prajnan calendar. Department of Veterinary Gynaecology and Obstetrics, GADVASU, Ludhiana.

xxiii. Singh, A.K., Sharma, A., Mahajan, V., Kaur, P., Chahal, U., Sodhi, S.S., Bansal, B.K. & Singh, P. (2021). Soorian da garabhkaal da calendar. Department of Veterinary Gynaecology and Obstetrics, GADVASU, Ludhiana.

Singh, S., Sharma, R. & J.S. Bedi (2021). Know important laboratory symbols. Centre for One Health.

4. Compendia published

Mehta, N. Malav, O. P., Rajesh, V., Wagh & Kaur, S. (2021) Training manual: Entrepreneurship Development Program on Value Addition of Meat and Meat Products. Department of Livestock Products Technology, COVS, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab

5. Chapters in Books

Verma, H. K. and Kaur, S. (2021). Multisided, Multitier Extension Approaches and Digital Strategies of Veterinary Varsity for Sustainable Livestock Development. In: Novel Extension Approaches For Reshaping Indian Agriculture. Eds.: Gautam, U. S., Nain, M. S., Mishra, M. & Joshi, V. Bio Green Publishers (ISBN No: 9788176225144).

6. Articles published

Aansal, M. D. (2021). Punjab day machi palaka layi pradhan mantri matsia sampda jojana. *Vigiyanak Pashu Palan* 15 (5), 30-32.

Aansal, M. D. (2021). Machi palan, sahi shuruat- mushkila ton nijaat. *Vigiyanak Pashu Palan* 15 (6), 26-27.

Aansal, M. D. (2021). Jhinga palan- jiv surakhya naal hi khaitar rakhya. *Vigiyanak Pashu Palan* 15 (7), 26-28.

Aansal, M.D. (2021). Machi palan-Bhojan surkhia vich yogdan ate mung. *Vigiyanak Pashu Palan* 15 (11), 5-6.

Aansal, M. D. (2021). University duara tiyar kite gaye machi protein yukt biscut. *Vigiyanak Pashu Palan* 16 (1), 29-30.

Ansal, M.D. (2021). Fisheries college vikhe uplabadh kisani sevava. *Vigiyanak Pashu Palan* 16 (2), 29-30.

Acharya, P., Singh, Y. & Mehla, V. (2021). Pashudhan bima: pashu palkon ke liye vardan. *Livestock Technology*, 11(4), 12-14.

Acharya, P., Singh, Y. & Mehla, V. (2021). Pashuon mein swatch dugdh utpadan: Pranalian avum abhias. *Livestock Technology*, 11(4), 30-31.

Aulakh, R.S. & Sharma, R. (2021). Brucellosis bimari bare jankari. *Vigiyanak Pashu Palan* 15 (12), 9.

Bal, S. S., Gavade, S., Leishangthem, G. D. & Singh, N. D. (2021). Diseases of cattle associated with lymph node affection. *ePashupalan*, 12(2), 28-33.

Bansal, A. & Khatkar, S. K. (2021). Dudh vich pao haldi, sahet banao jaldi. *Vigiyanak Pashu Palan* 15 (10), 18-20.

Bansal, V. (2021). Processed yogurt cheese: ik sehatmand utpad. *Vigiyanak Pashu Palan* 16 (1), 19-20.

Bansal, V. & Goyel, N. (2021). Cheese banao, vadare munafa kamao. *Vigiyanak Pashu Palan* 15 (7), 23-25.

Bansal, V. & Sihag, M. K. (2021). Dudh ate dudh padartha de utpadan lyi dudh da mandikaran. *Vigiyanak Pashu Palan* 16 (3), 27.

Basak, G. & Kaur, S. (2021). Emerging and reemerging bacterial zoonotic infections: Factors and surveillance mechanisms. *Livestock Technology*, 11(7): 7-9.

Bedi, J.S. & Sharma, R. (2021). Zoonsis bimaria- mudlyi jankari. *Vigiyanak Pashu Palan* 15 (12), 6.

Brar, N. S. & Singh, P. (2021). Vigiyanak tarikya naal parali di suchaji vartoh. *Vigiyanak Pashu Palan* 16 (4), 5-7.

Chahal, U. & Kaur, S. (2021). Katurian di Khurak. *Vigiyanak Pashu Palan* 15 (8), 27-28.

Chawla, R. (2021). Dhodha barfi- ik rawayti mithai. *Vigiyanak Pashu Palan* 15 (12), 22-23.

Chawala, R. & Kakkar, S. S. (2021). Dudh di munyad vadoun lyi navintum tachniqan. *Vigiyanak Pashu Palan* 16 (3), 15-16.

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Singh P. & Mavi G. K. (2021). Thand vich chuchian di sambh sambhal. *Vigiyanak Pashu Palan* 15 (5), 21-24.

Singh, P. & Singh, J. (2021). Khurak 'ch dudh dee bantar te prabhav. *Vigiyanak Pashu Palan* 15 (7), 8-10.

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Singh, R. & Singh, K. (2021). Sur palan de kitte di aarthikta. *Vigiyanak Pashu Palan* 15 (11), 22-24.

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Singh, T. & Singh, G. (2021). Soon vale pashun di dekhbhal. *Vigiyanak Pashu Palan* 16 (1) 9-10.

Singh, T. & Singh, G. (2021). Aao janie murgian ate broileran di khurak bare. *Vigiyanak Pashu Palan* 16 (3), 23-26.

Singh, T. & Verma, P. (2021). Pashuan de mukh jamandaru roga'n di pachan te janwara di sambh sambhal. *Vigiyanak Pashu Palan* 16 (1), 11-12.

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Talwar, G. & Goyel, R. (2021). Gyan naal vadai apne dudh pardatha di shan – Gorav Sandhu, *Vigiyanak Pashu Palan* 15 (8), 24.

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Veena, N. & Kumari, A. (2021). Dudh vich milavati tatan di parkh. *Vigiyanak Pashu Palan* 15 (10), 29-30.

Veena N. & Singh, V. P. (2021). Dudh ik poshtik aahar. *Vigiyanak Pashu Palan* 15 (10), 8-10.

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E. TV/Radio Talks

University has liaison with electronic media for flashing various livestock related interventions and precautions for disease control and seasonal correct management practices. University experts deliver TV talks regularly on Doordarshan/ Cable networks/ private channels on current & seasonal topics related to livestock and fish farming. On an average two to three talks are delivered/broadcasted in a week. The comprehensive list of TV talks has been given below.

S. No.	Name of the Faculty Member	Date of the Talk	Title of the Talk
Department of Animal Breeding and Genetics			
1	S Kaur	16.11.2021	Sahi pashu di chone kivan karyae; DD Jallandhar
Department of Animal Nutrition			
2	J S Lamba	12.04.2021	Urea treatment of wheat straw; AIR, Jalandhar
3		22.10.2021	Use of paddy straw for dairy cows; AIR, Patiala
4	J S Hundal	12.10.2021	Sajjar sue levere layi khurak; AIR, Patiala
5		10.05.2021	Pashua layi turi/prali urea nal sodhke varto; AIR, Bathinda

Directorate of Livestock Farms			
6	R S Grewal	25.02.2022	Calf feeding; DD Jalandhar
7		09.03.2022	Paddy straw feeding; ZEE Punjab
8.		09.03.2022	Paddy straw feeding; DD Jalandhar
9.		09.03.2022	Paddy straw feeding; Living Media News
10.		09.03.2022	Paddy straw feeding; Rozana Spokesman YouTube channel
11.		09.03.2022	Paddy straw feeding; ETV Bharat
12.	Navdeep Singh	21.04.2021	Corona sankat doran veterinary doctor di bhumika; Akashwani , Ludhiana
13.		29.10.2021	Pashuan di sue ton pehlan te baad di sambhal; DD, Punjabi
14.	P P Dubey	27.11.2021	Murgi paalan layi behtar utpaadan layi nukte; FM, Bathinda
15.	P Malhotra	10.11.2021	Sardian vich laveria da prabandh; DD, Jalandhar
16.	R K Dhaliwal	24.05.2021	Setting up of Backyard poultry farms; Akashwani, Ludhiana
17.		04.06.2021	Effects of high temperature (summer season) on cattle; DD, Jallandhar
18.		07.06.2021	Pashuan te vadhere tapsh de parbhav te parbandh; AIR, Jallandhar
Department of Veterinary & Animal Husbandry Extension			
19.	R K Sharma	04.06.2021	Harvariyae laveirian lai parbandhaki nukte. DD, Jallandhar
20.		11.03.2022	Dairy Farming, AIR, Patiala
21.	Rajesh Kasrija	18.08.2021	Parjivia da pashu prajanan te parbhav; AIR, Jalandhar
Department of Veterinary Microbiology			
22.	Gurpreet Kaur	06.08.2021	Muh Khur di Bimari Bare Jaankari; AIR, Patiala
23.	Paviter Kaur	10.09.2021	Pashuan vich laag kaaran prajanan samasiyavan; AIR, Jalandhar
24.		14.12.2021	Pashuan vich laag dian bimarian ate bachao; Akashwani, Ludhiana
25.	D Narang	17.06.2021	Barasat de dina wich pashuan di sambh sambhal; AIR, Jalandhar
Department of Veterinary Parasitology			
26.	Paramjit Kaur	29.06.2021	Garmi ate barsat vich pashuan da prajivian ton bachao; AIR, Patiala
27.		26.08.2021	Pashuan vich mok de prajivi kark; AIR, Jalandhar
28.	Harkirat Singh	11.06.2021	Garmi ate barsatan vich pashuan da parjivian to bacha; AIR, Jalandhar
29.		24.08.2021	Dudharuan vich khooni parjivian ton bachao; AIR, Patiala

30.	L D Singla	20.08.2021	Pashuan vich chichran ate makhia ton bachao; DD Jalandhar
31.		27.08.2021	Pashuan da makhi, machhar ate chichran ton bachao; AIR, Patiala
Department of Veterinary Pharmacology and Toxicology			
32.	V K Dumka	13.11.2021	Jaddi butian ranhi pashuan di aam bimarian di roktham ate Ilaaj; AIR, Bathinda
33.	S P S Saini	22.04.2021	Pashu utpaad ate corona: mithaan ate sachai; AIR, Bathinda
34.	S K Sharma	28.12.2021	Pashuan vich zeharbad te bacha; DD, Jalandhar
Department of Veterinary Gynecology and Obstetrics			
35.	A K Singh	28.07.2021	Mausami dabab da pashuan te asar; AIR, Jalandhar
36.		11.01.2022	Behtar Nasal layee nar pashu da yogdaan; AIR, Patiala
Department of Veterinary Surgery and Radiology			
37.	Navdeep Singh	15.10.2021	Hospital vich janvaraan layi operation rahi ilaaz; DD, Jallandhar
38.	S K Mahajan	03.08.2021	Kuttain vich akhaan di bimariyan ate ilaaj; AIR, Ludhiana
39.	Arun Anand	02.04.2021	Surgical management of equine affections; AIR, Patiala
40.		27.06.2021	Barsata vich pashua dia jakhmah dah sambah sambal; DD, Jalandhar
41.		29.07.2021	Care of animals during rainy season; AIR, Bathinda
42.	Ashwani Kumar	10.07.2021	Dudharu laveriayan vich tutti haddi di smasya; AIR, Bathinda
43.		21.12.2021	Kisan layee hospital vich maujood suvidhawan; AIR, Ludhiana
Department of Veterinary Medicine			
44.	Sushma Chhabra	20.07.2021	Hyperthermia in cows and buffaloes; FM Radio, Bathinda
45.	Sujata Turkar	24.07.2021	Bakriya de vishanu rog; AIR, Bathinda
Department of Veterinary Pathology			
46.	A P S Brar	21.12.2021	Murgian vich kitanuan dian bimaryan; AIR, Jalandhar
47.		08.03.2022	Murgian vich ghatak bimarian; AIR, Jalandhar
48.	B S Sandhu	14.02.2022	Biosecurity at animal farms; DD, Jalandhar
Teaching Veterinary Clinical Complex			
49.	S S Randhawa	21.04.2021	Corona doraan veterinary university pashu hasptaal vallon kisana lai sewawan, AIR, Jalandhar
50.		21.09.2021	Pashuan vich khuran di samasya ate bachaa; DD, Jalandhar
Centre For One Health			
51.	Simranpreet Kaur	03.02.2022	Saaf ate sehatmand dudh utpadan; Akashwani, Patiala

52.	J S Bedi	09.04. 2021	One health concepts related to animal and human health; AIR, Jalandhar
53.		16.04. 2021	Bird flu de bare jankari; Dainik Sawera TV (https://www.youtube.com/watch?v=8lFtMFkaWiM)
54.		20.04.2021	Corona mahamari ate pashu sehat; AIR, Jalandhar
55.		26.04.2021	One health and its importance in current scenario; DD, Jalandhar
56.	Randhir Singh	30.12.2021	Pashuan vich antibiotics di sahi varton; AIR, Jalandhar
57.	Rajnish Sharma	22.05.2021	Corona and pet animals; The City Headlines https://www.youtube.com/watch?v=qoVN9MUnZLs
58.		24.11.2021	Pashuan vich too jan di bimari ate bacha; DD Jallandhar
59.		20.04.2021	Corona mahamari ate pashu sehat; AIR, Jalandhar
60.		13.05.2021	Bird flu ate sawdhanean; AIR, Jalandhar
61.	Pankaj Dhaka	24.08.2021	Rabies awareness; AIR, Jalandhar
Animal Disease Research Centre			
62.	Vishal Mahajan	23.06.2021	Pashuan vich tikakaran; AIR, Jalandhar
63.	M. S. Bal	25.06.2021	Pashuan vich parjivi rogan dian mahanmarian; DD, Jalandhar
64.		22.03.2022	Pashuan vich garmian de mausam vich haun vale parjivi rog; AIR, Jalandhar
65.	Gursimran Filia	02.07.2021	Pashuan vich tikakaran; FM Radio, Patiala
66.		13.10.2021	Pashuan vich tikakaran; AIR, Jalandhar
College of Veterinary Sciences, Rampuraphul			
67.	Sandeep Kaswan	11.05.2021	Bakri palan lahewand kita; AIR, Bathinda
68.	M K Chatli	15.02.2022	Radio Kisan Diwas; AIR, Bathinda
69.	Maninder Singh	15.02.2022	Radio Kisan Diwas; AIR, Bathinda
College of Dairy Science and Technology			
70.	Gursharn Singh	01.06.2021	World Milk Day; DD Punjabi
71.	Varinder Pal Singh	20.12.2021	Bakri pallan aarthikta ate munafa; AIR, Jalandhar
College of Fisheries			
72.	Meera D. Ansal	15.04.2021	Fish care during summer season; DD, Jalandhar
73.		10.08.2021	Fish farming management during rainy season; DD, Jalandhar
74.	Vaneet Inder Kaur	04.05.2021	Care of fish ponds during summer season; AIR Jalandhar
75.		06.08.2021	Care of fish pond during rainy season; AIR Jalandhar
76.		19.10.2021	Ornamental fisheries: A profitable venture; AIR Jalandhar
77.		03.12.2021	Fish consumption awareness in Punjab; DD, Jalandhar
78.		20.12.2021	Fish consumption awareness in Punjab; AIR, Jalandhar
79.	Ajeet Singh	11.02.2022	Macchi de gunwatta bharpoor utpadan rahin amdan 'ch wadha; AIR, Jalandhar

80.	Prabjeet Singh	25.10.2021	Best management practices for shrimp farming; AIR, Jalandhar
81.	Grishma Tewari	17.05.2021	Tips for management of fish farming in summer season; AIR, Patiala
82.		20.11.2021	Care of fish pond during winters; AIR, Bathinda
83.	Rajinder Kaur	10.08.2021	Fish pond management during rainy season; AIR, Patiala
College of Animal Biotechnology			
84.	S S Sodhi	28.06.2021	Soor paalan vich nasal sudhar ate munafa; DD, Jalandhar
85.	S Singh	11.08.2021	Pashuan ch roganu karan garbhpaat di samasiya in Punjabi; AIR, Jalandhar.
KVK and RRTCs			
86.	Parminder Singh	30.06.2021	Management of layers during monsoon; AIR, Jalandhar
87.	Vikas Phulia	23.07.2021	Barsat de mausam vich machi palan; AIR, Patiala
88.		26.11.2021	Sardian vich machhian di dekhbhal; AIR, Patiala
89.	H S Sohi	03.08.2021	Nawe baagh lagaun ate barsaat rutt vich baagha di saambh sambhaal; AIR, Patiala
90.	H S Sohi and P S Tanwar	04.10.2021	Barnale de ehh kisan mushroom de kheti naal change munaafe kiwe kama rahe han; BBC Punjabi Channel
91.	Parul Gupta	16.11.2021	Swai sahayata samooh ate aurtan di bhumika; AIR, Patiala
92.		07.03.2022	Swai sahayata samooh ate aurtan di bhumika; AIR, Patiala
93.	Munish Sharma	30.11.2021	Sabjiyan di vigianak ghar bageechi; AIR, Patiala
94.	Harmeet Kaur	03.01.2022	Kanak di fasal di keere ate bimarian ton roktham; AIR, Patiala
95.		04.01.2022	Kidian di rokhtham ate tandrusat vatavaran di sirjana; AIR, Patiala

F. Expert visits

University scientists have undertaken expert visits to various parts of ths state on different occasions. These visits have been enumerated below:

S. No.	Date	Department of Visiting Experts	Venue of Visit	Purpose of Visit
1.	07.04.2021	KVK, Barnala	Villages Kaire and Handiaya	To diagnose fruit plants
2.	12.04.2021	KVK, Barnala	Rampura Phul, GADVASU, Ludhiana	Layout and landscaping of Veterinary College
3.	16.04.2021	KVK, Barnala	Villages Rureke Khurd, Kotduna, Kaleke, Bhaini	To attend problems faced by pig, backyard poultry farmers

4.	22.04. 2021	CoF	River Kali Bein at Gurdwara Ber Sahib, Sultanpur Lodhi, Kapurthala	To investigate fish mortality
5.	30.04.2021	KVK, Barnala	Village Wahegurupura	Layout and design of orchard
6.	11.05.2021	CoF	Harike Wetland	To investigate fish mortality
7.	12.05.2021			
8.	08.06.2021	ADRC	Semen Station, Nabha	To check bulls for fertility
9.	16.06.2021	ADRC	Village Barewal, Ludhiana	To attend brucellosis outbreak
10.	28.06.2021	KVK, Barnala	Village Handiaya	To attemd problem of damping
11.	01.07.2021	ADRC	Villages of Mohali district	To attend coccidiosis outbreak
12.	02.07.2021	KVK, Barnala	Villages Pakho Kalan and Rurki Khurd	Diagnostic visit threap was observed below ETL
13.	08.07.2021	KVK, Barnala	RRTC, Fazilka	Layout and landscaping
14.	03.08.2021	ADRC	Village Dina Sahib, Moga	To attend FMD outbreak
15.	05.08.2021	KVK, Barnala	Village Barnala	Visit to inspect problems in fruit plants
16.	17.08.2021	ADRC	Village Karlwan, Tarn Taran	To attend FMD outbreak
17.	17.08.2021	KVK, Barnala	Village Badbar and Village Dhurkot	To visit orchards for possible solutions
18.	20.08.2021	KVK, Barnala	Barnala	To suggest the spawning growth and care time
19.	23.08.2021	ADRC	Village Jainpur, Ludhiana	To attend FMD outbreak
20.	25.08.2021	ADRC	Dhuri, Sangrur	To attend respiratory problems in dairy animals
21.	23.09.2021	ADRC	Village Balian, Sangrura	To attend septicaemia cases
22.	14.10.2021	KVK, Barnala	Sh. Deepak Goyal, Barnala	Button Mushroom issues
23.	18.10.2021	KVK, Barnala	Village Handiaya	Monitoring of SHG activities
24.	19.10.2021	KVK, Barnala	Barnala	To visit lemon orchards
25.	21.10.2021	KVK, Barnala	Village Kattu	To monitor SHG's activities
26.	08.11.2021	ADRC	Village Ladda, Sangrura	To attend intestinal worm cases
27.	20.12.2021	ADRC	Kurali, SAS Nagar	For disease investigation
28.	23.12.2021	ADRC	Village Gholian Kalan, Moga	To attend nitrate toxicity

29.	28.12.2021	ADRC	Village Hussainpura, Malerkotla	To attend respiratory problems in buffaloes
30.	12.01.2022	KVK, Barnala	Village Kothe Chung	To attend potato diseases
31.	03.02.2022	KVK, Barnala	Village Thikriwala	Fish Health Evaluation
32.	04.02.2022	KVK, Barnala	Village Mehta	CFLDs Visit
33.	11.02.2022	KVK, Barnala	Village Gurm	To assess water quality
34.	14.02.2022	KVK, Barnala	Village Katuba, Barnala	To attend problems in lemon orchards
35.	09.03.2022	KVK, Barnala	Village Thikriwala	Fish stocking of new pond
36.	23.03.2022	ADRC	Lalton, Ludhiana	For disease investigation

G. Utility Services provided by university

Various departments and outstations of GADVASU provide following utility services to different categories of livestock, poultry and fish farmers and other stakeholders.

i. Specialized diagnosis of diseased conditions of various livestock, pet, wild animals and birds.
ii. Specialized treatment for various livestock, pet, wild animals and birds.
iii. Provision of veterinary health services in the surrounding villages through ambulatory van.
iv. Blood transfusion and hemodialysis in small animals
v. Sale of mastitis diagnostic reagents, BTB cards and SLS Paddles.
vi. Sale of area specific mineral mixture, urea molasses multi-nutrient blocks (UMMB), bypass fat, eggs, semen straws live germ plasm
vii. Sale of germ plasm of Sahiwal and Crossbred Cattle; Murrah and Nili Ravi buffalo; Layer and Broiler birds; Beetal goat, Pig, Rabbit etc.
viii. Supply of male cow and buffalo calves for breeding purposes
ix. Service of Sahiwal cattle embryo transfers at farmers' door step
x. Sale of university literature
xi. Sale of Azolla inoculums
xii. Sale of mastitis detection kits, rumenal magnets, milk adulteration testing kits
xiii. Sale of vegetable kits, vermicompost, mushroom, vegetables, fruits, eed of different crops, honey, fruit fly traps
xiv. Testing of fecal, blood, semen samples etc.
xv. Soil and water testing

H. Awareness Creation among Students and staff

S No	Name of activity	Place of activity	No. of students
1	Awareness Camp organized by by Centre for One Health on 12.10.2021 	Police DAV Public School, Ludhiana	121
2	Awareness camp and Quiz competition during World Antimicrobial Awareness (AMR) Week organized by by Centre for One Health (18th -24th Nov, 2021)  	Govt. Senior Secondary School, Punjab Agricultural University, Ludhiana	68

I. Any other event

i. Department of Veterinary Anatomy developed plastinated specimens of kidney and heart of buffaloes, horses and goats.

ii. S. Gurwinder Singh Sandhu of Jindawala village under KVK, Tarn Taran won IARI Innovative Farmer Award at Pusa Krishi Vigyan Mela on 11.03.2022.

iii. KVK, Mohali organized Farmers Field School on Canola Type Gobhi sarson at Bhupnagar from Jan-Mar, 2022. A total of 60 farmers participated in this event.

University Library and Networking

The University Library is a state-of-the-art automated library facilitating the academic and research activities of the University. Koha (Open-Source Library Management Software) is used for automating its various in-house operations viz. circulation, creation of membership cards, database management for the books, journals, theses, etc. The Library manages its own website i.e. Cyberary to provide user friendly access its various e-resources, services and other important information. List of latest arrivals of books and journals are also regularly uploaded on the Cyberary to facilitate current information to users. The Online Public Access Catalogue (OPAC) of the library can be accessed to search books, journals and theses from their gadgets.

The university library successfully organized a book exhibition on March 16, 2022 wherein 10 book publishers and book sellers from different parts of the region had participated and 421 books worth Rs. 10,00,000/- were purchased for the library. The University Library purchased 666 print books worth Rs. 10,30,000/- (including books purchased for various departments/constituent colleges) on various disciplines of veterinary science & animal husbandry, dairy science & technology, fisheries and animal biotechnology during the year 2021-22. In addition to this, 120 e-books worth Rs. 17,50,000/- (including e-books for departments) were also purchased to boost the e-books collection. University Library also purchased two prominent online journals for its users out of the funds of available with departments. University library is a member of Consortium for e-Resources in Agriculture (CeRA). Access to about 4000 journals in various disciplines of Agricultural Sciences including Veterinary Sciences, Animal Husbandry, Livestock Management & Poultry Sciences, Fisheries and Aquaculture, Dairy Technology, Biotechnology, Animal Nutrition and allied subjects is available through CeRA.

E-Newsletter of the University Library is published quarterly to acquaint the academic fraternity of the University with the latest arrivals. University Library also publishes e-Newsletter of the University highlighting teaching, research and extension activities of the University.

An institutional repository has been developed by the University Library. Articles published by the faculty, reports of the University and annual reports of other institutes of repute are also uploaded on the repository. The repository has been customized to retrieve articles by NAAS Rating and Impact Factor. The digital contents available on the repository are accessible only to fraternity of the University for better comprehension of the teaching and research activities.

University Library facilitates the implementation of Anti-Plagiarism policy in the University. User accounts are created in Ouriginal Plagiarism Detection Software and assistance is provided to the faculty in uploading/ managing the manuscripts and generation of Similarity Index report.

Networking

Campus wide network connecting more than 700 nodes has been developed in the University by the University Library. The Library provides internet services throughout the University via Campus Wide Area Network on Fiber Optic Cable. The internet services are provided through User based authentication. Library also purchased additional lease line for providing redundant internet services throughout the Campus. The Library hosts Intranet Web Server to provide Library Services throughout the Campus from its website, i. e. Cyberary. The University website provides access to students, staff and other non-teaching employees regarding issues related to caste discrimination by reporting to SC/ST cell, anti-ragging issues or information about Post-Matric Scholarship (PMS) for SC/OBC by providing online guidelines.

The networking facility of GADVASU has also been extended to cover new buildings of College of Fisheries, College of Dairy Science & Technology and residence of the worthy Vice Chancellor. The Wi-Fi network is centrally controlled by using the control-based technology from centralized Library server room. Library established Video Conferencing facility in the committee room of the Vice Chancellor for conducting meetings in hybrid mode.

The Library provides the email services to the staff on domain @gadvasu.in which can be accessed worldwide. The Information Technology personnel of library manage and control the server for Apache Web-server, Mail Services, Network Management System and Server for Antivirus Software. The Library monitors the traffic and

security of Local Area Network through the monitoring software. The facility for managing network switches for continuous smooth functioning of internet services is also rendered by library. Library also offers remote access to its e-resources of the University through Virtual Private Network (VPN). Users are issued unique VPN ID and they can access digital resources of the Cyberary by using their electronic gadgets even from their home.

DIRECTORATE OF STUDENTS WELFARE AND ESTATE OFFICE

Sports

Inter-University Tournaments

1. Guru Angad Dev Veterinary and Animal Sciences University Swimming (W) team participated in All India Inter-University Swimming (W) Championsip held at KISS, Bhubaneshwar (Odisha) from 22.12.2021 to 26.12.2021 for the session 2021-22.
2. Guru Angad Dev Veterinary and Animal Sciences University Football (M) team participated in North Zone Inter-University Football (M) tournament held at Punjabi University, Patiala (PB) from 23.12.2021 to 30.12.2021 for the session 2021-22.
3. Guru Angad Dev Veterinary and Animal Sciences University Table Tennis (M) team participated in North Zone Inter-University Table Tennis (M) tournament held at Chitkara University, Solan (HP) from 30.12.2021 to 01.01.2022 for the session 2021-22.
4. Guru Angad Dev Veterinary and Animal Sciences University Badminton (W) team participated in North Zone Inter-University Badminton (W) tournament held at Chitkara University, Rajpura (PB) from 31.12.2021 to 02.01.2022 for the session 2021-22.
5. Guru Angad Dev Veterinary and Animal Sciences University Table Tennis (W) team participated in North Zone Inter-University Table Tennis (W) tournament held at Chitkara University, Solan (HP) from 04.01.2022 to 07.01.2022 for the session 2021-22.
6. Guru Angad Dev Veterinary and Animal Sciences University Badminton (M) team participated in North Zone Inter-University Badminton (M) tournament held at DCRUS&T, Murthal, Sonepat (HR) from 20.02.2022 to 23.02.2022 for the session 2021-22.

National Competition

44th State Handball Championship

Mehtab Singh Mander (L-2020-V-51-B) participation in 44th State Handball Championship held at Mastuana Sahib, Sangrur (PB) from 29.10.2021 to 31.10.2021 for the session 2021-22.

Junior State Power Lifting Championship

Sahil Sharma (L-2019-DT-59-B) got 1st Position in Junior Punjabi State Poer Lifting Championship held at Patiala (PB) on 23.11.2021 for the session 2021-22.

R&V Sqn NCC TRAINING ACTIVITIES

Various NCC Training activities performed by the NCC cadets of 1 Punjab R&V Sqn NCC, GADVASU-Ludhiana between 01/04/2021 to 31/03/2022

- 110 Cadets of this unit attended Annual Training Camp w.e.f. 24.12.2021 to 30.12.2021 at 1 PB R&V SQN NCC, Ludhiana. During the camp the cadets were imparted rigorous training in Drill, Physical training, lectures on basic army training, equitation, sports activities and firing etc.
- NCC cadets took part in various activities like swachchta abhiyaan, Operation Puneet Sagar wherein the initiatives to clean water bodies were undertaken, Har Ghar Tiranga campaign, Tree Plantation, Run for fun etc in which various activities like awareness rallies pertaining to the social causes were done.
- Various competitions like Poem recitations, lecturettes were organized for the personality development of the cadets.
- Lt. Nittin Dev Singh got promoted to Captain and was pipped by Worthy Vice Chancellor, GADVASU.
- Weapon training and firing practices were conducted for all the cadets.
- 78 cadets appeared for NCC “C” certificate exam held on 06.02.2022 at Guru Nanak Public School, Ludhiana.
- 35 cadets appeared for NCC “C” certificate exam held on 20.02.2022 at Guru Nanak Public School, Ludhiana.
- Cadets were imparted rigorous training in Horsemanship.

A CADET RECITING A POEM

CADETS DURING PARADE

CADETS ESCORTING WORTHY VICE CHANCELLOR

CADETS IN TUG OF WAR DURING ANNUAL TRAINING CAMP

CADETS DOING TREE PLANTATION

CADETS DOING AIMING AND WEAPON HOLDING PRACTICE

Infrastructure Developed

S. No.	Department	New Infrastructure/ Renovation of existing infrastructur*	Name of the new instruments/ equipment purchased	Month & year of purchase
College of Veterinary Science, Ludhiana				
1.	Animal Genetics & Breeding	Development of Cytogenetics Lab	10 Binular Microscope 01 Trinocular Microscope	2021-22
2.	Vety Gynaecology	Breeding Sow Pig Shed	Ph meter, dry bath and Weighing balance	March, 2022
3.		-	Air Conditioner	March, 2022
4.		-	Tharmo Controled and rocking shaker	March, 2022
5.		-	Manual boar semen dispenser	July, 2021
6.		-	Air Conditioned Box	July, 2021
7.		-	Device for measurement of Backfat	August, 2021
8.		-	3-tube manual sealer	August, 2021
9.		-	Semen Storage Unit with TC 200 Controller	November, 2021
10.		-	Loser Messtechnik LCD Touch Screen Freezing point osmometer	November, 2021
11.		-	Laminar Air Flow	March, 2022
12.	Livestock Production Management	*Classroom at Poultry Farm is renovated Annexure II (photo)	-	March 2022
13.		*Fencing for backyard poultry rearing was done; fencing around the Poultry Farm got repaired.	-	March 2022
14.	Animal Nutrition	Farm Machinery, Processing Plants etc	Flour Mill	28.10.2021
15.		Lab Apparatus/ Scientific Equipments	LG Refrigerator	11.12.2021
16.			Laboratory Hotplate	02.03.2022
17.			Fibra Plus	25.03.2022
18.			pH Meter	24.03.2022
19.			Digestion Heater	25.03.2022
20.			Bomb Calorimeters	29.03.2022

21.		Furniture & Fixtures Tables & Chairs	Office revolving chair	23.11.2021
22.			White Magnetic Board	28.03.2022
23.		Computers, Printers & Accessories	Multifunction printer	30.11.2021
24.			APC UPS battery	16.03.2022
26.			All in One PC	18.02.2022
27.			All in One PC	21.02.2022
28.			Hp Printer	24.03.2022
29.	Veterinary Pathology	*Renovation of Post-mortem Hall		21.10.2021 19.01.2022
30.		*Fixing of stone granite at post-mortem hall		11.10.2021
31.		Installation of submersible pump		07.10.2021
32.			Purchase of Post-mortem Tables	03.03.2022 22.03.2022
33.			Purchase of post-mortem Kit	03.03.2022
34.		*Wooden work in the department		22.03.2022
35.		*Wire mesh jalli for post-mortem hall		15.11.2021
36.	TVCC	Strengthened the clinical diagnostic lab	1. Hormone Assay Unit, 2. Biochemistry Unit 3. Blood Gas Assay Unit	2021
37.		*Upgradation of audio-visual system in seminar room for better teaching	Chemistry Analyzer, Acid-base Analyzer in Clinical Diagnostic Laboratory	
38.		*Upgradation of audio-visual system in auditorium* for conduct of seminars, workshops and conferences	Dialysis Machine and Multipara Monitors in Dialysis Unit	
39.			6 KVA online UPS and batteries in server room	
40.		Creation of teaching aid: *Upgradation of digital Seminar Room, MSVH & Auditorium, SJB for better teaching.	Smart Screen, high end digitl recording cameras, wireless audio aids, smart podium	March, 2021

41.		Dialysis Unit *Upgraded with induction of new dialysis machine	Dialysis machine Fresenius 4008Sng, Multi parameter monitor	March, 2021
42.	RRTC Talwara	Demonstration fish pond unit	A fish pond of size 25X 20 metres^2, depth-7.5 ft for demonstration purpose	

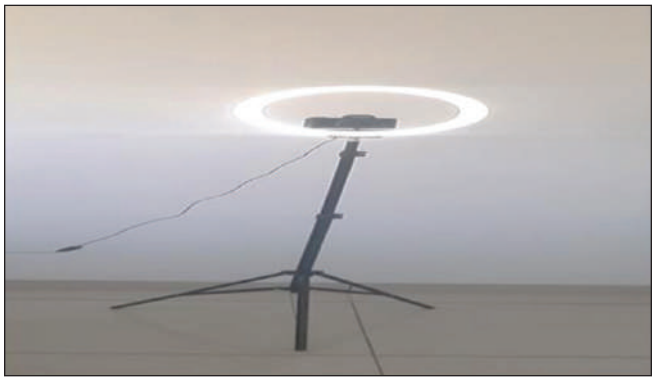
Upgradation of Clinical Diagnostic Laboratory

Dialysis Unit: Upgradation

COVS, Rampura Phul

S. No.	New Infrastructure/ Renovation of existing infrastructure	Name of the new instruments/ equipments purchased	Month & year of purchase
1.	Public Address System	Microphone, Amplifier, Speakers, stand etc.	March, 2022
2.	Photography unit	DSLR camera, storage DDR, tripod, LED etc.	March, 2022
3.	Portable Multimedia Projector Assembly	Portable Multimedia Projector, stand, screen etc.	March, 2022
4.	Multimedia Projector enabled A.V. lab	Multimedia Projector, motorized screen etc.	March, 2022
5.	Livestock Advisory Unit	Display material, Model etc.	March, 2022
6.	Pharmacology Laboratory	Tail Flick analgesiometer, Plethysmometer, Rota Rod apparatus, Actophotometer	Oct, 2021
7.	-	Biosafety Cabinet Class II	March, 2022
8.		Vertical Laminar Hood	March, 2022
9.		Mini short spin	March, 2022
10.		Large Animals Digital X Ray	
11.		Ultrasonography Machine	

Public Address System to organize extension programs

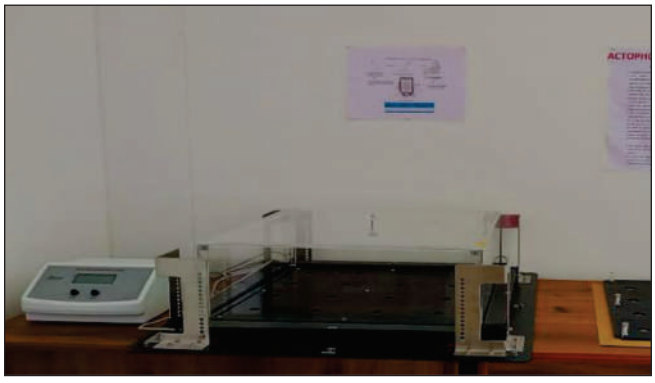


Photography Unit

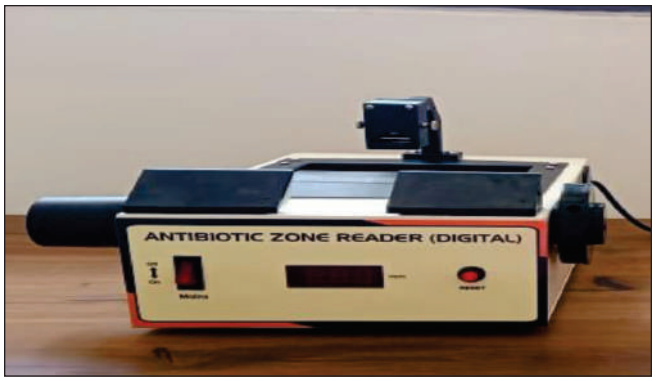
Portable Multimedia Projector

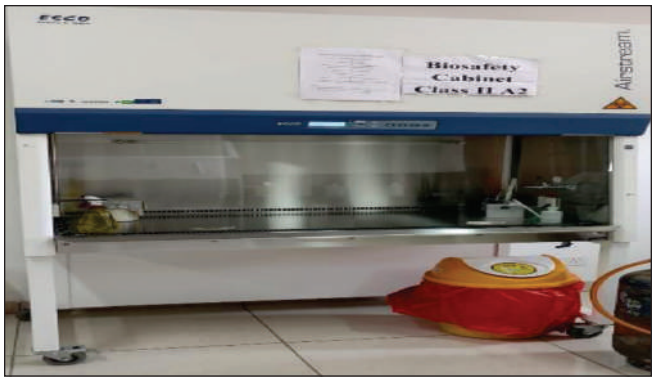
Multimedia enabled practical lab

Livestock advisory unit



Pharmacology Laboratory





Microbiology Laboratory

Digital Large Animal X ray Machine

Ultrasonography Machine

Backyard Poultry Unit at Department of LFC

College of Fisheries

S. No.	New Infrastructure/ Renovation of existing infrastructure	Name of the new instruments/ equipments purchased	Month & year of purchase
1	Fish-cum-duck Farming Unit at Instructional-cum-Research Farm, COF for Demonstration & Training	-	March, 2022
2	Establishment of Duck Egg Hatchery unit for Demonstration & Training purpose	Duck egg incubator cum hatchery & back up system (inverter with batteries)	March, 2022
3	Renovation of Feed Mill at Instructional-cum-Research Farm, COF	-	October, 2021
4	-	Multi Meter with LDO & Ammonia Probes	March, 2022
5	-	Fish skinner	March, 2022
	-	Fish filleting machine	March, 2022
6	-	Fish Burger/Patties/ cutlet forming machine	March, 2022
7	-	Lab Blender/ Homogenizer	March, 2022
8	BSL-2 facility	BSL-2	March, 2022

Fish-cum-Duck Farming Unit

Duck Egg Incubator-cum-hatchery & back up system (inverter with batteries)

Renovation of Feed Mill at Instructional cum Research Farm, COF

Fish skinner

Fish Filleting machine

Fish Burger/Patties/Cutlet forming machine

BSL-2

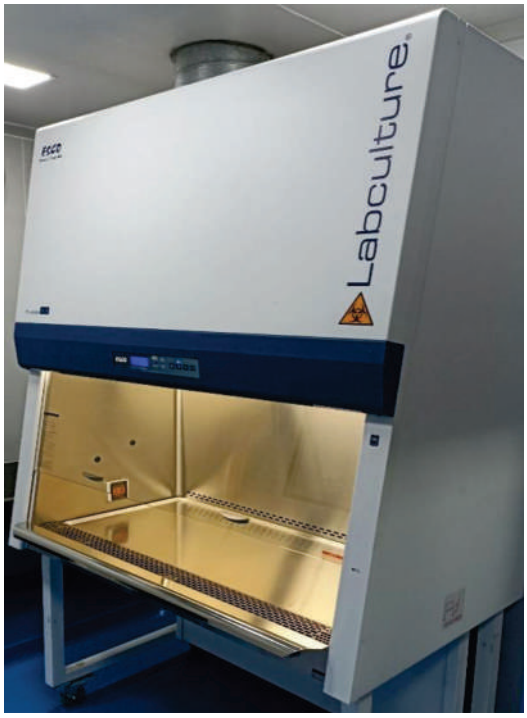
College of Dairy Science and Technology

S. No.	New Infrastructure /Renovation of existing infrastructure	Name of the new instruments/ equipments purchased	Month & year of purchase
1.	Prototype for Mozzarella Cheese Manufacture	-	January, 2021
2.	Establishment of Cheese Manufacturing Facility and Laboratory	• Stability Chamber • Basket centrifuge • Colloid Mill • Laminar Air Flow • Incubator • pH meters • -30° Freezer	2021-2022

Cheese manufacturing facility and Laboratory

College of Animal Biotechnology

S. No.	New Infrastructure/ Renovation of existing infrastructure	Name of the new instruments/ equipments purchased	Month & year of purchase
1	Walkable Chamber	Biosafety Cabinet Type-II B-2	March 2022
2	--	PCR Workstation	October 2021



Biosafety Cabinet Type-II B-2

PCR WorkStation

Walkable Chamber

Awards/Honors/Fellowships by Faculty

a. Awards/Honors/Recognitions

S.No	Name of the Faculty	Detail of the Award/Honour/ other Recognitions	Date of the Award
College of Veterinary Science, Ludhiana			
Animal Nutrition			
1.	Drs Bilal Chamadia, R S Grewal, Jasmine Kaur, J S Lamba and Chanchal Singh.	*Best Poster Award* at Indian Society for Buffalo Development (ISBD) Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
2.	Dr. Sandeep Uniyal		
3.	Dr. J S Lamba	*Team Award* during 73rd Republic Day Celebration Function, GADVASU, Ludhiana.	January 26, 2022
Animal Genetics & Breeding			
4.	Dr. Simarjeet Kaur	*Inspiring Lady Veterinarian Award 2021,* by Pashudhan Praharee a Professional Society.	March 08, 2021
5.	Dr. Bharti Deshmukh	*Best Oral Presentation Award* at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
Livetock Production & Management			
6.	Dr. Yashpal Singh	*Best Oral Presentation Award* at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
7.	Dr. Subhash Chandra	*Best Poster Presentation Award* at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
Livestock Product Technology			
8.	Drs. Rushikesh A. Kantale, Rajesh V Wagh, M K Chatli and O P Malav	*Third Best Poster Presentation Award* in IMSACON-X and International Symposium on Holistic Approach to the Meat Food Quality & Safety in Continuum from Farm to Fork, Organized Department of LPT, COVS, Sardar Valhbhai Patel University of Agriculture & Technology, Meerut.	November 25-27, 2021
Veterinary Anatomy			
9.	Dr. Varinder Uppal	Elected as *Joint Secretary-cum Treasurer* of Indian Association of Veterinary Anatomists.	March 10-12, 2022
10.	Dr. Neelam Bansal	Elected as *Vice President* of Indian Association of Veterinary Anatomists.	March 10-12, 2022

11.	Dr. Devendra Pathak	*Best Poster Presentation Award* at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
12.	Dr. Kritima Kapoor	*First Best Oral presentation Award* at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
Department of Veterinary and Animal Husbandry Extension			
13.	Dr. Jaswinder Singh	Associate Fellow, National Academy of Dairy Science -2021.	May 26, 2021
14.	Dr. Rajesh Kasrija	Dr Sarvepalli Radhakrishnan Best Teacher award 2021 in Veterinary Extension Education by Centre for Professional Advancement Continuous Education, a unit of IMRF registered with GOI Niti Aayog Darpan, Vijaywada, Andhra Pradesh.	September 05, 2021
15.		*Outstanding Achievement Award* during three day International Conference on Advancement in Interdisciplinary Research jointly organized by Shia P G College, Lucknow and Science Tech Institute, Lucknow	October 28, 2021
16.	Dr. Y S Jadoun	*Scientist of the Year Award* for outstanding contribution in the field of Veterinary Extension in International Web conference on Innovative and Current Advances in Agriculture & Allied Sciences (ICAAAS-2019) by Society for Scientific Development in Agriculture and Technology (SSDAT), Meerut.	July 19, 2021
Department of Teaching Veterinary Clinical Complex			
17	Dr. Swaran Singh Randhawa	*Editor* Indian Journal for Veterinary Medicine	2018-2022
18	Dr. Raj Sukhbir Singh	*Best poster presentation Award* at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
19.	Dr. Randhir Singh		
Department of Veterinary Microbiology			
20.	Dr Paviter Kaur	*3rd Best Oral Presentation Award* during XXVI Annual Convention of ISVIB and International Conference on Transforming livestock economy through innovations in Immunology and Biotechnology at GADVASU, Ludhiana.	February 04-05, 2022

21.		*3rd Best Poster Presentation Award* at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
Department of Veterinary Parasitology			
22.	Dr L.D. Singla	*Editorial Excellence Award* as Associate Chief Editor to Indian Journal of Animal Research.	2021
23.		*Selected on Editorial Board* of Acta Scientific Veterinary Sciences.	2021
24.		*Selected on Editorial Board* of The Indian Journal of Veterinary Research as expert Member.	2021
Department of Veterinary Pathology			
25.	Dr. Kuldip Gupta	*Certificate of Recognition* for acting as member Jury Panel in Technical Session-III Veterinary Para Clinical during 5th National Online Clinical Case Conference by Department of Clinical Medicine, PGIVAS, Akola.	December 28, 2021
26.	Dr. Sidhartha Deshmukh	Fulbright-Nehru Academic and Professional Excellence Fellowship.	July 30, 2021
27.	Dr. N.D. Singh	Dr. B.L. Purohit Memorial Best Toxicopathologist Award 2020 by Indian Association of Veterinary Pathologists during International Veterinary Pathology Congress 2021 at RAJUVAS, Bikaner.	December 17-19, 2021
28.	Dr. L. Geeta Devi	*First Best Poster Presentation Award* at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
29.	Dr. A P S Brar	*Best Poster Presentation Award* at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
Department of Veterinary Pharmacology & Toxicology			
30.	Dr. M.K.Lonare	*Best Poster Presentation Award* at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
Department of Veterinary Gynaecology and Obstetrics			
31	Dr. Amarjeet Bisla	*Best Poster Presentation Award* at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
32	Dr. Mrigank Honparkhe		
33	Dr. Bilawal Singh		

34	Dr. Mrigank Honparkhe	*First Rank* for Faculty effectiveness for UG teaching assessed by Dean COVS, GADVASU, Ludhiana.	2021
Department of Veterinary Surgery & Radiology			
35.	Dr. P. Verma	*Certificate of Appreciation* for poster presentation at 10th Asian Buffalo Congress at Nepal.	October 25-29, 2021
36.	Dr. S.K Mahajan	*Adjudged Second Best Teacher* amongst COVS, GADVASU faculty for the year 2021	2021
37.	Dr. J. Mohindroo	*Adjudged Third Best Teacher* amongst COVS, GADVASU faculty for the year 2021.	2021
38.	Dr. Ashwani Kumar	*Appointed Chief Editor* of Vet Alumnus.	2021
39.	Drs. J.S. Khosa, A. Anand, V. Sangwan, H. Kaur and J. Mohindroo .	*Gold Medal* in Equine Surgery Session during the 44th Annual Congress and National symposium of Indian Society of Veterinary Surgery ISVS at GBPUA & T Pantnagar.	February 26, 2022
40.	Dr Arun Anand	*Second Best Presentation Award* in open award session during International Veterinary Pathology Congress-2021 held at RAJUVAS, Bikaner.	December 17-19, 2021
Department of Veterinary Medicine			
41.	Dr. D. K. Gupta	*Best Poster Presentation Award* at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
42.	Dr. Sushma Chhabra	*Sri Ram Lal Agrawal Award* for research work on Effect of herbal biocholine and herbal vitamin E in prevention of ketosis, hepatic lipidosis and subclinical mastitis.	July, 2021
43.		*Best Paper Presentation Award* during XVII Annual Conference of Indian Association of Veterinary Public Health Specialists (IAVPHS)	May, 2021
Animal Disease Research Centre			
Centre of One Health			
44.	Dr. Jasbir Singh Bedi	*Fellow of Indian Association of Veterinary Public Health Specialists (IAVPHS)* - 2021, India	May 29, 2021
45.	Dr Simranpreet Kaur	*Best Presentation Award* at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021

46.	Dr Rajnish Sharma	*Zoetis Grant Fund* to attend and present research work in 28 International Conference of the World Association for Advancement of Veterinary Parasitology, Dublin, Ireland	July19-21, 2021
47.	Dr Pankaj Dhaka	*Superheroes Against Superbugs (SaS)* Fellowship to bolster existing efforts in the country to raise public awareness and action to address the public health threat of antibiotic resistance with financial support from Stop Superbugs, an initiative of the *British Society Antimicrobial Chemotherapy (BSAC)* and L.V. Prasad Eye Institute 2021-22	October10, 2021
48.	Dr. Deepali G. Kalambhe	*Prof. Mahendra Pal Zoonoses Award-2021* and *Best Poster Awards* in "International e-Symposium on 'One Health Concept: Opportunities and Perspectives in Present Scenario' & XVII Annual Conference of Indian Association of Veterinary Public Health Specialists (IAVPHS).	May 28-29, 2021
49.	Drs. Jaswinder Singh, B B Singh, Rajnish Sharma, Rakesh Sharma, and P.S. Brar	*Best Language Film- Punjabi* on "Zoonoses Diseases between Animals and Human" at MANAGE Agri Film Festival- 2022 at Hyderabad	March11, 2022
College of Dairy Science and Technology			
50.	Dr. N. Veena	*Best Paper Award* at SAFETY-2021 organized by Tezpur University, Assam, India and University of Georgia Georgia (US) in association with AFST(I) Tezpur chapter.	June 25, 2021
52.	Dr. Harsh Panwar	*Associate Fellow, National Academy of Dairy Science* (India)	May 26, 2021
53.	Drs. Inderpreet Kaur and Varinder Pal Singh	*Best Poster Presentation Award* at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December10-11, 2021
54.	Drs G S Bhatti, Nitika Goel, S. Sivakumar, Santosh Kumar Mishra and A C Gautam		
55.	Drs. Harsimran Kaur Gill, Siva Kumar S, Gurpreet Singh, Rekha Chawla, and Viji P C	*Best Oral Presentation Award* during International Conference VIBCON at COABT, GADVASU, Ludhiana	February 04-05, 2022
College of Fisheries			
56.	Dr. Surjya Narayan Datta	*Outstanding Faculty in Fisheries Award* by Centre For Advanced Research And Design, Venus International Foundation, Chennai, Tamil Nadu.	November 06, 2021

College of Animal Biotechnology			
57.	Dr. C.S. Mukhopadhyay	*Appreciation Award* by GADVASU for contributions towards the establishment of COVID testing facility at GADVASU, Ludhiana; January 26, 2022.	January 26, 2022
58.	Dr. B.V. Sunil Kumar	*Best Oral Presentation Award* at XXVI Annual Convention of the Indian Society for Veterinary Immunology & Biotechnology.	February 04-05,2022
59.	Dr. R.K. Choudhary	*Best Oral Presentation Award* at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
60.	Dr. R.S. Sethi	*Best Poster Presentation Award* at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December10-11, 2021
		Appreciation Award by GADVASU for contributions towards establishment of Covid testing facility at GADVASU, Ludhiana.	January 26, 2022
College of Veterinary Science, Rampura Phul			
61.	Dr. Pratikshya Panda	*Best Oral Presentation* during at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December10-11, 2021
62.	Dr. Sreekala S. Mohandas	*ISVIB-GADVASU Women Scientist Award-2021* from Indian Society for Veterinary Immunology and Biotechnology.	Feburary 05, 2022
63.	Dr. Gurpreet Singh	*Best Poster Award* at International e-symposium One Health concept opportunities and perspectives in Present Scenario.	May 28,2021
64.	Dr. Gurpreet Singh	*Honour Core Competency Certificate* for Agmooc Six-week Training on "Management of Infertility in Animals"	October 15, 2021

Awards/Honors/Fellowships by Students (2021-22)

Name of Student	Detail of the Award/Honour	Date of the Award
College of Veterinary Science		
Animal Genetics & Breeding		
Shende Tejas Ramandeep Kaur	Best Poster Presentation Award at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
Veterinary Anatomy		
Samikshya Sarangi	Best Poster Presentation Awards (Two) at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana. Second Best Paper Presentation Award at National Web Conference on 'Advances in Teaching and Research in Veterinary Anatomy in India' NTR College of Vet.Sci., SVVU, Gannavaram	December 10-11, 2021 December 16-18, 2021
Centre for One Health		
Simranjot Kaur	Best M.V.Sc thesis award for work on Aflatoxin M1 consumption through market milk and milk products in Ludhiana, Punjab: Exposure assessment and risk characterization during International e-symposium and XVII Annual Conference of IAVPHS held at GADVASU from 28-29 May, 2021.	May 29, 2021
B. Srinu	Dr. B.N. Bachhil Young Scientist award-2021 at XVII Annual Conference of Indian Association of Veterinary Public Health Specialists.	May28- 29, 2021
Vijay Deepthi	DST-Augmenting Writing Skills for Articulating Research (AWSAR) award for best popular research story in PhD category	March 01, 2022
Vijay Deepthi, J.S. Bedi, Pankaj Dhaka, Randhir Singh, Jaswinder Singh, A.K. Arora and J.P.S. Gill	Best Oral Presentation Award at XVII Annual Conference of Indian Association of Veterinary Public Health Specialists.	May 28-29, 2021
Deepthi Vijay, J.S. Bedi and Pankaj Dhaka,	Best Essay Award at XVII Annual Conference of Indian Association of Veterinary Public Health Specialists.	May 28-29, 2021

Deepthi Vijay, J.S. Bedi, Pankaj Dhaka, Randhir Singh, Jaswinder Singh, A.K. Arora and J.P.S Gill	Best poster presentation at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
Hina Malik	Alexander Fleming Prize for the best Postgraduate research proposal in 'Student Research Champions of AMR 2021'	Aug-Nov-2021
	First prize-Quiz competition on the occasion of World Antimicrobial Awareness Week	November 18-24,2021
	Best Innovative Idea Award, during "Antimicrobial Resistance Dx Bootcamp" organized by IIT Delhi in collaboration with The University of Edinburgh and University of the Arts, London	March 28-29, 2022
Hina Malik, Randhir Singh, Ravneet Kaur, Sunita Kumawat, Simranpreet Kaur, Pankaj Dhaka, J.S.Bedi, G.N. Gongal & J.P.S. Gil	Best Poster Presentation Award at XVII Annual Conference of Indian Association of Veterinary Public Health Specialists.	May 28-29, 2021
Hina Malik	Second Poster Presentation on the theme "Veterinarian's response to the COVID-19 crisis" organized by IDP-Cell, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, India. 2021	April 24, 2021
Natasha Sambyal	Three Minute Thesis (3MT) Competition organized by Genome Editing for Food Security and Environment Sustainability (GEFSES- CREATE) by Faculty of Agriculture and Environment Sciences, McGrill, Canada	August 27, 2021
Manjeet Sharan	First Prize in "Student Focus Competition-by International Training Centre Food Safety & Applied Nutrition (ITCFSAN) on the occasion of its 2nd anniversary 2021.	September 28, 2021
Manjeet Sharan	Second Prize in online quiz competition (International level) in International Virtual Conference on "Safe food now for a healthy tomorrow" by Meat Technology Unit, Mannuthy, KVASU, Association of Food scientists & Technologists (India), Thrissur and ICAR- Central Institute of Fisheries Technology.	June 07, 2021

Manjeet Sharan Avni Sharma Sakshi Rashmi Sharma	Best Poster Presentation Award at XVII Annual Conference of Indian Association of Veterinary Public Health Specialists.	May 28-29, 2021
Othman Juma Othman, B.B. Singh, R.S. Aulakh and Rajnish Sharma	Best Oral Presentation Award at XVII Annual Conference of Indian Association of Veterinary Public Health Specialists.	May28- 29, 2021
Othman Juma Othman,	WAAVP African Foundation Scholarship to present a paper in 28th International Conference of the World Association for Advancement of Veterinary Parasitology, Dublin, Italy	July 19-22, 2021
Veterinary Gynaecology & Obstetrics		
Harjap Kaur	Best presentation Award at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
Livestock Products Technology		
A. Rushikesh, K. Rajesh V. Wagh, M. K. Chatli and O. P. Malav	Third Best Poster Presentation Award in IMSACON-X and International Symposium on "Holistic Approach to the Meat Food Quality & Safety in Continuum from Farm to Fork" Sardar Valhbhai Patel University of Agriculture & Technology, Meerut.	November 25-27, 2021
Ishani Parmar, Rajesh V. Wagh, Nitin Mehta and O. P. Malav	First Best Poster Presentation in IMSACON-X and International Symposium on "Holistic Approach to the Meat Food Quality & Safety in Continuum from Farm to Fork" Sardar Valhbhai Patel University of Agriculture & Technology, Meerut.	November 25-27, 2021
Deepika Jamadar, Rajesh V. Wagh, O P Malav and Nitin Mehta Mehak Jandyal, O. P. Malav, Rajesh V. Wagh and Nitin Mehta Mehak Jandyal, O. P. Malav, Nitin Mehta and Rajesh V. Wagh Tejinder Pal Singh, O.P. Malav, Rajesh V. Wagh, Nitin Mehta and A.P.S. Sethi	Second Best Oral Presentation Award in IMSACON-X and International Symposium on "Holistic Approach to the Meat Food Quality & Safety in Continuum from Farm to Fork" Sardar Valhbhai Patel University of Agriculture & Technology, Meerut.	November 25-27, 2021
S. Jeyapriya, Nitin Mehta and Rushikesh A. Kantale	Best Poster Presentation Award in Ideathon at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021

Veterinary Medicine		
HabbuAishwarya Sunder	Best poster presentation award in the International Web Conference (ICAAAS 2021)	July 19-21, 2021
Iqra Shafi Khan	Excellence in Research Award in International Web Conference on Innovative and Current Advances in Agriculture and Allied Sciences.	July 19-21, 2021
A.Ragini	Best Clinical Case Presentation Award at 5th National Online Clinical Case Conference at PGIVAS Akola.	December 27-29, 2021
Veterinary Microbiology		
Moon Moon Satpathy	Second Best Oral Presentation Award in XXVI Annual Convention of ISVI" and International Conference on Transforming Livestock Economy Through Innovations in Immunology and Biotechnology at GADVASU, Ludhiana.	February 04-05, 2022
Veterinary Pathology		
Vikas Jaiswal	IAVP Savithree Jibachch Sinha Third Best Poster Presentation Award 2021 at RAJUVAS, Bikaner.	December 17-19, 2021
T. Mohanapriya	IAVP-Organizing Secretary Second Best Poster Presentation Award, 2021	December 17-19, 2021
Priyanka	Second Oral Paper Presentation in Indian Association of National Veterinary Pathologists 4th Zonal (Central) Conference-2021 and National Symposium	October 5-6, 2021
Diksha Gupta, APS Brar and NK Sood	Appreciation Award for the case presentation in International Veterinary Pathology congress at RAJUVAS Bikaner.	December 17-19, 2021
Jasmine Kapoor	Dr. S. Damodaran Award for Best Oncology Paper/Case Report published in Indian Journal of Veterinary Pathology by International Veterinary Pathology Congress at Jaipur	December 17-19, 2021
Jadhao Abhilash Dattatraya	Second ICVP Case presentation award (second) in International Veterinary Pathology Congress-2021	December 17-19, 2021
	Best Oral Presentation Award at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
	MAFSU Best Research Publication Award – 2020 by Maharashtra Animal and Fishery Sciences University, Nagpur, (Maharashtra)	December 03, 2021

Veterinary Pharmacology & Toxicology		
Zarzoliani	Best Poster Presentation Award at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 11-12, 2021
Veterinary Surgery & Radiology		
A. Verma, V. Sangwan, A. Anand, K. Kaur	Gold Medal for Large Animal Poster Session at 44th Annual Congress and National symposium of Indian Society of Veterinary Surgery at GBPUA & T, Pantnagar.	February 24-26, 2022
Mehak Mahant, A. Anand, R. Singh and S.R. Pradhan	Gold Medal for Small Animal Surgery Session at 44th Annual Congress and National symposium of Indian Society of Veterinary Surgery at GBPUA & T, Pantnagar.	February 24-26, 2022
B. Jena, S.K. Mahajan, J. Mohindroo, and K.l Gupta		
C. Premsairam, T. Singh, A. Kumar, S.K. Mahajan, J. Mohindroo	Gold Medal for Orthopedic Session at 44th Annual Congress and National symposium of Indian Society of Veterinary Surgery at GBPUA & T, Pantnagar.	February 24-26, 2022
D' Sharma, J' Mohindroo, N. Kashyap, S.K. Mahajan, T. Singh	Appreciation award for Radiology and Imaging Session at 44th Annual Congress and National symposium of Indian Society of Veterinary Surgery at GBPUA & T, Pantnagar.	February 24-26, 2022
A. Verma, V. Sangwan, N. Bansal, H. Kaur, N. Wangdi, S.K. Mahajan	Gold Medal for Large Animal Poster Session at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
Veterinary Animal Husbandry & Extension Education		
Sukhwinder Singh	Dr Sarvepalli Radhakrishnan Best Researcher award 2021 in Veterinary Extension Education by Centre for Professional Advancement Continuous Education, a unit of IMRF registered with GOI Niti Aayog Darpan, Vijaywada, Andhra Pradesh.	September 05,2021
Naman Khurana, Rajesh Kasrija, Rajnish Sharma , Kulvinder Singh and R K Sharma	Best Oral Presentation Award in International Conference on Recent Advances in Agricultural Engineering and Biotechnology for Food Security Banaras Hindu University, Varanasi and Lovely Professional University, Jalandhar.	September 25-26, 2021
Paramveer Singh Sallan P Singh, J Kaur, R Kasrija	Best Oral presentation Award at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021

Tegdeep Singh Brar	Best Thesis Award in International Web Conference on "Innovative and Current Advances in Agriculture & Allied Sciences of Society for Scientific Development in Agriculture and Technologyat Meerut.	July 19-21, 2021
College of Dairy Science Technology		
Anamika Singh M.K. Sihag and Harsh Panwar	Best Poster Presentation Award in the National Webinar on Cowpathy and Human Health, Society for Immunology & Immunopathology at COABT, GADVASU Ludhiana December 15-16, 2021.	December 16, 2021
Rachael T Duche and H. Panwar	Best Poster Presentation Award in the International e-Symposium on Probiotics, Prebiotics & Gut Microbiome: Key Regulators for Human and Animal Health under the aegis of Probiotic Association of India at GADVASU.	November 11, 2021
Rabia Bhardwaj, Rohini Devidas Gulhane, H. Panwar	Young Scientist Award at the International e-Symposium on Probiotics, Prebiotics & Gut Microbiome: Key Regulators for Human and Animal Health under the aegis of Probiotic Association of India, at GADVASU.	November 11, 2021
Nivedita, Inderpreet Kaur, Varinder Pal Singh, Hanish Sharma and Navjot Kaur	Best Poster Presentation at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
College of Fisheries		
Prapti Sudan	Best Poster Presentation Award at the 1st Indian Fisheries Outlook-2022 on Priming Indian Fisheries in Attaining Sustainable Development Goals held at ICAR-Central Inland Fisheries Research Institute, Barrackpore.	March 22-24, 2022
College of Animal Biotechnology		
Shilpa Tewari, C.S Mukhopadhyay	Smt. Rajvanshi Devi Memorial Award 2022: in the national-level essay writing competition held on the occasion of World Veterinary Day by Pashudhan Praharee.	March 17, 2022
Jaswinder Kaur, C.S Mukhopadhyay.	Best poster Award at Conference of the Society of Immunology & Immunopathology National Webinar on Cowpathy and human health.	December 15-16, 2021
P. Kaur, C.S. Mukhopadhyay, D. Deka, Y.S. Malik.	Best Poster Presentation Award at the Conference on Advances in Microbial Technologies at Amity University, Jaipur.	December 01-02, 2021

B. Singh, I. Kaur, D. Deka, R.Verma, S.K. Uppal, S.K., C.S. Mukhopadhyay,N. Saini, Y.S. Malik.	Best Poster Presentation Award at conference on "Advances in Microbial Technologies" held at Amity University, Jaipur.	December 01-02, 2021
I. Kaur, C. S. Mukhopadhyay, A. Mishra, Y.S. Malik	Second Best Poster Presentation Award at XXVI Annual Convention of ISVIB & International Conference on "Transforming Livestock Economy through Innovations in Immunology and Biotechnology.	February 04-05, 2022
B.Singh, I. Kaur, D. Deka, R. Verma, S.K. Uppal, ., C.S. Mukhopadhyay, N. Saini, Y.S. Malik.	Best Oral Presentation Award in National Webinar on "CowPathy and Human Health" by GADVASU in collaboration with the Society for Immunology and Immunopathology.	December 15-16, 2021
S. Rajput, J. S. Arora, J. K. Dhanoa, C. S. Mukhopadhyay, and R. S. Sethi.	Best Oral Presentation Award at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana	December 10-=-11, 2021
Yousuf, S., Choudhary, S., Choudhary, R.K., Kaur, I., Sharma, A. and Malik, Y.S.	Third Best Oral Presentation Award at XXVI Annual convention of ISVIB & International Conference on "Transforming Livestock Economy through Innovations in Immunology and Biotechnology (VIBCON).	February 04-05, 2022
Shivangi, J S Arora, C S Mukhopadhyay.	Best Poster Presentation Award at XXVI Annual Convention of the Indian Society for Veterinary Immunology & Biotechnology (ISVIB) & International Conference on "Transforming Livestock Economy through Innovations in Immunology and Biotechnology.	February 04-05, 2022
Aksh Sharma, R S Sethi, C S Mukhopadhyay R. Verma.	Third Best Oral Presentation Award at XXVI Annual Convention of the Indian Society for Veterinary Immunology & Biotechnology (ISVIB) & International Conference on "Transforming Livestock Economy through Innovations in Immunology and Biotechnology.	February 04-05, 2022
Paramjeet Sharma, R. K Choudhary, and Navdeep S Ratta.	Best Poster Presentation Award at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana.	December 10-11, 2021
Paramjeet Sharma, Ratan K. Choudhary, Yashpal S. Malik, and Navdeep S. Ratta	Best Poster Presentation Award at XXVI Annual Convention of the Indian Society for Veterinary Immunology & Biotechnology (ISVIB) & International Conference on "Transforming Livestock Economy through Innovations in Immunology and Biotechnology.	February 04-05, 2022

Paramjeet Sharma, and Ratan K Choudhary. Komal Basra, and Ratan K Choudhary.	Best poster presentation award at ISBD Symposium on Scientific Interventions to Address Challenges for Sustainable Buffalo Production at GADVASU, Ludhiana	December 10-11, 2021
S Attri, D. Deka, and Y.S Malik	Third Best Poster Presentation Award at XXVI Annual Convention of the Indian Society for Veterinary Immunology & Biotechnology (ISVIB) & International Conference on "Transforming Livestock Economy through Innovations in Immunology and Biotechnology.	February 04-05, 2022
Ananya Aeri, B.V. Sunil Kumar, Kuldip Gupta, and R.S. Sethi. Sheza Farooq, Shikha Chaudhary, Y.P.S Malik, R.S Sethi.	Best poster presentation award at XXVI Annual Convention of the Indian Society for Veterinary Immunology & Biotechnology (ISVIB) & International Conference on "Transforming Livestock Economy through Innovations in Immunology and Biotechnology.	February 04-05, 2022

Participation of faculty in Conferences/ Symposia/ Workshop/ Trainings etc. (2021-22)

Sr. No.	Name of the Conferences/ Symposia/ Workshop/ Trainings	Organizing agency, place and date	Name of the Faculty Member who attended the meeting
INTERNATIONAL			
Overseas			
College of Veterinary Science			
1	One-day international workshop on Basic Scientific Writing Workshop	Halal Products Research Institute, Universiti Putra Malaysia, March 8, 2022.	Dr Pavan Kumar
2	One-day international workshop on Advanced Scientific Writing Workshop	Halal Products Research Institute, Universiti Putra Malaysia, March 29, 2022.	Dr Pavan Kumar
3	73rd North Central Avian Disease Conference- 2022	American Association of Avian Pathologists, Minnesota, USA, March 21-22, 2022.	Dr. Sidhartha Deshmukh
International Conferences/Workshop held in India			
College of Veterinary Science			
4	10th Asian Buffalo Congress (Virtual mode)	Agriculture and Forestry University, Kathmandu, Nepal, October 25-29, 2021.	Drs V Uppal, N. Bansal, O. Singh, A. Gupta, D. Pathak, M Honparkhe, Ajeet Kumar, P. Verma, Tarunbir Singh, V. Sangwan, N U. Devi, J. S Khosa

5	UKIERI-DST partnership development work workshops on "Medical additive manufacturing: Cost-effective and sustainable solutions for innovative development of high value added products and services	Lovely Professional University, Phagwara. March 25, 2022	Dr Arun Anand
6	International Conference on Reproductive Healthcare & 32nd Annual Meeting of the Indian Society for the Study of Reproduction and Fertility	AIIMS, New Delhi, February 11-13, 2022.	Dr Devendra Pathak
7	International Virtual Conference on "Veterinary Anatomy Education"	World Association of Veterinary Anatomists, March 11, 2022.	Dr Kritima Kapoor
8	XXXV Annual Convention of IAVA and International Symposium on "Modern Concepts in Anatomy: New Era Tools in Health and Disease"	IAVA and LUVAS, March 11-12, 2022.	Drs V. Uppal, N. Bansal, A. Gupta, D. Pathak
9	Online 2 days international training program 'Teaching Days 2021'	Taylor Institute of Teaching and Learning, University of Calgary, August 25-26, 2021,	Drs Anuradha Gupta, D. Pathak, K. S. Sandhu, D. Kaur, N. Mehta, O.P. Malav, R. Kasrija
10	28th International Conference of World Association for the Advancement of Veterinary Parasitology (Virtual Edition)	World Association for the Advancement of Veterinary Parasitology, Dublin, July 19-22, 2021.	Dr. Rajnish Sharma
11	Workshop on "Emerging One Health Zoonotic Diseases: Challenges and Perspectives in SAARC Regional Countries"	SAARC Regional Veterinary Association, July 6, 2020.	Dr Randhir Singh
12	International symposium of Indian Society for Study of Animal Reproduction	KVASU, Kerala, December 27-29,2021.	Drs M Honparkhe, Amarjeet Bisla
13	IMSACON-X and International Symposium on "Holistic Approach to the Meat Food Quality & Safety in Continuum from Farm to Fork"	Sardar Valhbhai Patel University of Agriculture & Technology, Meerut, November 25-27, 2021.	Drs. Rajesh V. Wagh, Dr. O P Malav
14	International Virtual Conference - IVACON2021 on "Emerging Challenges to Veterinary Profession"	Indian Veterinary Association in collaboration with Confederation of Indian Industry, June 19 -20, 2021.	Dr OP Malav

15	XXVI Annual Convention of ISVIB and the international conference on "Transforming Livestock Economy through Innovations in Immunology and Biotechnology"	GADVASU, Ludhiana. Feb 4-5, 2022.	Drs N. Mehta, P. Kaur, D. Narang
16	International e-Symposium on "Probiotics, Prebiotics & Gut Microbiome: Key Regulators for Human and Animal Health"	Probiotic Association of India, GADVASU, Ludhiana, November 11, 2021.	Dr Harkirat Singh
17	Online Consortium for Anthelmintic Resistance and Susceptibility Meeting	WAAVP, Dublin July 18,2021	Dr L.D. Singla
18	Mid Year Webinar on Latest Scientific Updates on Covid-19 in Malaysia	Malaysian Society of Parasitology Tropical Medicine, August 13, 2021.	Dr L.D. Singla
19	International Veterinary Pathology Congress- 2021, XXXVIII Annual Conference of Indian Association of Veterinary Pathologists, XII Annual meeting of Indian College of Veterinary Pathologists	Rajasthan University of Veterinary and Animal Sciences, Bikaner, December 17-19, 2021.	Drs. Amarjit Singh, APS Brar, Kuldip Gupta, N. D. Singh, L. Geeta Devi, Omer K Baba, Jagmeet Kaur
20	International Webinar and Memorial Oration of ISVPT	Indian Society of Veterinary Pharmacology & Toxicology, Veterinary College and Research Institute, Namakkal. December 21, 2021	Dr. S.K. Sharma
College of Dairy Science Technology			
21	Sustainable Approaches in Food Engineering and Technology (SAFETy-2021)	Tezpur University, Assam, and University of Georgia, Georgia in association with AFST(I) Tezpur chapter, June 24-25,2021	Dr. Veena N
22	International e-Symposium on Probiotics, Prebiotics & Gut Microbiome: Key Regulators for Human and Animal Health	GADVASU, Ludhiana under the aegis of Probiotic Association of India, November 11, 2021	Dr. Harsh Panwar Dr. Manvesh Sihag
23	International webinar on "Recent Advances in Design and Emerging Applications in Lateral Flow assays"	ICAR-NDRI, Karnal, May18 - 21, 2021	Drs Anuradha Kumari, Veena N
College of Fisheries			
24	Online Teaching Workshop on '2021 Teaching Days'	Taylor Institute for Teaching and Learning, University of Calgary, Canada, Aug 25-26, 2021.	Drs S. N. Datta, Prabjeet Singh, Amit Mandal, S.S. Hassan

25	Online Training Course on "Innovative Aquaculture Models"	Productivity Organization (APO) Tokyo, Japan and Ministry of Industries, Bangladesh, Nov 16-18, 2021.	Drs Vaneet Inder Kaur, Prabjeet Singh
26	International Symposium on "Probiotics, Prebiotics & Gut Microbiome: Key Regulators for Human and Animal Health"	GADVASU, Ludhiana, November 11, 2021.	Dr. Anuj Tyagi
College of Animal Biotechnology			
27	American Dairy Science Association (ADSA), ADSA® 2021 Virtual Annual Meeting	American Dairy Science Association, July 11-14, 2021	Dr. Ratan Kumar Choudhary
28	35th Annual Convention of the Indian Association of Veterinary Anatomists and International Symposium	LUVAS, Hisar, March 10-12, 2022	Dr. R.S. Sethi
College of Veterinary Science, Rampura Phul			
29	International E- training cum orientation program on "Physiological and biotechnological interventions for the improvement of production, reproduction and health status in animals	College of Veterinary Science &Animal Husbandry, Mhow, Nov.16 - Dec. 06, 2021	Dr Parag Acharya
30	International Veterinary Pathology Congress 2021 "Advances in Veterinary Pathology for Diagnosis and Control of Emerging and Re-emerging Diseases of Livestock, Wild Animals and Poultry"	Indian Association of Veterinary Pathologists	Dr. Ravindran R
31	Two days Interactive Teaching Development Workshop Online Training Course.	Taylor Institute for Teaching and learning, University of Calgary, Canada, August 25-26, 2021	Dr. Yashwant Singh
NATIONAL			
College of Veterinary Science			
1	National symposium of Indian Society for buffalo development (ISBD)	ISBD and GADVASU, Ludhiana, December 10-11, 2021.	66 faculty member attended the conference
2	Animal Breeding Strategies in the Era of Genomics and Phenomics	ICAR-NBAGR, Karnal December 17-18, 2021.	Dr. Saroj Kumar Sahoo

3	National Veterinary Foundation-Vetopia on veterinary neurology and oncology	Pet Practitioner Association of Karnataka in collaboration with National Veterinary Foundation, Bangalore, July, 15-17, 2022	Dr. Raj Sukhbir Singh
4	'Newer Concepts and Approaches in Small Animal and Welfare'	Indian Society for Advancement of Canine Practice, Udaipur.	Dr JS Hundal
5	National Women Food Science and Technology Conference	Indian Institute of Food Processing Industry, Thanjavur, Tamil Nadu, March 8, 2021.	Dr Simranjeet Kaur
6	Twenty one days online refresher course on "Reorienting Extension Education and Advisory Services for Sustainable Development of Farming Community".	Karnataka Veterinary Animal and Fisheries Sciences University, Bidar & NADCL, Baramulla, July 08-28, 2021.	Dr. Bharti Deshmukh
7	SIU AIU Annual Conference on Internationalisation of Higher Education (Virtual) 'Reimagining internationalisation: Blended Education as a catalyst'	Symbiosis International (Deemed University) and Association of Indian Universities, April 6- 9, 2021.	Dr Opinder Singh
8	19th Convocation cum Scientific Seminar of NAVS (online)	National Academy of Veterinary Science, September 24-25, 2021.	Drs Neelam Bansal, Anuradha Gupta
9	2nd National Web Conference on 'Advances in Teaching and Research in Veterinary Anatomy in India'	NTR College of Veterinary Science, Sri Venkateswara, Veterinary University, Gannavaram. December 16-18, 2021	Drs Varinder Uppal, Neelam Bansal, Kritima Kapoor
10	Online training on Sexual Harassment of Women at Workplace	National Productivity Council, New Delhi, December, 21-22, 2021.	Dr. Neelam Bansal
11	Online training conducted on "Safe Campus Program for Women" by "Martha Farrell Foundation"	Association of Indian Universities, February 24-25, 2022	Dr. Varinder Uppal Dr Kritima Kapoor
12	3 days online training programme on "Microsoft Azure Data Fundamentals" conducted	Association of Indian Universities, March 28 -30, 2022	Dr Kritima Kapoor
13	Online MOOCS Training program on "Agricultural Extension Policies for Risk Mitigation in Agriculture". "Course Management through MOOCs"	MANAGE, Hyderabad, May 24-31, 2022. MANAGE, Hyderabad June 6- 10, 2022.	Dr Devendra Pathak

14	National Conference (Online) of Virology (VIROCON) on "Emerging and Reemerging Viral Diseases-Climate Change Impacts and Mitigation"	AIIMS, Hyderabad under the aegis of Indian Virological Society, March 26-28, 2022.	Dr. Simranpreet Kaur
15	International e-Symposium "One Health Concept: Opportunities and Perspectives in Present Scenario" & XVII Annual Conference of Indian Association of Veterinary Public Health Specialists	Centre for One Health GADVASU, Ludhiana from May 28-29 ,2021.	Drs. JS Bedi, RS Aulakh, Randhir Singh, BB Singh, S. Kaur, R. Sharma, P. Dhaka, Neetu Saini
16	21 Days training on Physiological and Biotechnological Interventions for the improvement of Production, Reproduction and Health Status in Animals'	Nanaji Deshmukh Veterinary Science University, Jabalpur, November16-December 06, 2021.	Dr. Kulvinder Singh sandhu
17	International e- Symposium 'One Health Concept: Opportunities and Perspectives in Present Scenario'XVII Annual Conference of Indian Association of Veterinary Public Health Specialists	School of Public health and Zoonosis, GADVASU, Ludhiana.	Dr. Kulvinder Singh Sandhu
18	Online Enhancing Teaching and Managerial Skills among the Faculty of SAU and SVU	MANAGE, Hyderabad, June28-30,2021	Drs. N K Singh, . Paramjit Kaur
19	Webinar on "IPR strategy and clean tech innovation	Turnip Innovation Kolkata, July 16, 2021.	Dr. L.D. Singla
20	Innovation in online Teaching, Learning and Evaluation	Karunya Institute of Technology and Sciences, Coimbatore August 05-07, 2021.	Dr. L.D. Singla
21	21 days online National Training Course on "Advances in Veterinary Research for Sustainable Development of Livestock Sector"	ICAR-IVRI, Regional station, Palampur and NADCL. Baramulla September 01-21,2021	Dr. Jyoti
22	Interactive Webinar on Interpreting ICMR & other regulation towards good clinical practice for ophthalmic research in India	Shankara Academy of Vision November 28, 2021.	Dr. L.D. Singla
23	Online General Management Programme for Women Scientists	DST, New Delhi December 06 -17, 2021	Dr. Paramjit Kaur
24	Online National Level workshop on NIRF India ranking 2022 for higher education institutions	Institute for Academic Excellence and Collegiate Education and Technical education, January 05-06, 2022	Drs L.D. Singla, Paramjit Kaur

25	21 days NRDMS-DST Winter School on Geospatial Technologies	Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Srinagar, November 10-30,2021.	Dr. Omer Khalil Baba
26	National Symposium of Indian Society of Buffalo Development	GADVASU Ludhiana December 10-11, 2021.	Drs. S.P.S.Saini, M.K.Lonare
27	Advanced Techniques for Microbiological Quality and Safety Assessment of Foods of Animal Origin	ICAR-IVRI, Izatnagar, March 2-11, 2022.	Dr. M.K.Lonare
28	Detection and Mitigation of Antiparasitic drug resistance	NDVSU Jabalpur; February 8-17, 2022.	Dr. M.K.Lonare
29	Entrepreneurship orientation program in medicinal and aromatic plants-IV	ICAR- Directorate of Medicinal and Aromatic Plants research Boriavi, Anand, January 05 – 25, 2022.	Dr Saloni Singla
30	21 days training on "Advances in Pharmacology and Toxicology to Combat New Challenges in Modern Healthcare of Human and Animals"	College of Veterinary Science and Animal Husbandry, Mhow Feb. 24-March 16, 2022.	Dr. Rashmi Sagar Bhullar
31	Short course on "Opportunities of Naturally occurring Nutraceuticals as Potent Alternate Medicines of Future"	Sher-e-Kashmir University of Agricultural Sciences & Technology of Kashmir, March 5-14, 2022.	Dr. Manjinder Sharma
32	44th annual congress and National symposium of Indian Society of Veterinary Surgery	ISVS, GBPAUT, Pantnagar, February 24-26, 2022.	Dr J Mohindroo Dr Navdeep Singh
33	Workshop ' Recent Advances in livestock Management to enhance farm productivity"	Directorate of Extension Education,GADVASU, Ludhiana	Dr Jaswinder Singh
34	Online training programme on " Contract farming in India-Issues and Challenges	MANAGE, Hydrabad May 25-27, 2021.	Dr Jaswinder Singh
College of Dairy Science Technology			
35	Online faculty development program	National Institute of Food Technology Entrepreneurship and Management , Kundli, Sonipat, March 28- April 2, 2022	Dr. Manvesh Kumar Sihag

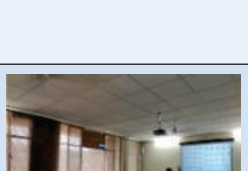
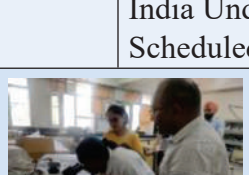
36	4-week Induction/Orientation Programme for "Faculty in Universities/ Colleges/Institutes of Higher Education"	Teaching Learning Centre, Ramanujan College, University of Delhi, June 19 - July 18, 2021	Dr. Veena N
37	Training on Massive open online courses on "Theoretical Foundations of Educational Technology"	ICAR-NAARM, Hyderabad, June 01 - June 30, 2021.	Dr. Anuradha Kumari
38	Theoretical Foundation of Educational Technology (Online)	ICAR-NAARM, Hyderabad, June 01-30, 2021.	Dr. Namita Rokana
39	1st Annual Conference of Indian Society for Agricultural Development and Policy on "Challenges of Indian Agriculture"	PAU, Ludhiana, March 21-22, 2022,	Dr Varinder Pal Singh
40	MOOCs training programme on " Theoritical Foundation of Educational Technology"	ICAR-NAARM, Hyderabad	Gursharn Singh
41	One day capacity building training programme on Energy efficiency & conservation of government Departments of Punjab	Mahatma Gandhi State Institute of Public Administration Technology, December 27, 2021	Dr Gopika Talwar Dr Amandeep Sharma
42	(Online) International conference advances in smart agriculture and bio diversity conservation for sustainable development	Jaipur National university, Jaipur, March 04-06, 2022.	Dr Gopika Talwar
College of Fisheries			
43	Training on "Communication and Management Skills in Transfer of Agrotechnology"	PAU, Ludhiana, February 7- 16, 2022.	Dr. Abhed Pandey
44	Online workshop on 'GIS & Remote Sensing and its Applications'	Punjab Remote Sensing Centre, Ludhiana, June 7-11, 2021.	Dr. Prabjeet Singh
45	Online training program on 'NUTRISMART FISH' to boost the Nutritional Security of the Rural Women"	ICAR-CIFRI, Barrackpore & MANAGE, Hyderabad, Aug 10-12, 2021.	Dr. Abhishek Srivastava, Dr. Sachin O. Khairnar and Dr. Amit Mandal
46	Online Refresher Training Program on "Middle Level Fisheries Extension officers on New Dimensions in Extension Management"	MANAGE, Hyderabad, Sep 1-3, 2021.	Drs. Vaneet I Kaur, A. Srivastava, S.O. Khairnar, S. N. Datta, G. Tewari, Prabjeet Singh

47	ICAR sponsored winter school on "Recent advances in Taxonomic Techniques of marine fishes for conservation and sustainable fisheries management"(Online)	Central Marine Fisheries Research Institute, Kochi, January 3-23, 2022.	Dr. Prabjeet Singh
48	ICAR sponsored short course on "By-catch Reduction in Fisheries: Recent Advances" (Online)	ICAR- Central Institute of Fisheries Technology, Kochi, January 17-26, 2022.	Dr. S. N. Datta
49	Training on National Education Policy	Mahatma Gandhi State Institute of Public Administration, Punjab, March 8-10, 2022.	Dr. S. N. Datta
50	'1st Indian Fisheries Outlook -2022' on 'Priming Indian fisheries in attaining sustainable development goals'	ICAR-CIFRI, Barrackpore, Kolkata, March 22-24, 2022	Dr. Vijay Reddy
51	"Quality Accreditation with NAAC and Institutional Preparedness"	Madhya Pradesh Bhoj University, Bhopa, lMarch 8-12, 2022.	Dr. Siddhnath
College of Animal Biotechnology			
52	Winter School training on "Integrating Phenomics and Genomics for Improving Production, Health and Well-being"	ICAR-IVRI, January 28-February 17, 2022.	Dr. Satparkash Singh
53	Annual virtual Conference of Indian Society for the Study of Reproduction and Fertility, New Delhi	ISSRF, February 11-13, 2022.	Dr. Ratan Kumar Choudhary
54	Conference on Advances in Microbial Technologies (Online)	Amity University, Jaipur, Rajasthan, December 1-2, 2021.	Dr. Y S Malik
55			Dr. Satparkash Singh
56	National Symposium of Indian Society for Buffalo Development (Online)	GADVASU, Ludhiana, December 10-11, 2021.	Dr. Y S Malik
57	Conference of the Society of Immunology & Immunopathology and National Webinar on "Cow Pathy and Human Health"	GADVASU, Ludhiana and Society for Immunology and Immunopathology, December 15-16, 2021	Dr. Y S Malik
58	VIBCON-XXVI Annual Convention of ISVIB and National conference on "Transforming Livestock Economy through Innovations in Immunology and Biotechnology"(Online)	GADVASU, Ludhiana February 4-5, 2022.	Drs. Y S Malik, Satparkash Singh,, Adarsh Mishra, B.V. Sunil Kumar, Ratan K. Choudhary, S.S. Sodhi, J.S. Arora, C.S. Mukhopadhyay,

College of Veterinary Science, Rampura Phul			
59	21 days online training cum orientation program on "Physiological and Biotechnological Interventions for the Improvement of Production, Reproduction and Health status in Animals".	College of Veterinary Sci. & Animal Husbandry, Mhow. November 16- December 06, 2021.	Dr. Yashwant Singh
60	online National Refresher Course (NRC-2022) on "Recent Technologies of Livestock Based Integrated Farming System for Doubling Farmers Income"	BAU, Ranchi, ICAR-NAHEP, RRS Srinagar and NADCL Baramulla, February 1- 21, 2022.	Dr. Yashwant Singh
61	Online training programme on "Behavioral Skills for Extension Personnel"	MANAGE, Hyderabad, March 14-17, 2022	Dr. Yashwant Singh
62	Online training programme for Master Trainers on "Introduction to Natural Farming- Principles and Practices".	MANAGE, Hyderabad, April 5-9, 2022	Dr. Yashwant Singh
63	AgMOOCS course on "Management of Infertility in Cattle"	.TANUVAS, Chennai and IIT, Kanpur, Aug. 31-Oct.15, 2021.	Drs. Ravindran R, Sandeep Kaswan,
64	4 weeks online course on "Digital Training Techniques"	NAARM, Hyderabad, December 1-31, 2021,	Dr. Ravindran R
65	Massive Open Online Course on "Theoretical Foundations of Educational Technology"	ICAR-NAARM, Hyderabad, June 1 – 30, 2021,	Dr. Sandeep Kaswan
66	National Symposium of Indian Society of Buffalo Development	GADVASU, Ludhiana, December 10- 11, 2021,	Dr. Pratikshya Panda
67	Concepts and Applications of Pharmacology for Meeting Challenges of One Health in 21st Century	College of Veterinary Science & AH, Jabalpur, July1 -August 1,2021.	Dr. Deepak Sumbria
68	Processing and quality evaluation of functional foods of animal origin (Winter School)	DUVASU, Mathura, January 18 - February 07 2022,	Dr. Jay Prakash Yadav
69	Winter school on Intervention for paradigm shift from Conventional to Modern Approach in Goat Farming: A novel insight for doubling farmers' Income	ICAR DUVASU, Ludhiana, Jan11 -31,2022.	Dr. Amit Sharma
70	Statistical tools in research and data analysis	College of Veterinary and Animal Sciences, Parbhani, August 09-14, 2021.	Dr. Deepak Sumbria
71	Strategies for one health approach to parasitic disease	College of Veterinary Science & AH, Jabalpur, November 9- 29, 2021	Dr. Deepak Sumbria
72	Massive Open Online Course (MOOC) on 'Digital Teaching Techniques'	ICAR-NAARM, Hyderabad. December 1- 31, 2021,	Dr. Sandeep Kaswan

CONFERENCES/ SYMPOSIA/ WORKSHOPS/ TRAININGS (OTHER THAN EXTENSION TRAININGS) ORGANIZED

S. No	Name of Conferences/Symposia/ Workshops/Trainings	Organizing Agency	Date
College of Veterinary Science			
1.	National "Symposium on Scientific interventions to address challenges for sustainable buffalo production organized by COVS, GADVASU, Ludhiana. 	Indian Society for Buffalo Development, Hisar	10-11.12.2021
Department of Animal Genetics and Breeding			
2.	Online webinar on Process of registration of breed in India.	ICAR- Tutorial Classes for SC students by inviting eminent experts for preparing students for national/ international competitions	21.02.2022
3.	Online webinar on Risk status classification and conservation of AnGR in Indian context		22.02.2022
4.	Online webinar on Linear and nonlinear models and their application in veterinary sciences.		23.02.2022
5.	Online webinar on Advance selection methodology of poultry birds and development of inbred lines and applications.		23.02.2022
6.	Online webinar on Breeds status in India and World.		23.02.2022
7.	Online webinar on New technologies for augmenting animal production.		25.02.2022
8.	Online webinar on Livestock Genomics and One health.		24.02.2022
9.	Online webinar on Descriptive Statistics, its uses and estimation using Excel.		24.02. 2022
10.	Online webinar on Clean milk production in dairy animals.		26.02.2022

11.	Online webinar on Self-employment generation through animal husbandry practices.		26.02.2022
12.	Molecular and Cytogenetic tools in animal production	ICAR Scheme- Strengthening and Development of Higher Agricultural Education in India Under Sub-Component Scheduled Caste-Sub Plan.	20-21. 03.2022
13.	Advances in Breeding and Management strategies in livestock and poultry production	ICAR Scheme- Strengthening and Development of Higher Agricultural Education in India Under Sub-Component Scheduled Caste-Sub Plan.	18-20.02.2022
	  		
Directorate of Livestock Farm:			
Department of Livestock Production Management			
14.	Ethical issues, management and breeding in laboratory Animals by department of LPM, GADVASU, Ludhiana	Department of Livestock Production Management, GADVASU, Ludhiana	22.26.11.2021
Department of Veterinary Anatomy			
15.	Hands-on training on Gross anatomical techniques to preserve the specimens.	ICAR 1- Strengthening and development of higher agricultural education in India under sub-component- Scheduled Caste Sub Plan and Development grant	23.10.2021
16.	Tutorial Practical Classes for SC students on Learning Anatomy: Preserving Specimens by Gross Anatomical Techniques.		04.03.2022
17.	Hands-on training on Application of immuno- histochemistry in research and clinical practice.	ICAR 1- Strengthening and development of higher agricultural education in India under sub-component- Scheduled Caste Sub Plan and Development grant	23.03.2022
18.	Hands-on training on Tissue processing for paraffin and cryostat sectioning.		26.03.2022
19.	Hands-on training on Histochemistry: A powerful tool in Research.		28.03.2022

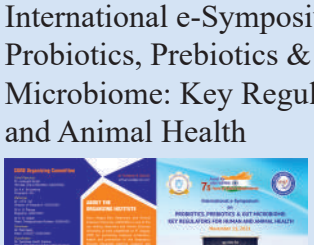
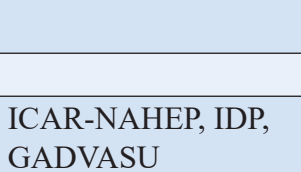
20.	Advanced Training in Histochemistry.		29.03.2022
21.	Hands-on training on Preparation of museum specimen and histological slides for teaching and learning.		30.03.2022
22.	Lecture Series by Eminent Experts for Preparing students for National / International Competitions • Role of animals in national security • Spirituality for holistic personality development • Basics in ECG • Covid-19 pandemic lessons learnt. Current status and looking forward • Strategies for effective sentence analysis	ICAR 1- Strengthening and development of higher agricultural education in India under sub-component- Scheduled Caste Sub Plan	10-18.01.2022
23.	Motivational talk on women empowerment: A professional perspective.	IDP Cell GADVASU	08.03.2022
24.	Motivational talk on mindset to succeed in life.	IDP Cell GADVASU	17.03.2022
Department of Veterinary and Animal Husbandry Extension			
25.	GADVASU-MANAGE Online collobative training on Health and feed management of dairy animals for extension functionaries.	MANAGE, Hyderabd	27-30.09.2021
26.	Fisheries Officers Workshop	Directorate of Extension Education, GADVASU, Ludhiana	09.10.2021
27.	Workshop on use of paddy straw in animal production.	Directorate of Extension Education, GADVASU, Ludhiana	20.08.2021
28.	Workshop on Strategies for control of parasitic infection in livestock during animal parasite awareness week	Directorate of Extension Education, GADVASU, Ludhiana	23.08.2021
Department of Teaching Veterinary Clinical Complex			
29.	Training Program on Practical tips on anemia and blood transfusion in dogs.	DBT and GADVASU	15-17.09. 2021
30.	Legal awareness seminars dedicated to Azadi ka Amrit Mahotsav on completion of 75years of India's Independence.	IDP, GADVASU	2021
31.	COVID 19 vaccination camp for the benefit of University faculty, ministerial staff and students.	District Health Department and TVCC, GADVASU	17-06-21

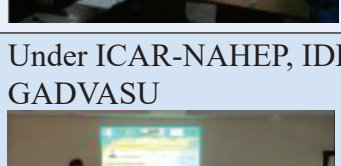
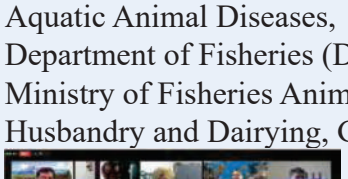
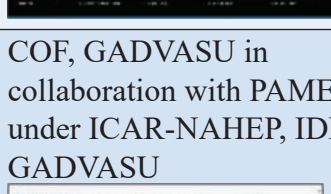
Department of Veterinary Microbiology			
32.	Applications of MALDI-TOF in bacterial identification.	Department of Veterinary Microbiology	15.11. 2021
33.	Applications of MALDI-TOF in bacterial identification.	Department of Veterinary Microbiology	24 .02. 2022.
Department of Veterinary Parasitology			
34.	Hands-on training on Sustainable management of gastrointestinal parasitic infections in livestock.	ICAR-I: Strengthening & Development of higher Agricultural Education in India under sub-component Scheduled Caste-Sub Plan.	15.02.2022
35.	Hands-on training on Surveillance and mitigation of antiparasitic resistance in livestock.	ICAR-I: Strengthening & Development of higher Agricultural Education in India under sub-component Scheduled Caste-Sub Plan.	22.03.2022
Department of Veterinary Pathology			
36.	Online training on Molecular techniques in pathology.	IDP- NAHEP, ICAR	17-21.05.2021
37.	Online training on poultry disease diagnosis.	IDP- NAHEP, ICAR	7-11. 06.2021
38.	Online Hands on training on diagnostic cytology.	IDP- NAHEP, ICAR	13-17.09.2021
39.	Hands on training on poultry diseases and efficient management practices.	ICAR Sub-component Schedule Caste-Sub Plan.	18.10.2021
40.	Hands on training on clinico-pathological approaches for diagnosis of animal diseases.	under ICAR Sub-component "Scheduled Caste–Sub Plan"	28.02. 2022
41.	Hands on training on infectious diseases in animals.	Tutorial Classes for SC Students ICAR-1, sub component Scheduled Caste Sub Plan.	14-17.03. 2022
42.	Hands on Training on clinicopathology.	ICAR-1: Strengthening & Development of Higher Education in India under ICAR Sub-component Schedule Caste- Sub Plan	16 .03.2021
43.	Hands on training on Rabies diagnosis.		17.03.2022
44.	Hands on training on diagnosis of infectious diseases in animals.	ICAR: Strengthening and Development of Higher Education in India under ICAR Sub-component Development Grant	21.03.2022

45.	Hands on training on Toxicopathology.	ICAR: Strengthening and Development of Higher Education in India under ICAR Sub-component Development Grant	22.03. 2022
46.	Hands on training on molecular diagnosis of animal diseases.	ICAR: Strengthening and Development of Higher Education in India under ICAR Sub-component Development Grant	23.03. 2022
47.	Hands on training on immunohistochemistry as a diagnostic tool for disease diagnosis in animals.		24.03.2022
48.	Hands on training on poultry disease diagnosis.		25.03. 2022
49.	Hands on training on post-mortem examination in animals.		26.03. 2022
50.	Hands on training on Collection, preservation and processing of tissue for diagnosis of animal diseases.		28.03.2022
Department of Veterinary Pharmacology and Toxicology			
51.	Hands on training on Alternate toxicological protocols and assays used in current toxicology research**.**	ICAR	25.03.2022
Department of Veterinary Physiology and Biochemistry			
52.	Seminar on Importance of Veterinary parasitology on animal health.	ICAR-1, Strengthening & development of higher education in India subcomponent Scheduled Caste Sub Plan.	21.02.2022
53.	Seminar on Role of extracurricular activities in the personality development of Vets.		22.02.2022
54.	Seminar on How to be successful in academics.		24.02.2022
55.	Seminar on How to be a good Veterinarian.		07.03.2022
56.	Seminar on Management of Stress.		22.03.2022
Department of Veterinary Gynaecology and Obstetrics			
57.	Online training on Reproductive Management in Dairy Animals.	MANAGE	07.0.2021-9.07.2021
58.	Dr VK Gandotra (Visiting National Professor)	NAHEP-IDP	21.02.22 to 21.03.2022
59.	Dr Jaswant Singh (Visiting International Professor)	NAHEP-IDP	15-25.03.2022
60.	Dr R.K Dedar (Guest Faculty)	NAHEP-IDP	15-25.03.2022

61.	Dr Talluri Thirumala Rao (Guest Faculty)	NAHEP-IDP	28-30.03.22
62.	Dr Yashpal (Guest Faculty)	NAHEP-IDP	28.03.22
63.	Dr Ramavtar Legha (Guest Faculty)	NAHEP-IDP	28.03.22
Department of Veterinary Surgery and Radiology			
64.	Online training on Diagnosis and management of musculo-skeletal disorders in small animals.	ICAR-22, and AINP DIMSCA	21-23.03. 2022
65.	Online training on Radiographic and ultrasonographic assessment of the thorax and abdomen in small animals.	ICAR-22 and AINP DIMSCA	14-16.03. 2022
Department of Veterinary Medicine			
66.	Training on Practical tips on anaemia and blood transfusion in dogs.	Department of Veterinary Medicine, GADVASU, Ludhiana under DBT-GADVASU-Canine Research Centre	15-17.09. 2021
Centre for One Health			
67.	International e-Symposium on One Health Concept: Opportunities and Perspectives in Present Scenario & XVII Annual Conference of Indian Association of Veterinary Public Health Specialists (IAVPHS).	Indian Association of Veterinary Public Health Specialists (IAVPHS)	28-29.05.2021.
68.	International e-symposium on One Health approach to Tackle Zoonoses.	ICAR- Institutional Development Plan- National Agricultural higher Education Project (IDP-NAHEP)	06.07.2021
69.	National e-Colloquium on Perspectives and opportunities for Brucellosis Control in India.	ICAR- Institutional Development Plan- National Agricultural higher Education Project (IDP-NAHEP)	07.07.2021
70.	COVID-19 Vaccination camp at Centre for One Health, GADVASU.	Estate Office, GADVASU.	16.04. 2021
71.	Basic Epidemiological Concepts in Veterinary Research workshop on Basic Epidemiological Concepts in Veterinary Research.	Scheme ICAR-1	11.10.2021
72.	Workshop on Occupational risks to Veterinarians.	Scheme ICAR-1	15.02.2022
73.	The Concept of One Health and Zoonoses	Scheme ICAR-1	16.03.2022

74.	World Antimicrobial Awareness Week	ICAR- Institutional Development Plan- National Agricultural higher Education Project (IDP-NAHEP)	18-24.11.2021
75.	National Colloquium on World Rabies Day		28.09. 2021
76.	Workshop cum Hands-on-Training on Basic Epidemiological Concepts in Veterinary Research.	ICAR-1- Strengthening and Development of Higher Agricultural Education in India' Sub-component: Scheduled Caste-Sub Plan.	12.11. 2021
77.	Celebration of *World Antimicrobial Awareness Week* 2021 Organized guest lectures, school students awareness program, quiz and poster presentation.	Supported by: National Agricultural Higher Education Project, GADVASU	18-24.11.2021
78.	Capacity building program and Awareness on Antimicrobial Resistance and One Health	Superheroes Against Superbugs Fellowship	30.03.2022
Human Resource Management Centre			
79.	Expert talk on "Physiology of Canine Olfaction" by Lt. Col. Surinder Saini, RVC, Meerut	Directorate HRMC, GADVASU in collaboration with IDP cell.	22.10.2021
			
80.	National webinar on "Animal Welfare and Ethics in Biomedical Research: Role of Veterinarians" by Dr Pradeep Bhatu Patil on organized by.	Directorate HRMC, GADVASU in collaboration with IDP cell	02.11.2021
81.	Guest Lecture on "Common Health concerns of Women our health: Our responsibility by Dr. Venus Bansal, Gynecologist and Obstractician.	Directorate HRMC in collaboration with CLIO, Orrison Hospital, Ludhiana.	10.11.2021
			

82.	Guest Lecture on "Dengue Fever Prevention" delivered by Dr. Anurag Chaudhary, Professor-cum-Head, DMC, Ludhiana 	Directorate HRMC in collaboration with DMC,Ludhiana	11.11.2021
83.	Training for better professional attitude (general etiquettes) of Security personnel (99) of GADVASU	HRMC in collaboration with I Punjab R & V NCC GADVASU, PAU Campus.	15.11.2021
84.	Workshop on use of CeRA for all Master's & Ph.D Students.	HRMC in collaboration with university Library	28.12.2021
85.	Webinar on "Wealth Awareness: Financial Wellness Enhancement" delivered by Kunal Joshi.	Directorate HRMC, GADVASU in collaboration with Advisors Organization, Pune.	30.12.2021
86.	Training on "Hygienic Practices at Work Place for class IV employees of GADVASU from at (HRMC/2021/339-340 dated 20.12.2022, email dated17.03.2022 by Assoc. Director, PAU)	HRMC in collaboration with Skill Development Centre, PAU, Ludhiana.	29-30.03.2022
College of Dairy Science Technology			
87.	International e-Symposium on Probiotics, Prebiotics & Gut Microbiome: Key Regulators for Human and Animal Health 	Department of Dairy Microbiology, CODST, GADVASU under the aegis of Probiotic Association of India (PAi)	11.11. 2021
College of Fisheries			
88.	Guest lecture on Scientific Temper-A way of Life.	ICAR-NAHEP, IDP, GADVASU 	06.10. 2021

89.	Expert lecture on Enterpreneurship opportunities in the Aquaculture industry.	COF, GADVASU 	09.10. 2021
99.	Expert lecture on Role of Youth and Accountability in Shrimp Farming Towards Blue Revolution.	COF, GADVASU 	09.10. 2021
91.	Guest lecture on Techno Cultural Ambassador of Punjab.	Under ICAR-NAHEP, IDP, GADVASU 	13.10. 2021
92.	Guest lecture on Self-Empowerment.	Under ICAR-NAHEP, IDP, GADVASU 	13.10. 2021
93.	10-days e-training on Recent advances in aquatic animal health and environment management for sustainable aquaculture.	Under the National Surveillance Program for Aquatic Animal Diseases, Department of Fisheries (DoF), Ministry of Fisheries Animal Husbandry and Dairying, GOI. 	31.08.21 to 10.09. 2021
94.	IDEA: Initiative for Development of Entrepreneurship in Aquaculture	COF, GADVASU in collaboration with PAMETI, under ICAR-NAHEP, IDP, GADVASU 	24-28.01. 2022

95.	Online training on Creative writing.	COF, GADVASU in collaboration with PAMETI, under ICAR-NAHEP, IDP, GADVASU 	05.02.2022
96.	Online training on Digital Journalism.	COF, GADVASU in collaboration with PAMETI, under ICAR-NAHEP, IDP, GADVASU 	12.02. 2022
College of Animal Biotechnology			
97.	Online Conference of the Society of Immunology & Immunopathology and National Webinar on CowPathy and Human Health.	Society of Immunology & Immunopathology (SIIP)	15-16.12.2021.
98.	Online VIBCON-XXVI Annual Convention of ISVIB and National conference on Transforming Livestock Economy through Innovations in Immunology and Biotechnology.	Indian Society of Veterinary Immunology and Biotechnology (ISVIB)	04-05.02.2022.
College of Veterinary Science, Rampura Phul			
99.	Training program on Stall-fed management of goats for SC farmers of the state.	COVS, Rampura Phul under RKVY-12	02.03.2022

Invited Lectures Delivered by Faculty

(a) Outside Campus

S. No.	Name of the Faculty and Detail of the Lectures
1.	Simerjeet Kaur. Characterization and documentation of AnGR of Punjab: A mission towards zero non-descript population at ICAR-NBAGR, Karnal February 08, 2022.
2.	Devendra Pathak • Immunohistochemical studies guidance to budding anatomists at Directorate of Entrepreneurship, Kerala Veterinary and Animal Sciences University Veterinary Anatomy in Multidisciplinary Mindscape Kerala from February 16- March 01, 2022. • Receptor-mediated regulation of female reproductive system and Microanatomy of female reproductive system in relation to hormonal profile at NTR COVS, Sri Venkateshwara Veterinary University, Gannavaram from December 16-18, 2021. • Animations can create magic: my experiments in teaching at Department of Veterinary Anatomy and Histology, COVS& AH, NDVSU, Mhow from July 12-26, 2021.
3.	Jasbir Singh Bedi • One health approach in food safety perspective in workshop on One Health at Institute of Management in Government Trivandrum on September 08, 2021(Online). • One health: role of veterinarian in urban context at NDVSU, Mhow (M.P) on February 11, 2022 (Online). • Overview on epidemiology and risk factors of brucellosis in Indian context brucellosis: A neglected zoonotic disease at CIIMS, Nagpur, September 24, 2021(Online).
4.	Simranpreet Kaur • Importance of conducting scientific ante-mortem inspection in production of hygienic meat at Centre of Excellence for Advanced Research on Animal Food Safety, Mumbai Veterinary College, MAFSU, Mumbai on January 17-28, 2022. • Public health perspective of ante-mortem inspection of food animals at Veterinary Public Health & Epidemiology, NDVSU, Mhow (M.P.) from February 07-27, 2022.
5.	Rajnish Sharma. Five key steps for safer food at Police DAV Public School, Ludhiana on October 12, 2021.
6.	Pankaj Dhaka • Epidemiological surveillance and disease modeling. In training on ICT Tools for knowledge management and control of emerging zoonoses and animal health threats at KVASU, on September 22, 2021. • Awareness facts on RABIES: together we can eliminate it. World Rabies Day-2021 celebration at Govt. Sen. Sec. Smart School PAU, Ludhiana on September, 22, 2021. • Emerging Zoonoses: the one health paradigm and safe food now for a healthy tomorrow awareness lectures at DAV Public School, by ICAR- ATARI, Ludhiana October 02, 2021 (Online).
7.	Nitin Mehta. Innovative approaches in value addition of poultry eggs in national webinar on World Egg Day by ICAR-CARI, Izatnagar, U.P. on October 08, 2021.
8.	M. Honparkhe • Use of assisted reproductive technology in management of reproduction in dairy animals. In Modern Dairy Farm Practices for optimizing health and production held at DUVASU, Mathura on December 18, 2021. • Management of infertility in large ruminants by using ultrasonography technique at KNPCVS Shirval, MAFSU, Nagpur from March 03-05, 2022.

9.	Sujata Turkar. Emerging health challenges associated with canine obesity at ICAR-IVRI, Regional Station, Palampur, H.P. on November 10,2021.
10.	Mudit Chandra • Advances in identification of foodborne pathogens with focus on mass spectroscopy based method in training on "Advanced Techniques for Microbiological Quality and Safety Assessment of Foods of Animal Origin from 2-11 March 2-11, 2022 at IVRI, Izatnagar on March 09, 2022. • Real Time PCR, it's various chemistries and its role in disease diagnosis by Society for Bioinformatics and Biological Sciences (SBBS), Prayagraj in collaboration with Applied Research and Development Organization (ARDO), Jammu at Meerut, U.P. March 07, 2021.
11.	N.K. Singh • Tick control strategies in Indian scenario at NDVASU, Mhow on September 24, 2021 • Biological control strategies for sustainable control of ticks at NDVASU, Mhow on November 11, 2021 (Online). • Biological control strategies for acaricide resistance mitigation in ticks at NDVASU, Mhow on February 10, 2022 (Online).
12.	L.D. Singla • Parasite talk in webinar under international parasite resource bank at Chungbuk National University South Korea on June 11, 2021 (Online). • Early and accurate diagnosis of parasites in proper management of dairy animals at Agriculture Information.com members on July 13, 2021 (Online). • CPCSEA guidelines on animal use: preclinical studies and biomedical research at Chitkara University, Chandigarh on July 09, 2021. • Trademarks & trade secrets at NDVASU, Mhow on September 11, 2021 (Online). • New state of affairs of parasitic diseases in the COVID-19 pandemic: whether threat factor or shielding agent at Chungbuk National University, Korea on November 18, 2021 (Online). • Antiparasitic resistance to parasiticides: from Awareness to action at KNPCV, Shirwal, Maharashtra on November 24, 2021(Online). • Covid-19 and Parasitic diseases: mutual influence on misdiagnosis, pathogenesis and control at COVS, Parbhani, Maharashtra on December 15, 2021.
13.	Amarjit Singh. MDV-induced oncogenesis: A comparative analysis of oncogenic genes of Marek's disease virus prevalent in India in conference of Indian Association of Veterinary Pathologists and Indian College of Veterinary Pathologists at RAJUVAS, Bikaner, December 17-19, 2021.
14.	Sidhartha Deshmukh. Development of bacterial ghost vaccine against chicken Reo-virus arthritis at Department of Veterinary Population Medicine, College of Veterinary Medicine, University of Minnesota, St. Paul, USA June 29, 2022.
15.	V. K. Dumka. Management of traumatic pain in animals: pharmacologic and non-pharmacologic interventions in 21 days training on "Advances in Pharmacology and Toxicology to Combat New Challenges in Modern Healthcare of Human and Animals" at NDVASU, Mhow from February 24-March 16, 2022.
16.	J Mohindroo • Skull radiography, dental radiography- Introduction to dental radiography, obtaining diagnostic dental radiographs, intraoral radiographic anatomy of dog and cat at RAJUVAS, Bikaner on March 23, 2022 (online) • Diagnostic imaging in CE program on Diagnostic Imaging at SACA, Chandigarh on • July 30, 2021. • Ultrasound of abdomen in small animals – essentials on making a correct diagnosis on July 18, 2021.

	• Critical decision making in small animal ultrasonography in conference by Indian Society of Veterinary Surgery, Pantnagar on February 24, 2022. • Radiographic interpretation of the skull in small animals and Ultrasound guided procedures in small animals in Capacity Building Program (CBP, ICAR), Mumbai on February 19, 2022 • Veterinary diagnostic ultrasonography in hands-on training program at KNPVC Shirwal, Maharashtra on March 5, 2022. • Abdominal scanning in companion animals in veterinary diagnostic ultrasonography in hands-on training program at KNPVC Shirwal, Maharashtra on January 21,2022.
17.	Arun Anand • 3D printing for veterinary applications In short term course on "3D and 4D printing applications" National Institute of Technical teachers training & Research (NITTTR), Chandigarh on January 19, 2022. • Medical additive manufacturing cost-effective and sustainable solutions for innovative development of high value added products and services at by University of Greenwich, UK, Cardiff University UK and NITTTR, Chandigarh at LPU, Phagwara on Match 25, 2022. • AM for dental prosthetics in veterinary patients in short term course on "Additive manufacturing for biomedical applications" NITTTR, Chandigarh on April 29, 2021.
18.	Ashwani Kumar • Intramedullary pin fabrication for veterinary patients through AM. Short term course on "Additive manufacturing for biomedical applications" at NITTTR, Chandigarh on April 26, 2021. • 3D printing for orthopedic applications of veterinary patients. In short term course on "4D printing for smart manufacturing" at NITTTR, Chandigarh from June28- July 03, 2021. • 3D printing for orthopedic applications. In short term course on "3D and 4D printing applications" NITTTR, Chandigarh on January 20, 2022.
19.	S.S. Randhawa. Lameness in dairy animals by MANAGE, Hyderabad & GADVASU, Ludhiana on September 27, 2021.
20.	Jaswinder Singh. Balance feeding in dairy animals at Verka, Gurdaspur October 14, 2021.
21.	C.S. Mukhopadhyay. Genetics. In Capacity Building Program for Senior Secondary Level Biology teachers in Police DAV, Ludhiana on July 9, 2022 (Online).
22.	Ratan Kumar Choudhary. Immunohistochemistry and Immunocytochemistry- a powerful tool for in situ protein expression at College and Research Institute, Orathanadu, and Dept of Animal Genetics and Breeding, College of Vet. and Animal Sciences, Pookode from January 27-28, 2021 (Online).
23.	Harsh Panwar • National Webinar on the occasion of National Milk Day at Faculty of Dairy Technology, MAFSU, Nagpur on November 26, 2021. • Probiotics, prebiotics and gut microbiome: from concept to promising therapeutics in National Webinar on Probiotics – A remedial approach for improving quality of life by Department of Dairy Microbiology, VKIDFT, Mannuthy, Kerala in association with Probiotic Association of India at Mannuthy, Kerala on March 24-25, 2022.
24.	Veena N. Importance of milk and milk products in the diet. Webinar organized by Department of Chemistry, Kamla Nehru College for Women, Phagwara on May 26, 2021 (online).
25.	S.Siva Kumar. Theoretical aspects and demonstration & practical aspects of equipments and specifications of machineries in milk and milk products processing in training for district level trainers of Puducherry on Dairy Processing at Rajiv Gandhi Institute of Veterinary Education and Research, Puducherry on March 18, 2022.

26.	Amit Mandal. Paddy –cum-Fish Integration in the webinar on "Importance of Integrated Fish Farming in West Bengal" organized by B.R. Ambedkar Institute of Panchayats and Rural Development, West Bengal on August 27, 2021.
27.	Abhed Pandey • Fish Culture: An employment opportunity at Nehru Gram Bharati, Prayagraj (U.P.) May 29, 2021(Online) • Freshwater pearl culture technique at Cotton University, Assam on September 09, 2021.
28.	Sachin Onkar Khairnar • Advanced aquaculture systems by COF, MAFSU, Udgir, Maharashtra November 21,2021. • Recent advances in ornamental fish culture in 3rd International Conference on Aquaculture and Marine Conference mind team on March 25, 2022.
29.	Naveen Kumar B.T. Biosecurity in shrimp farming and health management and disease diagnosis at DFTC Enakhera, Malout, Sri Muktsar Sahib on October 5, 2021.
30.	Prabjeet Singh. Shrimp farming at DFTC, Enna Khera, Shri Muktsar Sahib on March 15, 2022.
31.	Anuj Tyagi. Shrimp health management. DFTC, Enna Khera, Shri Muktsar Sahib on March 15, 2022.
32.	Anil Kumar • Parthenium control and compost preparation by KRIBHCO, Naushera Pannua Amritsar August 20, 2021. • Important products to improve soil health and vermicompost production at Khalsa College February 25, 2022. • Role of city compost in improve soil health by NFL, Kalsian Kalan, Amritsar on March 11, 2022. • Vermicompost production and balanced animal nutrition by PDDB, Tarn Taran on February 23, 2022.
33.	Suresh Kumar. Poultry housing and management practices at KVK, Barnala on January 18, 2022
34.	Harjot Singh Sohi. • Mushroom production technology by Department of Agriculture, Kattu, Barnala on April 16, 2021. • Protected cultivation technologies in vegetable crops by Department of Agriculture, Dhaula Barnala on April 19, 2021. • Value addition of fruits & vegetables by SBI RSETI (PMFME, Punjab Agro), Khudi Khurd Barnala on October 04, 2021

b) On Campus

S. No.	Name of the Faculty and Detail of the Lectures
1.	Jasbir Singh Bedi • Sampling strategies in epidemiological studies at Centre of Health (COH), GADVASU Ludhiana on October 11, 2021. • Regulation and risk assessments of chemical residue in animal origin foods in conference on "Transforming Livestock Economy through Innovation in Immunology and Biotechnology" of ISVIB at COABT, GADVASU on February 05, 2022. • Food safety and one health in workshop on The food we eat: impact on health and environment at COH, GADVASU October 14, 2021. • COVID 19 and its impact on animal husbandry in national webinar on "Veterinarians response to COVID 19 crisis" under NAHEP at COH, GADVASU April 21, 2021.

2.	Randhir Singh • Prevention & treatment of diseases of zoonotic importance in laboratory animals in Five days hands on training on "Ethical issues, management and breeding in laboratory animals" at GADVASU, Ludhiana on November 26, 2021. • Antimicrobial resistance and its awareness in "World antimicrobial awareness week" from November 21-26, 2021 by COH, GADVASU at Govt. Senior Secondary Smart School, PAU Ludhiana on November 26, 2021.
3.	Simranpreet Kaur • Safety guidelines and health hazards associated with lab animals Five days hands on training on "Ethical issues, management and breeding in laboratory animals" at GADVASU, Ludhiana on November 22, 2021. • Antimicrobial resistance and its awareness in "World antimicrobial awareness week" from November 21-26, 2021 by COH, GADVASU at Govt. Senior Secondary Smart School, PAU Ludhiana on November 22, 2021.
4.	Pankaj Dhaka • Management aspects in biosecurity measures at poultry and livestock farm in training on "Biosecurity measures at poultry and livestock farms" by Department of LPM, GADVASU on March 16, 2022. • Introduction to the concepts of veterinary epidemiology and study designs in workshop-cum-hands on training on "Basic epidemiological concepts in veterinary research" under IDP-NAHEP on November 12, 2021.
5.	Rajnish Sharma.Molecular characterization of zoonotic parasites in a training on "Biotechnological Approaches in Animal Research and Disease Diagnosis" by COABT, Ludhiana February 01-12, 2021.
6.	A.K. Singh. Semen evaluation and artificial insemination in dairy animals in collaborative training, on "Reproductive management in dairy animals", program with MANAGE Hyderabad and GADVASU, Ludhiana July 07–09, 2021.
7.	Shukriti Sharma. Tips on whole blood transfusion in dogs in training under DBT-GADVASU-Canine Research Centre from September 15-17, 2021.
8.	D.K.Gupta. Collection of blood from donor dogs and screening for infectious pathogens in training under DBT-GADVASU-Canine Research Centre from September 15-17, 2021.
9.	SujataTurkar. Demonstration of blood pressure monitoring and ECG in small animal practice in training under DBT-GADVASU-Canine Research Centre from September 15-17, 2021.
10.	Randhir Singh • Infectious diseases in dairy animals in training at PAMETI, Ludhiana on November 26,2021. • Infectious diseases of livestock during summer in meet of Progress Dairy Farmers Association at Ludhiana May 12, 2022.
11.	Mudit Chandra. Realtime-qPCR gene expression analysis at COABT, Ludhiana on February 03, 2021.
12.	J.S. Hundal. New horizons in calf nutrition in milk replacer and solid feed diets lead lecture in Indian Society for Buffalo Development, GADVASU, Ludhiana on November 10, 2021.
13.	L.D. Singla. Ethical/Welfare issues in biomedical research on November 23, 2021 and CPCSEA laws, regulations and policies for use of animals in experimentation and breeding November 24, 2021 in hands on training on "Management, ethical issues and breeding in laboratory animals at GADVASU, Ludhiana.

14.	• N.D. Singh & L. Geeta Devi. Collection and processing of samples for cytological examination • A.P.S. Brar & S. Deshmukh. Cytological smears of inflammatory conditions and interpretation of slides of body fluids • B.S. Sandhu & C.K.Singh. Microscopic examination of the urine samples • Amarjit Singh & K. Gupta. Cytology of poultry diseases • Kuldip Gupta & N. D. Singh. Cytology of round cells and melanocytic tumors. • Kuldip Gupta & L. Geeta Devi. Cytopathology of epithelial and mesenchymal tumors. In training under NAHEP-ICAR, GADVASU, Ludhiana at Department of Veterinary Pathology from September 13-17, 2021.
15.	A.P.S Brar. Diagnosis of poultry diseases in ICAR-1, Strengthening & development of higher education in India" subcomponent "Scheduled Caste Sub Plan" by Dept. Veterinary Pharmacology & Toxicology, GADVASU, Ludhiana on February 28, 2022.
16.	• B.S. Sandhu & N.D. Singh. Hands on training on Toxicopathology on March 22, 2022. • N.D. Singh & K. Gupta. Role of laboratory animals in toxicopathological research on March 22, 2022. • N.D. Singh & L. Geeta Devi. Practical hands on training on PCR on March 23, 2022. • L. Geeta Devi. PCR as a tools for disease diagnosis in animals on March 23, 2022. • Kuldip Gupta & Omer K. Baba. Hands on training on March 24, 2022. • Kuldip Gupta. Role of Immunohistochemistry for disease diagnosis on March 24, 2022. • Omer K. Baba. Immunohistochemical diagnosis and prognosis of canine mammary tumour on March 24, 2022.
	• Kuldip Gupta & Jagmeet Kaur. Systemic Necropsy examination in animals-II on March 26, 2022. • Kuldip Gupta & Omer K. Baba.Systemic necropsy examination in animals-I on March 26, 2022. • In training under NAHEP-ICAR, GADVASU, Ludhiana at Department of Veterinary Pathology from March 22-26, 2022.
17.	• C.K. Singh & B. S. Sandhu. Diagnosis of rabies in animals • C.K. Singh.Viral diseases of equines • C.K. Singh & Dr. L.Geeta Devi. Diagnosis of vesicular diseases of animals • C.K. Singh & N. D. Singh. Introduction of viral diseases in animals • N.K. Sood & Kuldeep Gupta.Hematology in disease diagnosis on March 16, 2022 • N.K. Sood & Kuldip Gupta. Hands on training on clinic-pathology on March 16, 2022 • C.K. Singh & B.S. Sandhu. Ante-mortem diagnosis of rabies on March17, 2022 • C.K. Singh &B.S. Sandhu. Hands on training on rabies diagnosis March17, 2022 In training program under NAHEP-ICAR by Department of Veterinary Pathology GADVASU, Ludhiana from March 14-17, 2022
18.	N.K. Sood & A.P.S Brar. Diagnosis of mycobacterial diseases in animals and hands on training on Diagnosis of Infectious diseases in animals. In training program under NAHEP-ICAR by Department of Veterinary Pathology GADVASU, Ludhiana on March 21, 2022
19.	N.D. Singh. Introduction to toxicopathology. In training program under NAHEP-ICAR by Department of Veterinary Pathology GADVASU, Ludhiana on March 22, 2022.

20.	• Dr. N.D. Singh and L. Geeta Devi. Collection, preservation and dispatch of morbid material • Kuldip Gupta. Processing of tissue for histopathology In training program under NAHEP-ICAR by Department of Veterinary Pathology GADVASU, Ludhiana on March 28, 2022.
21.	Amarjit Singh. Current Status of Fowl Adenovirus induced Diseases and Strategies for their Diagnosis and Control. In training program of COABT, Ludhiana on February 4-5, 2022.
22.	Saloni Singla. Pre and Post –operative care and management of laboratory animals. Department of LPM, Ludhiana on November 24, 2021.
23.	Manjinder Sharma. Application of stem cells for toxicity testing. ICAR-1, Strengthening & development of higher education in India" subcomponent "Scheduled Caste Sub Plan" under Department of Veterinary Pharmacology & Toxicology Ludhiana March 25, 2022.
24.	• J. Mohindroo & Navdeep Singh. Radiographic assessment of forelimb affections in small animals March 21, 2022 • Ashwani Kumar. Techniques for internal fixation of long bone fractures (bone plating, IM pinning and interlocking nailing) on March 22, 2022 • N. Umeshwori Devi. Current Techniques In The Management Of Long Bone Fractures on March 22, 2022 • Harmanpreet Singh Sodhi. Conservative management of musculoskeletal injuries in small animals on March 22, 2022 • Tarunbir Singh. Diagnostic techniques and surgical management of joint affections in small animals on March 23, 2022 In training on "Diagnosis and management of musculo-skeletal disorders in small animals ICAR-22, AINP DIMSCA by Veterinary Surgery & Radiology, GADVASU, Ludhiana from March 21-23, 2022.
25.	• Vandana Sangwan. Radiographic evaluation of thorax--lung and pleura in small animals on March 14, 2022 • Jasmeet Singh Khosa. Radiographic evaluation of abdomen in small, animals on March 14, 2022 • Arun Anand. Radiographic evaluation of thorax—Heart and mediastinum in small animals on March 15, 2022 • N. Umeshwori Devi. Basics of ultrasonography on March 15, 2022 • S.K. Mahajan. Ultrasonography guided procedures in small animals on March 16,2022 • Pallavi Verma. Ultrasonography of canine Abdomen on March 16,2022 In training on "Radiographic and ultrasonographic assessment of the thorax and abdomen in small animals ICAR-22, AINP DIMSCA by Veterinary Surgery & Radiology, GADVASU , Ludhiana from March 14-16, 2022.
26.	C.S. Mukhopadhyay. Bioinformatics approaches for molecular data analysis at School of Agricultural Biotechnology, P.A.U, Ludhiana on March 11, 2021
27.	Satparkash Singh • Molecular diagnosis of infectious diseases with special reference to leptospirosis. In hands-on training on molecular diagnosis of Animal diseases Department of Veterinary Pathology, GADVASU on March 23, 2022. • Applications of Recombinant DNA Technology. In training on "Molecular Modeling and Recombinant Protein Expression" COABT, GADVASU, Ludhiana on March 21-25, 2022

28.	Ratan Kumar Choudhary • RNA scope and its utility in gene expression analysis. COABT, GADVASU, Ludhiana February 1-12, 2021 (Online) • Double labeling and demonstration of image. In training by COABT, GADVASU, Ludhiana. December 1-12, 2021 (Online) • BLAST and Phylogenetic tree analysis using MEGA. In training by COABT, GADVASU, Ludhiana on December 22-24, 2021 (Online).
29.	Neeraj Kashyap.Gibbs Sampling, and MCMC in genomic selection. In training program by COABT and PMU-CRC-GADVASU, Ludhiana on March 05-25, 2021
30.	• Harsh Panwar. Microbiology in dairy processing: significance, challenges and future prospects • S. Siva Kumar. Recent innovations in fat rich dairy products in India • Nitika Goel. Cheese -new scope for dairy entrepreneurship • Veena N. Quality and safety aspects of adulteration in milk and its detection National Institute of Agricultural Extension Management (MANAGE) and GADVASU, Ludhiana in training program on 'Value Addition of Milk and Meat: A Push to Entrepreneurship' August 02-05, 2021 (Online).
31.	• S. Siva Kumar. Comparison of past and present approaches in manufacture of traditional & dairy products: scope and opportunities. • Nitika Goel. Technology of cheese: an emerging enterprise in India Department of Food Technology, PAU, Ludhiana. (Under ICAR Scheme) at PAU, Ludhiana on January 24, 2022.
32.	Naveen Kumar B.T. Disease surveillance, monitoring and reporting in aquaculture. Fisheries Officers Workshop, GADVASU, Ludhiana on October 09, 2021.
33.	Abhishek Srivastava. Aquaponics. New Avenues in Aquaculture at PAMETI, Ludhiana October 13, 2021
34.	• Sachin Onkar Khairnar. Re-circulatory aquaculture system on October 11,2021 • Surjya Narayan Datta Pond cage aquaculture on October 11,2021 and Pangas catfish: potential species for diversification in Punjab on October 12,2021 In training program on ' New Avenues in Aquaculture' at PAMETI, PAU, Ludhiana on October 11-12, 2021.
35.	Grishma Tewari. Fish Farming. Training course for young Farmers' at Skill Development Centre, PAU, Ludhiana on March 14, 2022 (Online)
36.	Ajeet Singh • Handling and processing of fish on September 29, 2021 • Fish processing and preservation techniques on September 29, 2021 • Concepts in value added fish products on September 30, 2021 • Preparation of project proposals for the funding by government agencies on October 01, 2021 In training on "Processing and Value Addition in Fish" by PAMETI, PAU, Ludhiana from September 29- October 01, 2021

37.	Vaneet Inder Kaur • Fish Farming In 3 months training program at Skill Development Centre, Ludhiana • September 23, 2021 • Ornamental fisheries: an upcoming avenue with diverse opportunities in training on "New avenues in aquaculture' at PAMETI, PAU, Ludhiana from December 11-14, 2021
38.	Balwinder Kumar. Round year fodder production in PDDB, Tarn Taran on February 10, 2022.

DISTINGUISHED VISITORS AT KRISHI VIGYAN KENDRAS OF GADVASU

S. No	Name and other details of the visitor	Date(s) of Visit
1	Dr. Inderjeet Singh, Vice-Chancellor, Dr. Satyavan Rampal, Director Student Welfare Officer and other officers of GADVASU, Ludhiana visited at KVK and RRTC Booh, Tarn Taran.	July 02, 2021
2	Mr. Rajiv, CGM and Mr. Raj Kiran Joshi, AGM of NABARD, Punjab Regional Office visited at Tarn Taran for progress meeting of project "Low cost fruit fly traps".	August 04, 2021
3	Dr. Inderjeet Singh, Vice Chancellor, GADVASU, Ludhiana visited at RRTC, Booh, Tarn Taran for inspection of all work of site.	September 14, 2021
4	Dr. Inderjeet Singh, Vice-Chancellor, GADVASU, Ludhiana and Dr.O.P.S. Khola, Head, ICAR-IISWC, Chandigarh visited the farm of KVK, Tarn Taran.	December 14, 2021
5	Dr. Inderjit Singh, Vice- Chancellor, GADVASU, Dr. Rajbir Singh, Director, ICAR-ATARI, Ludhiana, Dr. J.P.S. Gill, Director of Research, GADVASU, Dr. Jatinder Pal Singh, Assistant Director, Department of Animal Husbandry, Barnala, Mr. Jaskanwal Singh, Department of Agriculture, Barnala, Dr. S. S. Manhas, Agronomist, Department of Agronomy, PAU, Ludhiana, visited at KVK, Barnala.	December 22, 2021
6	Dr. A.K. Gahlot, Former Vice Chancellor RAJUVAS, Bikaner and Advisor Governor of Rajasthan visited at KVK, Mohali.	February 03, 2022
7	Dr. O.P.S. Khola Head Central Institute of Soil and Water Research, Chandigarh at KVK, Mohali	February 17,2022
8	Dr. R.K Rana, ICAR-ATARI, Ludhiana visit the farmers under KVK, Tarn Taran.	March 09, 2022
9	Dr. A.C. Varshney, Ex VC Pandit Deendayal Veterinary and Animal Sciences University, Mathura at KVK, Mohali	March 29, 2022
10	Dr. J.S. Samra, Senior Advisor, Renewable Energy Programme, CRRID visited at KVK, Barnala	March 30, 2022

Inauguration of Technology Information Gallery for visitors by Dr. Rajbir Singh Brar, Director, ICAR-ATARI, Zone-I, PAU Campus, Ludhiana at KVK, Tarn Taran

Inauguration of Home Science Lab by Dr. Inderjeet Singh, Hon'ble Vice-Chancellor, GADVASU at KVK, Tarn Taran

Dr. A.K. Gahlot, Former Vice-Chancellor RAJUVAS, Bikaner and Advisor Governor of Rajasthan visited at KVK, Mohali

Dr. OPS Khola Head Central Institute of Soil and Water Research, Chandigarh at KVK, Mohali

Inauguration of Pashu Palan Mela by Dr. Inderjeet Singh, Hon'ble Vice-Chancellor, GADVASU at KVK, Barnala

Dr. Inderjeet Singh, Hon'ble Vice-Chancellor, Dr P.S. Brar, Director Extensio n Education, Dr P.S. Dhaliwal, Director, PAMETI, PAU at KVK Barnala

DISTINGUISHED VISITORS AT GADVASU, LUDHIANA

S. No.	Name and other details about the visitor	Date (s) of the visit
1.	S. Rana Gurjeet Singh, Former Cabinet Minister of Punjab, Chairman, Punjab State Agriculture Production Planning Committee of at College of Fisheries	April 01, 2021
2.	Dr D.V.R. Prakasha Rao, President Governing Council, National Academy of Veterinary Science, India, New Delhi for lecture on "Entrepreneurial opportunity for Vets"	July 23, 2021
3.	Dr. Mahua Bhattacharjee from Amity School of Economics, Amity University, Uttar Pradesh an expert on pig breeding, marketing and economics.	September 13-14, 2021
4.	Mr. Neelam Dutta, innovative organic agri-entrepreneur and founder of Lakshmi Agriculture Multipurpose Project (LAMP) from Pabhoi (Assam) visited College of Fisheries, GADVASU.	November 15, 2021
5.	Dr. S.M. Shivaprakasha, Former Dean Fisheries and Former Director of Extension Education, Karnataka Veterinary, Animal and Fisheries Sciences University (KUFOS) and Dr. B. A. Shamasundar, Former Head, Department Fish Processing Technology, College of Fisheries, Managaluru, KUFOS.	December 13-17, 2021
6.	Dr. Atul Kumar Jain Director, Ornamental Fisheries Training and Research Institute (OFTRI), Udaipur.	December 20-24, 2021
7.	Dr. Eduardo Bastianetto, Veterinary School, Minas Gerais State University as International guest lecture faculty for undergraduate students under IDP NAHEP-ICAR.	February 21-March 23, 2022
8.	Dr. Baldev Raj Gulati from ICAR-National Research Centre on Equine, Hisar, Haryana	February 28, 2022
9.	Dr. Sandeep Ghatak from ICAR Research Complex for NEH Region, Meghalaya as a Guest faculty at Veterinary Public Health and Epidemiology	March 03-13, 2022
10.	Dr. Gaya Prasad, Former Vice Chancellor, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut.	March 22, 2022
11.	Dr. Chetan Aditya, Post Doctoral Fellow, Institute Pasteur, Paris.	
12.	Dr. Jaswant Singh, University of Saskatchewan, Canada	March 25, 2022
13.	Dr. Umesh Sharma, President, VCI and Dr. Pradeep Yadav, Vice-President, VCI, India	March 26, 2022

Visits Abroad:

S. No.	Name of the Faculty	Place of visit	Dates (s) of the visit	Purpose of the visit
1	Dr. Sidhartha Deshmukh	College of Veterinary Medicine, University of Minnesota, USA.	October 01,2021 to June 30, 2022	To pursue Academic and Professional Excellence fellowship

Dr. D.V.R. Prakasha Rao, President Governing Council, NAVS, New Delhi with Dr. Inderjeet Singh Vice-Chancellor, Dr. J.P.S. Gill Director of Research, Dr .S.P.S Ghuman Dean COVS

Dr Gurbachan Singh and Dr S.K. Ranjhan attended conference of Indian Society of Buffalo Development held at GADVASU, Ludhiana

Dr. Eduardo Bastianetto, Professor Veterinary School, Minas Gerais State University, Brazil, South Africa as international guest faculty at department of Veterinary Parasitology

Dr. Sandeep Ghatak, Principal Scientist, ICAR Research Complex for NEH Region, Meghalaya at Centre of One Health

S. Rana Gurjeet Singh, Former Cabinet Minister of Punjab at College of Fisheries

Dr. B.A. Shamasundar, Former Head, Department Fish Processing Technology, College of Fisheries, Managaluru, Karnataka visited at College of Fisheries

Dr. S. M. Shivaprakasha, Former Dean, College of Fisheries, Managaluru and Former Director of Extension Education, Karnataka at College of Fisheries

Dr. Deepjyoti Baruah, Senior Scientist (Aquaculture), ICAR-Indian Agricultural Research Institute, Assam at College of Fisheries

Dr. Atul Kumar Jain Retired Senior Scientist, ICAR-CIFE and now Director, Ornamental Fisheries Training and Research Institute (OFTRI), Udaipur at college of fisheries

Dr. Gaya Prasad, Former Vice Chancellor, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut visited at College of Animal Biotechnology

Dr. Baldev Raj Gulati, Principal Scientist, ICAR-National Research Centre on Equine, Hisar at College of Animal Biotechnology

Dr Jaswant Singh Professor, Department of Veterinary Biomedical Sciences, University of Saskatchewan, Canada at College of Animal Biotechnology

International and National Linkages

International Partners

- Royal Veterinary College, London, UK
- Department of Animal Nutrition & Management, Faculty of Veterinary Medicine & Animal Science, Swedish University of Agricultural Sciences (Slu), Sweden – PG/Ph.D. /Faculty Research
- PUM Netherland: Farmer Oriented Activities

National Partners

- National Institute of Technology Rourkela - Research Collaboration (MoU) under Impacting Research Innovation and Technology (IMPRINT) Scheme of the Ministry of Human Resource Development, Government of India
- Sri Venkateswara Veterinary University, Andhra Pradesh - Research Collaboration
- ICAR- National Dairy Development Research Institute (NDRI), Karnal - Research Collaboration
- Post-Graduate Institute of Medical Education and Research, Chandigarh - Research Collaboration
- Dayanand Medical College and Hospital, Ludhiana - Research Collaboration
- IVRI, Izatnagar, RAJUVAS Bikaner, DUVASU Mathura and TANUVAS Chennai in the All India Network Program on Diagnostic Imaging and Management of Surgical Conditions in Animals – Research Collaboration
- TANUVAS and IVRI - DBT canine - Network research scheme
- Small Animal Clinician Association (SACA) Chandigarh - for conducting continuing education programs for small animal clinicians
- IIT Delhi - Research Collaboration
- National Institute of Technical Teachers Training & Research (NITTTR), Chandigarh – Research Collaboration Bhabha Atomic Research Centre (BARC) - Research Collaboration
- ICAR institutes - CIFRI, CIFA, CIBA, DCFR, CIFT, CMFRI, MPEDA: Educational Tour of B.F.sc. 4th year students under student READY Program PG/PhD/ faculty Research
- Punjab Agricultural University (PAU): PG/Ph.D. Research, Teaching
- ICAR-Central Institute of Post-Harvest Engineering & Technology (CIPHET) - Research/Training, Member of Scientific Advisory Committee of KVK and resource person in training programs
- Centre for Development of Advanced Computing (C-DAC), MeiTY, Mohali. : Research and Training
- Punjab Agricultural management and Extension Training Institute (PAMETI), PAU, Ludhiana - Collaborative Training Programs for Farmers and Students
- IIT-Ropar, ICAR-CIPHET & Nestle - for the Internship Program of B. Tech. Students
- DBT Welcome Trust lecture series - for UG-PG students
- Farm Advisory Service - Scheme Trainings provided, KVK Scientists act as resource person for KisanMelas, block level camps organized by FASS in coordination with State department of Agriculture & ATMA

- Punjab Dairy Development Board - Organizing training programs, Member of Scientific Advisory Committee of KVK, KVK Scientists act as Resource Person for KisanMelas, Block level Camps organized by State Department
- CDPO Tarn Taran (Different blocks) - Training Program
- ATMA/NMSA -Trainings provided, KVK Scientists act as resource person for KisanMelas, block level camps organized by State deptt. and Extension Activities
- Agriculture Skill Council of India - Skill Development Training
- NABARD - Member of Scientific Advisory Committee of KVK and resource person in training programs
- Soil Conservation Department- Member of Scientific Advisory Committee of KVK
- Harvest Plus: Collaborative Extension Programs in district Tarn Taran
- ICAR-Agricultural Technology Application Research Institute (ATARI), Zone-1, Ludhiana: Financial, Technical, back stopping
- State Department Of Agriculture - Organizing training programs, Member of Scientific Advisory Committee of KVK, KVK Scientists act as resource person for KisanMelas, block level camps organized by State department
- State Department Of Fisheries - Organizing training programs, Member of Scientific Advisory Committee of KVK, KVK Scientists act as resource person for KisanMelas, block level camps organized by State department
- State Department Of Animal Husbandry - Organizing training programs, Member of Scientific Advisory Committee of KVK, KVK Scientists act as resource person for Kisan Melas, block level camps organized by State department
- State Department Of Horticulture - Organizing training programs, Member of Scientific Advisory Committee of KVK, KVK Scientists act as resource person for KisanMelas, block level camps organized by State department
- Department of soil and water conservation - Training programs, Member of Scientific Advisory Committee of KVK, KVK Scientists act as resource person for KisanMelas, block level camps organized by State department
- KVK Scientists act as resource person for KisanMelas, block level camps organized by State department

Research Publications (along with NAAS rating 2021):

S. No.	Publication Details	NAAS
1.	Akash, R., Saini, S. P. S., Lonare, M., Anand, A., Kaur, R., Kumar, D., & Dumka, V. K. (2021). Influence of general anaesthesia on disposition kinetic of ceftiofur in Buffaloes with diaphragmatic hernia. *Ruminant Science*, 10(1), 147-154.	5.47
2.	Ali, T. M., Narang, R., Dubey, P. P.,& Kaur, S. (2021). Characterization of lactation curve patterns using non-linear models in crossbred dairy cattle. *Indian Journal of Animal Research*. DOI: 10.18805/IJAR.B-4289	6.40
3.	Amit, Pandey, A., Khairnar, S.O., & Tyagi A. (2021). Effect of dietary supplementation of probiotic bacteria (*Lactobacillus plantarum*) on growth and proximate composition of *Cyprinus carpio* Fingerlings. *National Academy Science Letters-India*, 44, 495–502. DOI : 10.1007/s40009-021-01060-z	6.42
4.	Andrabi, S. A., Laltlan, K., Deka, D., Gupta, K.,& Singh, A. (2021). Pathology and molecular characterization of field isolates of chicken anaemia virus circulating in commercial poultry in and around Punjab. *Indian Journal of Veterinary Pathology*, 45(3), 195-201.	5.54
5.	Aparna, Kansal, S. K., Singh, S., & Hundal, J. S. (2021). Dairy cattle nutrition technologies: pre and post intervention awareness and its retention with independent variable. *Journal of Community Mobilization and Sustainable Development*, 16(1), 245-254.	5.67
6.	B. T., Naveen Kumar, Thakur, N., Singh, P., Shanthanagouda, A. H., Tyagi, A., Ansal, M.D., Bhatt, D., Singh P. P., & Kaur, A. (2021). Prevalence and incidences of shellfish diseases in shrimp farmed in Inland Saline waters of Punjab: A case study. *Journal of Experimental Zoology, India*, 24(2), 1601-1609.	5.25
7.	Bala, M., Turkar, S., Saini, S., Randhawa, C. S., & Kashyap, N. (2021). High Definition Oscillometric Blood Pressure Measurement in apparently Healthy Dogs: A Clinical Study. *Journal of Animal Research*, 11(4), 637-41.	5.43
8.	Balogun, A.S., Narang, R., Cheema, R.S., Dubey, P.P., Dash, S.K., Kashyap, N., & Sahoo, S.K. (2021). Freezing ability of two slow permeating cryoprotectants on rooster semen diluted with tris egg-yolk juice extender. *Letters in Animal Biology*, 1(2), 7-13.	NA
9.	Bansal, N., Gupta, A., Uppal, V., Pathak, D., & Sarangi, S. (2021). Histomorphochemical Studies on Ampullary Glands of Buffalo Bull. *Indian Journal of Veterinary Anatomy*, 33(1), 50-52.	4.86
10.	Begum, G., Singh, N. D., Leishangthem, G. D., & Banga, H. S. (2021). Pathology of bleomycin induced acute lung injury and early initiation of the pulmonary fibrosis in mice. *Indian Journal of Veterinary Pathology* 44(4), 235-241.	5.54
11.	Bhardwaj, H., Singh, C., & Nayyar, S. (2021). Assessment of adverse effects of lead, nickel and cadmium on biochemical parameters, antioxidants status and metallothionein expression in buffaloes slaughtered at local abattoir. *Indian Journal of Animal Research*, 56, 145-152. 10.18805/IJAR.B-4242	6.40
12.	Bhardwaj, H., Singh, C., & Nayyar, S. (2021). Biochemical profile, micro-mineral status and metallothione in expression in abattoir buffaloes environmentally exposed to heavy metals. *Indian Journal of Animal Research*, 56, 416-423. DOI:10.18805/IJAR.B-4464.	6.40
13.	Bhardwaj, H., Singh, C., & Singh, D.V. (2021). Role of metallothionein to moderate heavy metals toxicity in animals: A review. *The Pharma Innovation Journal*, 10(5S), 638-648.	5.23

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15.	Billing, J. K., Singh, O.,Pathak, D., & Sethi, R. S. (2021). Histochemistry and angiogenesis in thyroid gland of prenatal Indian Buffalo. *Journal of Animal Research*,11(5), 901-907. DOI: 10.30954/2277-940X.05.2021.22.	5.43
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17.	Brar, N. S., Kumar, B., Hundal, J. S. & Verma, H. K. (2021). Maize (*Zea mays*) cultivars evaluation for herbage yield and silage quality. *Indian Journal of Agricultural Sciences*,91(8), 1131–35.	6.21
18.	Brar, S. K., Singla, N., & Singla, L. D. (2021). Comparative comprehensive analysis on natural infections of *Hymenolepis diminuta* and *Hymenolepis nana* in commensal rodents. *Helminthologia*,58(3), 248-262.	6.67
19.	Brar, S. K., Singla, N., & Singla, L. D. (2021). Concurrent infection of *Cryptosporidium* and *Giardia* in synanthropic rodents: First report from Punjab, India. *Indian Journal of Veterinary Science & Biotechnology*, 17(1), 45-47.	5.58
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21.	Brar, T. S., Jadoun, Y. S., Kasrija, R., & Singh, P. (2021). Analysis of constraints faced by dairy farmers of western plain zone of Punjab. *International Journal of Livestock Research,* 11(4),69-75.	NA
22.	Brar, T. S., Jadoun, Y. S., Kasrija, R., Singh, P., & Deshmukh, B. (2020). Constraints perceived by dairy farmers in access and management of good dairy farming practices. *International Journal of Current Microbiology and Applied Sciences*, 9(11), 1600-1608.	NA
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24.	Chawla, R., Sivakumar, S., Mishra, S. K., Kaur, H., & Anurag, R. K. (2021). Modified atmosphere packaging for milk cake: assessment of ideal gas composition for extending shelf life. *British Food Journal*, 123(8), 2893-2906.	8.10
25.	Das, D., Mir, N. A., Chandla, N. K., & Singh, S. (2021). Combined effect of pH treatment and the extraction pH on the physicochemical, functional and rheological characteristics of amaranth (*Amaranthus hypochondriacus*) seed protein isolates. *Food Chemistry*, 353, 129466.	12.31
26.	Das, N., Pawar, P. D., Mhase, P. P., Sarawade, V., Dhaygude, V. S., Kumar, H., & Singla, L. D. (2021). First case of dirofilariasis in a dog from Goa, India. *Indian Journal of Veterinary Science & Biotechnology*, 17(2), 105-107.	5.58
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29.	Devi, N. U., Khosa, J.S., & Mohindroo, J. (2021). Surgical management of choke due to an unusual foreign body in a she buffalo. *Ruminant Science*, 10(1), 229-230.	5.47
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32.	Dhaka, P., Bedi, J. S., & Malik, Y. S. (2021). One health in India: Time to act together. *Indian Journal of Animal Sciences*,91(10), 803–806.	6.28
33.	Dhaliwal, A. D. S., Kasrija, R., Singh, P., & Jadoun, Y. S. (2021). Perceived constraints in goat farming by stakeholders in Punjab. *Ruminant Science*, 10(2), 429-432.	5.47
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37.	Dubey, S., Singh, A., Kumar, B. T. N., Singh, N. K., & Tyagi, A. (2021). Isolation and Characterization of Bacteriophages from Inland Saline Aquaculture Environments to Control *Vibrio parahaemolyticus* Contamination in Shrimp. *Indian Journal of Microbiology*, 61(2), 212-217. https://doi.org/10.1007/s12088-021-00934-6	7.83
38.	Gangil, R., Kaur, G., & Dwivedi, P. N. (2021). Isolation and molecular characterization of BoHV-1 from upper respiratory tract of bovines. *Indian Journal of Animal Research*. DOI: 10.18805/IJAR.B-4552	6.40
39.	Gupta, R., Sahoo, S.K., Kaur, S., Dash, S.K., & Malhotra, P. (2021). Prediction of first lactation 305-day milk yield by test day simple and multiple regression models in Holstein Friesian crossbred cattle. *International Journal of Livestock Research,* 11(4), 95-99.	NA
40.	Hassan, S. S. (2021). Raising experimental infection of paramphistomosis in sheep under laboratory condition. *International Journal on Biological Sciences,* 12(1), 39-46.	NA
41.	Holt, H. R., Bedi, J.S., Kaur, P., Mangtani, P., Sharma, N.S., Gill, J. P. S., Singh, Y., Kumar, R., Kaur, M., McGiven, J., & Guitian, J. (2021). Epidemiology of brucellosis in cattle and dairy farmers of rural Ludhiana, Punjab. *PLoS Neglected Tropical Diseases*, 15(3), e0009102. https://doi.org/10.1371/journal.pntd.0009102	9.89
42.	Hundal, J. S., Sharma, A., Pal, R., & Grewal, R. S. (2021). Harnessing *in vitro* nutritional potential of different varieties of sugarcane tops silages enriched with molasses and bacteria inoculants as an unconventional feed resource. *Sugar Tech*, 23, 923–932. https://doi.org/10.1007/s12355-020-00917-9	7.20

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44.	Jadhav, S. N., Nayyar, S., Hundal, J. S., Bedi, J. S., & Singh, C. (2021). In-vitro evaluation of *Mucuna pruriens* seeds by nutritional and phytochemical analysis, assessment of antioxidant property and estimation of L-DOPA content by RP-HPLC. *The Pharma Innovation Journal*, 11(1S), 289-294.	5.23
45.	Jadoun, Y. S., Chadda, A., Singh, J., Kansal, S. K., & Singh, A. (2021). Women Empowerment through livestock based Self-Help Groups. *International Journal of Livestock Research*, 11(6), 1-10.	NA
46.	Joshi, P., Tiwari, R., Panda, P., Singh, A., & Dutt, T. (2021). Constraints perceived in ICT tools utilization by veterinary graduates. *Indian Journal of Extension Education*, 57(1), 120-123.	5.95
47.	Jyoti, Singh, N. K., Singh, H., &Rath, S. S. (2021). Adult bioassay based amitraz resistance status in *Rhipicephalusmicroplus* populations of Punjab, India. *Exploratory Animal and Medical Research*, 11(1), 49–54.	5.85
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49.	Kamboj, S., Datta, S. N., Tyagi, A., & Tewari, G. (2021). Assessment of water quality and microbial load in the selected stretches of river Beas in Punjab, India. *Journal of Experimental Zoology, India*, 24(1), 435-440.	5.25
50.	Kanchan, A., Bansal, B. K., Gupta, D.K., Singh, S. T., & Singh, S. (2021). Somatic cell count and biochemical components of milk: relation to udder health and diagnosis of subclinical quarter infections in buffaloes. *Buffalo Bulletin*, 40(3), 419-430.	6.11
51.	Kapoor, J., Banga, H. S., Singh, N. D., & Deshmukh, S. (2021). Studies on pathology of ocular tumors in bovine. *Indian Journal of Veterinary Pathology*, 44(2), 65-68.	5.54
52.	Karan, K., Kumar, A., Anand, A., Verma, P., Sangwan, V., & Bansal, N. (2021). Clinical study on the occurrence pattern of equine lameness at referral veterinary hospital. *Indian Journal of Veterinary Medicine*, 41(2), 16-21.	4.57
53.	Kaur N., Sharma, M., Lonare, M. K., Udehiya, R., & Singh, D.V. (2021). Bio-antioxidants protect the buffalo bone marrow derived mesenchymal stem cells against oxidative stress induced during freeze-thaw cycle. *Toxicology International*, 28(1), 17-30.	NA
54.	Kaur, A., Verma. P., Singh, T., Sangwan, V., & Mohindroo, J. (2021). Prognostic factors affecting survival of buffaloes suffering from diaphragmatic hernia. *Ruminant Science*, 10(1), 203-208.	5.47
55.	Kaur, B., B. T., Naveen Kumar, Tyagi, A., Holeyappa, A. S., & Singh, N. K. (2021). Identification of novel vaccine candidates in the whole-cell *Aeromonas hydrophila* biofilm vaccine through reverse vaccinology approach. *Fish and Shellfish Immunology*, 114, 132-141. doi: 10.1016/j.fsi.2021.04.019.	10.58
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57.	Kaur, G., Kaswan, S., Singh, C., Singla, M., Sharma, A., & Lamba, J.S. (2021). Performance and welfare status of stable and regrouped Beetal does fed at hexagonal vs. linear feeder. *Indian Journal of Animal Sciences*, 91(11), 957–964.	6.28

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59.	Kaur, J., Brar, R. S., Banga, H. S., & Singh, N. D. (2021).Histopathological study of ascites syndrome in poultry in Punjab. *Indian Journal of Veterinary Pathology*, 44(4), 242-244.	5.54
60.	Kaur, J., Kaur, T., Sharma, A. K., Kaur, J., Yadav, H. N., Pathak, D., & Singh, A. P. (2021). Fenofibrate attenuates ischemia reperfusion-induced acute kidney injury and associated liver dysfunction in rats. *Drug Development Research*, 82(3), 412-421.	11.004
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63.	Kaur, M., Gupta, K., Mohindroo, J., & Singh, A. (2021). Cytopathology of round cell and melanocytic tumors of cutaneous and subcutaneous origin in dogs.*Indian Journal of Veterinary Pathology*, 45(4), 279-83.	5.54
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67.	Kaur, R., Batra, M., & Saxena, A. (2021). Histopathological investigations on the effect of vitamin C on sodium fluoride exposed-freshwater Amur Carp, (*Cyprinus carpio haematopterus*). *Fluoride*, 54(3), 241-256.	7.03
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73.	Kaura, R., Kaur, S., Arora, J. S., & Kashyap, N. (2021). Screening and association of polymorphism in alpha-lactalbumin gene in holstein friesian crossbred cattle. *Journal of Animal Research*, 11(3), 351-355. DOI:10.30954/2277-940X.03.2021.2	5.43
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75.	Khan, I. S., Sharma, S., Devi, G., & Narang, A. (2021). A study on diagnosis of immune mediated hemolytic anaemia in dogs. *The Pharma Innovation Journal*, 10(6S), 100-102.	5.23
76.	Khan, I. S., Sharma, S., Gupta, D.K., & Chhabra, S. (2021). Transfusion and evaluation of fresh plasma in hypoproteinemic dogs. *Indian Journal of Veterinary Medicine,* 41(2).	4.57
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80.	Khinda, U. S., Dhindsa, S. S., Honparkhe, M., Malik, V.S., & Singh, P. (2021). Relationship between Estrus expression and fertility in Sahiwal cattle following modified timed artificial insemination protocols. *The Pharma Innovation Journal*, 10(9S), 155-158.	5.23
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GURU ANGAD DEV VETERINARY AND ANIMAL SCIENCES UNIVERSITY

LUDHIANA - 141 004, PUNJAB, INDIA

Phone : +91-161-2553343 Fax : +91-161-2553342

E-mail : registrar@gadvasu.in

www.gadvasu.in