IFSTSL
INSTITUTE OF FOOD SCIENCE & TECHNOLOGY SRI LANKA

INSTITUTE OF FOOD SCIENCE & TECHNOLOGY SRI LANKA

NEWSLETTER

VOLUME 4, ISSUE II
August 2015

8th Aug. 2015	A Seminar organized by IFSTSL at Profood/Propack 2015 Exhibition
October 2015	First Annual Research Sessions of IFSTSL [Page 02]

ADDRESSING CONTAMINATION PROBLEMS IN THE FOOD INDUSTRY: TECHNICAL GUIDANCE

A Seminar of the IFSTSL at Profood/Propack Exhibition 2015

A seminar "Addressing Contamination Problems in the Food Industry" will be held by the Institute in parallel with the ProFood /ProPack & Agbiz Exhibition 2015 as a half-a-day session on 08th August. This seminar will address means to minimize microbial contamination of foods starting from sources of micro-organisms, good practices to control microbial threats, interpretation of microbiological test results and reporting with a view to recognize the levels of risks and the basis of microbiological problems. The seminar will provide an excellent opportunity for the industry to get a deep understanding of micro-biological safety issues, international requirements and ways and means to achieve microbiological safety of foods. Also the seminar plans to discuss the origins of aflatoxin contamination problems in Sri Lanka and means to prevent financial and quality losses faced by the industry as a separate topic. A special demonstration on application of rapid test methods in chemical & microbiological testing will be a highlight of the event.

Ifstsl Colombo

Find us on Facebook

IFSTSL INSTITUTE OF FOOD SCIENCE & TECHNOLOGY SRI LANKA

Addressing Contamination Problems in the Food Industry

A Seminar Organized by the Institute of Food Science & Technology Sri Lanka (IFSTSL)
at the ProFood/ProPack Exhibition 2015

Topics

- Scientific reasoning behind common microbiological practices in the food industry.
- Controlling microbial contaminations of export products with special reference to fruits & vegetables, fish, and spices.
- Interpreting microbiological test reports.
- Application of rapid test methods in food industry- aflatoxin, microbiology and pesticide residues
- Aflatoxin and polyaromatic hydrocarbons (PAHs) related problems in the coconut industry and control measures.

(Resource personnel: Emeritus Prof. Upali Samarajeewa, Dr. Niranjan Rajapakse, Dr. Eresha Mendis & Mr. M.N. Devaiah, Senior Area Manager, R. Biopharm Neugen Pvt. Ltd)

Date	:	08th (Saturday) August 2015
Time	:	2.00 – 5.00 p.m.
Venue	:	BMICH, Committee Room F
Entrance Fee	:	Rs. 2,000.00
		(Rs. 1,000.00 for IFSTSL members)

For more details contact IFSTSL secretariat (Mrs. Sandhya Fernando)
Phone: 011-7548770 or 011-4920206; Fax: 011-7548771
Email: ifstslinfo@gmail.com

IFSTSL ANNUAL RESEARCH SESSIONS IN FOOD SCIENCE AND TECHNOLOGY (OCTOBER 2015)

The Institute of Food Science and Technology Sri Lanka (IFSTSL) will be holding an annual research session starting from October 2015. The objective of the research session is to give an opportunity for all the Food Science and Technology graduates to present research findings on food science, food technology, food and nutrition, food analysis and allied fields. Further it provides an opening for the members of the food industry to create deeper understanding of research in the universities, identify mechanisms to utilize the research findings for improving food processing in Sri Lanka and to create employment opportunities for the students in the industry based on their knowledge, demonstrated skills and research capabilities.

Call for Papers

IFST welcomes successfully completed research papers relevant to the above fields. Manuscripts should be submitted electronically to ifstslinfo@gmail.com (IFSTSL Office, 1, 1/1 Anderson Road, Colombo 5). **The deadline for submitting the manuscripts is 30th August 2015.** Manuscripts will be refereed within 10 days of the receipt and sent back to the authors for improvements. Once the revised manuscript is accepted, the submitting author is expected to pay Rs. 300.00 as a submission fee. If the presenting author of the manuscript is a student member of IFSTSL, the submission fee will be waved. Accepted manuscripts to be presented at the research sessions will be published in a special issue of the IFSTSL.

GUIDELINES FOR PREPARATION OF THE MANUSCRIPT

General information

1. The manuscript should carry information related to food science and technology research carried out as student projects (undergraduate or postgraduate) of industrial relevance at the Universities or research institutes.
2. The presenting author should be the student engaged in the research.
3. The supervisor of the student is expected to certify that the research was carried out under his/her guidance
4. The length of the manuscript should be approximately 1000 words written in Microsoft Word
5. The manuscript should be prepared in Arial 12 font, with 1.15 line spacing and margins 2.54 in left and right.
6. Use SI units throughout.
7. Manuscript may contain graphs or similar diagrams prepared in Microsoft Excel.
8. Manuscript should indicate clearly the findings of the project, which could be considered by the food industry for further expansion or direct application.
9. Manuscripts containing designs (factories, equipment *etc*.) should carry a design diagram as attachment.
10. Use of past tense and first person active form of English ("We found" rather than "It was found") is encouraged in writing the results.
11. Avoid writing opinions as facts. Facts are generated from your research or research of others (Opinions are viewpoints of matters commonly considered as subjective and mostly are not supported by well planned and executed scientific research).
12. Grammar and spelling in the manuscript should be checked using spell checker (US English) and corrected.
13. All pages must be numbered in Arabic numerals at the middle-bottom of the page.

Format of the manuscript

Title page: The title should be short and self-explanatory. Title should be in bold capitals (Arial Font 14) and centered. Names of the authors, address for communications, Telephone number and email address of the author who would respond to referee comments should be given.

Summary: Should be approximately 150 words and show clearly the outcome of the research so to attract the industrialists

Introduction: Introduction should show the background and justification for the work and related references to show up how the work to be published differs or show improvements from existing knowledge. This section should be approximately 200 words.

Materials and Methods: Quality of all materials and reagents used should be indicated. All test methods given here should be supported by the reference. Any deviations from the reference method should be indicated. The methods should be described so that

another researcher could use the same method to check your results without seeking clarifications on the method from the authors. The sampling plans used and statistical methods applied should be clearly indicated. This section should be approximately 250 words.

Results and Discussion: Results and discussion may be written separately or as a combined section. Appropriate diagrams, graphs etc. to clearly show the trends are expected to be included. All figures tables should be appropriately labelled with titles, which explain the content of the table. The discussion should be based on the results generated in the research and its relationship to published work and the relevance of the work for the industry and its possible applications. This section should be approximately 250 words.

Conclusions: Outcome of the research is expected to be given under this section along with suggestions for future work. (Approximately 50 words)

References: Reference means the original document or the directions for the reader to find the original document. Follow the style given below in writing the reference.

a) For journals: Amarasiri, A. and Bulathsinhala, B.C. (2010). The nutritional value of Tilapia fish. *International Journal of Nutrition.* 15:20-31.

b) For books: Potter, N, and Hotchkiss, J. H. (1995) Food Science. – Fifth edition. (Springer Science Press, USA).

c) Thesis and dissertations: Wimalaratna, K. (2009) The effect of monosodium glutamate on flavor of cooked beef. (M.Phil. thesis). University of Pakistan. p.124.

d) Conference abstracts and proceedings: Kudagama, B. T., Keheliya, C. P. and Wewegama, T. B. (2005) Artefacts in electron microscopic pictures of arsenic fed rat livers. Workshop on Electron Microscopic Techniques. Ragama, Sri Lanka.

e) Web references: Wanniaarachahi, P. (2014 July 25) Food Additives and their safety. Retrieved from http://www.slfpa.org

BEYOND THE CLASSROOM: SECOND SEMINAR FOR UNDERGRADUATES BY IFSTSL AT UNIVERSITY OF SABARAGAMUWA

Institute of Food Science and Technology conducted the second seminar in the series at the Department of Food Science and Technology in the Sabaragamuwa University on 6th July 2015. The objective of the program is to expose the students to food science related issues of current industrial and public interest. Sixty two students and staff members participated at the event. The program consisted of a video on "Food Processing – a field trip" followed by three presentations on the titles given below.

1. Global Trade and Food Industry – Prof. Upali Samarajeewa
2. Expectations of the Food Industry from Graduates – Mr. Ruwan Kumara
3. Food safety and Food Security – Prof. Upali Samarajeewa

All the students filled applications to become members of the IFSTSL. This opens the avenue for the students to work more closely with the industry and enjoy the benefits offered by IFSTSL for them, to improve their career prospects. The next seminar in the series is proposed to be held at University of Wayamba or University of Peradeniya in August or October.
The program was coordinated by Dr. Nimsha Weerakkody of IFSTSL.

QUALITY PROBLEMS IN COCONUT OIL

Coconut oil is the main source of fats in the Sri Lankan diet, providing much needed energy. Coconut oil manufacture is an important industry. There are about 50 coconut oil mills in the country, which employs mechanically operating expellers to extract oil from copra. The extracted oil is filtered and made available in bulk to the rural market. Refinement of coconut oil through a chemical process is carried out to provide bottled oil as an up market product. The oil of extremely poor quality and unsuitable for edible purposes is marketed as industrial oil for the soap industry.

Apart from the expellers used in commercial mills, there are smaller oil expellers available at the rural level for individuals to get about 5-10 kg of coconut expelled to obtain the oil. The coconuts used for this purpose are either sun-dried, or dried over the fire place, exposing them to ready contamination by bacteria and fungi. Both these types of expellers expose the oil and the cake to very high temperatures rising up to 140°C, or even more, doing much damage to product quality. To regain the quality of the dry-pressed oils, they are subjected to refining (removal of free fatty acids by chemical reactions with alkali), bleaching (filtering through clay) and deodorizing (steam treatment).

A coconut oil described as liquid coconut oil or MCT (medium chain triglyceride) oil is available in markets of temperate countries. MCT is produced by removing lauric acid, the major fat in coconut oil by fractionation. Removal of lauric acid decreases the melting point of MCT making it remain a liquid, but the important nutritional characters of the coconut oil is changed.

Currently there is much interest in production of virgin coconut oil in commercial scale. Virgin vegetable oils are of high demand today, especially by those preferring natural products. In processing of virgin oils, the raw materials are subjected to direct extraction of oils without subjecting them to high heat or heavy processing. The mild extraction processes retain the antioxidants in the oils making oil a product of high health benefits. Virgin oil is also produced by extracting the coconut milk from fresh coconuts and allowing the separation of lipids (fat or oil) from water by boiling, allowing to ferment overnight, refrigeration, enzymatic action or centrifugation. In these processes exposure to low heat enables inactivation of enzymes, preventing the breakdown of lipids which causes rancidity. Research carried out at the University of Kelaniya has shown that the low heat does not destroy antioxidants in coconut oil, and the traditional process of preparing coconut oils at home by heat separation of the emulsion actually brings about better dispersion of antioxidants, reflecting high antioxidant values in the products.

Quality problems arising due to inherent properties of coconut and oil extraction methods

The lipids play an important role in quality of coconut oil by contributing attributes such as texture, flavor, nutrition and calories. The major quality loss in coconut oil is due to action of the inherent enzymes, which brings about breakdown of lipids to fatty acids increasing the free fatty acid content. The initial breakdown is followed by further breakdown of the fatty acids to smaller volatile compounds which gives rancidity and off flavors. Increased free fatty acids in coconut oil reduce the oxidative stability, smoking point, and cause foaming, reducing its value. The control of oxidative deterioration of the lipids is of major economic importance to the coconut industry. Oxidation of lipids also results in development of many new compounds having offensive odors and flavors discouraging the edible use of coconut oils. Among the lipids in vegetable oils, the unsaturated lipids are highly vulnerable to oxidation through various mechanisms. Coconut oil possesses an advantage of having 86.5 % saturated and 8.6 % unsaturated fatty acids in its lipid composition indicating low possibility of oxidation. There are three major oxidative mechanisms causing breakdown of lipids in foods. They are summarized in the figure 1 below and described later.

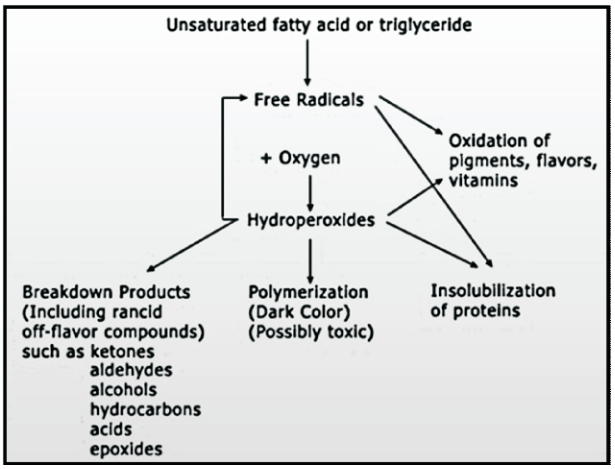

Fig 1 – Biochemical reactions leading to quality losses in food lipids

In one of the mechanisms the active molecular entities present in the oil may generate free radicals such as hydroxyl groups (HO) or alkyl (-CH_2) groups. The free radicals enter into chain reactions, which continue into propagation reactions until the chain is terminated as shown below (Fig 2).

1. **Initiation [formation of free radicals]**
   $RH + O_2 \rightarrow R\cdot + \cdot OH$
   $R\cdot + O_2 \rightarrow \cdot + ROO\cdot$
2. **Propagation [the free-radical chain reactions]**
   $ROO\cdot + RH \rightarrow R\cdot + ROOH$
   $ROOH \rightarrow RO\cdot + HO\cdot$
3. **Termination [formation of non-radical products].**
   $R\cdot + R\cdot \rightarrow RR$
   $R\cdot + ROO\cdot \rightarrow ROOR$
   $ROO\cdot + ROO\cdot \rightarrow ROOR + O_2$

Fig 2 – Oxidation of fatty acids in lipids due to interaction of free radicals

Oxidation of coconut oils can also occur due to interaction with sunlight. In this mechanism described as photo-oxidation, certain compounds described as photosensitizers initiate production of highly active oxygen molecules described as singlet oxygen ($^1O_2$). The singlet oxygens produce hydroperoxides by combining (adding) across carbon-carbon double bonds of unsaturated fatty acids. The mechanism of breakdown of lipids is given in Fig.3.

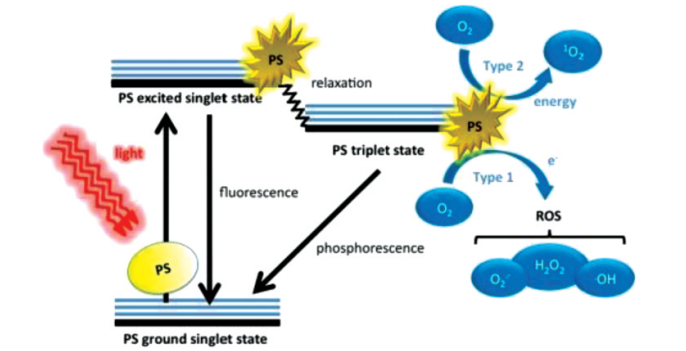

Fig 3- Production of singlet and reactive oxygen species leading to photo-oxidation

Thirdly, quality of coconut oil could also be affected by oxidation reactions of lipids due to enzymes naturally present in the coconut kernel, or introduced by the molds growing on coconuts during production and storage of copra. The enzyme lipase present in coconuts brings about breakdown of the lipids releasing unsaturated fatty acids. They could next be acted on by enzymes such as lipoxygenases making the acids to react with oxygen from the environment. A chain of reactions occur during enzymatic oxidation yielding small volatile molecules imparting rancidity.

Action of naturally occurring enzymes in coconut kernels which moves in to oil, the exposure to sunlight and air (oxygen), and contacts with metals contribute much to production of fatty acids and rancidity in coconut oils. Fig 4 summarizes the factors contribution to oxidation of lipids (fatty acids) which could be operative in coconut oil.

Moisture:	free water in raw material and feed
Catalysts:	metals promoting free radical formation
Light:	promotes oxidation
Temperature:	increase oxidation also during cooling
Enzymes:	lipase, lipoxygenase
Time:	storage time, production

Fig 4 – Factors contribution to breakdown of lipids and fatty acids in foods

In a study of 100 coconut oil samples produced by rural small expellers ("baby-expellers"), the mean percent of free fatty acids was found to be 3.56% with a range of 0 – 20%. Small expellers operating at rural levels handle small amounts of coconut dried under sun or over the fire place. Such coconut oils can bring in many health problems to the consumers.

Quality problems arising due to aflatoxin contamination of copra during processing

Production of coconut oil through copra continues to be the widely used method in the coconut industry. There are two major areas of concern on safety of coconut oil arising from contaminations.

Firstly the methods used in drying and handling of copra leave room for contamination by molds that produce the cancer causing compounds aflatoxins. On extraction of coconut oil, about 70% of aflatoxins move into coconut oil. The general presence of aflatoxins in copra, coconut oil and copra meal over a 1 year period in 45 commercial mills expelling coconut oil (poonac) are presented in Figure 5.

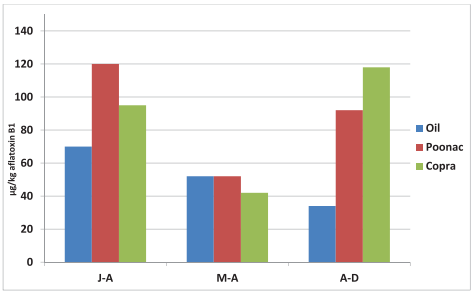

Fig 5 – Mean aflatoxin concentrations detected in coconut products from all coconut oil mills in Sri Lanka (J-A; January to April: M-A; March to August; A-D; August to December)

It clearly shows that the average levels for the country are high throughout the year. When the practices of mixing copra before oil expulsion were examined there were four types of practices, which are described below.

1. Always using substandard mold contaminated copra purchased at low price. The aflatoxin levels were very high throughout the year.
2. Mixing substandard copra with good copra during lean seasons of copra production. Their aflatoxin levels were high during certain seasons of the year.
3. Regularly mixing substandard copra with good quality copra. Their aflatoxin levels are uniform, but unacceptably high throughout the year.
4. Those having their own desiccated coconut and copra processing facilities and using parings to extract oil. The aflatoxin levels in their products were comparatively low, but still marginally acceptable.

With the current levels of aflatoxins in coconut oils they cannot be accepted as edible oils unless they are chemically refined. Chemical refining removes aflatoxins in oil and reduces the unacceptable free fatty acid levels. Apart from coconut oil, the poonac from contaminated copra carry aflatoxins, which moves into animal feed and appear in milk of cows and goats, exposing children to aflatoxins.

Drying of coconut kernels is done at home levels too by a combination of sun-drying and drying over the fire place. Such copra is expelled at small expellers at the rural level. A comparison of aflatoxin in coconut oil from the large and small expellers is given in the table 1.

Table 1 – Comparison of aflatoxin concentrations from large and small expellers in Sri Lanka

Type of mill	Number of samples	Mean (µg/kg)	Range (µg/kg)
Small	115	186	0-5000
Large	116	50	0-400

It is obvious from the contents of the table that the threat to human health from contaminated coconut oil is much higher with expulsion at small mills. It should also be recognized that it would be the same population in an area who would be continuously exposed to very high aflatoxin levels in a given locality selling coconut oil obtained from in small expellers. The tolerance limits for aflatoxins for food to be processed (copra) and processed foods (oil) are 15 (µg/kg) and 10 (µg/kg) respectively according to the internationally accepted regulations established by the joint committee of World Health Organization (WHO) and Food and Agriculture Organization (FAO). The quality of coconut oil thus stands much below the required quality and safety limits due to heavy aflatoxin contaminations.

Growth of the aflatoxin producing fungus begins at the sun-drying stage. The damage by crows during sun-drying creates cavities and they introduce the molds through their beak. The moisture at this point is heavily supportive of mold growth, unless smoke drying commence within 12 hours of splitting nuts. The next stage of heavy mold growth occurs during storage of processed copra. It is therefore essential to extract oil as soon as copra is dried. The damages in copra (cracks due to bad handling), inadequate smoke drying and long durations of storage thinking that it improves oil yields provide more opportunities for mold contamination. Mixing of contaminated copra is the next cause of aflatoxin contamination. Contrary to what is done in the coconut oil industry in Sri Lanka, the mold contaminated peanuts are separated by hand picking from a moving belt in India. Unless measures are taken to avoid mold contamination of copra, and keep moisture below 8%, the food safety problem arising due to aflatoxins in coconut oil and poonac cannot be eliminated.

Quality problems due to Polycyclic Aromatic Hydrocarbons (PAH) in Copra

Copra is manufactured in smoke kilns designed for the purpose using coconut shells to produce the heat. The industry is expected to construct the standard kiln designed by Coconut Research Institute, without changing its dimensions and design, to achieve the uniform heating ensuring low possibility of smoke deposition on copra kernels. Deviation from suggested practices would naturally produce poor quality copra of dark color.

The smoke emanating from burning shells contain a variety of chemicals in fine droplets of smoke, imparting a range of sensory characteristics to copra as shown in the table 2.

Table 2 – Constituents of smoke deposited on copra and their effects

Constituents in smoke	Effects
Volatile acids	Flavor, preservation and changes in pH
Carbonyl compounds	Reacts with proteins, affect color
Phenolic compounds	Flavor, bactericidal, antioxidant
PAH	Causes cancer

Polycyclic aromatic hydrocarbons consist of a group of chemical compounds, of which some are highly carcinogenic. The compound BaP is the most carcinogenic. The PAH are also produced due to exposure of oils to temperatures above 140 °C. Expulsion of coconut oil in expellers operating with screw press and no cooling systems raises the temperature at the point of extraction of oil permitting formation of PAH. Internationally accepted food regulations limit the presence of BaP to 5 µg/kg and total PAH to 25 µg/kg. The concentrations of PAH detected in some of the coconut kernel products in Sri Lanka are given in table 3.

Table 3 – Mean BaP and total PAH detected in processed coconut kernel products.

Product	BaP µg/kg	PAH µg/kg
Fresh coconut	0	0
Copra	3	102
Coconut oil	12	359
Poonac	1	68
Desiccated coconut	1	11
Parings	5	109

The table indicate that the levels of PAH in copra based products are above the tolerance limits. Chemical processing of coconut oil eliminates PAH from coconut oil. The deposition of PAH through smoke is relatively low when coconut shells are used, compared to coconut husks and leaves as fuel. In Sri Lanka only shells are used in drying copra. There are other countries where coconut husks and fronds are used in kilns. Research has shown that the levels of PAH in copra could be kept within tolerance limits if coconut shell charcoal is used for firing. The other alternative is to use indirect heat. Irrespective of the method of drying, the oil should be expelled from kernels within a day or two to avoid growth of aflatoxin producing molds.

Conclusions and recommendations

The coconut oil suffers from three major quality problems, high free fatty acid content, aflatoxin levels above tolerance limits and PAH levels above tolerance limits. All three get eliminated in chemical refining of the coconut oil. Formation of free fatty acids and the aflatoxins are time linked. If the storage between splitting nuts and extraction of oil could be minimized, the first two problems could be controlled to a great extent. Introduction of permitted antioxidants could minimize formation of free fatty acids in oil, but the reactions occurring in the kernels before oil extraction would be a problem unless storage period between copra production and extraction of oil is minimized.

The current practice of bulk delivery of coconut oil to the open market should be abolished and each miller should start bottling of oil with their identity established. The current practices, which leave no room for tracing the origin of coconut oil, leave much room for entry of poor quality coconut oil to the edible oil market. It also leaves room for mixing of coconut oil with palm oil threatening the existence of coconut oil milling industry.

Emeritus Prof. Upali Samarajeewa
President of IFSTSL

VEGETARIANISM TOWARDS A HEALTHIER BODY AND A MIND

Vegetarians enjoy a diet of various grains, pulses, nuts, seeds, vegetables, fruits and dairy. Studies suggest that a plant-based diet like this can be a healthier way to eat with fewer rates of obesity, heart disease and type -1 diabetes. Typically a vegetarian diet contains more folate, fiber, antioxidants and less saturated fat. Many people think that vegetarians are at a risk of being low in the mineral iron, but there are plenty of plant foods that are good sources of iron, including breakfast cereals. Simple "kurrakkan" porridge made with milk and brown sugar with cardamom to flavor and accompanied with slices of banana and dried sultana to garnish provides ideal nutrition for all ages. Hundred grams of our own "gotukola" contains 65 mg of iron.

"Gotukola" juice strained after blending and added to hot soy protein milk, which is already enriched with vitamins and minerals would be an excellent convenient choice of acquiring many health benefits of "gotukola" such as, memory power, helping mental fatigue and, providing sound sleep *etc.*, as explained in "Aurvedha". It can be taken regularly if a person is suffering from sinuates, catarrh, bronchitis, diabetes and epilepsy. It is a healing agent for eczema and other skin disorders. Vitamin C rich foods such as guava or papaya taken at the same time would help efficient absorption of iron to the body as 100 g of guava contains 228 mg of vitamin C and papaya contains 60 mg of vitamin C. Vitamin B12 is the only other vitamin that vegetarians need to be conscious of. Vitamin enriched soy protein milk, marmite, vegemite and the B12 vitamin tablets are also available for vegetarians.

Infants and children can be given pureed legumes such as chick peas, lentils *etc*. A group of scientists in Los Angeles has analyzed the diet of 73,000 vegetarians and found that they were less likely to die from any cause except for cancer compared to those who ate meat. They assume that the higher quantity of plant food consumed by the vegetarians is the major reason for the observation. Nowadays plant-based eating is recognized as not only nutritionally sufficient but also as a way to reduce the risk of many chronic illnesses.

Vegetarians get more vitamin C, fiber, folic acid, minerals, plant chemicals such as carotenoids, and flavonoids- the red colour in beet and yellow colour in pumpkin. As a result, such a diet lowers blood cholesterol, blood pressure and lowers the body mass index which is associated with longevity and reduced risk of chronic diseases. Nuts are also heart protective, but should be limited to 25 g per day. Residents in Okinova, Japan who are centenarians were found to on a diet of unrefined complex carbohydrate-rich foods and vegetables and soy. Whole wheat and "kurakkan" are the unrefined carbohydrates in their diet.

Women in menopause can be conscious of taking food that contain phytoestrogens and calcium, such as soy protein milk being the highest, beet, dates, garlic *etc*. Soy is by far the most abundant natural source of phytoestrogens, and such low fat, high fiber vegetarian diet can ward off extra pounds from your body. Seventy percent of grains produced in the world go to feed animals. Yet, if we go vegetarian, it would create a hunger free world. Moringa (drumstick) is great super food for vegetarians and the health conscious. It boosts energy levels, improves digestion, lowers blood pressure, protects stomach lining and treats stomach ulcers.The leaves contain high levels of vitamin A, B, and C. It contains 92 nutrients, 46 antioxidants, 36 anti inflammatories, 18 amino acids and 9 essential amino acids similar to animal food. It contains 272 % daily value of vitamin A, 125 % of calcium, 71 % of iron. It is known as mystical miracle tree to eradicate malnutrition in the poor world.

Our own "beli" (bale fruit) and "divul" (wood-apple) are wonderful healing food with many medicinal properties to improve immunity and contribute to gut health, prevents heart diseases and gastro intestinal diseases.

Look for these super foods and add them to your diet plan and enjoy being a vegetarian. It cleanses your body and thereby taking the mind to a composed and calm state. Think of the next step to be aware of your breath to practice a basic meditation technique, even for 3-5 minutes to heal the mind and to see things as they are. It would help your life to be much less complicated, spread loving kindness in thoughts, words and deeds to achieve true humanity, for no amount of knowledge based on science, mathematics or history can help you to be happy and calm. The power of divinity is within us to be unfolded. Let vegetarianism and simple meditation techniques like breath meditation make you rise like the lotus which originate from the mud and springs above water, giving forth its splendor and fragrance.

Mrs. Sunanda Weerasinghe
President,
Sri Lanka Food Processors Association

OBJECTIVES OF IFSTSL

- To create an apex body representative of professionals involved with the processed food industry of Sri Lanka.
- To uplift the level of professionalism within the food processing sector in the country.
- To benchmark and promote best practices beneficial to the national processed food industry.
- To interact at an advisory level with state bodies engaging the Government and consumer representation in all national policies and regulatory matters.
- To serve as a forum for professionals to exchange ideas, conduct research and promote innovation.
- To conduct educational programs, training programs, award certificates and engage in any knowledge infusing activities which benefit the sector.
- To develop, nurture and promote the national image and the competitiveness of the food processing sector.
- To pursue co-ordination and interaction with Non-Governmental Organizations, International Funding Agencies and fellow professional bodies in furtherance of these objectives.
- To undertake all matters incidental or conducive to the attainment of these objectives.

MEMBERSHIP BASE OF IFSTSL

The membership base of IFSTSL is rapidly expanding with more persons from the industry and potential employees of the industry, the university students reading for degrees in Food Science & Technology enrolling and participating in the activities of the Institute. This is a healthy sign for the future of the food industry in Sri Lanka.

EXECUTIVE COMMITTEE FOR THE YEAR 2014/2015

BOARD OF GOVERNORS

Prof. K.K.D.S. Ranaweera
Mr. Mario de Alwis
Mrs. Sunanda Weerasinghe
Prof. K.B. Palipane
Dr. D.B.T. Wijeratne

COUNCIL MEMBERS

Prof. Upali Samarajeewa - President
Mr. Manju Gunawardana - Vice President
Dr. Niranjan Rajapakse - Secretary
Mr. Rasika Senaviratne - Assistant Secretary
Mr. Chamila Perera - Treasurer
Mr. Sarath Alahakoon - Assistant Treasurer
Dr. (Mrs) Priyadarshani Talgaswatte - Immediate Past President
Mr. Nanda Kohona - Committee Member
Mr. Hamilton Diaz - Committee Member
Mr. Damitha Perera - Committee Member
Mr. Cyril Wickramaratne - Committee Member
Dr. (Mrs) Eresha Mendis - Committee Member
Dr. (Mrs) Nimsha Weerakkody - Committee Member

SPECIAL OFFER TO BE A STUDENT MEMBER OF IFSTSL

IFSTSL offers a special **50% discount** for the University Food Science students on admission fee to obtain student membership of the institute during Profood/Propack exhibition **(7-9th August, 2015)**. The membership obtained on this concession (Rs. 500) entitles you to enjoy membership till you graduate with free membership fee. It also provide you benefits to participate in seminars and workshops organized by the IFSTSL on concessionary terms, receive free copies of the Newsletter containing current Food Science related articles and present your final year projects to the food industry, at the annual sessions exposing you to the World of Food Science & Technology at no additional cost.

Please note that the above concession is given to you against a Rs 1,000 admission fee and Rs. 2,500 annual membership fee, which are charged for anybody becoming members of IFSTSL.

IFSTSL MEMBERSHIP CARDS

IFSTSL introduces membership cards for Fellow and Associate Members with effect from October 2015, which will be extended to other categories in time to come. This gives the opportunity to carry with you the proud identity of IFSTSL, which is operating in line with all Food Science & Technology Institutes in the World. The membership card would become the "key" to receive special benefits of the Institute and the Food Industry. Please contact IFSTSL secretariat to obtain the membership card application forms.

IFSTSL - MEMBERSHIP

IFSTSL membership is open to all those who are engaged in the food industry. The following membership categories are available for individual applicants and corporate bodies.

- **Fellow members**
- **Associate members**
- **Student members**
- **Corporate members**
- **Associate corporate members**
- **Interim members**

Information and the application forms for membership could be obtained from:

Mrs. Sandya Fernando
IFSTSL OFFICE
No 1, 1/1, Anderson Road, Colombo 5, Sri Lanka.
Tel: +94 11 7548770 Fax: +94 11 7548771
E-mail: ifstslinfo@gmail.com Web: www.slfpa.org/ifstsl