NATIONAL WORKSHOP ON LIVESTOCK BUSINESS OPPORTUNITIES IN INDIA AND ABROAD

Before the commencement of the Technical Sessions of the International Conference, a very interesting ICAR sponsored National Workshop on “Livestock Business Opportunities in India and Abroad” took place on the First Day. Chairman for this Workshop was Dr Antonio Rota, International Fund for Agriculture Development (IFAD) of UN, Rome, Co-Chairman was Dr John Casius Moreki of Botswana and Moderators were Dr Ravi Kumar, National Innovative Foundation, Ahmadabad and Dr. John Abraham, Kerala Veterinary & Animal Sciences University.

Sixteen Speakers from the above organisations, representatives from well-known Indian livestock product and infrastructure/feed manufacturing/production corporate entities, main rural financing organisation NABARD, as well as, veteran Indian livestock and poultry experts spoke on the challenges to and opportunities for initiating and development of livestock based business, followed by lively discussion and suggestions from the floor.

Some of the salient recommendations that emanated from this Workshop are as follows –

- practice of IFAD business model for financing livestock investment projects and the part of poultry in developing countries, elements related to goat value chain development, livestock opportunities in Southern Africa development community, National Information Foundation (NIF) initiatives towards indigenous innovations in livestock production systems, global and Indian prospective business outlook in animal health, business opportunities to meet the diverse constraints to livestock production in India and rural livelihoods through commercial organisation of small farmer livestock and backyard poultry rearing.

Also enlightened were the support activities and models from NABARD for small to large scale livestock and poultry farming and allied activities, strengthening of dairy farming through value chain process, financial support from banking and other supporting agencies in livestock sector, animal health products industry, tax provisions for livestock enterprises, automation in dairying, automation for the complete diets and Trade Marks Regime (TMR) preparation etc. An important issue that came out of discussion was the need for a central accreditation agency in India for monitoring and certification of various livestock and livestock products to meet the international protocol standards.

INTERNATIONAL CONFERENCE, ISAPM, TECHNICAL SESSIONS ORGANISED

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Dr Paulo Salgado | Dr Datta V Rangnekar | Dr Ramachandran Natesan | Dr S Venkata Seshiaah

Lead Papers presented: 7 / 8 | Research Abstracts presented: 27 / 100

**TS – IV**  
Information Technology in Livestock Production

*Chairman* | *Co-Chairman* | *Moderator 1* | *Moderator 2*
---|---|---|---
Prof Krishna Reddy | Dr C. Trace | Dr Vivek Patil | Dr A.P. Ruhil

Lead Papers presented: 5 / 5 | Research Abstracts presented: 11 / 11

**TS – V**  
Livestock Physiology, Nutrition and Feeding

*Chairman* | *Co-Chairman* | *Moderator 1* | *Moderator 2*
---|---|---|---
Prof Metha Wanapat, Prof (Dr) Vishnu Sharma | Dr. WAD Nayananjali | Dr Hari Krishna

Lead Papers presented: 6 / 7 | Research Abstracts presented: 41 / 107

**TS – VI**  
Livestock Genetics and Breeding

*Chairman* | *Co-Chairman* | *Moderator 1* | *Moderator 2*
---|---|---|---
Prof John Williams | Dr. Satish Kumar | Dr. Subhash Sahu | Dr Kalyan Chakravarthi

Lead Papers presented: 8 / 9 | Research Abstracts presented: 31 / 77

**TS – VII**  
Livestock Reproduction Management

*Chairman* | *Co-Chairman* | *Moderator 1* | *Moderator 2*
---|---|---|---
Dr Sandeep Goel | Prof Dr KNWadhawani | Dr Tirumala Rao, Talluri | Dr N Rajanna

Lead Papers presented: 3 / 3 | Research Abstracts presented: 29 / 53

**TS – VIII**  
Livestock Health and Emerging Diseases

*Chairman* | *Co-Chairman* | *Moderator 1* | *Moderator 2*
---|---|---|---
Dr MM Kailas | Dr PK Dogra | Dr. Ninan Jacob | Dr D Suresh Babu

Lead Papers presented: 2 / 3 | Research Abstracts presented: 10 / 41

**TS – IX**  
Value Addition, Post Production Technologies and Economics

*Chairman* | *Co-Chairman* | *Moderator 1* | *Moderator 2*
---|---|---|---
Dr K K Saharia | Prof (Dr) Sanjita Sharma | Dr Bindu Madhuri | Dr Vijaya Bhaskar Reddy

Lead Papers presented: 2 / 4 | Research Abstracts presented: 29 / 69

**TS – X**  
Veterinary Education-Indian and global perspectives

*Chairman* | *Co-Chairman* | *Moderator 1* | *Moderator 2*
---|---|---|---
Dr SS Nagra | Prof A L Saini | Dr Suresh Rathod | Dr Asha Latha

Lead Papers presented: 3 / 3 | Research Abstracts presented: 29 / 53

**KNOWLEDGE POOL OF THE CONFERENCE**

In all 47 lead papers (90%) and 244 (43%) of research papers received were presented by livestock specialists from India and abroad followed by discussions and suggestions. All the lead papers and abstracts, however, are presented in separate compendia (both soft and hard copies) entitled “INDIGENOUS” edited by Prof K Sarjan Reddy, Dr RMV Prasad and Dr Anand Rao and “Abstract Souvenir” edited by Prof D Sreekumar, Dr Ninan Jacob, Prof M Mahender and Dr N Rajanna. Adding to the research information pool of the Conference is the Special Publication of ISAPM (released on the First Day) at the Inaugural Function entitled “Livestock Production under Diverse Constraints: Indian Experience in its Management” comprising of 114 research review articles from specialists across India (630 pages). Chief Editor of this book is Prof DrNSR Sastry assisted by Editors Dr R Roychoudhury, Dr D Sreekumar, Dr KNWadhwani and Dr G Ravikiran.

**RECOMMENDATIONS OF THE CONFERENCE FOR EDUCATION, TRANSFER OF TECHNOLOGY AND RESEARCH**
**TS - I: Animal Welfare, Behaviour and Ethics**

1. The terms ‘Animal Welfare’, ‘Animal Behaviour’ and ‘Animal Ethics’ have to be clearly defined with respect to commercial and small farmer livestock production at appropriate fora and by agencies not only at the Indian national level but at the regional and World levels.
2. Combining tradition with modern technologies, production systems have to be developed for different agro-geo-climatic zones keeping in mind the farmers’ goals, namely – welfare, conservation, commercial production, livelihood security etc.
3. Standards or codes of animal welfare measures for each system, species and scale and nature of farming have also to be developed by such fora.
4. Crucial is deciding on the appropriate agencies at provincial and national level that would monitor implementation of such standards with some statutory authority to decide on the steps to be taken when such standards are violated.
5. Importance of animal welfare, behaviour and ethics have to be regularly conveyed to the farmers via appropriate means – media, training, meetings, demos – so that everyone is aware of the importance of contented animals for good production.
6. Similarly veterinarians, para-veterinary staff and all others concerned with livestock have also to be educated and given refresher training on a regular basis.
7. Indigenous knowledge and technology with respect to animal welfare have to be collected in an unbiased and unambiguous manner, recorded and conserved for the benefit of the future generations.

**TS II: Changing Climate- Global Perceptions on Indian livestock Production systems towards the Global Warming**

1. Development of “green” livestock production systems based on reduction of enteric methane genesis mainly through manipulation of feeding and thermal ameliorator housing and management for livestock and poultry is the recourse available to livestock farmers in India.
2. There is considerable scope for developing region and breed/type/species specific fodder varieties resilient to extremes of weather, especially in the vast dry regions of the country, and cultivable round the year. Packages of environment friendly soil, water and crop management have to be developed and transferred to the farmers. In this legumes – wild, existing or newly developed are crucial.
3. Adoption of nutrition-feeding strategies like – inclusion in rations of oils and fats, certain chemicals, plant secondary metabolites, probiotics, use of fortified complete feed blocks, total mixed rations, newer feeds screened for suitability via Near Infrared Reflectance Spectroscopy, phytogenic feed additives (common Indian herbs and spices), use of intrruminal hydrogen sinks, ‘vaccination’ against rumen methanogenesis etc.
4. Exploration of proper carbon sequestration strategies, shelter and waste management to reduce impact of climate change on livestock production.
5. Need for undertaking extension and services to ensure implementation of such measures at small farmer livestock farms that abound in the country.

**TS – III: Precision Livestock Farming-Commercial models vis-a-vis small holder production systems:**
1. Use of Precision tools for enhancement of livestock productivity by optimizing the resources by central and regional organisations but involving small farms too.

2. Area specific adoptable technologies for overall development of livestock production, especially that of small farmers and small ruminants.

3. Woman oriented livestock farming with technical inputs in the form of methods such as Near-Infrared Spectroscopy etc., to give the estimation of feed input values so as to go for improved feeding systems.

4. Training programmes for women should be practical oriented, considerate to their perceptions and convenience (venue, time and trainer profile wise).

5. Undertaking necessary departure from conventional ToT approach – recommendations should be situation and area specific and socio-economically adaptable. Soil management has to be part of such activities.

6. There is a big need to study livestock production considering prevailing main and secondary systems in different areas and with different socio-economic strata. A country wide database of such information has to be developed.

7. Need for in-depth understanding of the reasons for low level adoption of scientific recommendations and technologies, perceptions of women farmers, and involving farmers in research programmes from the beginning.

**TS – IV: Information Technology in Livestock Production**

1. It was felt that very little usage of the revolutionary Information Technology Sciences is made in the field of livestock production and management, which has to change well and soon.

2. The scope for this is vast – use of Decision Support System and Expert Systems to develop actionable advisory to livestock farmers.

3. The deliberations held in the session reemphasized the need of awareness creation about various improved technologies available and the importance of making them more accessible to the needy farmers.

4. It was also felt that the Spot Learners should be encouraged through modern gadgets in making the technologies more accessible.

5. E-learning technologies for veterinary students as well as farmers, livestock behaviour monitoring and welfare via sensor-based technologies, automation in livestock management practices, modern technology support in livestock product manufacture, market information system and database creation in breed conservation, grazing/feed resources etc. are seen as actionable practices for the country, in fact other developing countries.

6. Research is needed into animal identification based precision livestock farming, especially animal health care, via web and mobile based two-way livestock information systems. In this, and in view of the rural illiteracy, utilisation of services of educated rural youth is seen as a distinct possibility.

7. On the one hand, there is need for developing appropriate curriculum mapping tools and using learning analytics, while on the other hand, the need for creation of awareness, accessibility and availability of information among scientists, field officials and farmers.

**TS-V: Livestock Physiology, Nutrition and Feeding**

1. The session focused on the advanced technologies and concepts like nutraceuticals, feed supplements, hydroponics, housing models in relation to environmental zones, management of feeding schedules etc., and recommended the concept of adopting the non-conventional feeding approaches to mitigate the nutritional deficiencies.
2. Indigenous breed promotion to resist the effect of environment on production and boosting the research through improved funding on production improvement and also giving importance to make them reach the farmers.

3. While a lot of information on nutritional features of indigenous livestock, indigenous feeds, processes, feeding techniques, fodder cropping and dry fodder enrichment methodologies are available within the country, there is need for orderly compilation of the same de novo. More crucial is our inability to carry the same to the farmers properly and, to some extent, to the feed industry.

4. Demonstrations of such processes at the farmers’ farm level are not to the same extent as that seen in the agriculture (crop farming) sector. We have to improve this situation.

5. Location specific feeding systems, mineral mixtures and feed supply linkages have to be developed to obtain optimal average daily weight gains and production of local livestock have to be developed.

6. Feeds and feeding techniques have to be eco-friendly aimed at minimal enteric methane emission.

**TS-VI: Livestock genetics and Breeding**

1. The deliberations were held on the bio technological approaches for efficient livestock production and management, genomics etc. The need of creation of genomic research teams was recommended.

2. Collaborative studies among institutions with emphasis on extension and other related fields are suggested to be undertaken to give the technological advances a farmer’s orientation.

3. Making the conservation data as precise and as valid as possible, especially in in-situ conservation and creation of appropriate data base are essential.

4. There is a lot of scope for creations of breed conservation infrastructure on scientific basis, including appropriate training of workers and farmers on the procedures and protocols to be followed.

5. We are much behind in use of molecular level information and procedures in breed conservation and improvement that needs correction as early as possible.

6. Inter-state and international collaborations are required for making genetic improvement of livestock and poultry in the fields of exchange of information, experiences and genetic material.

**TS – VII: Livestock Reproduction Management**

1. The session deliberated on the recent protocols on the synchronization of estrus, embryo transfer technology and traditional and new solutions to overcome reproduction disorders of buffaloes and other livestock.

2. It was resolved to recommend the maintenance of superior germ plasm and elite bull mother farms to improve the reproductive efficiency and advised to take the same on area specific basis. In this the physical, physiological and sterile (infection wise) nature of the semen to be assured by following orderly protocols.

3. Enhancing reproduction efficiency in livestock in general and buffaloes and high yielding cows in particular, have to be based mainly on rectifying nutritional and feeding related issues discussed in the other Technical Sessions. Measures of balanced rations, complete feeds, green fodders including legumes, areas specific mineral mixtures, overcoming micronutrient imbalances were suggested.

4. In dairy animals, especially buffaloes, inadequacies in heat detection and insemination at the appropriate time(s) and overcoming these issues by appropriate management have been suggested, as this is the single most common concern. This calls for better outreach and quality of insemination service in the villages.
5. Also considered are the measures of early diagnosis of infertility due to specific and non-specific causes and overcoming the same by appropriate measures.

**TS – VIII: Livestock Health and Emerging diseases**

1. It was recommended that India’s age old proven ethno veterinary practices may be put into practice and also to reduce the use of antibiotics indiscriminately.
2. Need, and ways and means of assuring biosecurity and control of emerging diseases, creation of value chain systems, following the principles of risk analysis, hazard identification, risk assessment, management and communication were emphasized.
3. Because of wider acceptability and coverage (outreach) and economic reasons use of various Indian (*Ayurveda*) and traditional herbs and biotech products – ethno-veterinary practices – that have a remedial effect for the need to be widely used, especially in the light of excessive use of antibiotics that affect product quality as human food, besides building up undesirable antibiotic resistance.
4. The herbs *Tulsi* and *Turmeric* supplemented @ 0.5% and 0.4% respectively are effective in mitigating the changes in blood constituents induced due to heat stress. Feeding 1.9% condensed Tannin through oak leaves based diets reduced gastrointestinal nematode loads in goats without any adverse effects.
5. A thorough database and ‘dos’ and ‘don’ts’ as regards wide usage of antibiotics and anthelmetics has to be developed and made accessible to all veterinary practitioners.
6. Main recommendations of the session are –
   a) *India*: Indiscriminate use of antibiotics in treating infectious diseases needs to be stopped. Foot-rot in sheep caused by *Dichelohacternodus* needs further extensive investigations to contain its spread.
   b) *Asia*: Scientific validation and documentation of Etno Veterinary Practices used in the field needs to be done.
   c) *Global*: Emerging diseases need to be identified and categorized as a hazard, the risk and loss has to be assessed, and proper management policies need to be formulated and also communicated and put in practice among the farmers to avoid its further spread to other states and nations.

**TS – IX: Value addition, Post production technologies and Economics**

1. The session emphasized and recommended the analysis of pesticide residues in the livestock products so as to make them more market acceptable. The development of simple farmer oriented and easily adoptable technologies are agreed to be the need of the hour.
2. It was found that residues of pesticides like Endosulfan were not found in milk and milk products analysed in Chittoor dist of A.P; where as in Rajasthan 0.6 per cent of milk samples had shown above MRL values for organochlorine pesticide residues, and in the feed and fodder very low concentrations of BHC while chloropyriphos in milk samples analysed in Gulbarga district of Karnataka. Hence all India standard protocols have to be designed in this regard,
3. It was recommended to create a nationwide data base of levels of pesticide residues to create consumer awareness. International health standards are felt to be achieved to give Indian livestock products a global brand.
4. Weaning of piglets at 40 days is better (in terms of obtaining better carcass quality). In fact, economic importance of value of weaning and management fattener pigs and small ruminants as
well as post-production technologies of animal produce and utilization of animal products were suggested for revisiting and deciding for each region.

5. Post milking teat dipping can be effectively used to reduce the somatic cell count in milk and to increase the daily milk yield marginally.

6. Conditioning of poultry excreta improves the bio-gas production efficiency-so farmers can establish simple bio-gas plant and produce bio-gas at cheaper cost.

7. Some feeding manipulations that can result in better yields are – a) Feed incorporated with poultry carcass meal giving good results in their performance and economical also; b) Supplementation of Aloevera powder at the rate of 0.5 % yielding better growth and carcass composition of broilers. c) Dietary supplementation of curry leaf or turmeric powder in combination with linseed oil to broiler chicks for six weeks. d) Rabbits rised with 5 % spirulina and 3% thyme supplementation yielded better wool quality.

8. Adoption of simple processes the livestock produce like meat and milk into various value added meat and milk products that give higher profits.

9. Similarly practicable methods of organic livestock farming, use of traditional cow dung-urine based organic plant elixirs and pesticides, have to be propagated widely.

10. Simple and farmer friendly technologies have to develop for conversion of livestock produce into value added livestock products which increase the profits to producers and also benefit to consumer.

11. Provide the curriculum regarding the different post production technologies of livestock produce, marketing and economics. Better and simple scientific management methods adopted at rural level that increase the economic status of the producer. Implementation of technologies is very important - identify those technologies and motivate the farmers for adoption of technologies in appropriate channels.

12. A national wide data base has to create for pesticide and toxic residues entering into different livestock products.

**TS – X: Veterinary Education-Indian and global perspectives**

1. The session deliberated on various components of imparting the education to not only the students but also to the farmers, trainings and hands on skill development.

2. Suggested steps were – a) Massive open online courses on knowledge ‘cloud’ mode; b) Digitalization of veterinary libraries and other knowledge sources; c) Fine-tuning veterinary curriculum to meet challenges of Indian livestock farming and industries, which should also take into consideration of the perceptions of the immediate past veterinary students towards e-learning; d) Classrooms to be well equipped for e-learning for individual students.

3. Veterinary and animal sciences subject wise professional associations too have to pay a key role in formulation of veterinary curriculum with national, regional and international perspectives. This came into focus based on discussions on presentations about veterinary education systems in UK, USA and Europe in comparison with that in India.

4. Veterinary education system has to act as a motivation force for the students rather than preparing for a salaried job only. For a similar reason continuous education and refresher courses have to be standardized and regularized for field veterinarians for the country as a whole. In this care has to be taken of professional needs specific to the regions.

5. At present examination of MVSc students is based on his/her work and theory, which should be made more practical based, like knowledge of facing different field/professional situations.

6. Research emphasis has to be more on producing livestock products of good quality and quantity based on a consortium basis – cooperation across departments.
The perennial problems of shortage of infrastructure and manpower resources in veterinary and animal sciences Education, Research and Development organizations has to be solved in near future, on installment basis to begin with.

The recommendations may look specific to India, but are common to sister developing countries and the World livestock sector as a whole.

(Sd) CHAIRMAN
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Conference - Chief Patron
Editor-in-Chief, IJAPM

(Sd) CO-CHAIRMAN-1
Prof Dr K Sarjan Reddy
Conference - Organising Secretary
President, ISAPM

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