OIL TECHNOLOGISTS' ASSOCIATION OF INDIA

JULY 2019 - DECEMBER 2019

EASTERN REGION

FOR LIMITED CIRCULATION

CONTENTS

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From the Editor's desk

Most people already understand that when they eat a healthy, nutritionally-dense diet, they feel better and have more energy. However, fewer people realize that the food they eat has a direct effect on their ability to think, learn and commit items to memory.

Numerous studies have now demonstrated a link between certain nutrients and improved cognitive performance. Not only do these brain power foods help you to perform your best, but also they protect brain cells and synapses against the degeneration that often plagues people as they age. Researchers even believe that these healthy foods may delay the onset or mitigate the symptoms of conditions like dementia and Alzheimer's disease.

Here are 12 of the best foods for improving memory and brain function. Each one is readily available at most grocery stores and is easy to incorporate into an existing diet.

1. **Salmon**

   The omega-3 fatty acids that are packed into every portion of this deep-water fish are essential to optimal brain function. This is the component that makes salmon not only one of the best foods for your brain but valuable for overall health. Scientists cite salmon's anti-inflammatory properties as another reason to select this food to feed your brain. Consuming salmon two or three times a week can help improve alertness and memory.

2. **Leafy, Green Vegetables**

   Kale, spinach, romaine lettuce and Swiss chard are among the best foods for brain health. This is because they are loaded with powerful antioxidants that protect the brain from deteriorating. One study shows that older adults who enjoyed one or two servings of leafy, green vegetables every day showed fewer of the warning signs of dementia.

3. **Blueberries**

   Researchers believe that substances like the Gallic acid that is found in this super-fruit protect the brain from oxidative stress. Blueberries may also ameliorate the effects of dementia and Alzheimer's disease. Studies demonstrate that regularly consuming blueberries may improve motor skills and the capacity to learn, thanks to mega-doses of vitamins C and K as well as fiber.

4. **Walnuts**

   Because they are rich in vitamin E, researchers believe that the wholesome walnut can help people maintain mental sharpness as they age. Vitamin E achieves this effect by trapping free radicals that might otherwise damage valuable brain cells.

5. **Eggs**

   People who are keen to maintain their ability to communicate as they grow older and make certain that their memory remains razor sharp are advised to eat whole eggs on a regular basis. This also involves eating the yolk which contains choline, a substance that supports neurotransmitter health.

6. **Avocados**

   This succulent fruit is loaded with monounsaturated fat, a healthy supply of which supports blood flow throughout the body. This is beneficial for all of the organs, including the brain, making the avocado the best brain food for people of all ages. The avocado's potential benefits don't end there. It also lowers blood pressure, a key component that helps to improve brain function, because of its high potassium content.

7. **Whole Grains**

   Foods that contain whole grains provide the essential fuel that keeps your brain alert and active. Keep in mind that although your brain is relatively small compared to the rest of your body, it claims a sizable percentage of the energy you consume. Whole grain foods like quinoa, whole-wheat bread, and brown rice enhance blood flow and provide the brain with the fiber, antioxidants and vitamin E that it needs for optimal functioning.

8. **Oranges**

   This incredibly healthy fruit may be the key to staying mentally sharp as the years go by. A single, medium-sized orange contains the entire recommended daily allowance of vitamin C. This is critical because vitamin C helps to protect the brain against age-related decline. Additionally, vitamin C is an anti-oxidant, which means that it traps free radicals that would otherwise damage brain cells.

9. **Dark Chocolate**

   Anyone who has a sweet tooth will be pleased that this item is included among the foods that improve memory. With anti-oxidants, flavonoids and caffeine all being natural components of dark chocolate, it's easy to see why moderate amounts of this food can boost brain health. Flavonoids are thought to assist with learning and memory while other components in dark chocolate protect against cognitive decline.

10. Pumpkin Seeds

Pumpkin seeds deserve a place on this list of brain-boosting foods because they contain a variety of substances like zinc, magnesium, copper, and iron, all of which support brain function. Zinc and copper support healthy nerve signaling while magnesium is a key component of learning and memory. An iron deficiency contributes to the impairment of brain function, so getting extra iron from pumpkin seeds can contribute to more alert mental processing.

11. Almond Butter

This is one of the best foods for brain health because it contains outstanding concentrations of vitamin E. Indulging in a teaspoon of almond butter on a piece of whole grain bread, in oatmeal, spread on a piece of celery or slathered on a slice of apple can help people improve their cognitive abilities.

12. Cherry Tomatoes

Like other red and orange fruits and vegetables, cherry tomatoes are packed with carotenoids, a nutrient that scientists believe improves thinking and memory. One specific carotenoid, lycopene, is present in extremely high concentrations in the skin of cherry tomatoes, so snacking on a few of these every day is an excellent idea for people who want to preserve their cognitive abilities.

In addition to consumption of "Best Foods" for Brains Health, exercise of the "Brain" in terms of engazing in academic activities may help in maintaining "Brain Health"-

Wish you all a Good Health
which includes "Brain Health".

Ack / Courtesy
"Eastern Chronicle"

S. K. Roy
Editor

OBITUARY

Prof. Sunit Mukherjee

A, Cryobiologist Sunit Mukherjee, who assisted Dr. Subhas Mukherjee in using in-vitro-fertilization (IVF) technique to create India's first and the world's second test tube baby, Durga, on October 3, 1978, died on Saturday 14th January 2020, He was 89.

“He was born on March 1, 1931. He died around 3.30 am on Saturday,” a relative, Animesh Chakraborty, told TOI. Instrumental in having Mukhopadhyay's name included in the Dictionary of Medical Biography, Sunit ran Subhas Mukherjee Memorial Reproductive Biology Research Centre and Food & Nutrition Division inside Behala Industrial Estate almost single-handedly. He had a degree in applied nutrition from Grad School of Nutrition, Cornell University, USA and headed JU's food technology department. He and Dr Mukherjee did extensive research on the role of food intake in prevention of infertility.

All his life, Sunit fought for his mentor's recognition, from the time he had approached IVF specialist Dr T C Anand Kumar, who, till then, was known as the “creator of India's first test-tube baby”. Sunit made kumar go through Dr Mukherjee’s handwritten notes and made him and the world accept that the Title belonged to Dr Subhas Mukhopadhyay.

On June 19, 1981, Dr Mukherjee committed suicide. It was thanks to Sunit's pursuit that in 1997, Bengal recognized Mukhopadhyay's feat posthumously. Sunit told the world that by the time Kumar's “Harsha” was born in Mumbai on 6 August 1986, Subhas's “Durga” or “Kanupriya Agarwal” was already eight years old, born 67 days after Robert G Edwards had the world's first test-tube baby delivered in England. “Subhas' method of assisted reproduction is the most preferred, worldwide. His use of human menopausal gonadotrophin (HMG) in multiple ovulations has the most success rate. He transferred the embryo after cryo-freezing and preservation to the next menstrual cycle,” Sunit had told TOI in an interview in 2018.

Prof Sunit Mukherjee, an executive Committee member of O.T.A.I. (E.Z.) was also a Life Time Achievement Awardee and Chairman of an Internationally recognised N.G.O. C.I.N.I., & Convenor of Nuttrition Society of India (Kolkata Chapter)

May His Soul rest In peace!!

In Grief
Members of OTAI

Ack : Times of India

A Short communication

Sunit Mukherjee

"Unknown facts about sauerkraut"

Indian sauerkraut as characterised by "Hand book of Indigenous Fermented Foods, Ed K.H. Steinkraus, Pub: Mercel Dekker Inc, N.Y &Basel, 1983"is a debatable item in Indian culinary.

Highly perishable primary foods like fruits and vegetables should be processed in India at least to an intermediate stage at the village level where the raw materials are grown. For several reasons, such approach was effective in the early stage of development in U.S.A in the thirties and much later in Canada. Continued training, pilot production and preservation at low cost, developing appropriate products and processes may be required to achieve success.

It should be appreciated that the waste from the processing of fruits and vegetables could be as much as 40-50%, which is fully biodegradable & can be a powerful pollutant of the environment. However, the waste could be used as organic manure in the nearby agriculture field. It would be appropriate if biogas plants are set up to utilize the waste efficiently for production of energy and simultaneous generation of organic manure containing nitrogen, phosphorous and potassium for use in the agricultural field.

It is known that traditionally & commercially Sauerkraut is prepared in the western world by fermentation with natural flora present in the cabbage, which is to certain extent lactic acid bacteria. Under appropriate conditions the vegetable will undergo spontaneous lactic acid fermentation. A definite sequence occur in the growth of Lactic acid bacterial species, wherein the fermentation is initiated by heterofermentative Leuconostoc mesenteroides, and followed by heterofermentative rods such as Lb brevis, homofermentative Lb plantarum and Pediococous cerevisiae. L. mesenteroides is an unique flora which produces acetic acid, ethyl alcohol, carbon dioxide and hydrogen peroxide apart from lactic acid each of which has special significance. Sauerkraut is known to provide certain laxative properties, which are due to the formation of acetyl choline and lactyl choline coming from lecithin. It is also known that an optimum temperature of 18□C. favours the development of desirable flavour, taste and texture and when the Ph falls below 4, no pathogen can grow and the sauerkraut is largely safe for consumption. The author's basic studies (Sunit Mukherjee & H. Ganguly, J.F.S.T. 8,127-131, 1971) indicate that though the flora followed the traditional path the Indian sauerkraut did not have the flavour and texture similar to the one in western world, as the temperature is generally above 18□c. Further Studies at Dr. Subhas Mukherjee Memorial R.B. Research centre, Food & Nutrition Division indicate (Ref 1) that the loss of solid in the Kraut juice is as much as 20-25%.The juice can be diluted and mixed with sugar & spices. Such product can be an acceptable drink for the Indian population. At the level of 3% salt the development of acid and subsequently change in pH is enumerated in the following table.

Changes in pH & acidity at different temperature during Indian sauerkraut fermentation at a salt level of 3%

Based on the above considerations it is suggested that during the cabbage season in West Bengal in particular and others states in India in general, when ambient temp. Ranges from 20□C to 30□C, the time of fermentation may be maintained at 5 to 7 days. After which the sauerkraut may be dipped in a solution of sodium benzoate for further preservation up to 4 months, such that the final concentration of sodium benzoate in the sauerkraut comes to 1000ppm.

In such way mixed vegetables can be preserved where the share of cabbage should be 80%, preferably. Sliced cauliflower, carrot, radish, green papaya and peas can be used in the mixture. Green vegetables should be avoided as in acid pH they turn brown. With our efforts the Food Safety & Standards Act of India -2006 has incorporated the standards of sauerkraut in India, where the

allowable limit for addition of sodium benzoate has been set at 1000 ppm.

It should be appreciated that large majority of the population in India do not have the facility of canning in tiny or small scale sector, also they do not have the facility for refrigeration, hence class Π preservative is allowed by the FSSAI. Furthermore, after long experimentation it is seen that the fermentated sauerkraut is not well accepted in the raw form, hence the kraut was washed with hot water to remove much of the lactic acid as well as the preservative, and then the washed cabbage and vegetables are cooked in Indian style with spices and only then the product is more acceptable to the Indian consumers. It should be acknowledged that the Indian cooking practices lose most of vitamins B and C. Fortunately much of the carotenoids in carrot is retained even after washing & cooking.

The potential for utilisation of seasonal vegetables exists in India and should be explored in practical programs wherever needed.

Av. Temp	No. of days of Fermentation	pH (approx)	Acidity %lactic acid
18℃	3 days	4.2	0.70
18℃	7 days	3.8	0.85
30℃	3 days	3.9	0.94
30℃	7 day	2.8	1.77

Based on the above considerations it is suggested that during the cabbage season in West Bengal in particular and others states in India in general, when ambient temp. Ranges from 20°c to 30°c, the time of fermentation may be maintained at 5 to 7 days. After which the sauerkraut may be dipped in a solution of sodium benzoate for further preservation up to 4 months, such that the final concentration of sodium benzoate in the sauerkraut comes to 1000ppm.

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The potential for utilisation of seasonal vegetables exists in India and should be explored in practical programs wherever needed.

Skin protection effects of Vitamin E

Vitamin E is an important fat-soluble antioxidant and has been in use for more than 50 years in dermatology. It is an important ingredient in many cosmetic products. It protects the skin from various deleterious effects due to solar radiation by acting as a free-radical scavenger. Experimental studies suggest that vitamin E has anti-tumorigenic and photo-protective properties, as well.

There are eight types of vitamin E (alpha, beta, gamma, and sigma-tocopherols and their related corresponding tocotrienols). Gamma-tocopherol is the most abundant tocopherol in diet, whereas alpha-tocopherol is the most abundant vitamin E derivative in human tissues and sera.

Alpha-tocopherol can be derived synthetically or sourced naturally from a variety of foods including vegetable oils. It plays an important role in neutralizing free radicals, moisturizing skin, and improving the appearance of visible skin aging.

Vitamin E, occurring naturally in food in the form of alpha-tocopherol oxidizes slowly when exposed to air. The stability of topical vitamin E may be increased by the use of vitamin E conjugates, which are esters of tocopherol, resistant to oxidation but can still penetrate skin layers.

Although many cosmeceuticals contain vitamins C and E, very few are actually effective in topical application because the stability is compromised as soon as the product is opened and exposed to air and light. However when a stable formulation delivers a high concentration of non-esterified, optimal isomer of the antioxidant, vitamins C and E inhibit the acute UV damage as well as chronic UV photo-aging and skin cancer (1).

Thanks to its easy absorption, permeating both the epidermis and the dermis, alpha-tocopherol is the most popular form of vitamin E in skin care products. Soothing and moisturizing, alpha-tocopherol helps protect against the harmful effects of UV rays while fighting free radicals. Some studies also show that it blocks the enzymes that break down elastin – a powerful protein that contributes to our skin's youthfulness and elasticity. Alpha-tocopherol is often used in sunscreens and aftrer-sun products, eye creams, moisturizing hair products, and anti-aging products (2).

Although there is widespread use of tocopheryl acetate as a topical medication, with claims for improved wound healing and reduced scar tissue, reviews have repeatedly concluded that there is insufficient evidence to support these claims. There are reports of vitamin E-induced allergic contact dermatitis from use of vitamin-E derivatives such as tocopheryl linoleate and tocopherol acetate in skin care products. Incidence is low despite widespread use (3).

Forms used in cosmetic products

Rather than tocopherol itself, esters of tocopherol are often used in cosmetic and personal care products. These esters include (4):

- Tocopheryl acetate, the acetic acid ester of tocopherol;
- Tocopheryl linoleate, the linoleic acid ester of tocopherol;
- Tocopheryl linoleate/oleate, a mixture of linoleic and oleic acid esters of tocopherol;
- Tocopheryl nicotinate, the nicotinic acid ester of tocopherol; and

Ack / Courtesy “hpic India” vol-5 No.5

- Tocopheryl succinate, the succinic acid ester of tocopherol.

Potassium ascorbyl tocophyeryl phosphate, a salt of both vitamin E (tocopherol) and vitamin C (ascorbic acid) may also be used in cosmetic products.

Other tocopherol-derived ingredients that may be found in cosmetic products include:

Dioleyl tocopheryl methylsilanol, which is the dioleyl ether of tocopheryl acetate monoether with methylsilanetriol; and

Tocophersolan, which is also called tocopheryl polyethylene glycol 1000 succinate the addition of succinic acid and an average of 22 ethylene oxide groups to tocopheryl makes tocophersolan a water-soluble form of tocopherol.

The forms, d--tocopheryl acetate and dl--tocopheryl acetate, are extremely stable in formulations and therefore the compounds of choice for cosmetic preparations with maximum vitamin efficacy.

The tocopherol forms dl--tocopherol and mixed tocopherols are mostly used to stabilize oxygen-sensitive ingredients in cosmetic formulations, to enhance shelf-life of the formulation.

In cosmetics and personal care products, tocopherol and other ingredients made from tocopherol, including tocopherol esters are used in the formulation of lipsticks, eye shadows, blushers, face powders and foundations, moisturizers, skin care products, bath soaps and detergents, hair conditioners, and many other products.

Mode of action and benefits

The protecting effects of Vitamin E are manifold and reported in many publications. But its central role is that of a strong antioxidant, capturing free oxygen radicals generated by exposure to UV-light or pollution and preventing damages (5).

Benefits of Vitamin E in skin care include:

Table 1

Concentration of use, function and product formulationdata of vitamin E and its derivatives (8)

Compound	Concentration of use (%)
Tocopherol	Baby products: 1 Bath products/shampoo/rinse off products: 0.01-0.8 Deodorants: 0.05 Hair products: 0.01-0.6 After shave lotion: 0.2 Moisturizing preparations, creams, lotions, body/hand ointments: 0.05-2 Sun tan gels and creams: 0.001-0.3 Make up preparations (e.g., liquids, eye shadows, lipsticks, face powders, blushers, foundations): 0.001-0.9
Tocopheryl acetate	Baby products: 0.001-1 Bath products/shampoo/rinse off products: 0.0001-25

	Deodorants: 0.2 Hair products: 0.001-0.3 After shave lotion: 0.2 Moisturizing preparations, creams, lotions, body/hand ointments: 0.001-25 Suntan gels and creams: 0.05-1 Cosmetics (e.g., make up liquids, eye shadows, lipsticks, face powders, blushers, foundations): 0.02-0.8
Tocopheryl linoleate	Shaving cream: 2
Tocopheryl linoleate/oleate	Moisturizing preparations, creams, lotions, body/hand ointments: 0.1-2 Suntan gels and creams: 2 Cosmetics (e.g., make up liquids, eye shadows, lipsticks, face powders, blushers, foundations): 0.1-2

Helps to protect beautiful and healthy-looking skin;

Helps improving skin resilience induced by damages from urban pollutants;

Helps to enhance skin sensation by soothing;

Helps in skin softening & improves appearance of skin with acne and blemishes; and

Significantly strengthens the skin barrier, even with rinse-off products containing -tocopherol in concentrations of less than 0.2%

In recent years, scientists have discovered that a class of vitamin E known as the tocotrienols are better antioxidants and confer greater health benefits than tocopherols, although they are poorly absorbed into the bloodstream from dietary sources such as palm oil and cereal grains. As a result, researchers are now attempting to improve the bioavailability – the fraction of the ingested vitamin that reaches the target tissues – of tocotrienols.

According to some studies, alpha-tocotrienol is 40-60 times more potent as an antioxidant than alpha-tocopherol and, when applied topically, penetrates the skin better than tocopherol. Firming creams and moisturizers containing tocotrienols are now commercially available (6).

Most of the tocopherols are reported to function in cosmetics as antioxidants or skin conditioning agents. In contrast, tocotrienols is not reported to function in cosmetics as an antioxidant, but instead as a light stabilizer, oral care agent, or skin conditioning agent. The US Food and Drug Administration (FDA) collects information from manufacturers on the use of individual ingredients n cosmetics as a function of cosmetic product category in its Voluntary Cosmetic Registration Program (VCRP). VCRP data obtained from the FDA in 2013 report that the frequency of use increased considerably for both tocopherol and tocopheryl acetate. The reported use of tocopherol increased from 1,072 (1998 data) to 6,175 uses (2013 data), and the reported use of tocopheryl acetate increased from 1,322 (1998

data) to 8,960 uses (2013 data). For both of these ingredients, the 2013 VCRP data includes uses under more than one name. Tocopherol has 6,003 reported uses as tocopherol, 122 reported uses as tocopherol d-alpha, and 50 reported uses tocopherol dl-alpha.Tocopheryl acetate has 8,433 reported uses as tocopheryl acetate and 527 reported uses as tocopheryl acetate dl-alpha. Both of these ingredients are used in almost every product category. Tocopheryl linoleate also increased in use frequency since the time of the original assessment, from 103 to 279 formulations; the use of the other tocopherols that were included in the original safety assessment did not change much.

The use concentration of tocopherol, but not of tocopheryl acetate, has increased. According to the survey conducted by the Personal Care Products Council in 2013, the concentration of use of tocopherol in leave-on products increased from 2% in 1999 to 5.4% in 2013. Tocopheryl acetate continued to have the highest reported use concentration; it is used at up to 36% in leave-on formulations, and that use is in cuticle softeners (7).

End – notes

The process of skin aging has been linked to the destruction caused by free radicals over time. Although there are many different factors at work, wrinkled skin is largely the result of cumulative UV exposure and exposure to chemical pollutants in the environment, as well as oxidative stress created by normal cellular processes in the body. The destructive power of these toxic molecules gradually breaks down healthy collagen and compromises the skin's integrity.

Vitamin E is a well-known antioxidant and its unique chemical structure enables it to effectively and safely quench free radicals. Research has shown that vitamin E, particularly the gamma tocotrienol form, can modulate genetic signals in skin cells to help prevent oxidative damage. Additionally, scientists have found that delta tocotrienols are quite effective at slowing the production of melanin, the skin pigment responsible for unsightly age spots. Vitamin E plays an important role in maintaining the barrier function of the skin as well. Topically applied vitamin E is an excellent moisturizer that helps keep the skin healthy and soft. This valuable nutrient locks moisture into the skin and prevents dehydration. Vitamin E is able to deeply penetrate the skin and provides broad-spectrum defense against signs of skin aging from the inside out.

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Dr. Santinath Ghosh Memorial Research Award 2019

Formulation of omega-3 PUFA loaded functional food nanoemulsion: an efficacious tool to deliver the 'bioactives'

Tanmoy Kumar Dey[#],

Priya Banerjee, Roshni Chatterjee, Pubali Dhar

Colloids and Surfaces A: Physicochemical and Engineering Aspects; 538 (2018) 36–44

FUNCTIONAL food '**NANO**'emulsion:

What ?

- Very small droplets, generally lower than ~100 nm.
- Kinetic Stability.
- Appearance varies from milky, opaque (concentrated) to bluish, translucent (diluted).
- Functional food component as encapsulated cargo.

Why ?

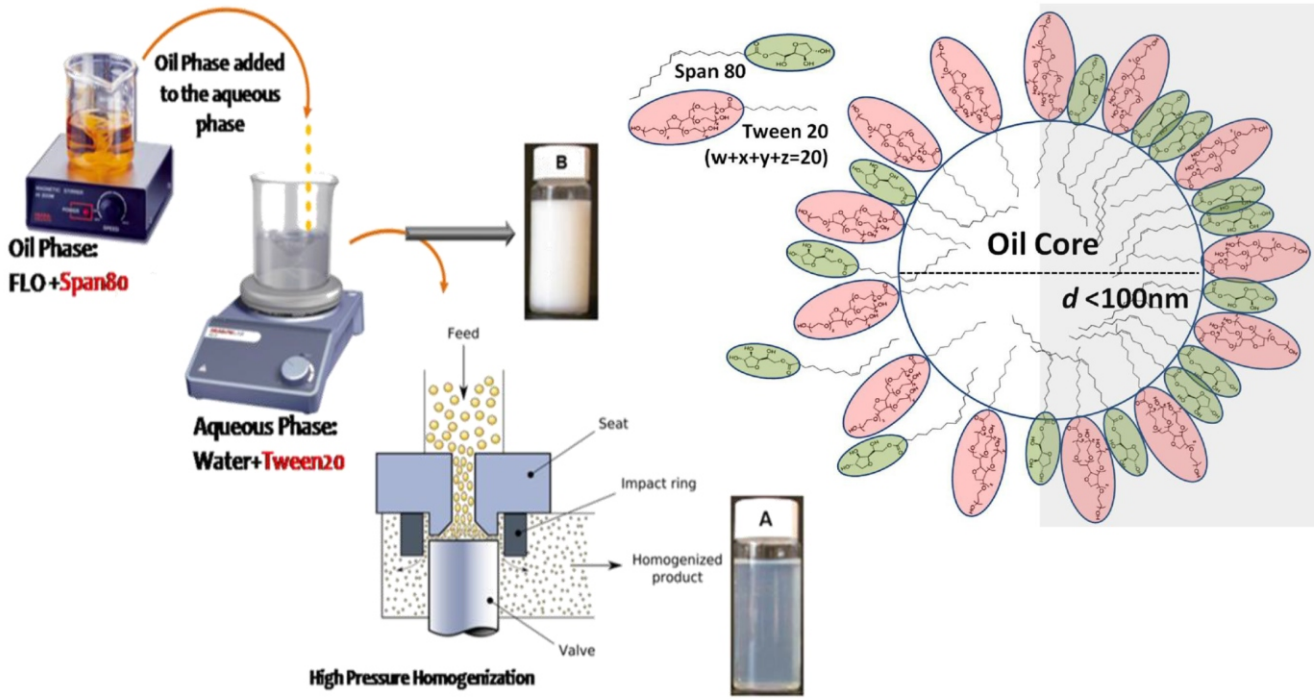
- Enhanced delivery of the functional food components into biological system.
- Biomimetic design.
- Extended shelf-life.

Concerns:

- ☑ Formulation
- ☑ Stability
- ☑ Benefits from the physiological context
- ☑ Probable toxic effect

Formulation of Functional Food Nanoemulsion

- Oil concentration: 1.5% (w/v), Oil to Surfactant ratio: 1.5:1.
- Surfactants are the most critical components for nanoemulsion preparation.
- Factors:
  1. HLB value **10.5**
  2. Interfacial tension **0.430 mNm^{-1}**



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Research paper

Designing of ω-3 PUFA enriched biocompatible nanoemulsion with sesame protein isolate as a natural surfactant: Focus on enhanced shelf-life stability and biocompatibility

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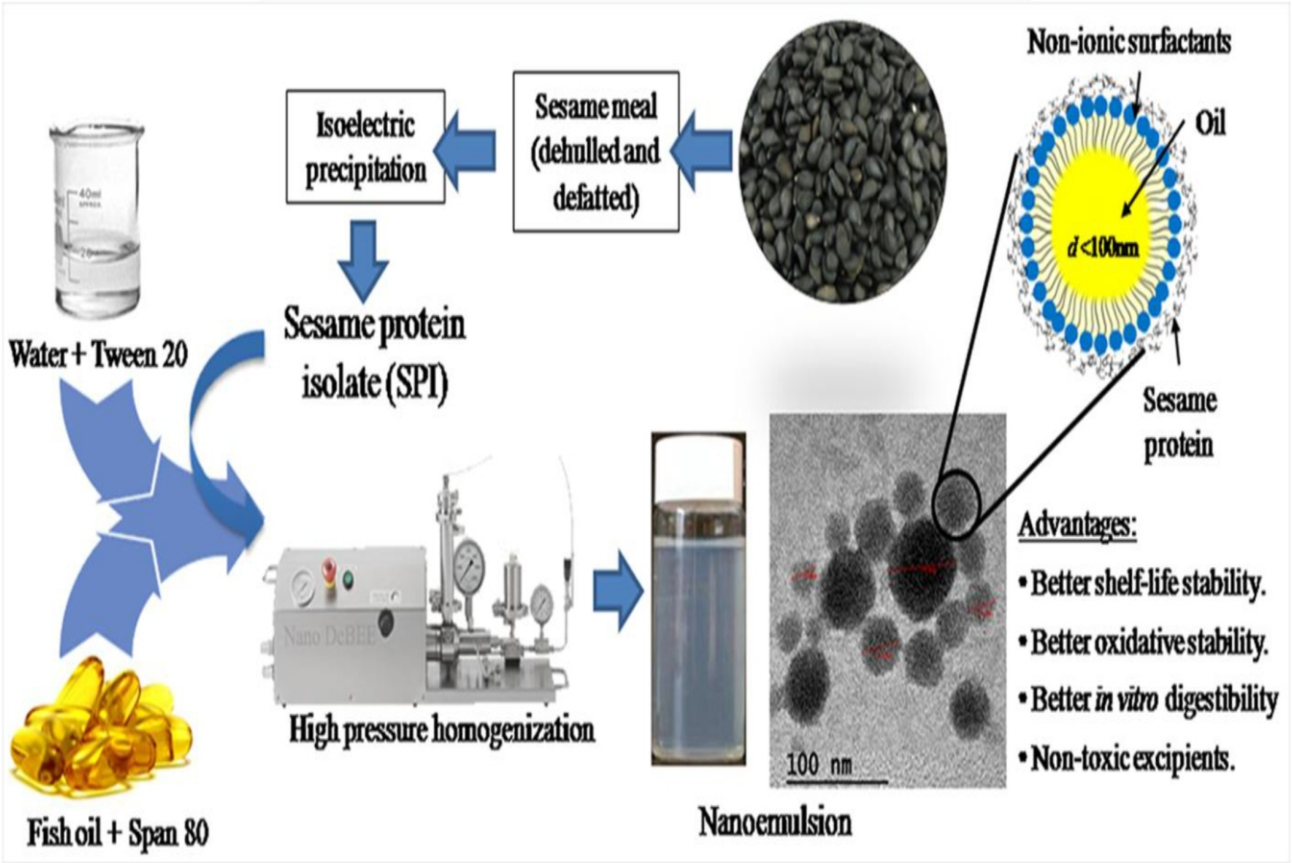
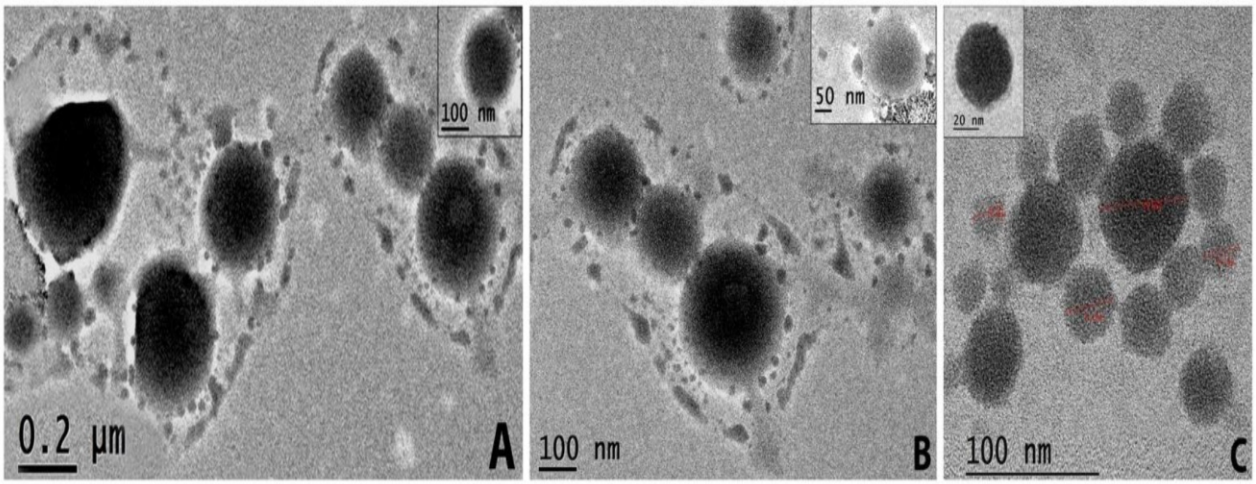
GRAPHICAL ABSTRACT

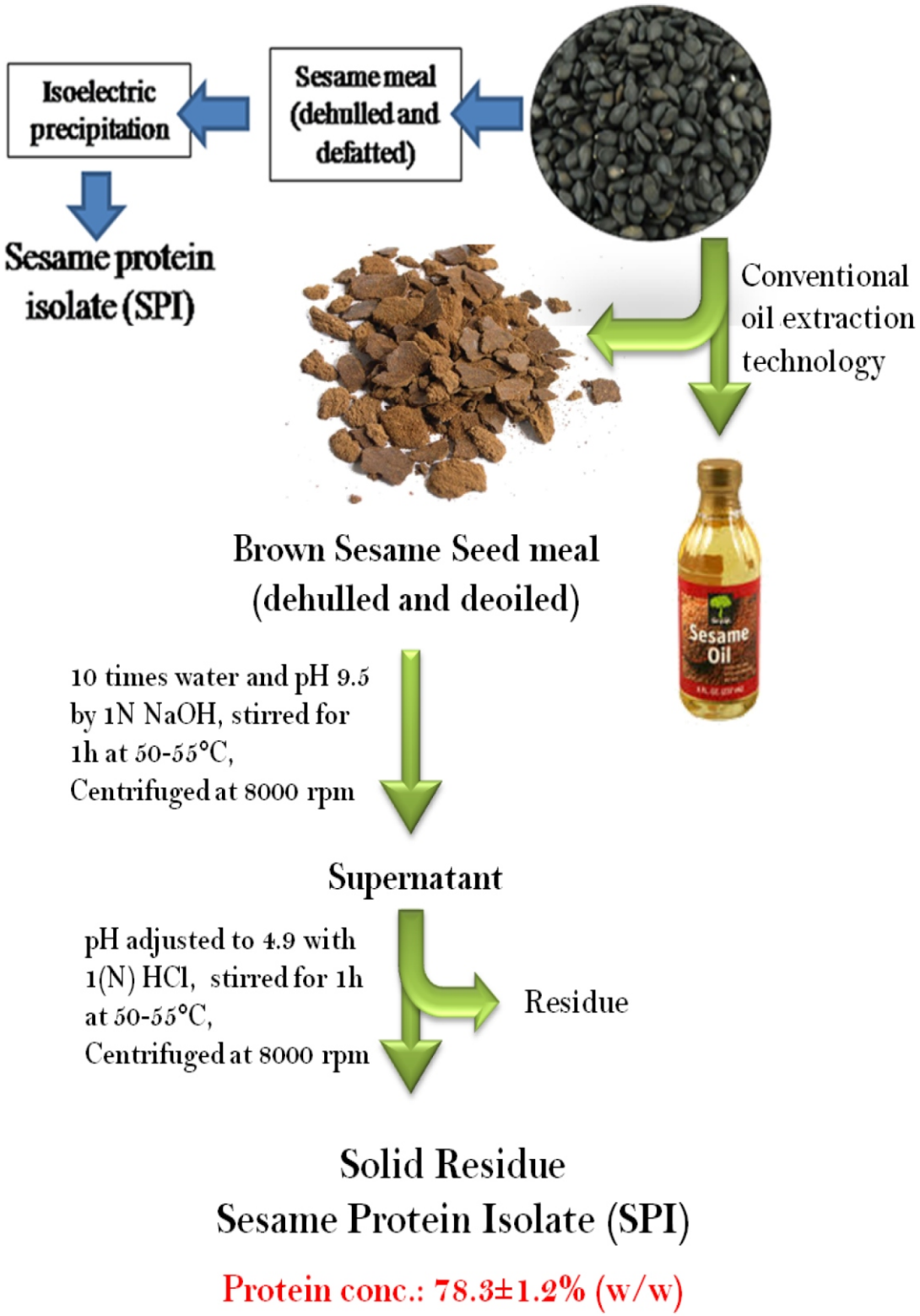


Inclusion of SPI as co-surfactant in food nanoemulsion

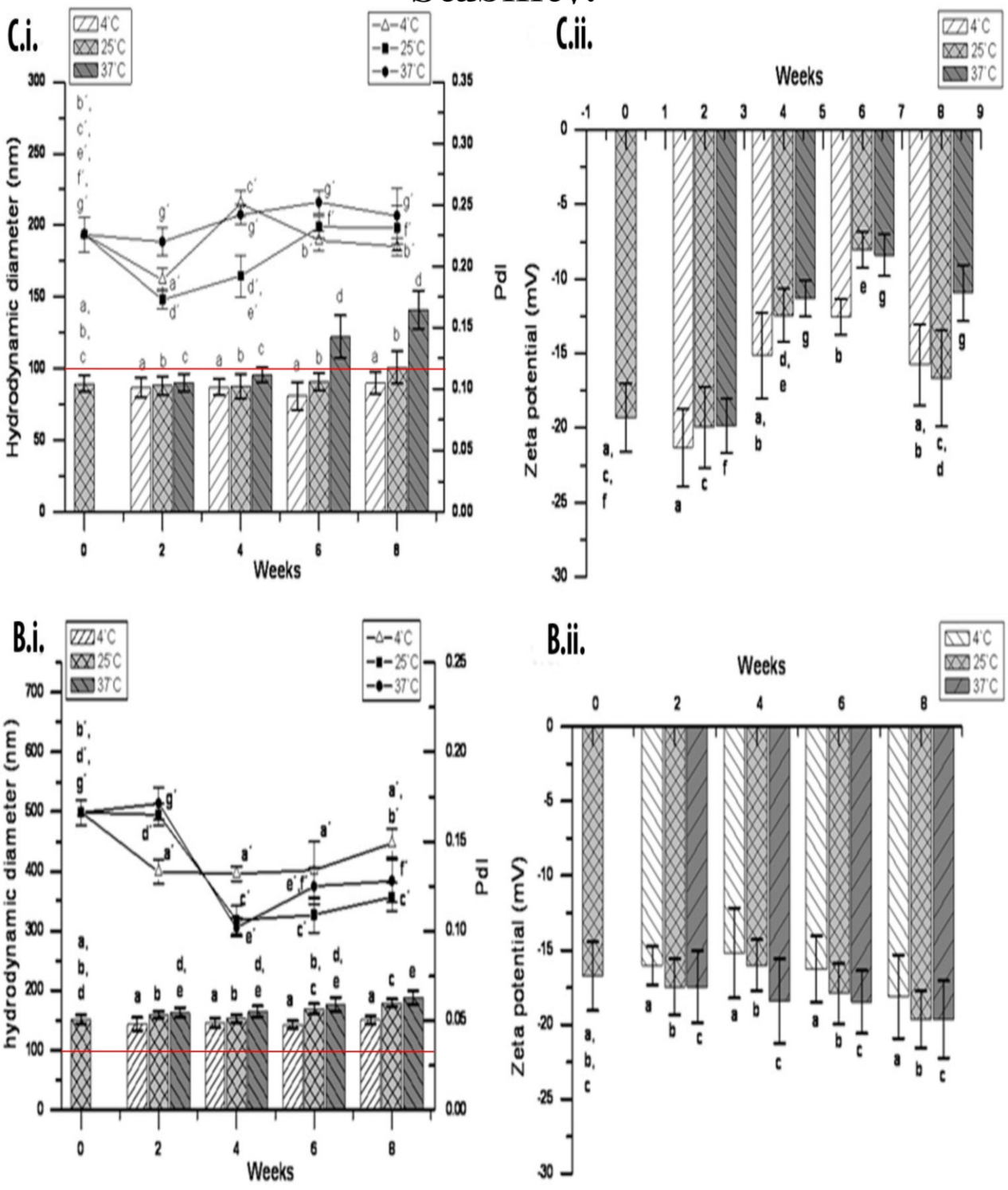
	Surfactant composition	Cumulative hydrodynamic diameter (nm)	Polydispersity index	Zeta potential (mV)	pH
A	Total surfactant= 1% w/v Tween 20 : Span 80 = 1:1	**125.87 ±2.54**	**0.199± 0.01**	**-11.98 ± 0.598**	**6.12 ± 0.15**
B	Total surfactant= 1% w/v • 1:1 mix of Tween 20 : Span 80 = 0.75 % w/v • SPI = 0.25 % w/v	**101.7± 2.86**	**0.146± 0.021**	**-12.31 ± 0.682**	**6.14 ± 011**



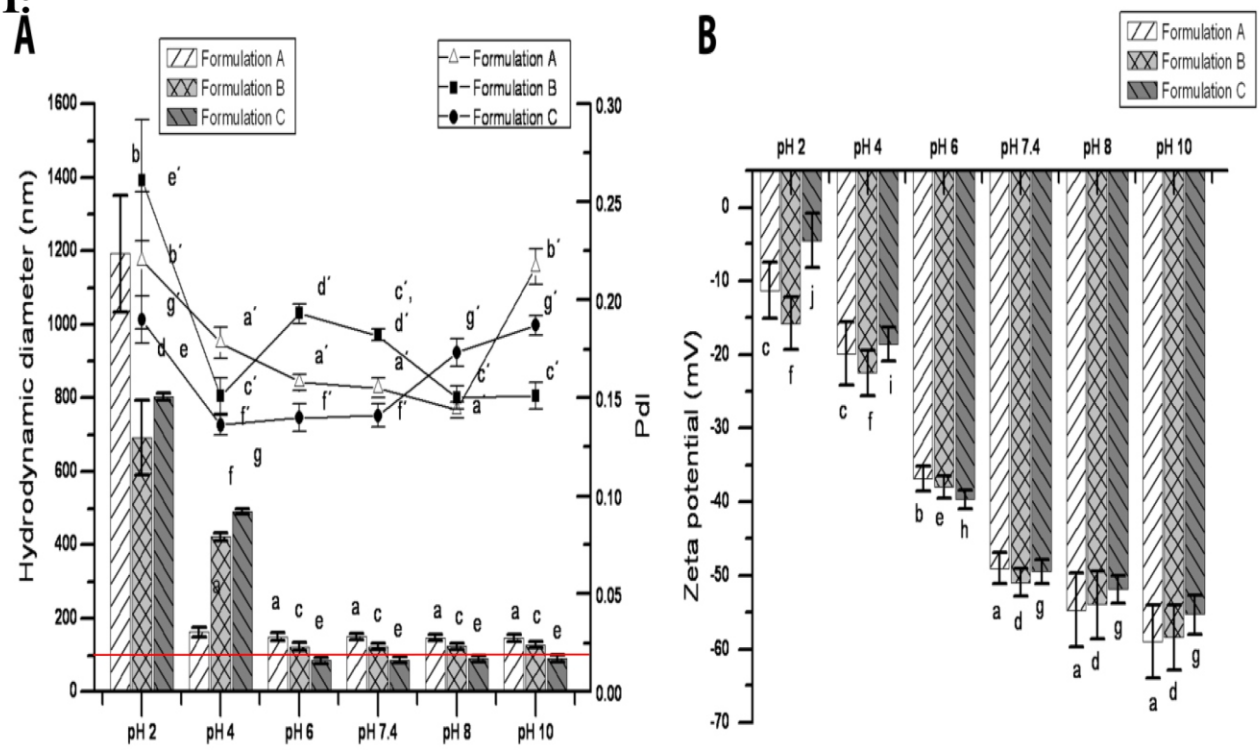
177.9 ± 63.89 nm **144.42 ± 38.46 nm** **96.81 ± 16.68 nm**


Isoelectric precipitation
Sesame meal (dehulled and defatted)
Sesame protein isolate (SPI)
Conventional oil extraction technology
Sesame Oil
Brown Sesame Seed meal (dehulled and deoiled)
10 times water and pH 9.5 by 1N NaOH, stirred for 1h at 50-55°C, Centrifuged at 8000 rpm
Supernatant
pH adjusted to 4.9 with 1(N) HCl, stirred for 1h at 50-55°C, Centrifuged at 8000 rpm
Residue
Solid Residue
Sesame Protein Isolate (SPI)
Protein conc.: 78.3±1.2% (w/w)

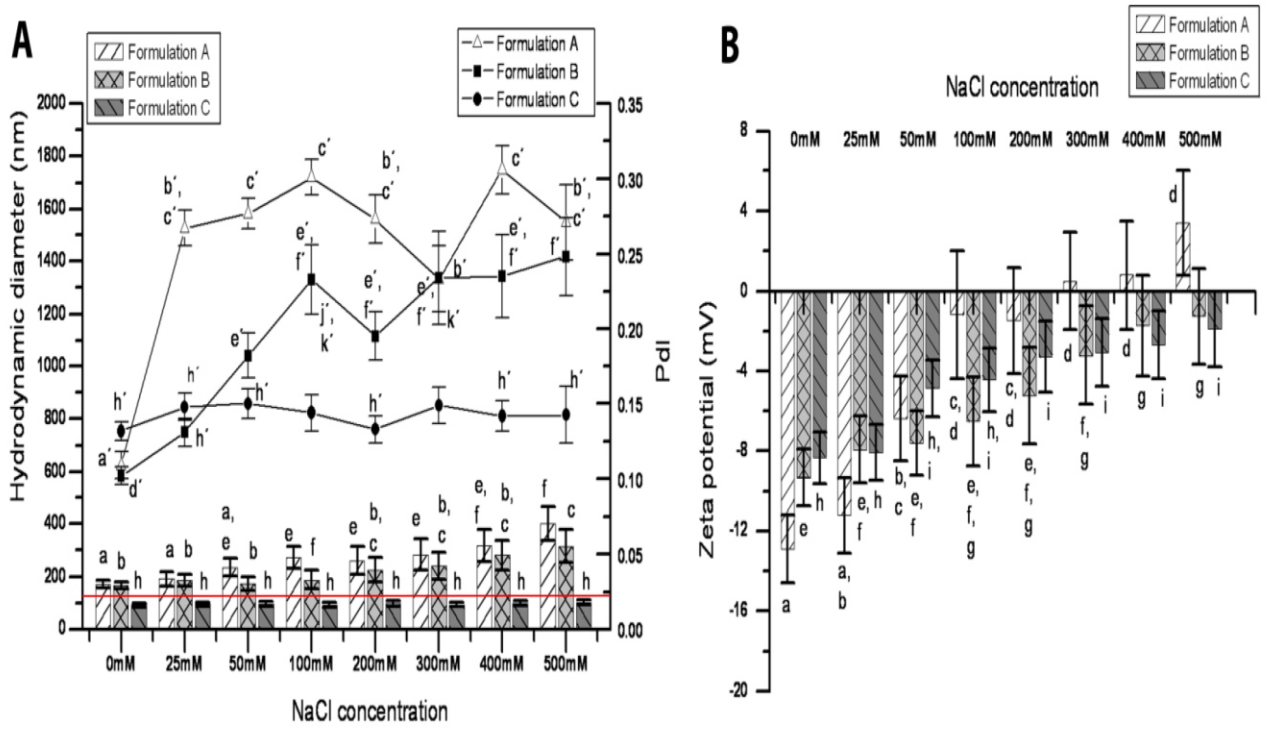
Shelf-life Stability:



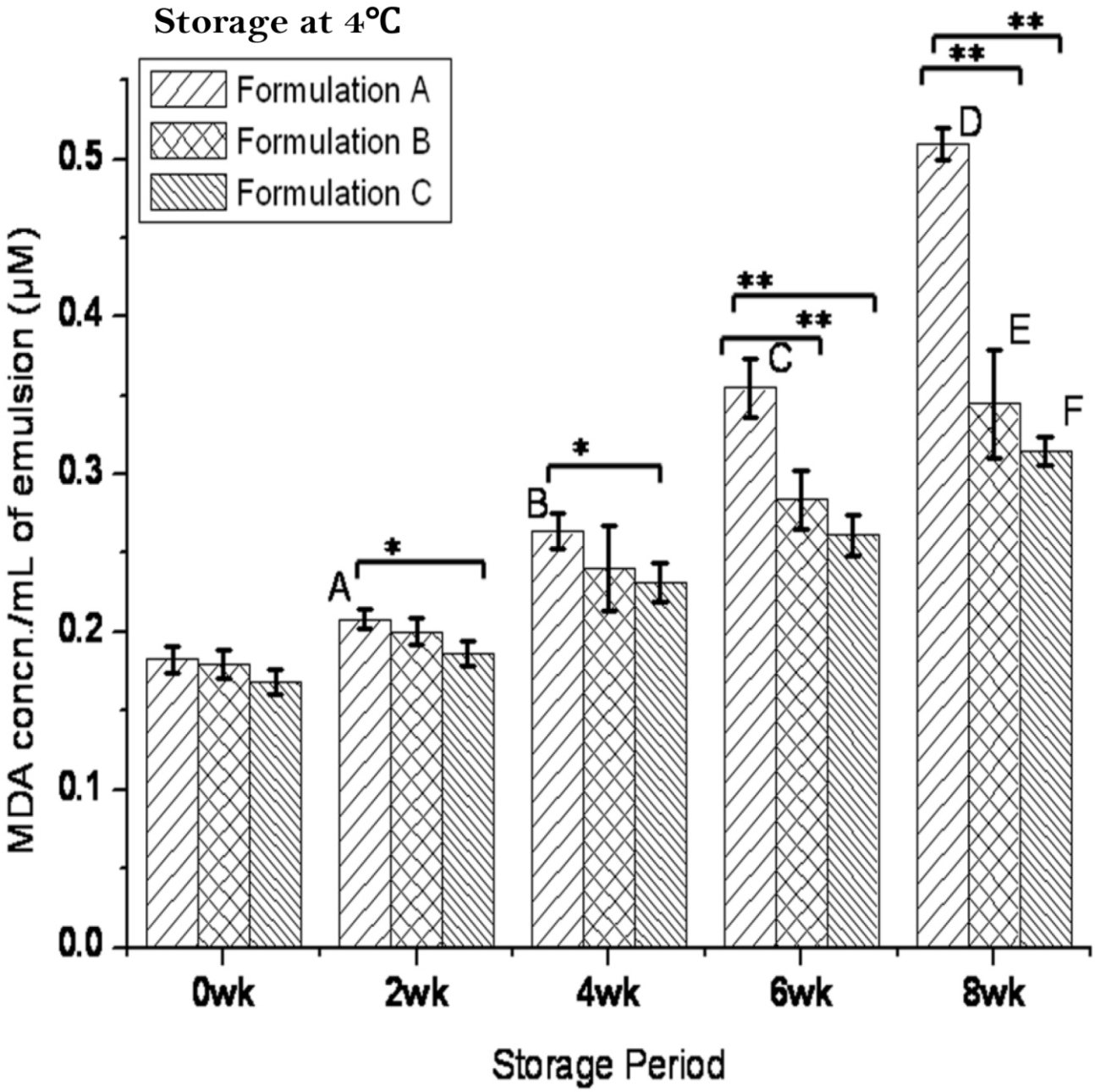
pH:



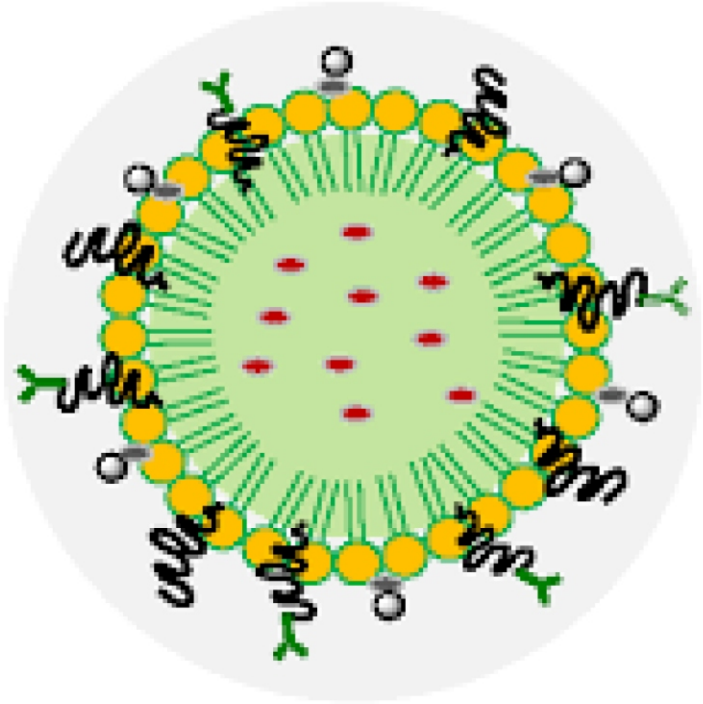
Ionic strength:



Chemical stability of omega-3 PUFA cargo

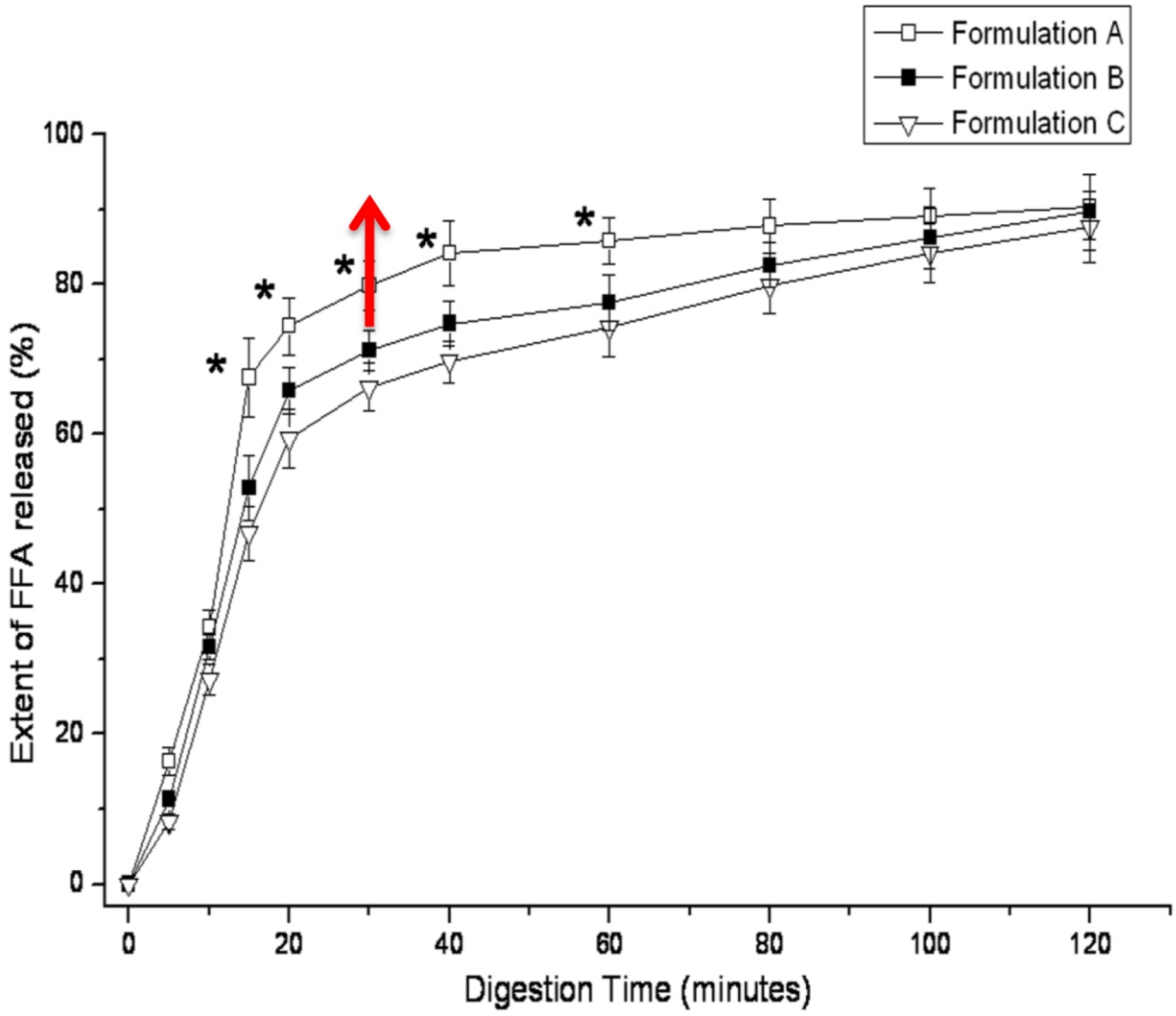


Explaining the stability factor of SPI:

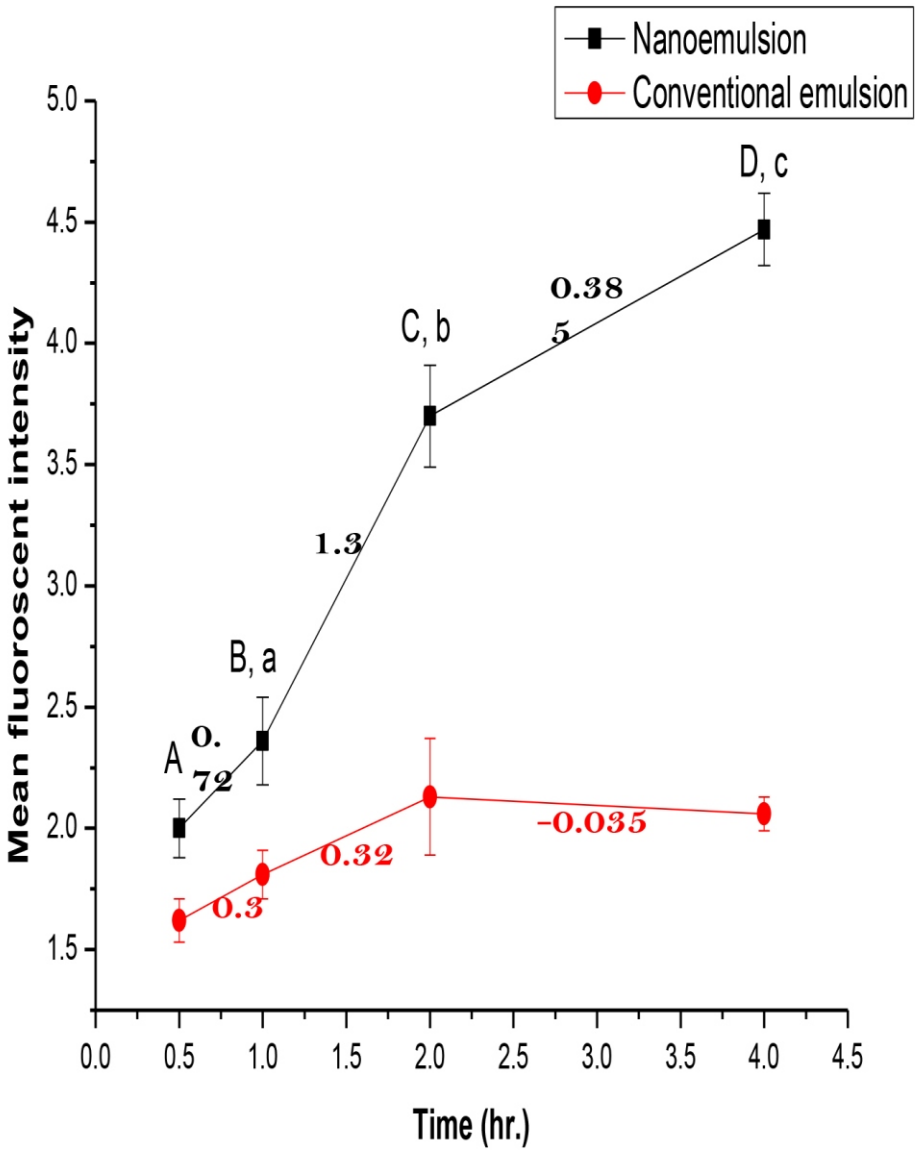


1. High surface activity index of SPI (EAI= 114.4 ± 0.458 m2/g; ESI = 35.9 ± 0.3 min).
2. Charge balancing role of Arginine (9.7%); Glutamic acid (19.8%).
3. Steric stability by Tween20+Span80 combination; additional electrostatic stability by SPI.
4. Electrostatic screening effect protect o/w interface.
5. Quench the oxidized lipid ROS, protect the oxidation prone omega3 PUFA cargo.

In vitro digestion of the nanoemulsion:

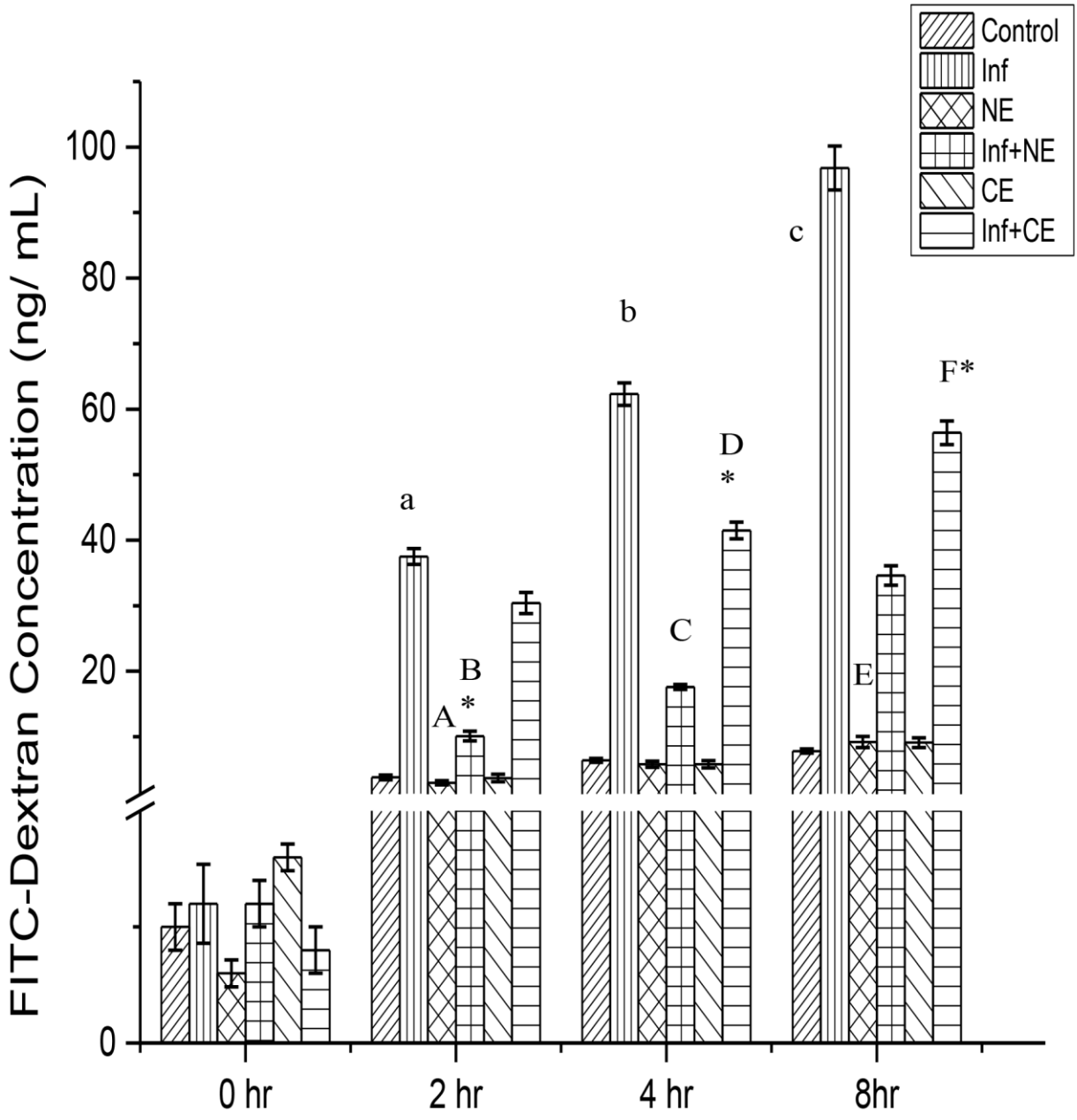


Nanoemulsion uptake in Rat peripheral blood mononuclear cells (PBMCs):



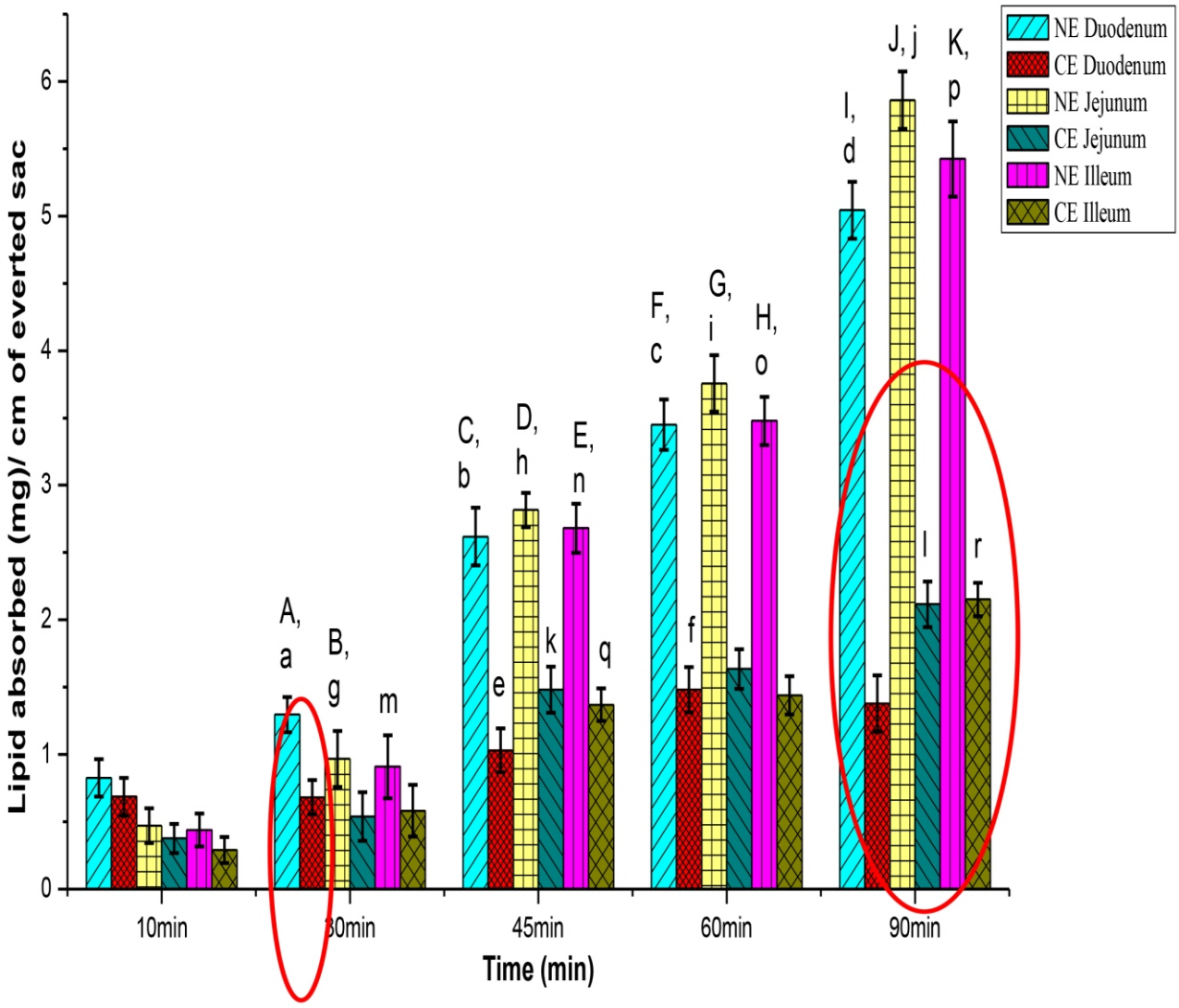
- The slope of the line connecting two subsequent points is indicative of the time-based kinetics of the uptake into the PBMCs

Assessment of barrier function in Caco-2 monolayers against infection:



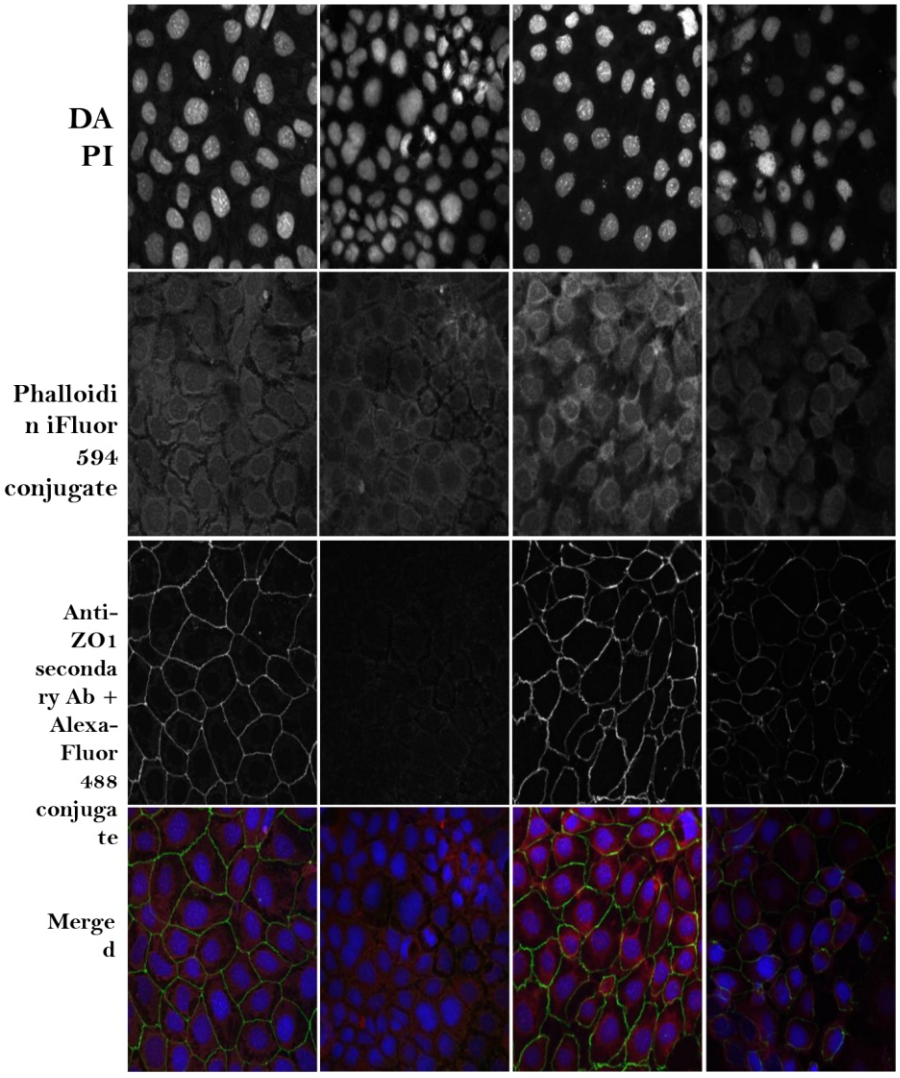
• Bacterial infection leads to permeability of Caco 2 cell monolayer, which is otherwise impermeable to FITC-Dextran (avg. mol wt. 4kDa).

Uptake across Rat Everted intestinal Sac:



- The extent of uptake of nanoemulsion is significantly higher in than conventional emulsion.
- Nanoemulsion is absorbed even in the duodenum, in contrast to conventional emulsion.

Assessment of membrane integrity in Caco-2 monolayers:

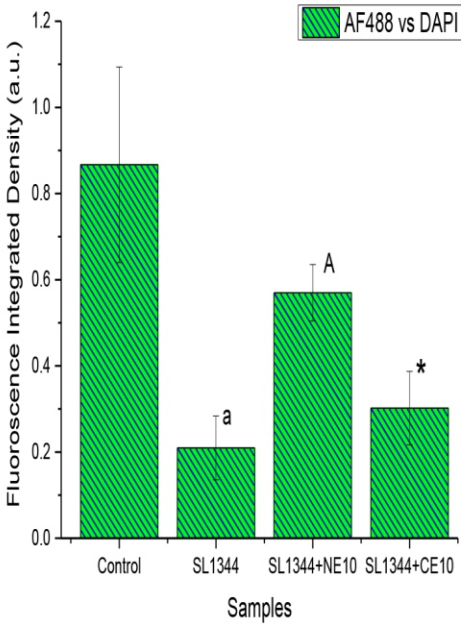


Caco2 Control

Caco2 infected by *STM* strain SL1344 (@100 MOI, 4hr)

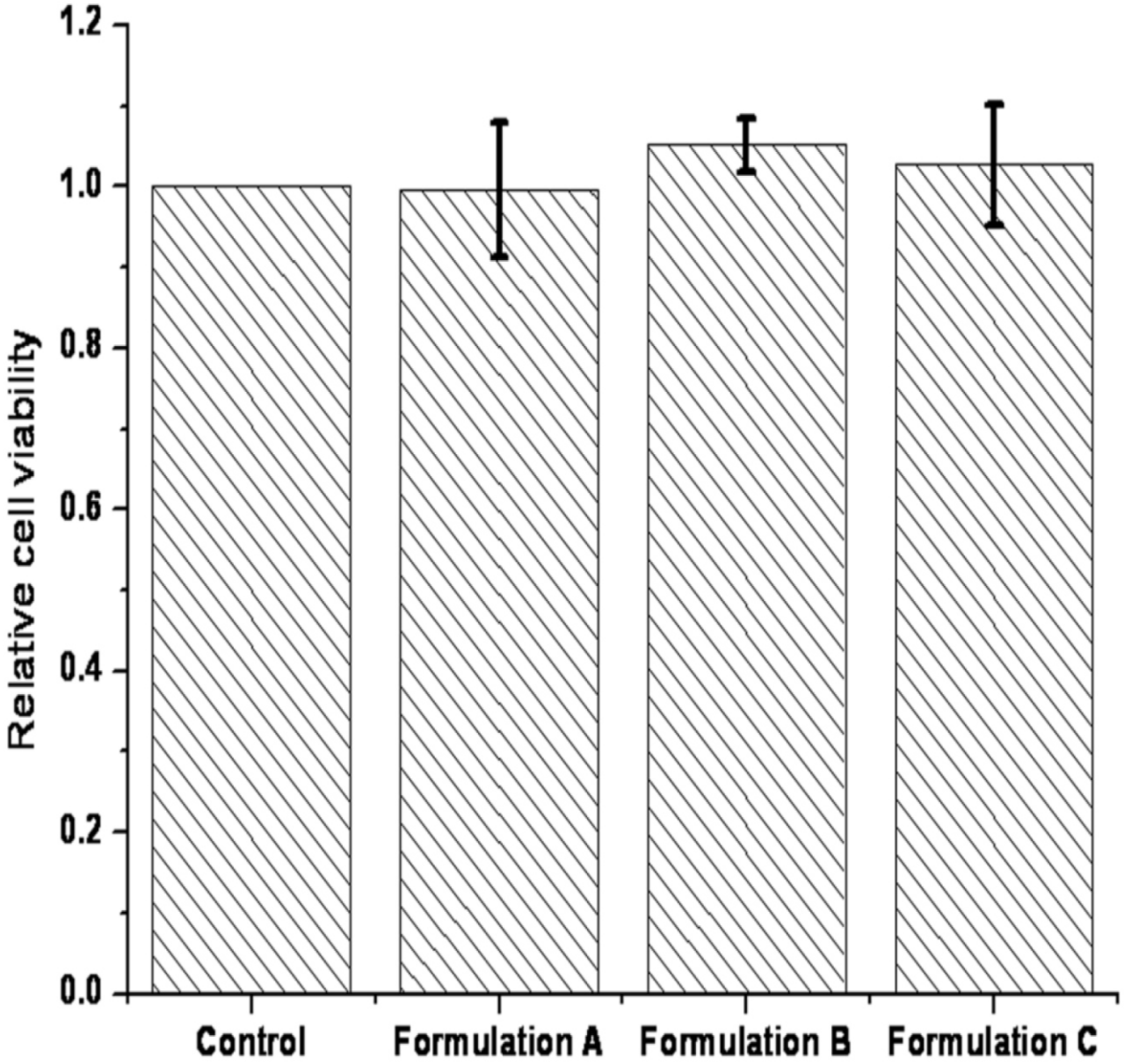
Caco2 infected by *STM* strain SL1344 (@100 MOI, 4hr)+ 10µL NE/mL culture media.

Caco2 infected by *STM* strain SL1344 (@100 MOI, 4hr) + 10µL CE/mL culture media



- The fluorescence integrated density of alexa fluor, normalized against DAPI signals have clearly shown the advantages of NE.
- The tight junction protein ZO1 of the Caco2 cells had been delocalized from the cell-cell junctions by the STm infection.
- Treatment with NE and CE had clearly protected the localization of ZO1.

Relative viability of Rat peripheral blood mononuclear cells:



Summary

- Safe, non-toxic, GRAS category excipients
- Enhanced delivery across GI epithelium.
- Uptake independent of receptors.
- Enhanced functionality, Boost in nutraceutical value.
- Value-addition to low-cost sesame meals.

About ourselves

73rd Annual convention & international conference was held I.I.T.(B.H.U) Varanasi on the 22nd &23rd Dec 2018.

S.K.Roy, B.P.Manchanda & Souvik Battacharyya attended the conference

S.K.Roy Chaired a technical session and B.P.Manchanda & Souvik Bhattacharyya Co.Chaired Technical sessions.

Prof R.K.Trivedi National President and Mr D. Mathur Convener and
Mr C.S Joshi Co.Ordinator in Association with Mr D.N.Tewari Gen secy and other members of OTAI made the Conference a Grand success.

**Sept..2019

A National Conference was held in H.B.TU Kanpur on 28...29th Sept 2019 where
S.k.Roy; B.P.Manchanda &
Souvik Bhattacharya participated.
S K.Roy Chaired a Technical Session and was a Panelist in the concluding session.
B.P.Manchanda actively participated in the Technical Session.

A lecture was organized on the 3rd Dec 2019 and the speaker was
Dr Tanmoy kumar dey recipient of Dr Santinath Ghosh Award .

It was well attended.

74 th Annual Convention was held in Mumbai on the 14th Dec at I.C.T. and

Dr Mahua Ghosh and
Dr Tanmoy kr Dey attended the conference.
Dr Tanmoy Kumar dey received the Prestigious Dr santinath Ghosh award .
Dr Mohua ghosh supported the conference being the judge of a Poster Session

8**STOP Press

Prof Sunit Mukherjee left for heavenly abode on the 4th Jan.2020.

PARLIAMENT NEWS

Lok Sabha Starred Question No. 203 Answered on the 3rd December, 2019

Palm Oil Production

Dr. Rajdeep Roy:

Will The Minister Of Agriculture And Farmers Welfare be pleased to state:

(a) the State-wise Oil Palm potential in India in hectares vis-a-vis the actual coverage and crude palm oil production in the last five years and the projection for the next ten years;

(b) the constraints and challenges in promoting Oil Palm plantation in the North-Eastern States;

(c) the follow-up action taken on the May 2015 Report prepared by the Ministry and the Solvent Extractors' Associations' (SEA) of India on the North-Eastern State potential for Oil Palm;

(d) whether the Government has prepared any roadmap/framework for Indian Palm Oil Sustainability and if so, the details thereof; and

(e) whether the Government is considering to relax land laws for speedy expansion of Oil Palm cultivation and if so, the details thereof?

Answer

Minister of Agriculture and Farmers Welfare Shri Narendra Singh Tomar

(a) to (e): A statement is laid on the Table of the House.

Statement Referred to in Reply to Parts (A) to (E) of Lok Sabha Starred Question No. 203 Replied on 3rd December, 2019.

(a) : The total Oil Palm potential area in India is estimated at 19.33 lakh hectare in 19 states and actual coverage is 3.49 lakh hectare upto October, 2019 in 16 states of which approximate fruiting area is 1.35 lakh hectare in 8 states. Crude Palm Oil (CPO) production during 2018-19 from fruiting area is 2.78 lakh tonnes. During 2019-20 an area of 17410 hectare has been targeted to cover under oil palm. The details of state-wise potential area, coverage so far, fruiting area and last 5 years CPO production is given at Annexure (a) & (b).

(b) : The major constraints & challenges in promoting Oil Palm plantation in the North Eastern States are;

I. Hilly and undulating topography and non- availability of flat land

ii. Oil Palm has long gestation period and restricts flow to farmers for at least 4-5 years.

iii. Small holding of farmers with limited resources.

iv. Price instability due to fluctuation in international CPO prices.

Competition with crops like Tea, Rubber and Areca nut

(c) to (e): Government of India has already given emphasis to promote Oil Palm cultivation in

North-Eastern States. The funding pattern of the Government of India scheme which was 50:50 percent share in between Government of India and State Government in 2014-15 has been revised to 90:10 percent share in case of North Eastern states from 2015-16. Mizoram, Assam, Nagaland and Arunachal Pradesh are implementing National Food Security Mission (NFSM)-Oil Palm Scheme for area expansion. So far 39400 hectare has been covered in these four states up to October 2019 and during 2019-20 an area of 3400 hectare has been targeted.

Since, Agriculture is a State subject, DAC&FW has requested all the potential states to declare Oil Palm as plantation crop to facilitate captive farming and speedy expansion of Oil Palm cultivation in the Country.

Annexure (a)

State-wise Oil Palm Potential Area, Coverage and Fruiting area:

A. Major States

Sl No.	States	Potential area (in ha)	Planted area as on 0ct2019 (in ha)	Approximate Fruiting Area (in ha) @12 tons FFB/ha
1	Andhra Pradesh	419500	173349	115000
2	Karnataka	260000	44992	1100
3	Tamil Nadu	205000	31958	584
4	Kerala	6500	5786	442
5	Telangana	50000	18933	16470
	Total	**941000**	**275018**	**133596**

B. North- Eastern States

Sl No.	States	Potential area (in ha)	Planted area as on 0ct2019 (in ha)	Approximate Fruiting Area (in ha) @10 tons FFB/ha
_	Mizoram	61000	28914	530
2	Arunachal Pradesh*	25000	2561	0
3	Nagaland*	50000	3322	0
4	Meghalaya**	50000	0	0
5	Assam*	25000	1849	0
6	Tripura**	7000	530	0
	Total	**218000**	**37176**	**530**

*AII the plantations are below four years and no FFBs production.

**Potential but State Government is not interested.

C. Other potentials States

Sl No.	States	Potential area (in ha)	Planted area as on Oct.'19 (in ha)
1	Goa*	2000	953
2	Maharashtra"	180000	1474
3	Gujarat""	260250	6365
4	Andaman & Nicobar*	3000	1593
5	Chhattisgarh*"	48000	5086
6	West Bengal"	25000	0
7	Bihar"	200000	0
8	Odisha""*	56000	22075
	Total	774250	37546

*Plantation is more than economic life (25 Years).

"Potential but State Government is not interested.

***Schemes under implementation but CPO production not started.

****Approximately 100 ha fruiting area and FFBs are processed in Goa.

*****Approximately 700 ha fruiting area and FFBs are processed in other state.

Annexure (b)

Five year state-wise Crude Palm Oil (CPO) production

Sl	States No	Crude Palm Oil (CPO) Production (in tonnes)				
		2014-15	2015-16	2016-17	2017-18	2018-19
1	Andhra Pradesh	170478	193562	190999	234696	232938
2	Karnataka	2176	2538	2051	2224	2280
3	Tamil Nadu	1019	1222	1115	938	1017
4	Kerala	6515	7015	5929	5190	4857
5	Mizoram	365	496	603	648	625
6	Telangana	10012	12499	8947	27275	37205
7	Odisha	557	618	NA	NA	NA
8	Goa	388	581	NA	NA	NA
	Total	**191510**	**218531**	**209644**	**270971**	**278922**

NA: Data not available

Summary:

,, Total potential area 19.33 lakh hectare in 19 States.

,, Area cover so far 3.49 lakh hectare as on Oct, 2019 in 16 states.

,, Approximate fruiting area 1.35 lakh hectare in 8 states.

,, Total CPO production from fruiting area 2.78 lakh tonnes during 2018-19

Lok Sabha Unstarred Question No. 2702 Answered on 04th December, 2019

IMPORT OF PALM OIL

Dr. Rajdeep Roy:

Will the Minister of Commerce & Industry be pleased to state:

(a) whether India is taking any concrete action pertaining to palm oil imports from Malaysia in response to the statement by that country's Prime Minister; and

(b) whether the Government will curtail imports of refined palm oil in India in line with the 'Make In India' programme?

Answer

The Minister of Commerce And Industry
Shri Piyush Goyal

(a) & (b) Import of edible oil is under Open General License. Import of palm oil happens mainly from ASEAN countries such as Indonesia and Malaysia under the Free Trade Agreements. Following surge in imports and threat of serious material injury to domestic industry, Government has increased Customs Duty by 5% on imports of refined bleached deodorized palmolein and palm oil into India from Malaysia for a period of 180 days w.e.f. 4th September, 2019 based on the preliminary findings of Directorate General of Trade Remedies (DGTR) under India-Malaysia CECA (Bilateral Safeguard Measures) Rules, 2017. On similar lines, Government will use all available instruments in the National interest, as and when necessary.

Prof. D. K. Bhattacharyya

M. Sc., (Tech), Ph. D
Emeritus Fellow (AICTE)
Ex-Ghosh Professor of Applied Chemistry

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A REVIEW

The book entitled ***"A treatise on Analysis of Food, Fats and Oils"*** is an example of unique competence and contribution of the authors, S. K. Roy, N. K. Pramanik and A. R. Sen.

The book is the first of its kind in India. It covers the traditional and modern analytical methods for the characterization and quality of fats, oils as well as other food items.

The authors are well reputed and qualified and they have applied their collective wisdom and expertise in including and presenting more appropriately and meticulously the analytical methods.

The book can also be viewed as a rarer type as it deals with the statutory and industrial aspects of fats, oils and their products, and pollution control in vegetable oil industry. In fact these aspects are of extreme use and importance to those concerned with these issues.

The book is already well received by the readers and users in the academic and industrial circles throughout India because of he highly relevent and beneficial methodologies and basic-cum technological information. The book will be recognised in due course of time as one of the top quality analytical books in the area of food, fats and oils.

Prof. D. K. Bhattacharyya
21-06-2003

Regarding availability/price enquiries may be made to :
S. K. ROY, President OTAI (EZ)
5C, Tarak Mitra Lane, Kolkata - 700 026
Phone : 24666243 / 24639721
E-mail : esskay_roy81@rediffmail.com
es.k.ray@gmail.com

BOOK REVIEW

A book entitled “Perfumery Materials, Production and Applications” has been authored by an very eminent Professor (Dr) D. K. Bhattacharyya, Emeritus Fellow (AICTE), Adjunct Professor Bengal Engineering and Science University, former President, O.T.A.I and a Scientist of National and International repute.

The book speaks for itself about his mastery and competence in the discipline of “Perfumery Materials”.

“The book demonstrates the scopes of certain specific reactions and raw materials in producing new synthetics. The enormous scopes of biotechnology involving bioconversioin processes’, with isolated enzymes and by fermentation biotechnology involving selective microorganisms has been indicated in making synthetics. The applications of natural aromatic oils in aromatherapy, food, cosmetics/toiletries, imitation perfumery and allied sector have been included.

Standardisation and evaluation of natural aromatic (essential oils and incidence of their adulteration have been elaborated in order to ascetain their quality and authenticity for sustaining the business in the industry” says Prof (Dr) R. N. Mukherjee, Former, Professor and Head, Deptt of Chemical Engg, University of Jadavpur. The book will fulfill a long felt want in the discipline of Essential Oils and will cater to the various categories of Scholars, Scientists and Technologists. The book has already been well appreciated in India and abroad, though published by the Stadium Press L.L.C., USA.

Those interested to procure a copy of this Valued book on Essential Oils may contact Professor D. K. Bhattacharyya at Phone No (033) 2461 9662.

(S. K. Roy)
Editor

Panel Discussion H.B.T.U. Kanpur
28-29th Sept - 2019

B. P. Manchanda

Life Time Achievement Awardee (OTAI)
Prof. Sunit Mukherjee

OIL TECHNOLOGISTS' ASSOCIATION OF INDIA

EASTERN ZONE, KOLKATA

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INCUMBENCY CHART OF PRESIDENTS
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1952 to 1956 ..... DR. N. G. CHATTERJEE
1956 to 1963 ..... PROF. S. R. PALIT
1963 to 1967 ..... MR. P. N. MATHUR
1967 to 1971 ..... MR. S. L. GARG
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1987 to 1991 ..... PROF. D. K. BHATTACHARYYA
1991 to 1995 ..... DR. R. K. SHAH
1995 to 1999 ..... MR. S.K. ROY
1999 to 2001 ..... MR. S. S. MANDHANA
2001 to 2005 ..... MR. S. K. ROY
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