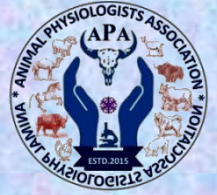
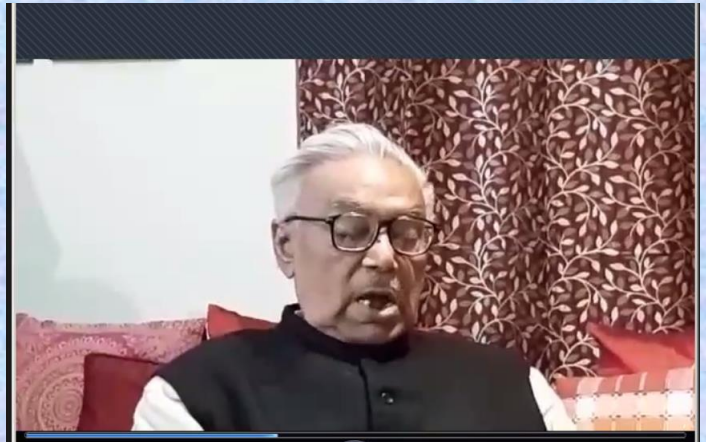




*Proceedings of the National webinar held on the occasion of golden/silver jubilee celebrations of the Division of Physiology and Climatology/ Centre of Advanced Faculty Training in Veterinary Physiology (25.11.2020)*

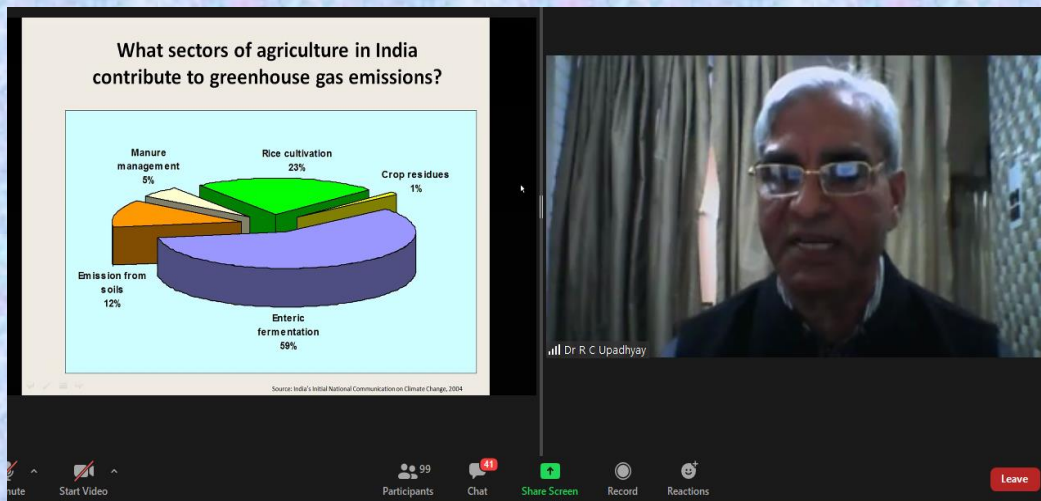


One day **National webinar** on **“Role of Animal Physiology Towards National Food Security Through Production Enhancement”** was organized on 25<sup>th</sup> November, 2020 to commemorate the golden/silver jubilee celebrations of the Division of Physiology and Climatology/ Centre of Advanced Faculty Training in Veterinary Physiology under the aegis of Animal Physiologists Association. During the Inauguration, honorable Director cum Vice-Chancellor, ICAR-IVRI applauded the performance of the Division of Physiology for carrying out translational research work in the area of embryo transfer technology and stem cell technology and also offered his tributes to the stalwarts for their contributions and efforts in making the foundation of the division of Physiology and Climatology stronger. Dr N. K. Bhattacharya (founder head) and Dr B. B. Mahapatro sent their wishes through video recorded messages in this online platform. Dr D. C. Shukla and Dr V.P. Varshney graced the occasion with their presence and briefly shared their experiences and congratulated the current HD and her entire team from Division of Physiology and Climatology. Dr G Taru Sharma, head of the division of Physiology and Climatology, the Director CAFT cum president APA detailed the golden history of the division of Physiology and Climatology, activities and the silver journey of CAFT and highlighted the importance of the current theme of a webinar in the present scenario. Dr Gyanendra Singh, General Secretary APA and principal scientist, proposed welcome address to the virtual house and the profile, mandate and objectives of APA too. Dr Vikash Chandra, senior scientist and the treasurer APA, proposed the vote of thanks.



The first technical session was chaired by Dr D.C. Shukla, former Director, CAFT in Veterinary Physiology, and Dr. Kusumakar Sharma, former Assistant Director-General (HRD). Dr R.C. Upadhayay, former head of the division of Dairy Cattle Physiology, National Dairy Research Institute, Karnal, delivered lecture on **“Livestock and the climate change”**. Dr Vikash Chandra, and Dr Hari Abdul Samad, co-ordinated the session-I and session rapporteurs were Dr Mahesh Gupta, Assistant Professor, MAFSU, Nagpur and Dr.

Bhabesh Milli, Assistant Professor, CAU, Imphal. Dr D.C. Shukla emphasized the role of physiology, being a mother discipline, in meeting up the challenges put forth by the climate change. The technical lecture was given by nationally acclaimed stress physiologist and Dr R.C. Upadhayay detailed the opportunities and challenges involved in securing food security through animal production enhancement. Dr R.C. Upadhayay also emphasized the importance of assisted reproductive techniques and livestock management practices for further improving the biological and biophysical potential of native cattle and buffaloes. He suggested the possible solutions for achieving food security under



the global climate change as increasing the growth efficiency, optimizing the nutrient utilization, reducing the age of maturity, restriction of antimicrobials, good feed and fodder management, remote sensing for animal disease surveillance and monitoring. He discussed the critical components involved in ensuring food security including the dairy production and milk processing, increased use of clean energy, manure and farm waste management and entrepreneurship in animal husbandry and dairying sector. Dr R.C. Upadhayay finally concluded that improved, green and scientific livestock and dairy products will lead to better human health and well being. Invited lecture was followed with panel discussion for valuable inputs from the distinguished panellists all over the country. Dr. K. P. Agarwal, former national co-ordinator NAIP, Dr Leela Venkata Subramanian, the Professor and Head, Department of Veterinary Physiology, TANUVAS, Chennai, Dr M.Narayana Swamy, Professor and Head, Department of Veterinary Physiology, KVAFSU, Bidar, Dr. Sohanvir Singh, Principal scientist, division of dairy cattle physiology, National Dairy Research Institute, Karnal, Dr Vijay Kumar Bharti, Scientist, DRDO were the panelist for the session. The session concluded with the final remarks of panel chairs Dr D.C. Shukla and Dr Kusumakar Sharma. The session was co-ordinated by Dr. Vikash Chandra and Dr. Hari A. Samad while Dr. Babesh Mili and Dr Mahesh Kr. Gupta acted as rapporteurs.

Technical session-II started was chaired by Dr C.S. Prasad, former Director NIANP, and Dr Suresh S. Honnappagol, former Animal Husbandry Commissioner. Dr P.C. Sanwal, former director CAS, division of



Veterinary Physiology and Climatology, Dr D.K. Nandy, the former principal scientist, CIRG-Makhdoom, Dr Shrikant Tyagi, former Director Central Institute for Research on Cattle, Meerut, Dr Anubha Barua, Professor and Head, Department of Veterinary Physiology, College of Veterinary Science, Khanapara, Guwahati, were the panelist of the session. The session was coordinated by Dr. Vikrant Singh Chauhan and Dr T.Yasotha. Dr Mansi Shukla, and Dr Devendra Pathak were the session rapporteurs.

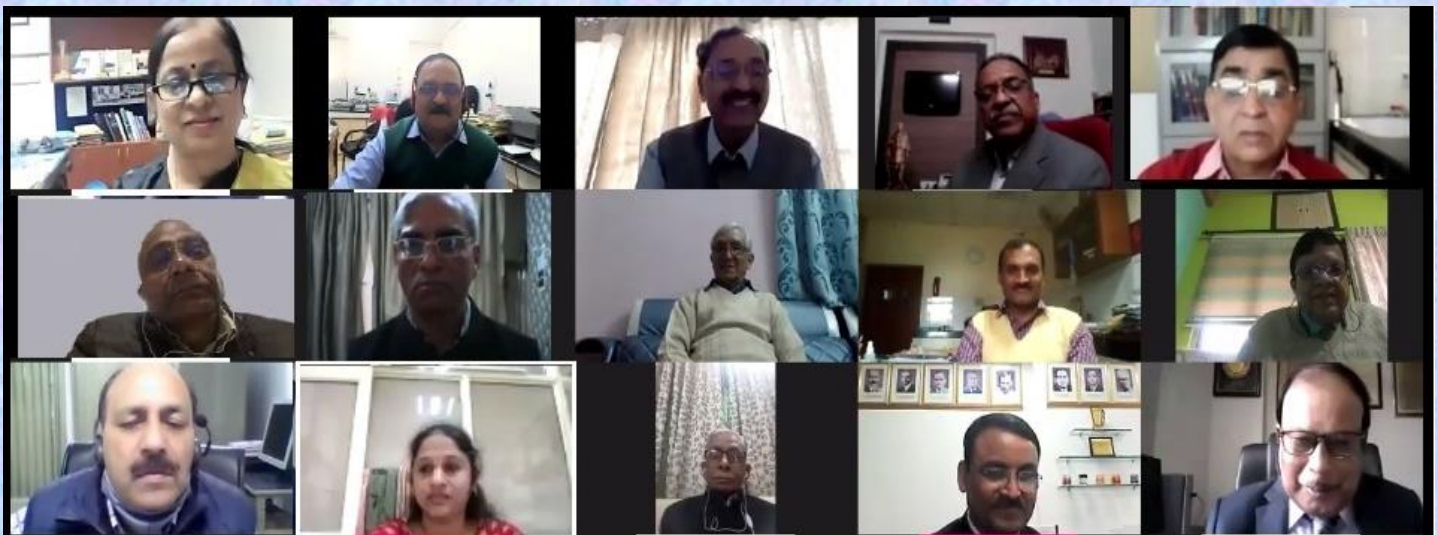
In the concluding session Dr K. M. Bujarbaruah, former Deputy Director General (Animal Sciences) and former Vice-Chancellor of AAU was the chief guest and Dr C.S. Prasad and Dr Suresh S. Honnappagol were the guest of honours and honourable director cum vice-chancellor ICAR-IVRI, Dr B. P. Mishra presided over the function. Dr K. M. Bujarbaruah, the distinguished chief guest in his key address mentioned the importance of food security over the growing population, deteriorating soil health, diminishing water resource and malnutrition. Dr K. M. Bujarbaruah also mentioned the significance of developing climate-resilient animals, reducing methane production, understanding the physiology of indigenous livestock population



including the adaptability in heat stress condition, assisted reproductive technologies in meeting the challenges faced by changing climate scenario. Digital version of the compilation of two booklets for celebrating the golden jubilee of the division of physiology and climatology and the silver jubilee of CAFT-veterinary physiology was released by the chief guest of the function.

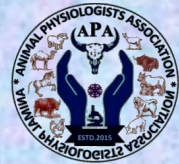
Dr C.S. Prasad, in his key address emphasized the importance of studying the effect of heat/cold stress and formulation of mitigation strategies to combat climate change for improving the animal production. The director cum vice-chancellor Dr B. P. Mishra in his presidential address praised the achievements and evolution of the division of physiology and climatology under the successful leadership of heads of the division and also

emphasized the importance of research in inter-disciplinary collaboration. Dr G. Taru Sharma, HD P&C/Director CAFT in her key address conveyed gratitude to the stalwarts of the field and narrated the commendable works carried out in the division of P&C, IVRI during last 50 years, including the establishment of a first climatic chamber in south-east Asia, development of radio-immune assay techniques, pioneer works in assisted reproductive techniques including in-vitro fertilization, embryo genomics, development of cell lines and embryonic and adult stem cell research along with nanotechnology and gene knock-in and knock out approach, using the upstream techniques for production enhancement. Dr. G. Taru Sharma also briefed about the importance of animal production in securing national food security amidst the global climate change scenario. The welcome address was given by Dr. Gyanendra Singh while Dr Hari Abdul Samad presented formal vote of thank.



Following **recommendations** came out from the one day webinar:

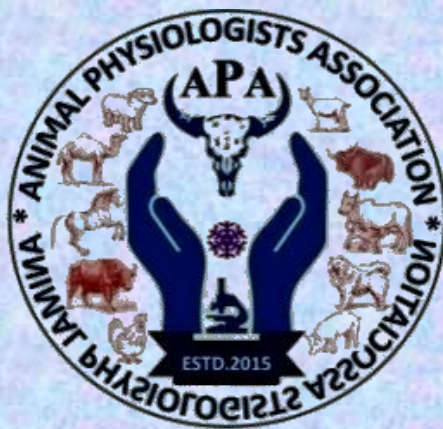
- It is required to have a multidisciplinary approaches including animal and agriculture science streams to address the contemporary challenges associated with livestock feed and fodder.
- Need to insure precision feeding of the animals to exploit the maximum production with available resources.
- Phenotypic, geneomic, transcriptome, proteome and metabolome based data should be generated to decipher the animal adaptation/ adaptive changes so as to develop strategies at the earliest.
- Immune merits of indigenous livestock and underlying reasons to counteract the stress should be explored and documented.



- Role of sweat glands in heat stress adaptation in different breeds of cattle and other species should be studied in more depth and detail.
- Epigenomic changes should be investigated to scale the stress cushioning effect of indigenous breeds of livestock towards different production and environmental challenges for sustainable production.
- Adaptation Physiology with special reference to extreme agro-climatic zones including high altitude as well as extreme desert should be included in PG teaching.
- Identifying bull fertility markers to select elite bulls and nation standards should be developed.
- Research on manipulation of ruminant micro-biota to reduce the methanogenesis contributed by livestock should continued further to evolve a carbon neutral farming systems.
- Assisted reproductive technology should be catch hold to disseminate indigenous germplasms of higher genetic merit to the farmers.

### WAY FORWARD

Emphasis should be given on generation of strong scientific data-base with respect to livestock physiology for the support and reference of policy makers while framing the roadmaps to ensure nutritional and livelihood security. Intense research is warranted to tap the resilience and productive efficiency of indigenous and locally available animals to frame the work plan for the sustainable livestock production in the era of climate change. Selection of agro climatic zone based resilient animals would be a long set goal in a way forward, before that ample set of validated scientific data should be generated to go ahead for climate smart agriculture. A two way approach is needed by blending the cutting edge research like annotation technologies at different strata of genomic and functional workflow (genomics, transcriptomics, proteomics, metabolomics) and assisted reproductive technologies with basic animal physiological and productive parameters.



*With Best Complements from APA*