

OIL TECHNOLOGISTS' ASSOCIATION OF INDIA

OCTOBER - JANUARY 2010

EASTERN REGION
NEWS LETTER



FOR LIMITED CIRCULATION



With Best Compliments From :



A. B. POLYPACKS PVT. LTD.
A. B. POLYMERS

147, NILGANJ ROAD, KOLKATA - 700 056

Phone : 3295-7811, Fax : 2563-7494, Mobile : 98301-34594, 98300-06932

E-mail : abpolymers2008@gmail.com, abpolypacks@gmail.com



Contact Person : SANDIP DAS, CHINMAY KUMAR



Specialist in 5 layer & 3 layer polyfilm and also lamination jobs done carefully

CONTENTS

<i>Sl. No.</i>		<i>Page No.</i>
1.	From the President's Desk	1
2.	About Ourselves	3
3.	Obituary	4
4.	Report of the Workshop & Practical Short Course conducted by OTAI (EZ)	5
5.	Dietary Lipids : Overemphasized "Only Polyunsaturation and Cholesterol - by Dr. D. P. Sen	6
6.	Controversy Regarding Trans Fatty Acids in Food - by Dr. M. K. Kundu	12
7.	Parliament News	16
8.	Government Notification	24
9.	Book Reviews	25

EXECUTIVE COMMITTEE (2009-2011)
OIL TECHNOLOGISTS' ASSOCIATION OF INDIA (Eastern Zone)
3 Parasar Road, 1st Floor, Kolkata - 700 029

<i>President</i>	Mr. S. K. Roy	2466 6243/2463 9721	
	Mr. A. S. Khanna	2445 5782	
	Prof. Sunit Mukherjee	2466 3024	
	Dr. J. Chakraborty	2471 3434	
	Mr. J. P. Singh	2282 2708	98300 40404 (M)
<i>Hony. Secretary</i>	Dr. Santinath Ghosh	2484 3679	94332 68703 (M)
<i>Hony. Jt. Secretary</i>	Mr. Manoj Sinha	—	98312 60312 (M)
<i>Hon. Treasurer</i>	Mr. H. Lahiri	2400 0553	98304 73149 (M)
<i>Members</i>	Mr. P. P. Gupta	2400 5494	98301 83277 (M)
	Prof. D. K. Bhattacharya	2461 9662	
	Dr. A. K. Guha	2425 3519	
	Mr. R. S. Vaidyanathan	2481 0915	
	Mr. K. S. Parasuram	2423 8426	98311 32068 (M)
		2424 0153	
	Mr. Sarjit Singh	2586 0175	
	Mr. K. N. Sarkar	—	94333 99840 (M)
	Prof. Ranjit Chakraborty	2343 4124	
	Dr. Mohua Ghosh	2416 0138	94331 12273 (M)
	Dr. P. K. Chowdhury	2359 1139	94330 91166 (M)
<i>Co-opted Members</i>	Mr. Sudarshan Sikdar	2556 3026	94330 03026 (M)
	Mr. Sandip Das	2417 6654	98301 34594 (M)
	Mr. K. C. Lahiri	2410 0616	
	Mr. Asoke Roy	2669 9645	93301 87206 (M)
	Mr. Anup Das	2593 0470	
	Dr. (Mrs.) P. Sengupta	2287 2345	
<i>Imm. Past President</i>	Dr. R. K. Shah	—	
<i>Special Invitee</i>	Dr. B. R. Roy		
	Dr. D. P. Sen		
	Prof. R. P. Singh has taken over as President OTAI.		

Editorial Advisory Committee

D. K. Bhattacharyya, S. Ghosh, R. S. Vaidyanathan
D. P. Sen, B. V. Mehta, R. K. Shah

Editor

S. K. Roy

For enquiries please contact : S. K. Roy, Editor
5C, Tarak Mitra Lane, Kolkata - 700 026, Pb. : 2466 6243 / 2463 9721
E-mail : esskay_roy81@rediffmail.com / s.k.roy@gmail.com

FROM THE PRESIDENT'S DESK

We have just celebrated our Annual Social Meet on the 26th of January' 10. It has a very special meaning for the members of Eastern Zone. It's unique in term of a OTA FAMILY GET TOGETHER like our "Tricolour" of many lives.

Talking of colours , all natural colours in fruits and vegetables are beneficial for our human system. Let us have a look how these fruits and veggies help us in maintaing good health, with special reference to 'Tri Colour.

ORANGE

Fruits and vegetables in this colour are rich in beta-carotene, Vitamin C and various nutrients that help reduce age-related loss of vision. They are also anti-cancerous. They lower cholesterol and blood pressure, promote collagen formation and help maintain healthy joints.

Oranges : "If there's one thing oranges are famous for, it's their vitamin C concentration," says Dr shachi Sohal, head, department of dietetics, BL Kapur Memorial Hospital, Delhi. "They offer antioxidant protection and help build protection and help build strong immunity." They are also a good source of fibre.

Carrots : "Besides being good for eyesight, the carrot is a good source of a variety of nutrients including vitamins K and C, potassium and fibre, magnesium, phosphorous and others. It helps regulate blood sugar and has anti-cancerous nutrients," says Sohal.

Papayas : "These are high in folic acid and other unique protein-digesting enzymes," says Sohal. "Papayas are also a good source of vitamins A and E and potassium, besides being a natural laxative."

WHITE

The whites contain nutrients that provide powerful immune-boosting activity. These nutrients also help maintain cholesterol and blood pressure levels.

Onions and Garlic : "Rich in sulfides and a phyto chemical called allicin, they protect against tumours, reduce inflammation and lower blood fats, blood pressure, cholesterol and blood sugar," says Sohal. They are also great infection fighters with their anti-bacterial, anti-fungal, anti-viral and anti-tumour properties.

Radish : Very fibrous and rich in moisture, the radish is a great natural laxative. Its high moisture content makes it, very good for the skin and eyes.

GREEN

These are perhaps the best fruits and veggies to consume. They contain chlorophyll, fibre, folic acid, calcium, vitamin C and beta-carotene. The nutrients found in these vegetables reduce cancer risks, lower blood pressure and cholesterol levels, normalise digestion time, support retinal health and vision, fight harmful free radicals, and boost the immune system, say experts.

Spinach : Very high in iron and folic acids, spinach helps reduce birth defects. Its high calcium and fibre content make it good for the digestion, skin and eyes.

Broccoli : "A cruciferous vegetable, broccoli has anti-cancerous properties. The presence of antioxidants, minerals and vitamins A and C make it very good for health," says Sohal.

Kiwi : A kiwi a day keeps the doctor away, is the latest saying. Rich in vitamin C and potassium, it protects against weak eye-sight. Because it is low-calorie and high in moisture, it is a good diet food too. It also protects skin against damage.

Let these colourful fruits & vegetables, provide you good health & cheers for the days and years to come !!

*Ack
T. P. Rastogi*

(S. K. Roy)
President

ABOUT OURSELVES

1. A group of executive committee members, other members and a group of research scholars from Department of Chemical Technology, University of Calcutta attended and participated in the 64th Annual Convention and International Conference on Oils, Fats, Fuels and Surfactants at New Delhi during 9-11 December, 2009 (ICOFFS 09). Sri S. K. Roy, Dr. Santinath Ghosh, Mr. H. Lahiri, Sri R. S. Vaidyanathan, Dr. Mahua Ghosh have attended the conference.

In the research section there were about 20 oral and 16 poster presentations. From our eastern zone : Four Five oral presentations four poster presentations were there.

Oral presentation by

Dr. Pubali Dhar

Sri Siddhartha Saha

Avery Sengupta

Susmita Roy

Sugata Bhattacharyya

Poster presentation by

Moumita Bhattacharyya

Dr. Sumita Sil Roy

Sanjukta Datta

Rupali Dhara

From our Eastern zone Susmita Roy as oral presenter and Moumita Pal as poster presenter were adjudged as best presenters and awarded by Citation and cash prize of Rs. 5000/- each.

2. Annual social of OTAI (E2) was celebrated with usual pomp & grandeur, followed by sports. Participation of family members of OTAI (E2) & their enthusiasm was noteworthy on the 26th January 2010. The most notable point was active participation of Mr. P. P. Gupta & Mr. & Mrs. A. S. Khanna.

WELCOME TO NEW MEMBERS

OTAI (EZ) welcomes

MR. SREEPRAKASH CHETANI of

M/s. Replete Packaging Pvt. Ltd.

Office : 143D, Sarat Bose Road, Kolkata - 700 026

Resi. : 522, Parnasri Pally, Behala, Kolkata - 700 060

As Life fellow Member

OBITUARY

OTAI (E.Z) offers heartfelt condolences at the sad demise of

Professor Dr B. R. Roy

a Scientist of National and International repute

and our Life Fellow Executive Committee Member
who left for heavenly abode in December, 2009.

OTAI (E.Z.) also offers heartfelt condolences at the sad demise of

Mrs. Ila Sen

Wife of Dr. D. P. Sen

and

Mrs Tarulata Chakraborty

Mother of Dr. J.Chakraborty



May their souls rest in peace.

REPORT OF THE WORKSHOP & PRACTICAL SHORT COURSE CONDUCTED BY OTAI (EZ)

A three days workshop & practical short course on "Processing and Analysis of Oil Seeds and Oils" was organised by Oil Technologists' Association of India (EZ) in collaboration with Dept. of Chemical Technology, University of Calcutta on 20-22 November, 2009 at the auditorium of Chemical Technology Dept., University College of Sc. & Technology, University of Calcutta. Some senior members of OTAI (EZ) and distinguished personalities from different industries were present in the Inaugural session.

15 participants from various oil processing units such as M/s. Ruchi soya Industries Ltd., Rasoi Ltd., Adani Wilmar Ltd., K.S. Oils Ltd., Vinayak oils and fats, Edible Agro Products Ltd., Emami Biotech Ltd., Kalyani Solvex Ltd., Sethia Oils Ltd., Deepak Vegpro Ltd. R. P. Edibles and Research laboratories such as CGCRI, IJIRA etc. attended.

The programme was inaugurated by Head, Dept. of Chemical Technology, University of Calcutta. There were six theoretical lectures delivered by Prof. D. K. Bhattacharyya, Dr. Santinath Gosh, Dr. (Ms.) Mahua Ghosh, Mr. S. K. Roy, President, OTAI (EZ), Mr. Subhas Saha, GM, Specialty Chemicals, Hyderabad. The topics covered were Basic Chemistry of Fats & Oils; Refining of Fats & Oils; Chromatographic Techniques of analysis of Fats & Oils; PFA, Nutritional information on label in Oils & Fats ; Modification of Fats & Oils and Solid Fat Technology; Oxidative stability & Rancidity of Fats & Oils. An extensive demonstration on laboratory techniques including TLC, GLC, HPLC, analytical techniques for detection of adulterants was given. The study materials were also supplied for future reading. In the valedictory session certificates were distributed to the participants by The Director, School of Material Science, Bengal Engineering and Science University, Shibpur, Howrah.

DIETARY LIPIDS : OVEREMPHASIZED "ONLY POLYUNSATURATION" AND CHOLESTEROL

D. P. Sen, Scientist (Retd.),

Central Food Technological Research Institute (CSIR) Mysore

During second half of the last century, there was an amazing advancement in our knowledge on foods and their nutritional and metabolic functions, particularly with reference to a few classes of lipids (fat and cholesterol). Foods supply necessary nutrients to our body system from birth onward as specified by its genetics. As with essential amino acids, our lipid foods must provide adequate amount of essential fatty acids. Our physiology cannot cope with any nutritional insult due to overload or absence of one or more of molecular classes of dietary lipids, In the long run this gives rise to metabolic disorders and associated diseases. Also, depot fat of a farm animal, in the long run, gets the imprint of that of the fat of the food; this is a basic speciality of fat metabolism.

The present article gives, in brief, a bird's eye view of the present status of our knowledge on metabolic disorders and diseases due to in vivo dysregulation of fat and cholesterol at the adult stage of human life.

Classes of Dietary Fats

Dietary fats discussed here may be divided into following classes:

1. Saturated fatty acids (SFA)
2. Monounsaturated fatty acids MUFA
3. ω -6 (Omega - 6) polyunsaturated fatty acids (PUFA): linoleic acid (LA) and arachidonic acid (ArA)
4. ω -3 (Omega - 3) polyunsaturated fatty acids (PUFA): alpha linolenic acid (ALA), eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA)
5. Trans fatty acids (hydrogenated vegetable oils, TFA)
6. Cholesterol

Membrane Fluidity and Lipids

Cell membrane of different tissues of our body is composed of phospholipid bilayers interspersed with molecules of cholesterol, vitamin E and proteins. Membrane has receptors spanned over it to bind and transport cellular nutrients into a cell. For proper functioning a membrane should have proper fluidity and structure. Fluidity is regulated by its fatty acids more particularly by PUFA of phospholipids and structure by cholesterol.

SFA adversely affects fluidity of a membrane. Compared to SFA, PUFA has lower melting point. This is a factor which makes it desirable to have PUFA in phospholipid of membrane. 'Kinked' structures of PUFA prevent them from regrouping too tightly thereby promoting membrane fluidity. On the other hand the straight nature of SFA and TFA and also disproportionate amount of cholesterol allow these lipids to pack tightly together and increase membrane rigidity. At the same time, a membrane overloaded with PUFA and with an inadequate amount of vitamin E may bring about oxidative stress through unchecked *in vivo* lipid peroxidation.

PUFAs and Eicosanoids

Significant portion of dietary Omega-6 LA is converted to long chain Omega-6 ArA by human liver and other tissues. Omega-6 ArA present in plasma and cell membrane is converted to hormone like metabolites known as eicosanoids via the action of two enzymes (5-lipoxygenase, 5-LOX and cyclo oxygenases COX). Leukotriene B₄ (LTB₄), thromboxane A₂ (TXA₂) and prostaglandin E₂ (PGE₂) are just a few important metabolites which favour inflammation, tissue destruction, blood clotting, cell growth and cell division. Excessive production of these metabolites contributes to many diseases namely heart attack, stroke, rheumatoid arthritis, degenerative arthritis, osteoporosis, Alzheimer dementia, cancer of breast, colon and prostate.

Similarly through the same enzymes (5LOX and COX), membrane and plasma Omega - 3 EPA derived directly from dietary EPA or generated from its precursor Omega -3 ALA gets converted into TXA₃, LTB₅ and PGE₃. These eicosanoids are anti-inflammatory, anti-thrombotic, and oppose arthritis and carcinogenesis.

As the same enzyme systems are involved for the generation of eicosanoids from both ArA and EPA, massive intake of Omega 6 LA results in massive formation of corresponding eicosanoids. When Omega - 3 EPA is present in diet, plasma or membrane, it limits the generation of harmful mediators from Omega - 6 LA or Omega - 6 ArA. There should be an appropriate balance between Omega - 6 and Omega -3 PUFAs in one's diet. Thrombosis and inflammation are closely related. Dual prothrombotic and inflammatory mediators are TXA₂ originating from ArA through LA. Overloading our diet with LA is highly undesirable.

Dietary PUFA and Antioxidants

PUFAs give rise to *in vivo* peroxidation through free - radical chain reaction. Oxygen metabolism in the body invariably helps the process and also produces pro-oxidant free radicals from other mother molecules. These other free radicals damage other important biomolecules of lipid membrane and, if unchecked, are causes of many diseases. This necessitates intake of antioxidant network i.e. frequent and balanced consumption of diverse antioxidant molecules. This can be achieved through intake of fruits, vegetables, nuts, legumes, spices, whole grains, tea and coffee which are rich in antioxidants.

Dietary MUFA

Dietary MUFA, particularly oleic acid (present in high amount in olive oil) reduces generation of pro-inflammatory LTB₄. Long term consumption of MUFA reduces the risk of thrombosis by inhibiting platelet aggregation and other mechanism. Net health effect of MUFA is moderately beneficial.

Dietary SFA

Dietary SFA may promote platelet aggregation and thus cerebral and coronary thrombosis. This helps to explain positive correlation between excessive SFA intake and coronary heart disease which remains after adjusting for the effect of blood cholesterol. The overall effect of SFA is moderately deleterious.

Dietary TFA

TFA includes pro-inflammatory molecules and also promotes platelet aggregation, and coronary and cerebral thrombosis. The deleterious effect helps to explain strong correlation between even a small quantity of dietary TFA and cardiac events. TFA causes long term fat accumulation through hypertrophy and hyperplasia. Other adverse effect of TFA related to cholesterol dysregulation is increase of blood LDL/HDL ratio, small and dense LDL, LpA and VLDL. Net effect of TFA is profoundly deleterious.

Dietary Cholesterol

In our body system cholesterol is the mother substance of many highly important physiological components. Despite this, high blood cholesterol, more particularly LDL ("bad") cholesterol predisposes one to the development of cardiac and vascular diseases, heart attack and stroke. However, recent investigations have indicated that all the cholesterol of LDL is not "bad". LDL has five subtypes. Cholesterol of the subtype called dense and buoyant LDL is "good" while cholesterol of oxidized LDL and small and dense LDL are "bad". The remaining two are "bad".

Effect of dietary cholesterol on blood cholesterol is rather dubious. According to a few findings, dietary cholesterol has little impact on the status of overall blood cholesterol. In a few studies dietary cholesterol has been reported to reduce the atherogenicity of LDL platelets by increasing their size and buoyancy.

Thanks to massive publicity by different organisations of medicine of USA and elsewhere, dietary cholesterol has become a "rogue" compound even to a layman. But this has created a problem too. A common man overlooks similar danger from other dietary aspects and components such as Omega - 6 LA overload, neglect of Omega - 3 ALA, neglect of fish as source of EPA and DHA and lastly, no stress on antioxidants.

Modern diet and lipids

During the last five or six decades, in every country, upper stratum of society and urban people are switching to modern processed foods best exemplified by foods in USA and advanced European countries. These foods are based on refined sugar, highly refined starch, common salt, expelled or solvent extracted, refined vegetable oil, hydrogenated vegetable oil and meat from animals or birds reared in captivity on formulated feeds. A diet based on above foods is (1) overloaded with massive amount of Omega 6 LA and ArA and concurrently (2) poor in Omega 3 ALA, EPA, and DHA, (3) has adverse Omega_3 /Omega 6 ratio, (4) contains harmful TFA, (5) has limited contents of antioxidants network and (6) poor in fibres including soluble ones. Following table indicates adverse effects of such foods vis a vis cardiovascular mortality.

Table: Plasma ω - 6 ArA and ω - 3 EPA as % age of total ArA and EPA and Cardiovascular mortality

	ω - 6 ArA	ω - 3 ArA	ArA / EPA ratio	CHD related mortality
Caucasian American	96%	4%	24:1	Very high
Japanese American	93%	7%	13:1	High
Urban Japan	69%	31%	2:1	Low
Rural Japan	56%	44%	1:1	Very low
Greenland Eskimos, 1975	10%	90%	1:9	Very low

Adopted from reference cited

According to authorities on the subject ,processed foods and diets of the present era are poor in quality compared to that of our ancestors of prehistoric time before "agricultural revolution" about 10,000 years ago. They used to take 10 times more Omega - 3 ALA as the modern USA people eat. Their food were poor in LA/ALA ratio, had trace or no TFA and a better MUFA/SFA ratio. Meat from game and wild animals had lower amount of SFA. Prehistoric men ate fruits, vegetables, nuts, seeds, grains etc rich in antioxidants network and different fibres.

Present day modern foods may be tasty, appealing, with aroma and easy to eat and serve. But they are in poor quality at least with reference to quality of fat.

Guidelines for Dietary Fats

In India, and also in USA recommendations of health authorities on dietary fat do not include any directions on the basis of omega - 6 and omega - 3 classes of fat.

Guideline on the basis of degree of unsaturation is available. Progress in applied nutrition on lipids during past fifty years or so demands a deeper and exhaustive recommendation. It has been recommended by many scientific authorities on the subject that Omega - 6/ Omega -3 ratio of our food lipids should be 4/1 or 5/1.

Dietary Fats (visible) in India

In India, different commercially available oils permitted for edible purposes under PFA Act are mostly rich in LA. Only three oils namely:

1. Linseed oil.
2. Soybean oil.
3. Mustard seed oil.

contain significant amount of Omega - 3 ALA. Linseed oil due to its very high Omega - 3 ALA content is not suitable for Indian cooking practice which involves heating the oil and this causes it to undergo various chemical changes and polymerisation. Mustard seed oil is objected in many countries due to its high erucic acid content. On the other hand, the presence of C22 unsaturated fatty acid in it is considered a positive plus point by many as this is considered to be a readily available mother substance of DHA with 22 carbon atoms. In an earlier issue of the News Letter of EZ of OTAI, present author expressed that rice bran oil is ,more or less, ideal because of its SFA, MUFA and PUFA contents approximately in right proportion; but this requires to be changed to include Omega - 3 ALA. It may be necessary to have blended oils.

Conclusion

Degenerations due to metabolic disorders are mostly slow processes and resulting diseases show their dangerous or painful affliction or symptoms in later half of ones life. Disorder due to a diet becomes clear only in aged people. It is necessary that an adult should select food items properly to minimise metabolic diseases in later life. Omega - 6 LA is well recognized for its hypocholesterolemic effect and most edible oils in India are over loaded with the above fatty acid. But, at the same time, Omega - 6 LA is the mother substance of many hormone like metabolites which, in excess, may cause serious dysregulation of normal metabolism and diseases. This is a profound weakness of modern foods overloaded with Omega -6 LA and this cannot be over looked. This can be counteracted by including appropriate amount of omega - 3 ALA, EPA and DHA in our foods and edible oils. For this blending of oils may be necessary and /or seafoods, freshwater fish, leafy and other vegetables in our diets.

Hydrogenated vegetable oils (TFA) have been reported to be deleterious to health. The matter requires critical examination. In 1940 an extensive investigation on the wholesomeness of hydrogenated vegetable oil (vanaspati) was carried out in more than one laboratory under the directive of Government of India. Vanaspati was found to be safe and fit for human consumption. However, there is a need to re-examine the matter in the light of present day advancement of applied nutrition; this is in the interest of public health.

Our emphasis to reduce dietary cholesterol requires modification as this makes one blind to other pressing issues on the nutritional quality of fat.

A modern food should include antioxidant network i.e. fruits, vegetables, nuts etc. to quench free radicals that arise from PUFA and other biological compounds.

Reference

Christopher E. Ramsden,
Nutrition By The Numbers, Optimize your health with the Nutritional Quality Index (NQI)
Applied Biochemistry, LLC.
Atlanta, GA, 30338-4047, USA, 2007
p. 267, > 1200 ref., price US\$ 18.95