

PROCEEDINGS

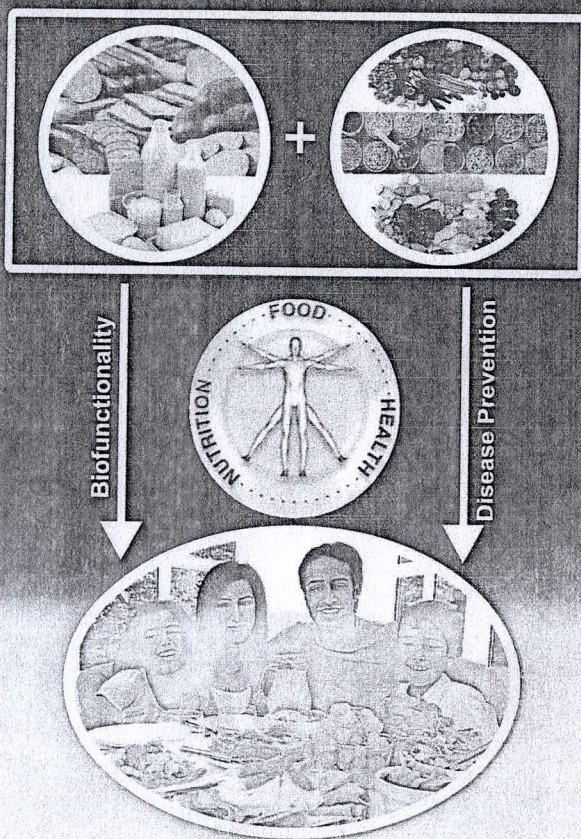
BRAIN STORMING SESSION

on

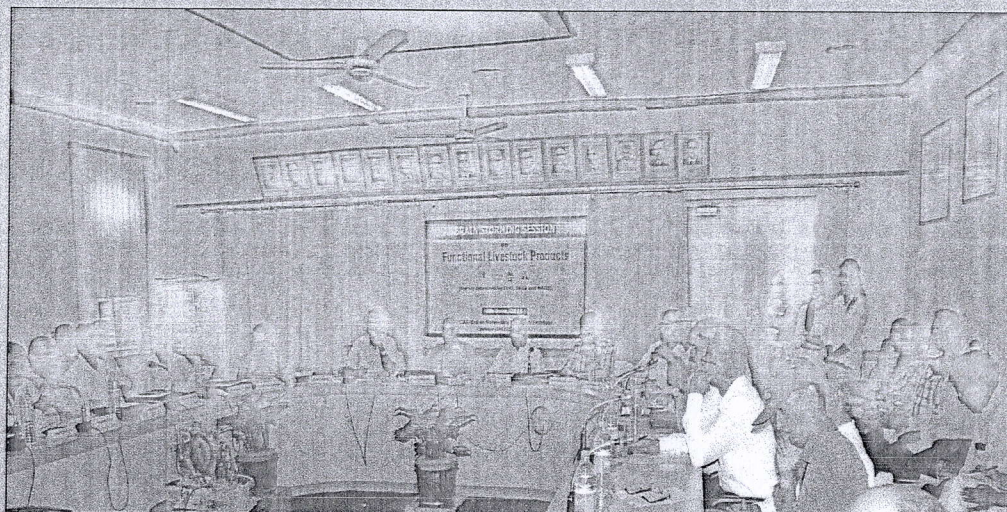
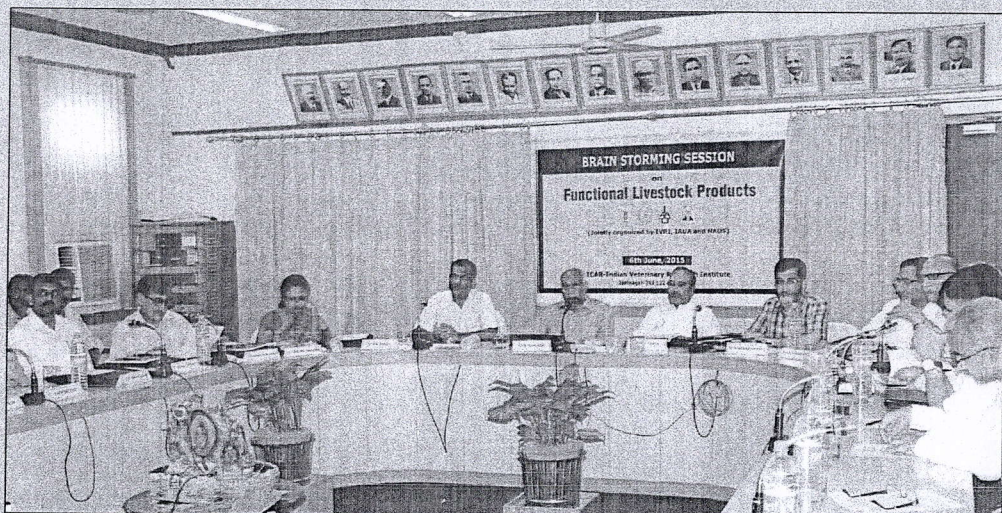
Functional Livestock Products

(Jointly Organized by IVRI, IAUA and NADS)

6th June, 2015



ICAR-Indian Veterinary Research Institute
Izatnagar-243 122 (UP) INDIA



PROCEEDING

Brain Storming Session on FUNCTIONAL LIVESTOCK PRODUCTS

6th June, 2015



(Jointly Organized by IVRI, IAUA and NADS)

ICAR- Indian Veterinary Research Institute
Izatnagar-243 122 (U.P.)

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Director, NDRI, Karnal

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Director, IVRI, Izatnagar

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Head, Div of LPT, IVRI, Izatnagar

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Dr Suman Talukdar
Scientist, Div of LPT, IVRI, Izatnagar

Proceedings of the Brain Storming Session on Functional Livestock Products

Foods of animal origin are not only required for body development, growth and maintenance but are also recognized to play a pivotal role in the quality of life. This has led to the concept of functional foods that might improve the health and/or reduce the risk of diseases. The functional food sector is undergoing significant changes with infusion of advanced food technologies for optimal human health. During last decade, efforts have been made to develop functional milk and meat products in ICAR Institutes as well as SAUs to maximize the popularity of livestock products. However, no co-ordinated efforts have been made to formulate effective strategies to further improve and popularize the functional role of livestock products.

Considering the importance and requirements of functional foods, Indian Veterinary Research Institute organized a Brain storming session on "Functional Livestock Products" in collaboration with Indian Agricultural Universities Association of (IAUA) and National Academy of Dairy Sciences (NADS) to address the relevance of functional foods in Indian perspective through appropriate amalgamation of scientific knowledge in livestock products.

The following person participated in the Brain Storming Session.

1. Dr. R.K. Singh, Director, ICAR-IVRI, Izatnagar
2. Dr. Nagendra Sharma, Former-VC, SKUAST, Jammu
3. Dr. R.P. Singh, Executive Secretary, IAUA New Delhi
4. Dr. Sarfaraz Ahmed Wani, Dean, FVSc, SKUAST, Kashmir
5. Dr. M.K. Agnihotri, PS and COE, ICAR Headquarter
6. Dr. S.K. Mendiratta, Head, LPT Div., IVRI, Izatnagar
7. Dr. S.V.S. Malik, PS, VPH, IVRI, Izatnagar
8. Dr V. P. Singh, JD (Acad), IVRI, Izatnagar
9. Dr. B.P. Mishra, JD (Res), IVRI, Izatnagar
10. Dr. V.K. Gupta, JD (CADRAD), IVRI
11. Shri. Shaju V.A., Manager, R&D, Kancor Ingredients Ltd., Kerala
12. Dr. Ramesh Chandaran, Scientist (QC), Kancor Ingredients Ltd., Kerala
13. Dr. Meena Sharma, Dietician, Bareilly
14. Dr. Manish Chatli, HOD, LPT, GADVASU, Ludhiana
15. Dr. B.M. Naveena, Sr.Scientist, NRC on Meat, Hyderabad
16. Dr. (Ms) Bimlesh Mann, Head, DC, NDRI, Karnal
17. Dr. (Ms) Latha Sabikhi, Head, DT, NDRI, Karnal
18. Dr. Sudhir Tomar, Principal Scientist, Dairy Microbiology, NDRI
19. Dr. A.K. Singh, Principal Scientist, DT, NDRI, Karnal (Rapporteur)
20. Dr. Vikas Pathak, Head, LPT, DUVASU, Mathura
21. Dr. B.D. Sharma, Former Head, LPT Div, IVRI, Izatnagar

22. Dr. R.C. Keshri, Retd. PS, LPT Div, IVRI, Izatnagar
23. Dr. Hari Shankar Gupta, Dy Manager (Quality Control), DMS, New Delhi
24. Dr. Fonglan, AOV Exports Pvt. Ltd., Unnao
25. Dr. Sumit Arora, PS, DM, NDRI, Karnal
26. Dr. Shilpa Vij, PS, DM, NDRI, Karnal
27. Dr. Suman Kapila, PS, ABC, NDRI, Karnal
28. Dr. Sunil Kumar Onteru, Scientist, ABC, NDRI, Karnal
29. Dr. Richa Singh, Scientist, NDRI, Karnal
30. Mr. Yogesh Khetra, Sci., NDRI, Karnal
31. Dr. V.P. Singh, Asstt. Prof., DUVASU, Mathura
32. Dr. S.R. Ahmed, Asstt. Prof., SKUAST, Kashmir
33. Dr. A.S. Yadav, PS and Head, PHT, CARI, Izatnagar
34. Dr. A.K. Biswas, Sr. Sci., CARI, Izatnagar
35. Dr. Divya, Sr Sci., CARI, Izatnagar
36. Mr. Prasad Behara, Marya Day Agro Food Pvt. Ltd., Bareilly
37. Dr. Kandeepan.G, Scientist, LPT, IVRI, Izatnagar (Rapporteur)
38. Dr. Geeta Chauhan, Sr Sci.LPT, IVRI, Izatnagar
39. Dr. Ravikant Agarwal, Sr Sci.LPT, IVRI, Izatnagar
40. Dr. Rajiv Ranjan Kumar, Sci.LPT, IVRI, Izatnagar
41. Dr. Suman Talukdar, Sci.LPT, IVRI, Izatnagar
42. Mr. Arfan Khan, AMU Aligarh
43. Mr. Zubair Ahmad, Our Food Factory, Bareilly
44. Dr. Ashok Kumar, Head VPH, IVRI, Izatnagar
45. Dr. P.S. Banerjee, Head, Para, IVRI, Izatnagar
46. Dr. A.K. Tiwari, Head, Standarization, IVRI, Izatnagar
47. Dr. A.K. Garg, PS, Anim. Nutrition IVRI. Izatnagar
48. Dr. D.K. Singh, PS, VPH, IVRI, Izatnagar
49. Dr. P.K. Joshi, PS, VBC, IVRI, Izatnagar
50. Dr. R.P. Singh, Head, BP, IVRI, Izatnagar

Besides the above participants, about 15 Scientists of related divisions from IVRI and about 15 students of LPT Division registered and participated in the event. Chapters on some of the emergent aspects of functional livestock products and research work carried out in various institutes viz: IVRI, NDRI, CARI, RIVER, GADVASU, SKUAST-J, SKUAST-K, NRC on Meat, GBPUA&T, LUVAS in the area of functional livestock products were compiled and provided to participants in form of a booklet.

Dr. S.V.S. Malik, Scientific Advisor, IVRI welcomed the dignitaries and participants. Dr. S. K. Mendiratta, Organizing Secretary and Head, LPT Division expressed his gratitude to Director, IVRI, Director, NDRI and IAUA for extending wholehearted support for conducting the brain storming session at IVRI, Izatnagar. In his welcome address he suggested the house to

come up with the prioritized areas for conducting research in functional livestock products in near future.

Dr. R.K. Singh, Director, IVRI, welcomed Dr. Nagendra Sharma, Former VC, SKUAST Jammu, Dr R.P. Singh, Executive Secretary, IAUA, New Delhi and other participants and said that it's a unique meeting interfacing the experts from functional livestock products area. Dr. Singh appreciated the initiation of Prof. A.K. Srivastava, Director, ICAR-NDRI; Karnal for flagging the issues and concerns of functional livestock products and leading from the front for organizing the event at ICAR-IVRI, Izatnagar. Dr. Singh also lauded the overall support rendered by IAUA for organizing the event at IVRI. He emphasized the need for the active and meaningful interactions among the researchers and institutes working in the field of "functional livestock products" to address the key issues desired for their widespread acceptance and popularization among the consumers for improved health and wellbeing. Also, he showed concerns for the non-validated health claims being made on several functional products.

Dr. R.P. Singh, Executive Secretary, IAUA, congratulated Dr R. K. Singh, Director IVRI and Dr A. K. Srivastava, Director NDRI for taking up the initiative of organizing brain storming session on "Functional Livestock Products". He emphasized the huge adulteration of foods in the market with synthetic preservatives and suggested to incorporate natural preservatives in the livestock products with enhanced health benefits. He mentioned about the great potential existing in functional dairy and meat products in the form of novel ingredients and technological reservoirs.

Dr. Nagendra Sharma, former Vice-Chancellor, SKUAST and Chairman of Brain Storming Session congratulated Dr. R.K. Singh, Director, IVRI and Prof. A.K. Srivastava, Director, NDRI for the excellent initiative. He then expressed his views on the potential of livestock products in food sector and the importance of manufacturing functional livestock products. In his presentation, he touched upon various aspects of "Functional Livestock Products" related to current status, prospective nutraceuticals and functional foods from meat and milk, bottlenecks in their acceptability for commercialization and marketing strategies that may assist in their popularization. Dr. Sharma also deliberated on colonic foods that could be of great help in maintenance and sustainability of gut health and pointed out that lack of well designed scientific validation trials are becoming major obstacles in granting the regulatory approval pertaining to health claims and also acceptance by a larger section of consumers.

The following presentations/discussions were made during the deliberations held during Brain storming session.

Shri. Shaju V.A., Manager, R&D, Kancor Ingredients Ltd., Kerala, delivered a presentation on certain antioxidative phytochemicals that could be utilized as novel ingredients in formulations of functional livestock products. Besides, acting as natural antioxidants these molecules including chlorophyll powder, lutein, cinnamon extract and carnosic acid could be utilized as natural food colorants and antimicrobial additive, respectively. Mr. Shaju also presented the salient findings of projects executed in collaboration with ICAR Institutes and desired to work with other R & D organizations.

Dr. Sarfaraz Ahmed Wani, Dean, Faculty of Veterinary and Animal Sciences, SKAUST (Kashmir), Srinagar delivered a talk on functional egg products with major target to improve the fatty acid profile, cholesterol reduction, enhancement in antioxidant status, enrichment of bioactive factors and therapeutic components in egg through dietary manipulation and other novel approaches. Dr. Wani also shared the success story of egg enriched with ω -3 fatty acids and carotenoids.

Dr. Meena Sharma, Practitioner Dietician at Bareilly discussed the ways and means for improving the nutritional and therapeutic virtues of staples and foods consumed on regular basis. She talked about consumer's increased interest for fortified food products especially with Fe, Ca and polyphenolic antioxidants. She emphasized that a well balanced diet with RDA having good functional property is the food of choice. Dr Sharma advocated the inclusion of livestock products in daily diets to harness their nutritional and therapeutic potential. However, their form and quantum needs to be changed with age, keeping in view the dietary needs of individuals.

Dr. Manish Chatli, HOD, LPT Department, GADVASU, Ludhiana discussed labeling and legal issues in marketing of functional foods. He also briefed about the misleading health claims, FSSAI regulations for health claims and penalties. He also briefed about the work carried out at GADVASU, Ludhiana on functional meat products.

Dr. B. M. Naveena, Senior Scientist, NRC on Meat, Hyderabad presented the current status and potential of functional meat products market. He highlighted the post-harvest interventions by incorporating the novel preservatives for improving the functionality of meat products by incorporating natural antioxidants such as grape seed extract, rosemary extract and green tea extract.

Dr. Latha Sabikhi, Head, Dairy Technology Division, NDRI, Karnal presented the perspective of milk based nutraceuticals and functional dairy foods. Dr. Latha opined that traditional dairy products and fermented milk could be modified through formulation and processing interventions to enhance their nutritional and health promoting benefits.

Dr. Sudhir Kumar Tomar, Principal Scientist, Dairy Microbiology Division, NDRI, Karnal delivered presentation with major focus on Lactic Acid Bacteria (LAB) metabolites including vitamins of B-group, low calorie sweeteners, galactooligosaccharides (GOS) and antimicrobials that have nutraceutical potential. Dr. Tomar presented the findings of basic and applied work related to biotransformation to trace elements such as Se & Zn and also the issues related to transfer of antibiotic resistance from probiotics to host microbiota.

Dr. Ashish Kumar Singh, Principal Scientist, Dairy Technology Division, NDRI, Karnal, presented the concept of composite dairy foods based on judicious combinations of milk/milk solids with plant foods mainly from millets, coarse cereals, fruits and vegetables and technological interventions for their commercial production. Composite foods, possessing the richness of nutrients and other bioactive components appears to be an ideal way of ensuring the delivery of diversity in food basket.

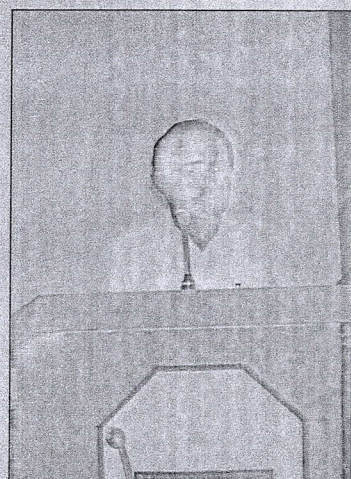
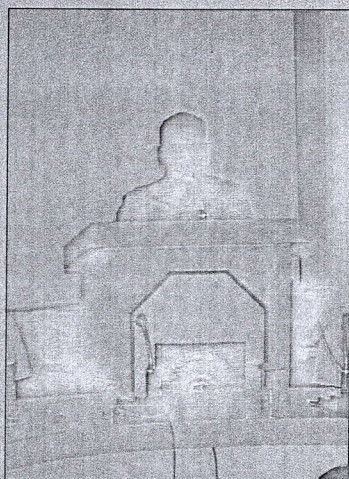
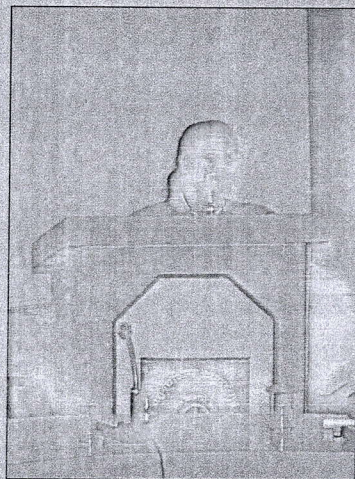
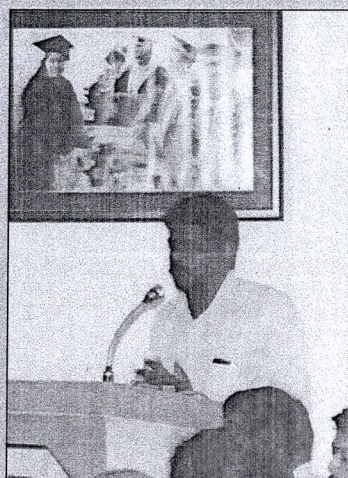
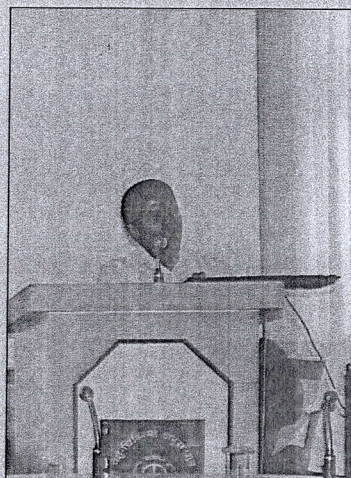
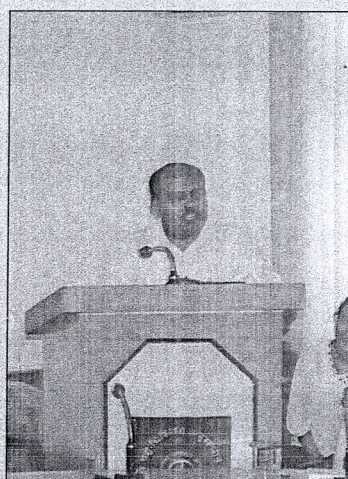
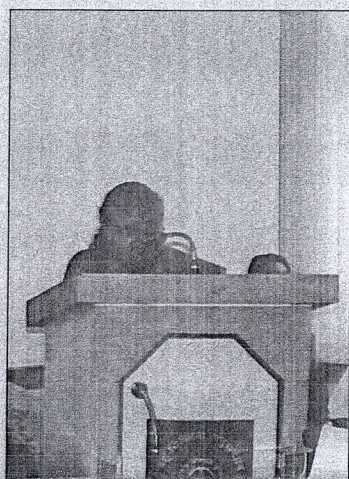
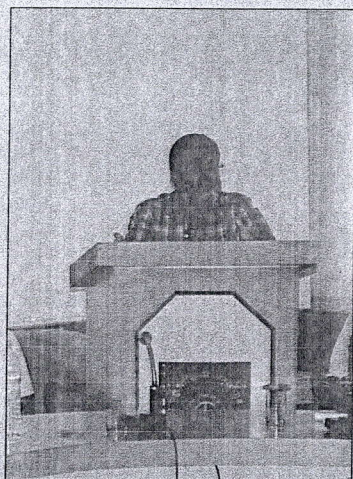
During lunch break, participants went through the posters covering diverse aspects of functional livestock products, concurrent research and exhibit materials displayed outside the committee room. In the afternoon session, observations/ views/ suggestions from the participants were solicited. Participants expressed their views in brief and relevant concerns related to production, processing, validation and marketing of functional livestock products.

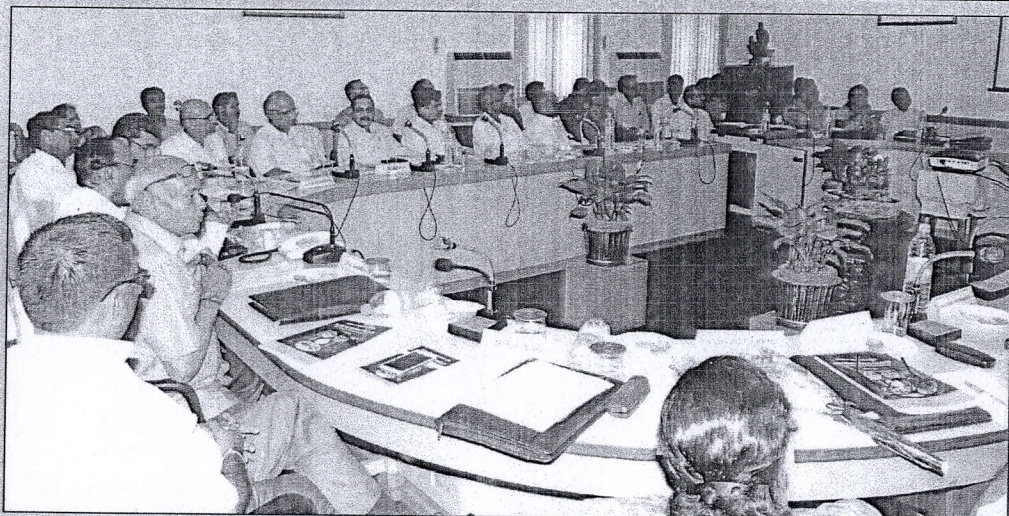
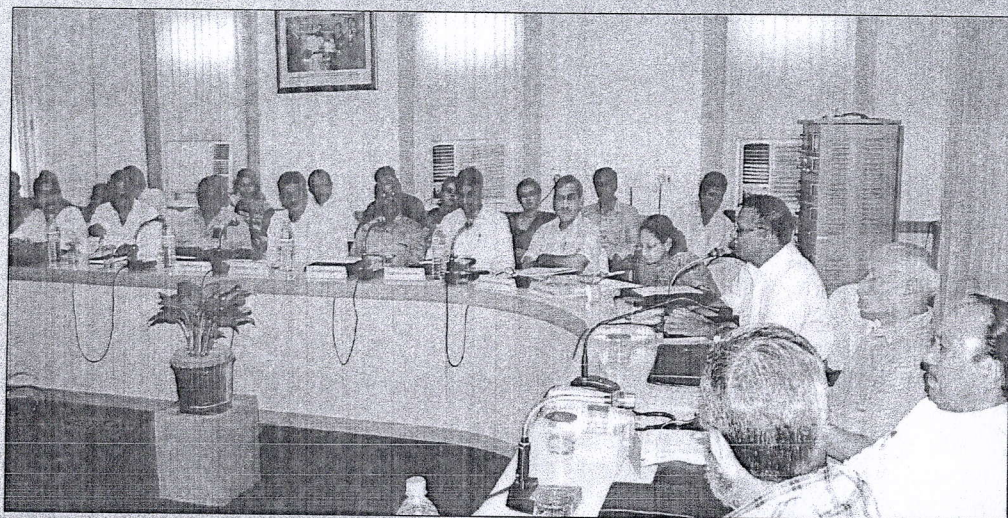
In valedictory session, Dr R.K. Singh, Director, IVRI complimented the participants for their willingness to share research achievements and expressed that Brain-storming Session shall provide new direction to functional livestock products in India. Brain-storming session ended with thanks to all the participants and person contributed for the success of the event.

The following recommendations were emerged after discussion during the session.

1. There is need to compile a data bank for the completed and ongoing research activities in the area of "Functional Livestock Products" to share the information and avoid the duplication of the work across the research organizations, educational institutes and industries. There should be close coordination between different research groups working on functional livestock products. Panel of experts, each for milk, meat and egg functional products shall be constituted to monitor and coordinate research activities at national level. A mega research project on the lines of "All India Coordinated Research Project" needs to be initiated by ICAR.

2. Nutritional and health claims should be validated through nutritional analysis, *in vitro*; *in vivo* investigations (to determine bioavailability/prophylactic/ therapeutic virtues) in laboratory animal models (eg. rat, mice etc.) followed by substantiation with clinical trials. There is a need for identification of appropriate biomarkers to evaluate the efficacy of functional products. For this, collaborative research may be taken up with institutions like NIN and AIIMS.
3. Efforts in producing functional milk, meat and egg shall be initiated at production level by promoting R&D work in the field of nutrition, genetics and management. There is a need of genetic selection of animals and identification of the genetic markers for selection of best animals for a specific functional ingredient.
4. R&D facilities in research institutes should be scaled up/modernized as per global standards to strengthen the analytical and technological skills of researchers/ technologists so that they can address the aspirations of industries and assist in successful commercialization of selected products.
5. Multi-sectoral and multi-disciplinary approach including nutritionists, technologists, medical practitioners, toxicologists and marketing professionals should be adopted for developing and marketing of functional livestock products successfully.
6. Product categories and research prioritization for functional livestock products should be initiated through meaningful consultations among stakeholders and accordingly goals may be set to meet the aspirations of consumers as it is envisaged in the form of vision documents.
7. Strategic interventions need to be developed for marketing of the functional foods considering requirements, cost, convenience, health benefit and associated risk by adopting all food safety measures including traceability.
8. Emphasis should be made on developing low cost composite functional livestock products using traditional knowledge to offer avenues for product diversification.
9. Supply chain related to livestock products needs to be strengthened to deliver “wholesome” raw material (milk, meat & egg) by adopting the “Good Handling Practices”. A value chain approach with major emphasis on maintenance of quality attributes involving stakeholders, needs to be adopted.
10. There is a need to develop comprehensive guidelines and country-specific regulations for functional foods by FSSAI.





BRAINSTORMING SESSION

on Functional Livestock Products

(Priority Organisms: LVI, LVI, LVI and LVI)

14th June, 2015

ICAR-Indian

Research Institute

(PBI BOKA)