Report of the

Third International Conference on

"Fermented Foods, Health Status and Social Well-being"

December 14-15, 2007 at Anand Agricultural University, Anand (Gujarat) India.

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The Third International Conference on "Fermented Foods, Health Status and Social Well-being" was organized at Anand Agricultural University, Anand during December 14-15, 2007 by SASNET-Fermented Foods www.fermented-foods.net in cooperation with Anand Agricultural University www.aau.in, Lund University, www.lu.se Sweden and Unesco Institute of Trace Elements, France. The two-day programme was attended by 200 delegates from various parts of India as well as from Australia, Denmark, Finland Sweden and United States. During the conference, four technical sessions, two poster sessions and an industry forum on *"Marketing of functional foods for health and nutrition of the society"* and a panel discussion on *"Regulatory, safety and marketing aspects of fermented foods"* were conducted.

The programme was started with a formal inauguration ceremony by lighting a lamp and prayer. Dr A. S. Ninawe, Vice Chancellor of Maharashtra Animal and Fishery Sciences University, Nagpur was the Chief Guest and Dr Amrita Patel, Chairman, National Dairy Development Board, Anand was the Guest of Honour. Prof. M. C. Varshneya, Vice Chancellor, Anand Agricultural University, presided over the function. Dr B P Shah, Principal and Dean of SMC College of Dairy Science, AAU, Anand, extended a warm welcome giving a short presentation of the activities of the Dairy Science College.

Dr Baboo M. Nair, Professor Emeritus, Department of Applied Nutrition, Lund University, Sweden who is also the present Chairman of the SASNET-Fermented Foods, introduced the theme of the meeting "Fermented foods health status and social wellbeing" to the audience in general and expressed the deep felt appreciation of the network on the participation of Dr. Amrita Patel, who is an important and influential personality of the Indian food and dairy industry, as the guest of honour of the conference and on the cooperation of the National Dairy development Board as the co organizer of the conference.

Session –I

The theme of the first technical session was 'Probiotics in Dairy Foods'. Prof. Nagendra Shah, Victoria University, Australia chaired the session and Dr. R. K. Shah, Dept. of Dairy Microbiology, AAU, Anand was rapporteur. There were four presentations in this session.

The first talk was given by Prof. Nagendra Shah on "Probiotics: From Metchnikoff To Bioactives". The speaker briefly narrated the history of probiotics, their types and world market scenario. He pointed out that apart from several western countries, probiotic products were most popular in Japan, which has around 53 different types of probiotic containing products in the market. He also highlighted the health benefits of consuming

probiotics and then discussed some of the research work and new products developed in his laboratory *viz.* probiotic cheese dips, soy- yoghurt *etc.*

Second deliberation was on "Recent Trends In Protecting And Delivering Probiotic Bacteria In Dairy Foods" by Dr. K. Kailasapathy. He explained the basics of micro encapsulation technique with a specific emphasis on probiotics and also justified the need for micro encapsulation of probiotics. The commercial encapsulator available for the technique was also discussed. He then highlighted some of the research work carried out in his laboratory on micro encapsulation of probiotics for use in yoghurt as well as cheese production.

The third presentation was made by Dr. Sampo Lahtinen, Senior Scientist, Danisco Health and Nutrition, Finland on "Use of probiotics for the benefits of human health". Dr. Lahtinen indicated the proposed health benefits of probiotic bacteria. He observed that while some of the health benefits were well documented others need concrete scientific evidence. He also pointed out some new frontiers for exploitation of probiotics *viz.* in binding dietary toxins, kidney and liver diseases, dental and oral problems, ear infections, austism as well as high rising disease like diabetes. He also discussed the results of some recent trials conducted in China and India using probiotic strains of Danisco for improving health and general well being of children.

The last presentation was made by Dr. R. R. B. Singh, Senior Scientist, NDRI, Karnal, India. He appraised the house on "Probiotic Dairy Foods - NDRI Experiences". Several formulations with probiotic bacteria *viz.* infant formula, dahi, ice cream, Edam cheese, cottage cheese and Kulfi, developed at NDRI were highlighted. Work related to micro encapsulation using calcium-alginate and coating with poly-L-lysine as well as micro encapsulated bacteria in synbiotic chocolate were also presented. The outcome of some animal and human trials using probiotics containing products was also presented.

Session - II

In the second technical session on Blended Functional Foods, four research papers and one technical paper were presented. This session was chaired by Dr K. Kailasapathy, Professor, University of Western Sydney, Australia and Ms. Lata Ramchandran, Victoria University, Australia functioned as the rapporteur.

There were four research presentations and one technical presentation.

The first presentation was made by Dr R K Shah on Synbiotic dairy products. Dr Shah presented the highlights of the last two years research work conducted at his department. After a brief introduction on synbiotics, he explained the methodology adopted for preparing synbiotic dahi using *L. acidophilus* LBKV3 and prebiotic inulin and concluded that dahi prepared with synbiotics had better overall acceptability and sensory scores. He then discussed the methodology and results of synbiotic stirred dahi with added fruits and vegetables namely, tomato, cucumber, banana and sapota. He concluded that addition of fruits and vegetables resulted in improved acceptability of synbiotic dahi. He also highlighted the HRD programmes of the department and informed the house that two short term programmes were conducted at the department aimed at informing the industry personnel as well as for the academia.

The second speaker was Pratima Khandelwal, who presented her work on the experiments on Biocompatability of selected probiotics used for preparation of a synbiotic acidophilus

milk and synbiotic shrikhand. The probiotics studied were *L. acidophilus*, *L. casei*, *Bifid. bifidum* as well as a commercially available bioyoghurt culture. The prebiotics tested were inulin, oats and honey. Based on the growth kinetics, resistance to acid pH and bile concentration and on pathogen antagonism, she concluded that *L. acidophilus* and *B. bifidum*, individually and in combination showed better ability to survive in the gastro intestinal tract. These probiotics could be used in the preparation of dietetic acidophilus milk and shrikhand along with suitable amounts of prebiotics.

Dr Latha Sabikhi was the third speaker who presented the research findings of her work on the use of *B. bifidum* as an adjunct starter and its influence on ripening of probiotic Edam cheese. The research work established the technological feasibility of manufacturing Edam cheese containing *B. bifidum* without compromising the textural, ripening and storage stability of the product. Thus Edam cheese with probiotic properties could be prepared without altering the typical biochemical processes of the product.

Dr Suresh Subramonian was the fourth speaker who presented the results of his work on proteomics of enzymatically modified soy substituted fermented milk. He used *L. helveticus* and *B. longum* along with Neutrase enzyme to modify soy proteins. He found the enzymatic modification of proteins resulted in better growth of starters, and higher proportion of coagulable proteins when the enzyme modified milk was used for preparation of shrikhand.

The last speaker of the session, Dr V R Boghra gave a lecture on trace elements and their bioavailability.

Session – III

The third technical session was chaired by Dr Jyoti Tamang, Sikkim University, Gangtok and Ms. Sreeja V form SMC College of Dairy Science was the rapporteur. There were five presentations in all.

Dr. Jyoti Tamang delivered the first talk on "Dietary Culture of the ethnic people of the Himalayas". He mentioned the importance of dietary culture in the Himalayas, which is the culmination of both Western and Eastern food culture as rice-soybean-milk-fish/meat-alcoholic beverage being the basic constitute in daily diet. He pointed out that there were more than 150 types of ethnic fermented foods and beverages in the Himalayan regions of India, Nepal, Bhutan and Tibet in China. Microorganisms and their functionalities play vital role in production of ethnic fermented foods imparting health benefits, and also have deep-rooted social-cultural aspects.

Prof. N. Rajmuhon Singh delivered the talk on "Fermented Foods of Manipur". He introduced the diverse types of ethnic fermented foods in Manipur which included ngari, hentak, soibum, soidon, hawaijar, etc. Their methods of preparations, mode of consumption and ethnical values were mentioned. He informed the house that most of these foods have not been scientifically.

Dr. Brijesh Srivastava presented his talk on "Comparative Study of Different Rice Beer of Arunachal Pradesh". Different alcoholic beverages prepared and consumed by ethnic communities in Arunachal Pradesh was presented. Traditional methods of preparation, consumption pattern, etc. were discussed.

Dr. T Longvah talked about "Nutritional Aspects of Fermented Foods of North East India". He pointed that some traditional foods of North East India have therapeutic values. Proximate and nutritional composition of some traditional foods of NE was presented. Nutritional survey in Sikkim conducted by Dr. Longvah and his team during 2003-2004 was also presented highlighting the status of local diet in-take of micro-nutrients as compared to gross micro-nutrients in-take in the country.

The last presentation was made by Dr Mir Salahaudin on "Functional Meat Foods-An Overview". His talk highlighted Meat as an important component of diet in the Himalayas. Various types of meat both fermented and non-fermented including sausages, hams, salami, etc. that were common to this region, were presented. Global interest on functional meats and their benefits was also highlighted. He stressed on need for further R&D on functional fermented meat foods.

This was followed by a lively cultural programme and dinner.

Session – IV

The following day, the fourth technical session on Fermented Foods: Clinical and Nutritional Aspects, was chaired by Dr P A Shankar and Dr C D Khedkar was the rapporteur. The session opened with a brief introductory note from the Chairman. The first speaker was Ms. Lata Ramchandran, Victoria University, Australia. She presented her work on addition of probiotics and prebiotics to improve antihypertensive properties of yoghurt. She very briefly narrated the experiments on production of bioactive peptides in yoghurt using selected probiotic microorganisms. She concluded that addition of a probiotics and prebiotics could positively influence the biochemical and health related properties of the fermented milks.

Dr Kalpagam Polasa presented her paper on fermented foods and their health benefits. She visualized a great demand for probiotics containing beverages and infant food formulas. She also emphasized the need of consuming fermented foods to maintain good health.

Dr Dinakaran gave the historical background and recent advances on role of probiotics in inflammatory bowel disease. He presented some clinical experiments on the topic. He concluded that the symptoms are the best indicators of drug efficiency and he emphasized the need of using probiotic for better GIT health.

Ms Cecilia Enelund and Marica Anderson jointly narrated their investigation on health effects of microbial β – glucans. Their presentation aimed at investigating the possibility of reducing plasma cholesterol levels by feeding three different microbial β – glucans in mice fed with high fat atherogenic diet. It was indicated that hypocholesterolaemic effect demonstrated by feeding β – glucans is due to viscosity and solubility

Industry Forum – Marketing of Fermented Foods for Health and Nutrition of the Society

The session held in the afternoon of 15th December 2007. The session was chaired by Dr Rickard Oste, CEO, Oatly, Sweden and Co-chaired by Dr Peter Oleson, V.P (R&D), Chr-Hansen, Denmark. Ms. Suja Senan, SMC College of Dairy Science, Anand was the

rapporteur. There were altogether 8 speakers representing the Industry in this session. The speakers shared their research, commercialization as well as marketing experiences on the fermented milk products and probiotic milk products.

Mr. H. Sabharwal, Laktobiotics LLC, USA presented the first talk on "Properties of Milk Alpha-Lactalbumin (MAL) enhanced by Probiotics"; He informed the house that the anti-infective properties of human milk were traced to the casein fraction of human milk which was later identified as a protein complex consisting mainly of multimeric alpha-lactalbumin (MAL). The MAL had also been shown to have anti-cancer effect by reducing breast caner in women. He then highlighted the patented method developed to produce MAL by converting cow's milk protein to a more "humanized form" by using probiotics, lactobacilli and bifidobacteria. The product was named as LAKTO. He then outlined the uses and health benefits of the product. He also mentioned M/s Laktobiotics had teamed up with M/s. Unique Biotech Limited, Hyderabad for the bulk production of LAKTO in India.

Presentation – II:
Dr. Olesen, P then made the presentation on "Cardio-04TM - A New Platform for Functional Dairy Foods Targeted to Heart Health Claims" After a brief introduction on the significance of fermented milks in relation to chronic lifestyle diseases, prevalent world wide, he mentioned that dairy products are the perfect functional foods for treating such diseases. He then discussed the new strain isolated by Chr- Hansen, Denmark, Lactobacillus helveticus Cardio-04TM, its use in a fermented milk product that was found to display simultaneous positive effects on 3-4 biomarkers. He confirmed the safety of the product as shown by human studies. It was believed that the Cardio-04 product concepts may provide a strong platform to reduce cardiovascular disease and improve heart health".

Presentation – III:
The talk on "The Future Developments in Dairy Based Probiotics" was presented by Dr Sampo Lahtinen. He pointed out that Lactobacillus and Bifidobacteria continue to be the major dairy probiotics studied all over the world. Of the 2700 probiotics related publications published in listed journals, about 972 probiotic products have been launched since 200o, which represented a 3- to 4- fold increase in the number of publications and 5 – fold increase in the number of products. In recent years more and more products were launched in the Asian region. He also informed the house that most claims made on the probiotic products target GI benefits and Immune Stimulation. Only 5% of the foods are targeted towards specific age groups possibly due to regulations;
Mr. DC Solanki, National Dairy Development Board , India then made his presentation on "Fermented Dairy Products – Lab to Industry: Research Creativity and Experiences". In his talk he highlighted the industrial methods developed and commercialized by NDDB viz., shrikhand, mishti dahi, dahi and probiotic dahi. NDDB had also developed technology for probiotic fermented milk fruit drink. NDDB in collaboration with other research organizations has been engaged in the development of new dahi cultures. He stressed that the stake holders viz., research scientists and ingredients & culture producers should work jointly to develop indigenously tested cultures as well as cost effective processes and products so that the poorest of the poor would also be benefited from the health benefits of probiotic fermented milk products.

Mr. S. De then gave a talk on "Danisco Capabilities" He briefly discussed the mission-vision- strategy of Danisco and their global presence and the range of products offered to various industries world wide.

Mr. B. Natraj, then talked on "Fermented Milk Products of Karnataka Milk Federation (KMF) - Sharing Experiences of Nandini". He presented in brief the market statistics of his organization and the fermented milk products range that included curds sweet curds, sweet lassi, spiced butter milk and UHT spiced butter milk. He informed that KMF has been successfully using the traditional method of culture propagation for preparing bulk culture for dahi production. He also shared the future plans of his organization to introduce a wide range of fermented milk products viz., yogurt, probiotic dahi, yogurt drinks as well as fruit based drinks. He urged the forum to develop systems to make available DVS cultures at a much cheaper rate so as to benefit the producer farmers as well as consumers.

In his talk entitled "Happy tummy to you" S. Ghosh highlighted the consumer awareness programme adopted by his firm, Mother Dairy India, prior to and after the launch of probiotic milk products viz., B-active Probiotic dahi and B-activ Lassi in Delhi.
Mr K T Thomas then shared with the house "Production & Marketing Experience of Curd by MILMA". He pointed out that his organization presently used thermophilic yogurt cultures. He also informed that production of dahi with jelly custard gave a product with high viscosity that was suitable for local culinary preparations of Kerala. He also informed that MILMA would be signing an agreement with SASNET to assist them in producing probiotic dahi.

Panel Discussion

The session began with the Chairman, acknowledging the issue of the day which was 'when different countries have different climatic, social, economical, and technical conditions, is it rational to suggest a common code of laws to judge the quality of the products?' The product in question was fermented foods and the emphasis laid on the socio economic feasibility of India to meet the stringent demands of the post WTO global market. He then announced that the house was now open for discussion and invited each discussant to express his/her thoughts and comments on the pertinent issue.

Dr. Baboo Nair was the first speaker, he presented the house with a document from the SASNET website www.fermented-foods.net namely; The Health Claims in labeling and marketing of food products – The Swedish Food Sector's Code of practice. He stressed on the need for India to come out with her own set of codes that will pave the way of quality management in all areas of food processing, regulation and marketing.

The Chairman then directed the discussion focusing on fermented foods in general and probiotic foods in particular. He highlighted that usually the microbiological standards include the maximum limits or the absence of bacteria in foods, but there is a deliberate addition of microflora in probiotic foods, so what should be the standards and suggestions to ensure the microbiological safety of such products?

Dr J V Parekh was next to comment on this issue. He talked on Food Safety and Standards Bill, 2005 which seeks to establish a single reference point for all matters relating to food safety and standards. He second the views of the Chairman, stating that advanced standards should be for advanced countries and conducive to the masses. He also voices his concern that if stringent standards are being laid for third world countries, can they make up to those standards of quality and safety?

The next to speak was Dr. Rickard Oste, the Founder of Oatly AB who based on his experiences stated that marketing and regulation go hand in hand. He stressed on his stand

that the manufacturer should not claim the benefits of his product until proved. He said that vague claims like 'good for stomach' was to be permitted but specific claims need to be backed with scientific validations.

Dr. Purnendu Vasavada spoke of his experiences in India regarding the overbearing sentiment among Indian retailers, that if the product needs to be exported, then they follow superior quality standards and if it is to be marketed locally, they resort to inferior quality management. This of a growing concern because 60% of the milk is still being processed in the organizing sector. He questioned the ability of India to follow stringent standards like 'milk should be procured from Brucella free zones'. Answering this query was Mr. Deepak Renac who drew a lot of attention and appreciation on his success of implementing stringent quality standards in a cooperative dairy in a village in Maharashtra. He led a team of villagers with no education or expertise to grab three ISO accreditations from DNV. Dr Vasavada applauded his efforts.

Dr. Peter Olesen laid stress on documentation of probiotic claims and efficacy studies of established strains. In the era of functional foods there should be studies on the various behavioural patterns when new ingredients are being added in matrices other than their natural source. Studies are still scanty on the safety issues, dosage and health claims of functional foods. He showed his interest in nutrigenomics. He concluded by saying that industry and authority should go hand in hand taking the consumers on their way up.

Dr. Sampo Lehtinen remarked on the inadequate number of human trials. He further stressed on the need for the industry and the academia working together. Further studies should be directed towards methods to enumerate Probiotics, measure the bioavailability of functional foods.

Dr Kalpagam Polasa commented on the Food Safety and Standards Bill, 2005 and enlisted some of the drawbacks of the bill like the stringent punishment which is similar to small and big manufacturers and applauded the speedy regressal system of adultered food laid down in the bill. There would be strict laws on preventive claims. Answering to Mr. Lehtinen, she listed some of the studies on nutrigenomics in her lab. She said that the general claim of salt reduction can aid in lowering the blood pressure is not applicable to all genotypes, like the GG genotype do not respond to salt reduction.

The last discussant to express his views was Dr. HK Desai who rightly stressed the need for including medical practioners in functional food research. He also suggested the need for issuing a license to the manufacture for manufacturing probiotic food. Ms Kanta Motiyani from the audience suggested that researchers on functional foods should also involve personnel from pharmaceutical companies, as they do efficacy studies regularly and have the resource and understanding of the concept.

The discussion concluded with the fermenting thoughts of Dr. PA Shankar questioning that why should there be two laws; one for India and one for the world, when both lives are equally precious. Dr Jasvir Singh finally threw a thought provoking question to all regarding if there is anything called 'absolute safety'?

The day ended with the Valedictory Function. Dr. B. P. Shah, Principal and Dean of SMC College of Dairy Science presided over the function. After a brief introduction he invited chairman/rapporteur of the various sessions to present their reports. Dr J. B. Prajapati requested all the rapporteurs to submit soft copy of the report and the relevant

recommendations at the earliest for compilation and uploading on the SASNET-FF website. Dr. Baboo Nair gave concluding remarks and thanks all concerned for the successful conduct of the conference.

The main recommendations of the conference can be summarized as follows:

For further details please contact :

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