

**CENTRES OF ADVANCED FACULTY TRAINING
DIVISION OF VETERINARY PHYSIOLOGY
ICAR- INDIAN VETERINARY RESEARCH
INSTITUTE IZATNAGAR**

Introduction:

Division of Physiology, Pharmacology & Biochemistry was formally established in 1970. Later on Divisions of Pharmacology & Toxicology and Biochemistry were separated and the existing Division was renamed as Division of Physiology and Climatology. On the basis of achievements in Animal Physiology research and teaching, ICAR granted the status of Centre of Advanced Studies in Veterinary Physiology to this Division in 1995. The centre is having the responsibility of teaching and research with a mandate of training scientists and teachers of universities and research Institute. The name of Centre of Advanced Studies (CAS) was changed as Centre of Advanced Faculty Training (CAFT) by the Council in the year 2010.

Objective of CAFT:

The Indian Council of Agricultural Research, New Delhi has identified the Physiology & Climatology Division, IVRI, Izatnagar, as a **Centre of Advanced Faculty Training (CAFT)**. The CAFT is entrusted with the organization of specialized and advanced training courses, for the State Agricultural University teachers / ICAR scientists to update their knowledge and skill, with the objective of Human Resource Development in the discipline of Veterinary Physiology in the country. To accomplish this mandate, this Centre proposes to conduct two advanced training course of 21 days duration during every financial year. The courses are useful and interactive, in fact CAFT undertakes improvement of faculty competence and development of human Resources thus supports Institutional Capacity Building.

CAFT Faculty: Name & Designation (as on 31.12.2019):

1.	DR. G. TARU SHARMA	M.Sc., Ph.D.	DIRECTOR CAFT
2.	DR. V. P. MAURYA	M.Sc., Ph.D.	PR. SCIENTIST
3.	DR. S. BAG	M.Sc., Ph.D.	PR. SCIENTIST
4.	DR. M. SARKAR	M.Sc., Ph.D.	PR. SCIENTIST
5.	DR. B. C. DAS (ERS, KOLKATA)	M.Sc., Ph.D.	PR. SCIENTIST
6.	DR. G. SINGH	M.V.Sc., Ph.D.	PR. SCIENTIST
7.	DR. VIKASH CHANDRA	M.V.Sc., Ph.D.	SCIENTIST (SS)
8.	DR. V. S. CHOUHAN	M.V.Sc., Ph.D.	SCIENTIST (SS)
9.	DR. S. S. DANGI (IVRI, MUKTESHWAR)	M.V.Sc., Ph.D.	SCIENTIST
10.	DR. H. A. SAMAD	M.V.Sc., Ph.D.	SCIENTIST
11.	DR. MADHUSOODAN A.P. (IVRI, MUKTESHWAR)	M.V.Sc.	SCIENTIST

Human Resource Development:

Particulars of Short Courses / Training program for HRD conducted during 2017-2020

List of CAFT Short Courses (2017-2020)

Sl. No.	Title of the Course	Duration	Course Coordinator
1.	BIOLOGY OF PHYSIOLOGICAL ADAPTATION AND PRODUCTION STRESS IN FARM ANIMALS	11.01.2017-31.01-2017	Dr. V. P. Maurya
2.	UPSTREAM REPRODUCTIVE TECHNOLOGIES FOR AUGMENTATION OF LIVESTOCK PRODUCTION	01.09.2017-21.09.2017	Dr. Vikash Chandra
3.	RECENT ADVANCES IN STRESS GENOMICS FOR LIVESTOCK PRODUCTION	09.01.2018-29.01.2018	Dr. Puneet Kumar
4.	ACCLIMATIZATION AND ADAPTATION OF HIGH ALTITUDE LIVESTOCK IN CHANGING CLIMATIC SCENARIO	01.06.2018 - 21.06.2018	Dr. S. S. Dangi
5.	APPLICATION OF GENOMIC TOOLS IN UNRAVELING PHYSIOLOGICAL PROCESSES	29.01.2019 -18.02.2019	Dr. Mihir Sarkar
6.	EMERGING CONCEPTS AND BIO-TECHNIQUES FOR AUGMENTING LIVESTOCK PRODUCTION: PHYSIOLOGICAL PERSPECTIVES	20.08.2019 -09.09.2019	Dr. H. Abdul Samad
7.	NEURO-ENDOCRINE REGULATION OF LIVESTOCK PRODUCTION: PROSPECT AND RETROSPECT *	28.01.2020-17.02.2020	Dr. G. Singh

*** To be conducted**

Infrastructure developed :

- Renovation work of Experimental Animals Sheds of Physiology and Climatology Division taken up by CPWD
- MoU signed between ICAR-IVRI and Indian Meteorological Department (IMD) to establish meteorological observatory at Climatology Laboratory. Three rooms of Climatology Laboratory spared for IMD
- Committee room refurnished with sofas.
- Renovated the experimental animal sheds of the division with the Institute grant.
- Added furniture and fixtures using Institute grant
- Added Centrifuge and deep fridge using PG grant.

Awards/Recognitions:

Awards

- Dr. G.Taru Sharma was elected fellow NASI, the oldest Science Academy of India.
- Rafi Ahmed Kidwai Award for outstanding research to Dr. G. Taru Sharma
- Prof. G.P. Talwar Gold Medal oration award-2019 to Dr. G. Taru Sharma
- NIL'S LAGERLOF MEMORIAL AWARD-2018 o in recognition of meritorious contribution to the research in Animal Reproduction to Dr. M. Sarkar and Dr. G. Singh
- SAPI D.N. Mullick Award-2018 to Dr. Vikash Chandra
- First prize for best article in Hindi entitled "Jalvau parivarvartan evam iska krishi evam pashu palan par prabhav" Published in Shalihotra Darshan. Rajbhasha Smarika-2018 by ICAR-IVRI, Izatnagar-to Dr. Puneet Kumar.
- Best M.V.Sc theis award to Dr. Bibhudatta S. K. Panda (Mentor: Dr. G.Taru Sharma)
- Young Scientist Award to Dr. Anjali Somal (Mentor: Dr. G.Taru Sharma).
- Best division award by IVRI-2016
- Dr. G. Taru Sharma was elected as NAAS fellow w.e.f 1.1.2017
- SAPI Fellow-2017 to Dr. G.Taru Sharma
- Bharat Ratna Dr. C. Subramaniam Award for Outstanding Teachers by ICAR-2016 to Dr. G.Taru Sharma
- IVRI Best Teacher Award (2016) to Dr. G.Singh
- Best M.V.Sc. student award (Bronze Medal) by Dr Jaya Bharti for the year 2014-15 conferred during IVRI convocation held on November 05, 2016.
- J.P. Mittal Best M.V.Sc Theis award to Dr Jaya Bharti on the topic " Expression dynamics of major heat stress induced genes and possible crosstalk between them in Tharparkar cattle" in SAPICON-2016 organized by Society of Animal Physiologists of India (SAPI) at Mhow (MP)
- Smt. Kamala Madan Memorial Young Scientist Award on the topic "Expression dynamics of Toll Like Receptors and Interleukins during acclimation to heat stress exposure in Tharparkar cattle" during SAPICON-2016 at Mhow (MP)
- Best PhD thesis award by SAPICON-2016 organized by Society of Animal Physiologists of India (SAPI) at Mhow (MP)

Recognition

Following recognitions are given to the Director CAFT:

- **Editorial board member of an Elsevier journal of Reproductive Health and Medicine**
- Regularly evaluating submitted research project proposals to DST, DBT, CSIR & ICAR
- Member of a sub-committee to workout general principles and data requirements for risk assessment on genome editing technologies, applications and regulations on animals RCGM, DBT.
- Project Formulation Group member to initiate phase-I, programme of Somatic cell derived bovine gametes/embryos. With the approval of the Secretary, Department of Biotechnology, a Project with NDDB.
- Member Board of Management, QRT, RAC of different ICAR Institute.
- DBT-NER Technical expert Committee in animal, aquaculture and fish biotechnology. TEC member of Animal Biotechnology.
- Member DBT Task Force for Animal Biotechnology-I
- Member, task Force on "Alternatives to Animal Testing", ILSI.
- Expert in the selection committee at various SAU's for Professor.
- Member, Broad Subject Matter Area (BSMA) committee of National core group for restructuring of Masters & Ph.d Curriculum & Syllabai-2019, for basic Veterinary Disciplines;(Vet. Anatomy, Vet &AH Ext. Edu., Biochemistry, Vet. Physiology and Vet. Biotechnology).Task completed in April.
- Evaluated a good number of M.V.Sc/M.Sc and Ph.D thesis & conducted viva- voce examination, as external examiner. Member of a screening and selection committee of ICAR-Netaji Sbbhash C. Bose International fellowship for Ph.D.
- President Animal Physiologists Association; Executive Member of Indian Society for the study of Reproduction and Fertility.
- Nominated as Sector Warden of IVRI for Civil Defence Plan from Security Section of IVRI, Izatnagar.
- Chairperson (being the senior most lady officer) of SAKSHAM-measures as per UGC/ICAR, New Delhi. Chairperson Internal Complain Committee for the well-being of the girl students and others.
- Member Research Project Screening and Evaluation Committee of the Institute.
- Chairperson for the Annual report (Hindi)-2019 of ICAR-IVRI.
- Chairperson of Technical Advisory Committee of the Equipment purchase of ICAR-IVRI till date.
- Participated in important meetings as Director's representative for the meeting with Animal Husbandry Commissioner and Vice Chancellor's conference (sponsored by IAUA) and symposium on 27th and 28th April 2017 at SHUAT, Allahabad. Presented a talk, entitled "Stress Management strategies to improve livestock productivity", on behalf of Hon. Director, IVRI.

Publications

2016-17

International Journals

1. Bharati J., S.S. Dangi, V.S. Chouhan, S.R. Mishra, M.K. Bharti, V. Verma, O. Shankar, V.P. Yadav, K. Das, A. Paul, S. Bag, V.P. Maurya, G. Singh, P. Kumar, Sarkar M. (2016). Expression dynamics of HSP70 during chronic heat stress in Tharparkar cattle. *International Journal of Biometeorology* DOI 10.1007/s00484-016-1281-1
2. Bhardwaj Rahul, Matin M. Ansari, Sriti Pandey, Mehtab S. Parmar, Vikash Chandra, G. Saikumar and G. Taru Sharma. (2016). GREM1, EGFR and HAS2; the oocyte competence markers for improved buffalo embryo production *in vitro*. *Theriogenology*, 86:2004-2011.
3. Reshma R., S R Mishra, N. Thakur, Mehtab S. Parmar, Anjali Somal, M K Bharti, Sriti Pandey, V.S. Chouhan, M.R. Verma, G Singh, G T. Sharma, V.P. Maurya, M. Sarkar. (2016). Modulatory Role of Leptin on Ovarian Functions in Water Buffalo (*Bubalus Bubalis*). *Theriogenology* 86: 1720–1739.
4. Dangi S.S., Saroj K. Dangi, V.S. Chouhan, M.R. Verma, Puneet Kumar, Gyanendra Singh, Mihir Sarkar. (2016). Modulatory effect of betaine on expression dynamics of HSPs during heat stress acclimation in goat (*Capra hircus*). *Gene*, 575: 543–550.
5. Krishan Jagriti, Surbhi Agarwal, Juhi Pathak, Rakesh Kaushik, Mehtab S. Parmar, Sriti Pandey, Mukesh K. Bharti, Vikash Chandra, S.K. Jindal, S.D. Kharche, P.K. Rout, G. Taru Sharma. (2016). Influence of follicular fluid and gonadotropin supplementation on the expression of germ cell marker genes during *in-vitro* maturation of caprine (*Capra hircus*) oocytes. *Small Ruminant Research*. 44: 41–47.
6. Kuldeep Kumar, Pranjali Agarwal, Kinsuk Das, Bhabesh Mili, Madhusoodan AP, Ajay Kumar, Sadhan Bag. (2016). Isolation and characterization of mesenchymal stem cells from caprine umbilical cord tissue matrix. *Tissue and Cell*, 48 (6): 653-658.
7. Mishra S.R., N. Thakur, A. Somal, M.S. Parmar, R. Reshma, G. Rajesh, V.P. Yadav, M.K. Bharti, Jaya Bharati, A. Paul, V.S. Chouhan, G.T. Sharma, G. Singh, M. Sarkar, (2016). Expression and localization of fibroblast growth factor (FGF) family in buffalo ovarian follicle during different stages of development and modulatory role of FGF2 on steroidogenesis and survival of cultured buffalo granulosa cells, *Research in Veterinary Science*, 108: 98-111.
8. Mishra S.R., M.S. Parmar, V.P. Yadav, R. Reshma, Jaya Bharati, M.K. Bharti, A. Paul, V.S. Chouhan, G.T. Sharma, G. Singh, M. Sarkar.(2016). Expression and localization of angiopoietin family in corpus luteum during different stages of estrous cycle and modulatory role of angiopoietins on steroidogenesis, angiogenesis and survivability of cultured buffalo luteal cells. *Reproduction in Domestic Animal* 51: 855–869.
9. Rajesh G, Avishek Paul, Jaya, Nipuna Thakur, Tanmay Mondal, Chandrabhan Singh Banjare, Madhusoodan AP, Narayanan K, Chouhan VS, Sadhan Bag, Das BC, Singh G, Taru Sharma G and Mihir Sarkar. (2016). Expression and localization of bone morphogenetic protein6 (bmp6) in the corpus luteum during different stages of estrous cycle in the buffalo (*Bubalus bubalis*). *Journal of Experimental Biology and Agricultural Sciences*, DOI: <http://dx.doi.org/10.18006/2016.4> (Spl-3-ADPCIAD).S108.S115.
10. Mahapatra P.S., Renu Singh, Kuldeep Kumar, NiharRanjanSahoo, Pranjali Agarwal, BhabeshMili, Kinsuk Das, Mihir Sarkar, Subrat Kumar Bhanja, B C Das, Sujoy Kumar Dhara and Sadhan Bag (2016). Valproic acid assisted reprogramming of fibroblasts for generation of pluripotent stem cells in buffalo (*Bubalus bubalis*). *International Journal of Developmental Biology*. DOI:10.1387/ijdb.160006sb
11. Somal Anjali, Irfan A. Bhat, Indu B, Sriti Pandey, Bibhudatta S. K. Panda, Nipuna Thakur, Mihir Sarkar, Vikash Chandra, G. Saikumar and G. Taru Sharma. (2016). A Comparative Study of Growth Kinetics, *In Vitro* Differentiation Potential and Molecular Characterization of Fetal Adnexa Derived Caprine Mesenchymal Stem Cells. *PLOS ONE*. June 3, 2016 <http://dx.doi.org/10.1371/journal.pone.0156821>.
12. Somal Anjali, Irfan A. Bhat, Indu B., Anuj Pratap Singh, Bibhudatta S. K.Panda, Perumal Arumugam Desingu, Sriti Pandey, Mukesh Kumar Bharti, Amarpal, G. Saikumar, Vikash Chandra and G. Taru Sharma (2016). Impact of cryopreservation on caprine fetal adnexa derived stem cells and its evaluation for growth kinetics, phenotypic characterization and wound healing potential in xenogenic rat model. *Journal of Cellular Physiology*.doi. 10.1002/jcp.25731

13. Rajesh G., Avishek Paul, S.R. Mishra, Jaya Bharati, Nipuna Thakur, Tanmay Mondal, Sanjhali Soren, S. Harikumar, K. Narayanan, V.S. Chouhan, Sadhan Bag, B.C. Das, G. Singh, V.P. Maurya, G. Taru Sharma, Mihir Sarkar. (2017). Expression and functional role of Bone Morphogenetic Proteins (BMPs) in cyclical corpus luteum in buffalo (*Bubalus bubalis*). *General and Comparative Endocrinology*. 240: 198–213.
14. Bharati Jaya, S. S. Dangi , S. Bag, V. P. Maurya, G. Singh, P. Kumar, M. Sarkar. (2017). Expression dynamics of HSP90 and nitric oxide synthase (NOS) isoforms during heat stress acclimation in Tharparkar cattle. *International Journal of Biometeorology*, DOI: 10.1007/s00484-017-1323-3
15. Bharati Jaya, S.S. Dangi, S.R. Mishra, V.S. Chouhan, V. Verma, O. Shankar, M.K. Bharti, A. Paul, Dilip K. Mahato, G. Rajesh, G. Singh, V.P. Maurya, S. Bag, Puneet Kumar, Sarkar M. (2017). Expression analysis of Toll like receptors and interleukins in Tharparkar cattle during acclimation to heat stress exposure. *Journal of Thermal Biology* 65: 48–56.
16. Kinsuk Das, AP Madhusoodan, Bhabesh Mili, Ajay Kumar, AC Saxena, Kuldeep Kumar, Mihir Sarkar, Praveen Singh, Sameer Srivastava and Sadhan Bag. (2017). Functionalized carbon nanotubes as suitable scaffold materials for proliferation and differentiation of canine mesenchymal stem cells. *International Journal of Nanomedicine*, 12: 1–20
17. Pratheesh M.D., Dubey P.K., Gade Nitin E., Nath Amar, Sivanarayanan T.B., Madhu D.N., Somal Anjali, Baiju Indu, Sreekumar T.R., Gleeja V.L., Bhatt Irfan A., Chandra Vikash, Amarpal, Sharma Bhaskar, G. Saikumar, Sharma G. Taru. (2017). Comparative study on characterization and wound healing potential of goat (*Capra hircus*) mesenchymal stem cells derived from fetal origin amniotic fluid and adult bone marrow. *Research in Veterinary Science*. 112: 81–88.
18. Mishra S.R., Jaya Bharati, G. Rajesh, V.S. Chauhan, G. Taru Sharma, S. Bag, V.P. Maurya, G. Singh, Sarkar M. (2017). Fibroblast growth factor 2 (FGF2) and vascular endothelial growth factor A (VEGFA) synergistically promote steroidogenesis and survival of cultured buffalo granulosa cells. *Animal Reproduction Science*, DOI: <http://dx.doi.org/10.1016/j.anireprosci.2017.02.006>
19. Mehtab S. Parmar, Smruti Ranjan Mishra Anjali Somal, Sriti Pandey, G. Sai Kumar, Mihir Sarkar, Vikash Chandra and G. Taru Sharma. (2017). Expression and secretory profile of buffalo fetal fibroblasts and Wharton's jelly feeder layers. *Animal Reproduction Science*. <http://dx.doi.org/10.1016/j.anireprosci.2017.02.012>

Indian Journals

20. Yadav Brijesh, Gyanendra Singh and Alok Wankar (2017). The use of infrared skin temperature measurements for monitoring heat stress and welfare of crossbred cattle. *Indian Journal of Dairy Science*, 70(1):127-131.

2017-18

1. Bhabesh Mili, Kinsuk Das, Ajay Kumar, A. C. Saxena, Praveen Singh, Srikanta Ghosh, and Sadhan Bag (2018). Preparation of NGF encapsulated chitosan nanoparticles and its evaluation on neuronal differentiation potentiality of canine mesenchymal stem cells. *J Mater Sci: Mater Med*, DOI 10.1007/s10856-017-6008-2
2. Das K, Mili B, A P M, Saxena AC, Kumar A, Singh P, Verma MR, Sarkar M, Bag S (2017). Proliferation of canine bone marrow derived mesenchymal stem cells on different nanomaterial based thin film scaffolds. *Tissue and Cell*, 49:270-274.
3. VH Muhammed Kutty, Sanjeev Kumar Bhure, Ashish M Shende, Harikrishna Pillai, SK Ghosh, Sadhan Bag (2017). Expression of Recombinant BSP3 Protein and its Localization Studies in Buffalo (*Bubalus bubalis*) Spermatozoa. *Proceedings of the National Academy of Sciences, India Section B: Biological Sciences*, 87: 1067-1072.
4. Bibhudatta S.K. Panda, Sriti Pandey, Anjali Somal, Mehtab S. Parmar, Irfan A. Bhat, Indu Baiju, B. Mukesh Kumar, G. Sai Kumar, Vikash Chandra, G. Taru Sharma. (2017). Leptin supplementation *in vitro* improved developmental competence of buffalo oocytes and embryos. *Theriogenology*. 98:116-122. doi.org/10.1016/j.theriogenology.2017.05.008.
5. Swati Gupta, Sriti Pandey, Mehtab S. Parmar, Anjali Somal, Avishek Paul, Bibhudatta S. K. Panda, Irfan A. Bhat, Indu Baiju, Mihir Sarkar, Vikash Chandra and G. Taru Sharma. (2017). Impact of oocyte-secreted factors on its developmental competence in buffalo. *Zygote*. 25(3):313-320. [doi:10.1017/S0967199417000156](https://doi.org/10.1017/S0967199417000156).

6. Pandey S., Somal, A., Parmar, M.S., Gupta, S., Chandra, V., SaiKumar, G. and Sharma G. T. (2017). Comparative analysis of developmental and molecular correlates of developmental competence of buffalo oocytes derived from small and large follicles. *Indian Journal of Animal Sciences*. 87 (10): 1194–1199.
7. Jaya Bharati, S.S. Dangi, S.R. Mishra, V.S. Chouhan, V. Verma, O. Shankar, M.K. Bharti, A. Paul, Dilip K. Mahato, G. Rajesh, G. Singh, V.P. Maurya, S. Bag, Puneet Kumar, M. Sarkar, (2017). Expression analysis of Toll like receptors and interleukins in Tharparkar cattle during acclimation to heat stress exposure. *Journal of Thermal Biology*, Volume 65, Pages 48-56, ISSN 0306-4565, <http://dx.doi.org/10.1016/j.jtherbio.2017.02.002>. (NAAS: 8.16; TR 2.16)
8. Rajesh, Avishek Paul, S.R. Mishra, Jaya Bharati, Nipuna Thakur, Tanmay Mondal, Sanjhali Soren, S. Hari kumar, K. Narayanan, V.S. Chouhan, Sadhan Bag, B.C. Das, G. Singh, V.P. Maurya, G. Taru Sharma, Mihir Sarkar. (2017). Expression and functional role of Bone Morphogenetic Proteins (BMPs) in cyclical corpus luteum in buffalo (*Bubalus bubalis*). *General and Comparative Endocrinology* 240: 198–213. (NAAS: 8.59; TR 2.59)
9. Nipuna Thakur, Girjesh Singh, A. Paul, J. Bharati, G. Rajesh, Vidyalakshmi GM, V.S. Chouhan, S.K. Bhure, V.P. Maurya, G. Singh, M. Sarkar, Expression and molecular cloning of interferon stimulated genes in buffalo (2017), *Theriogenology*, Volume 100, 2017, Pages 50-58, ISSN 0093-691X, <http://dx.doi.org/10.1016/j.theriogenology.2017.05.027>. (NAAS: 7.99; TR 1.98)
10. Jaya Bharati, S.S. Dangi, V.S. Chouhan, S.R. Mishra, M.K. Bharti, V. Verma, O. Shankar, V.P. Yadav, K. Das, A. Paul, S. Bag, V.P. Maurya, G. Singh, P. Kumar, Sarkar M 2016. Expression dynamics of HSP70 during chronic heat stress in Tharparkar cattle. *International Journal of Biometeorology*, DOI: 10.1007/s00484-016-1281-1.(NAAS: 8.20; TR 2.20)
11. Jaya Bharati, S.S. Dangi, V.S. Chouhan, S.R. Mishra, M.K. Bharti, V. Verma, O. Shankar, V.P. Yadav, K. Das, A. Paul, S. Bag, V.P. Maurya, G. Singh, P. Kumar, Sarkar M 2016. Expression dynamics of HSP70 during chronic heat stress in Tharparkar cattle. *International Journal of Biometeorology*, DOI: 10.1007/s00484-016-1281-1 (NAAS – 8.20; IF – 2.20)
12. Nipuna Thakur, Girjesh Singh, A. Paul, J. Bharati, G. Rajesh, Vidyalakshmi GM, V.S. Chouhan, S.K. Bhure, V.P. Maurya, G. Singh, M. Sarkar, Expression and molecular cloning of interferon stimulated genes in buffalo (2017), *Theriogenology*, Volume 100, 2017, Pages 50-58, ISSN 0093-691X, <http://dx.doi.org/10.1016/j.theriogenology.2017.05.027>. (NAAS – 7.99; IF – 1.99)
13. Jaya Bharati, S.S. Dangi, S.R. Mishra, V.S. Chouhan, V. Verma, O. Shankar, M.K. Bharti, A. Paul, Dilip K. Mahato, G. Rajesh, G. Singh, V.P. Maurya, S. Bag, Puneet Kumar, M. Sarkar, (2017). Expression analysis of Toll like receptors and interleukins in Tharparkar cattle during acclimation to heat stress exposure. *Journal of Thermal Biology*, Volume 65, Pages 48-56, ISSN 0306-4565, <http://dx.doi.org/10.1016/j.jtherbio.2017.02.002>. (NAAS – 8.16; IF – 2.16)
14. ajesh, Avishek Paul, S.R. Mishra, Jaya Bharati, Nipuna Thakur, Tanmay Mondal, Sanjhali Soren, S. Hari kumar, K. Narayanan, V.S. Chouhan, Sadhan Bag, B.C. Das, G. Singh, V.P. Maurya, G. Taru Sharma, Mihir Sarkar. (2017). Expression and functional role of Bone Morphogenetic Proteins (BMPs) in cyclical corpus luteum in buffalo (*Bubalus bubalis*). *General and Comparative Endocrinology* 240: 198–213. (NAAS – 8.59; IF – 2.59)
15. Alok K. Wankar, Gyanendra Singh and Brijesh Yadav (2017) Biochemical profile and methane emission during controlled thermal stress in buffaloes (*Bubalus bubalis*). *Buffalo Bulletin*, 36:35-42. (NAAS – 6.10; IF – 0.104)
16. Dimple, V.D., Dangi, S.S., Yadav, V., Sarkar, M., Singh, G., & Maurya, V.P. (2017). Effect of Melatonin Supplementation on Haematological Parameters in Buffalo Calves under Summer Stress. *International Journal of Livestock Research*, 7(5):266-274. <http://dx.doi.org/10.5455/ijlr.20170406044224> (NAAS - 5.36)
17. Khatti, A., Mehrotra, S., Maurya, V., Singh, G., & Sarkar, M. (2017). Effect of vitamin E, selenium and increased energy allowance on steroids and reproductive performance in transition period of crossbred cattle. *International Journal of Livestock Research*, 7(12):93-100. <http://dx.doi.org/10.5455/ijlr.20170807065402> (NAAS - 5.36)
18. Vijay D. Dimple, Vidhyalakshmi G. M., S. S. Dangi, Vijay Yadav, Patel Pankaj, M. C. Pathak, M. Sarkar, G. Singh, V. P. Maurya (2017) Effect of Melatonin Supplementation on Biochemical Parameters in Buffalo Calves under Summer Stress. *International Journal of Livestock Research*, 7(11):118-125 (NAAS – 5.36)

19. Nipuna Thakur, Girjesh Singh, A. Paul, J. Bharati, G. Rajesh, Vidyalakshmi GM, V.S. Chouhan, S.K. Bhure, V.P. Maurya, G. Singh, M. Sarkar, Expression and molecular cloning of interferon stimulated genes in buffalo (2017), *Theriogenology*, Volume 100, 2017, Pages 50-58, ISSN 0093-691X, <http://dx.doi.org/10.1016/j.theriogenology.2017.05.027>. (NAAS - 7.99; IF - 1.99)
20. Jaya Bharati, S.S. Dangi, S.R. Mishra, V.S. Chouhan, V. Verma, O. Shankar, M.K. Bharti, A. Paul, Dilip K. Mahato, G. Rajesh, G. Singh, V.P. Maurya, S. Bag, Puneet Kumar, M. Sarkar, (2017). Expression analysis of Toll like receptors and interleukins in Tharparkar cattle during acclimation to heat stress exposure. *Journal of Thermal Biology*, Volume 65, Pages 48-56, ISSN 0306-4565, <http://dx.doi.org/10.1016/j.jtherbio.2017.02.002>. (NAAS - 8.16; IF - 2.16)
21. Rajesh, Avishek Paul, S.R. Mishra, Jaya Bharati, Nipuna Thakur, Tanmay Mondal, Sanjhali Soren, S. Hari kumar, K. Narayanan, V.S. Chouhan, Sadhan Bag, B.C. Das, G. Singh, V.P. Maurya, G. Taru Sharma, Mihir Sarkar. (2017). Expression and functional role of Bone Morphogenetic Proteins (BMPs) in cyclical corpus luteum in buffalo (*Bubalus bubalis*). *General and Comparative Endocrinology* 240: 198-213. (NAAS - 8.59; IF - 2.59)
22. Jaya Bharati, S.S. Dangi, V.S. Chouhan, S.R. Mishra, M.K. Bharti, V. Verma, O. Shankar, V.P. Yadav, K. Das, A. Paul, S. Bag, V.P. Maurya, G. Singh, P. Kumar, Sarkar M 2016. Expression dynamics of HSP70 during chronic heat stress in Tharparkar cattle. *International Journal of Biometeorology*, DOI: 10.1007/s00484-016-1281-1 (NAAS - 8.20; IF - 2.20)
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Financial Statement

Expenditure under CAFT during 2016-17 to 2018-19

Head	2016-17 (Rs. in lakh)	2017-18 (Rs. in lakh)	2018-19 (Rs. in lakh)
Operating cost of Training Programme	5,20,214.00	6,36,631.00	9,81,071.00
Recurring Contingency	2,59,199.00	2,94,743.00	1,91,571.00
Non Recurring Contingency	-----	-----	-----
T.A.	18,723.00	26,683.00	36,910.00
Library	-----	34,000.00	-----
Total Expenditure (Rs.)	7,98,136.00	9,92,057.00	12,09,552.00
Funds allotted (Rs.)	12,00,000.00	17,98,000.00	24,63,000.00

Manual / compendium published

Manual / compendium published year wise:	Year
<ul style="list-style-type: none">• UPSTREAM REPRODUCTIVE TECHNOLOGIES FOR AUGMENTATION OF LIVESTOCK PRODUCTION (01.09.2017-21.09.2017)• RECENT ADVANCES IN STRESS GENOMICS FOR LIVESTOCK PRODUCTION (09.01.2018-29.01.2018)	2017-2018
<ul style="list-style-type: none">• ACCLIMATIZATION AND ADAPTATION OF HIGH ALTITUDE LIVESTOCK IN CHANGING CLIMATIC SCENARIO (01.06.2018 to 21.06.2018)• APPLICATION OF GENOMIC TOOLS IN UNRAVELING PHYSIOLOGICAL PROCESSES (29.01.2019 to 18.02.2019)	2018-2019
<ul style="list-style-type: none">• EMERGING CONCEPTS AND BIO-TECHNIQUES FOR AUGMENTING LIVESTOCK PRODUCTION: PHYSIOLOGICAL PERSPECTIVES (20.08.2019 to 09.09.2019)• NEURO-ENDOCRINE REGULATION OF LIVESTOCK PRODUCTION: PROSPECT AND RETROSPECT * (28.01.2020-17.02.2020)	2019-2020

* to be conducted