

Conference Report

**The 2nd International Conference on Food
Quality, Safety and Security 2018,**

**25th - 26th October 2018
Colombo, Sri Lanka**

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The Second International Conference on Food Quality, Safety and Security 2018 which was organized by the International Institute of Knowledge Management (TIKM), Sri Lanka concluded successfully with the participation of local and international scholars and participants from the food industry. The conference provided a single platform to present, discuss and share the experiences of participants. The theme of the conference was 'Towards sustainable healthy lives through value chains of quality and safe foods'.

Of the two day conference, day one was commenced with the Inauguration Session where the Conference Convener Mr. Isanka P Gamge welcomed the participants. Following the speech delivered by Professor KKDS Ranaweera, Conference Chair the Keynote Forum was conducted by Professor Hamis Alpas, Middle East Technical University, Turkey. On the same day there were three Technical Sessions on two areas namely Food Quality and Socio Economics, Value Additions, Emerging Foods and Technologies. Eleven papers were presented during the Technical Sessions of the first day. A Poster Session which includes three posters was held in the afternoon. Two Technical Sessions on Food Safety and a Conference Workshop were held on the second day of the conference. Six papers were presented in the second day. The details of the conference presentations are reported below.

Keynote Speech

The Keynote Speech was delivered by Professor Hamis Alpas from the Middle East Technical University, Turkey. The title of his speech was 'Effect of high hydrolytic pressure (HHP) treatment on microbial inactivation and concentration of lysozyme and lactoferrin in donky's milk'. Professor Alpas highlighted that HHP process is safer and increases the shelf life of milk with minimum damage to sensory and nutrient parameters. Participants expressed their concern about the cost effectiveness and ability to use the technique for other foods especially under Sri Lankan context.

Technical Session 1, Food Quality I

This session was chaired by Dr PNRJ Amunugoda, Industrial Technology Institute, Sri Lanka. Evaluation panel consisted of Professor KKDS Ranaweera, University of Sri Jayewardenepura, Sri Lanka and Profesor Hami Alpas, Middle East Technical University, Turkey.

The first paper presented in the session was on Ergonomics creating quality and safe culture for processed food: A case of Ceylon cinnamon industry by BMRL Basnayake, Sabaragamuwa University of Sri Lanka. Cinnamon is the number one export crop of Sri Lanka in the spice and condiments sector. Sri Lanka is the leading exporter of natural cinnamon. Traditional cinnamon processing methods have made number of health problems and injuries among people who are involved in processing. In this study information collected from 240 cinnamon processors in 4 districts were analyzed for the impact of ergonomic interventions and to determine ergonomic solutions. Impact of modernized processing methods has assessed and found that they were safe and increased the efficiency. Moreover, modernized methods increased the quality of product and helped to attract younger generation to the industry. Therefore, popularization of modern methods in the cinnamon industry is vital to sustain in the overseas markets.

WMTB Weddagala, Sabaragamuwa University of Sri Lanka presented results of a study on GI/ Traceability will assure the quality supply: a case of Ceylon cinnamon. Presenter highlighted the importance of promoting Ceylon cinnamon and establishment of geographical indication system to ensure the reputation especially in the overseas markets. Quick response code-based product source identification system to ensure the quality of supply has developed. This system can identify inferior quality products and hence facilitating traders and consumers to purchase high quality products. He recommended adoption of the system to Ceylon cinnamon with required rules and regulations in place.

Second presentation was done by Yelliantty, Institute Teknologi Bandung, Indonesia on Volatile constitute from fruit of *Antidesma Bunius* by GC- MS. The fruits of wild grown *Antidesma Bunius* possess antimicrobial and anticancer properties. Analysis of volatile constitutes of the fruit has revealed that it contains high amount of 5- hydroxyl methyl furfural (5HMF). She stated that 5HMF can be used as a food flavoring agent and an anticancer agent. However, during Q&A session it was revealed that there are positive and negative claims towards benefits of 5HMF. Therefore, applications have to be reviewed.

Plenary Speech

The Plenary Speech was conducted by Dr Sujeewa Gunaratne, President, Institute of Food Science and Technology, Sri Lanka. The title of her presentation was Sri Lankan export food industry facing dynamic global regulatory challenges: Is the industry ready? Dr Sujeewa explained the product categories, major markets and export performance of the export food industry of Sri Lanka. The challenges faced by the industry with current standards and regulations were presented by taking examples from different areas in the export industry such as standards of cinnamon export, management of perishables (security inspections & temperature fluctuations), quality and safety requirements of perishables with security checking, packaging requirements and market specific requirements. Participants raised some questions and needed clarifications over some issues such as how perishables are treated to ensure that they are free from pest and diseases, usage of agrochemicals and presence of residues and packaging methods. Recommendations from her presentation include close coordination with airport authorities to harmonize inspections, taking actions to minimize temperature abuse of perishable products, provide VIP treatment to perishable exports and enhance the knowledge of relevant staff members on rapidly changing global standards and regulations.

Technical Session 2, Food Quality II

Technical Session II was chaired by Dr PNRJ Amunugoda, Industrial Technology Institute, Sri Lanka. Evaluation panel included Professor KKDS Ranaweera, University of Sri Jayewardenepura, Sri Lanka and Professor Hami Alpas, Middle East Technical University, Turkey.

The first presenter of this session was BILM Mendis, Wayamba University of Sri Lanka and the title of the presentation was Quality characteristics of chicken jerky prepared with different physical forms of chicken meat types. To meet the consumer preference for diversified snack foods he suggested that chicken jerky prepared using minced breast muscles would be a high quality nutritious snack. However, high cost and poor consumer awareness about the product were identified as limitations.

EKGPU Dharmarathna, Uva Wellassa University, Sri Lanka conducted a presentation on Isolation and identification of possible microbes associated with black tea in commercial tea blending process factory. Tea being the leading export agricultural product of Sri Lanka the presenter emphasized the importance of food safety standards especially microbial quality of tea. This study focused on isolation and identification of possible microbes associated with black tea in a factory where tea is blended for export. Analysis of SWAB and other samples in the factory revealed that the microbial load (total aerobic bacteria, yeast and mould counts) of raw black tea and blended black tea samples exceeded the acceptable level stipulated by the Sri Lanka Tea Board. A strict monitoring system along the supply chain and better communication with importers and importing countries were recommended.

The third presenter of the Technical Session II was KP Madushani, Sabaragamuwa University, Sri Lanka. The title of the presentation was Standards and certifications as a means for competitive advantage in marketing- A case of Ceylon cinnamon. Most of the value chain actors including growers, peelers and exporters have a low level of awareness on the quality standards and certification of cinnamon. Exporters and peelers who follow quality standards achieved high level of compliance with the food safety and quality standards and showed a positive relationship between the compliance, and quality and safety standards. Recommendations included creating uniquely structured training framework and institutional set up for delivering National Vocational Qualification for people in the cinnamon value addition, training cinnamon peelers to meet food safety standards, upgrading traditional cinnamon peeling centers to comply with Good Manufacturing Practices and establishing village level farmer groups and trade associations to conduct workshops on novel technologies.

Technical Session 3, Socio Economics, Value Additions, Emerging Foods and Technologies

Technical Session III was chaired by Dr EDNS Abeyrathne, Uva Wellassa University, Sri Lanka. Evaluation panel included Professor KKDS Ranaweera, University of Sri Jayewardenepura, Sri Lanka and Professor Hami Alpas, Middle East Technical University, Turkey.

Dr PNRJ Amunugoda, Industrial Technology Institute, Sri Lanka presented first presentation on Dielectric barrier discharge atmospheric plasma: A review and comparison. The presenter compared three different sources of APCPs and explained the advantages and disadvantages. Taking in to account of breakdown voltages, densities of charge species, temperature of gas and electron temperature, densities of oxygen species of plasma and appropriateness for operational aspects, it is concluded that the APNDBD plasma is more applicable for food sterilization consideration.

WMS Warankulasooriya, Sabaragamuwa University, Sri Lanka had a presentation on Quality, safe, free backyard production: Role of neglected crops in rural household economy. Based on a survey conducted in the Eastern and Uva provinces of Sri Lanka with 384 households the presenter identified five types of underutilized crops namely finger millet and raja ala for Monaragala district and cowpea, groundnut and mungbeean for Ampara and Badulla districts. Family labor significantly contributed towards the farming activities of the households.

A presentation titled Optimization and storage studies of palm (*Borassus flabellifer*) ready to serve (RTS) juice was presented by S Mohanty from Pradhan National Institute of Technology Rourkela, India.

The physico chemical properties of palm fruit pulp were identified. The extraction process of palm fruit juice using pectinase enzyme was optimized. RTS was developed using the extracted juice and it had a shelf life of ten days under refrigerated condition.

The presentation of PAT Fernando, University of Peradeniya, Sri Lanka was on the Development of osmotically dehydrated banana chips breakfast cereal supplementation. Ripen Seeni banana has selected. Sliced banana chips dehydrated in 70 brix sugar solution and dried at 50°C for 5 hrs produced the best product which had acceptable sensory attributes. Product packed in Alufoil had a shelf life of four weeks. This could be a solution for minimizing the waste of ripened banana. However, participants pointed out that consumers now prefer low sugar foods.

Poster Session

There were three posters.

A poster titled A comparative study of Sri Lankan food controlling infrastructure with that of developed countries was presented by AU Pinnaduwa, University of Peradeniya, Sri Lanka. In this study, Sri Lankan food controlling infrastructure was compared with that of the USA and Canada with a view to identify how to improve our infrastructure. Gaps in our system have been identified. Establishment of an independent authority and introduction of new regulations for modern food safety aspects were recommended.

SAA Prabashi, Horizon Campus, Sri Lanka presented a poster on Development of a cookie supplemented with Lotus (*Nelumbo Nucifera*) seed flour. Lotus seeds are underutilized resource consisting nutritional benefits. Using different flour amounts cookies were developed. Analysis for proximate composition revealed that cookies made with lotus seed flour had higher nutritional value than normal cookies.

WDJW Gunawardana from University of Colombo presented a poster on An analytical protocol for estimation of true dietary load of heavy metal contaminants in Sri Lankan households. Heavy metal contamination of food has become an important issue due to lack of control and monitoring system in Sri Lanka. Major meals of households in four districts have been analyzed for heavy metals. Using the data a simulation system is to be developed for assessing the future impact of heavy metals in food.

Technical Session 4, Food Safety I

This session was chaired by Dr PNRJ Amunugoda, Industrial Technology Institute, Sri Lanka. Evaluation panel included Professor KKDS Ranaweera, University of Sri Jayewardenepura, Sri Lanka and Profesor Hami Alpas, Middle East Technical University, Turkey.

Edgar M Cambasa, Hokkaido University, Japan presented a paper titled *Fusarium graminearum* colors and deoxynivalenol (DON) synthesis at different temperatures. *Fusarium* fungi produce a chemical called deoxynivalenol. When consumers eat food prepared using wheat flour contaminated with *Fusarium* can cause gastroenteritis in human. This study identified a relationship between color and DON synthesis in *Fusarium graminearum*. Study concluded that *F. graminearum* surface RGB components are correlated; Temperature affects colors, especially red and blue, but the variation always presents the same trend; Temperature also affects DON production. Suboptimal temperatures

stimulate synthesis; RGB can estimate DON concentration through quadratic functions. During Q&A session how to reduce contamination of cereals with *F. graminearum* was discussed.

The paper titled Prevalence of *Escherichia coli* in chicken meat and edible organs at retail shops and supermarkets in Kurunegal district was presented by PS Anwarama, Wayamba University of Sri Lanka. As per capita consumption of chicken meat has increased determining microbial safety of meat has become important. Kurunegala district contributes significantly towards chicken meat supply in the country. Samples of chicken meat and edible organs collected from retail shops and supermarkets in the district were analyzed for *E. coli*. Results revealed that chicken meat and edible organs act as a source of *E. coli* strains potentially pathogenic for humans. How to minimize possible contamination with *E. Coli* and effectiveness of current monitoring systems were discussed during the Q&A session. Presenter highlighted establishing a stringent surveillance methods, regulatory measures and appropriate interventions to minimize *E. coli* contamination.

MANM Munasinghe, University of Peradeniya, Sri Lanka presented a paper titled Study on food adulteration of Sri Lanka and recommendation of rapid qualitative chemical detection methods to identify common food adulterants. Food adulteration has become a key problem. A rapid qualitative detection method of adulterants is lacking. Fourteen different food categories were tested for adulteration and seven categories were identified as mostly adulterated food categories. These include sugar confectionery, spices & condiments, edible oils & fat, fruits, vegetables & their products, dairy products, salt, and cereals, pulses, flour & cereal products. Rapid qualitative detection of food adulterants in Sri Lanka is not satisfactory

Conference Workshop

The conference workshop was conducted by Professor Hami Alpas, Middle East Technical University, Turkey. The title of the workshop was High hydrostatic pressure (HHP) engaged with time domain nuclear magnetic resonance (NMR). Professor Alpas explained about the HHP technology and its history, application of HHP technology, and HHP and NMR research in detail. He highlighted the applications of HHP on food sector relating to the importance of insect protein, modified corn starch, palm oil and use of cellulose and hydrolysis. Potential applications of HHP under Sri Lankan context also discussed.

Technical Session V, Food Safety II

The session Food Safety II was chaired by Dr Madhura Jayasinghe, University of Sri Jayewardenepura, Sri Lanka. Evaluation panel included Professor KKDS Ranaweera, University of Sri Jayewardenepura, Sri Lanka and Professor Hami Alpas, Middle East Technical University, Turkey.

The presentation titled Quantification of benzoic acid and sorbic acid in ready to serve jelly drinks available for sale in Colombo district was conducted by WAGE Wijelath, University of Peradeniya, Sri Lanka. Nine jelly drink brands available in the market have analyzed for benzoic and sorbic acid content. Benzoic acid content of five brands was significantly higher than the permitted level. One brand contained significantly higher amount of sorbic acid than permitted amount. Benzoic acid being carcinogenic it is more harmful than sorbic acid. Moreover, this study found two non permitted colors in the product. As the target market for jelly drinks is children the negative health impact over them

could be higher. Therefore, immediate intervention by relevant authorities was emphasized by the presenter.

Designing soy bean peel separator container for decreasing the intensity of skin contact in tempeh industries was the second paper in the session delivered by Fikri Abdulhakim, Telkom University, Indonesia. He explained that the skin separation of current tempeh production is highly involved with manual operations which increase the human contact and possible contaminations. Therefore, reduction of human skin contact and water usage in the process has become important aspect with a view to increase the safety and resource utilization efficiency. New machine has designed and tested to separate soybean peels. It has shown a number of advantages such as reduction of cycle time by 39%, labour requirement, skin contact and water usage by 42%. This equipment improved the efficiency and hygienic condition of the process.

NHGT Madushani, University of Peradeniya, Sri Lanka presented a paper on Determination of total aflatoxin levels in coconut oil produced in Sri Lanka and compliance to specifications. In Sri Lanka coconut oil is widely used for cooking. During the manufacturing process oil could be easily contaminated with aflatoxin. Eighty five coconut oil samples collected from retail shops, supermarkets and mills located in major coconut oil producing areas in Sri Lanka have been tested for aflatoxin. Results revealed that 68% of the samples were contaminated with aflatoxin. Coconut oil which is sold in bulk contained the highest amount of aflatoxin and 88% of the samples exceeded the permitted level. Of the branded coconut oil samples 20% has exceeded the accepted level. The findings of this research emphasized the establishment of monitoring system and increased awareness among people involved in coconut oil manufacturing and trading.

Conference summary was delivered by Dr JMJK Jayasinghe, University of Sri Jayewardenepura, Sri Lanka and the Awarding Ceremony was followed.

The Best Presenter was BMRL Basnayake from Sabaragamuwa University of Sri Lanka who presented the paper titled Ergonomics creating quality and safe culture for processed food: A case of Ceylon cinnamon industry.

The Best Student presenter was Edgar M Cambaza from Hokkaido University, Japan. The title of his paper was Fusarium graminearum colors and deoxynivalenol synthesis at different temperatures.

Session Best awards were given as follows.

BMRL Basnayake, Sabaragamuwa University of Sri Lanka was selected in the Food Quality I session for her paper titled Ergonomics creating quality and safe culture for processed food: A case of Ceylon cinnamon industry.

PAT Fernando, University of Peradeniya, Sri Lanka received the Session Best award for the presentation on Development of osmotically dehydrated banana chips breakfast cereal supplementation under Socio Economics, Value Additions, Emerging Foods and Technologies sessions.

Of the Food Safety sessions Edgar M Cambaza, Hokkaido University, Japan received the Session Best award for the paper titled *Fusarium graminearum* colors and deoxynivalenol synthesis at different temperatures.

Vote of Thanks was given by D Koralagamage, Assistant General Manager, International Institute of Knowledge Management.