

Nutraceuticals – Essence of food source with extra benefits

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NUTRACEUTICALS is a broad umbrella term that is used to describe any product derived from food sources with extra health benefits in addition to the basic nutritional value found in foods. They can be considered non-specific biological therapies used to promote general well-being, control symptoms and prevent malignant processes. The term "nutraceuticals" combines two words – "nutrient" (a nourishing food component) and "pharmaceuticals" (a medical drug). The name was coined in 1989 by Stephen DeFelic, founder and chairman of the Foundation for Innovation in Medicine, an Amer-

B12) for treatment of diabetes mellitus type II. Metformin mainly causes reduction in sugar level in diabetes. Diabetes being a chronic disorder, metformin needs to require

for a prolonged period of time. By doing this it induces deficiency of vitamin B12 which leads to neurological manifestations in patients. So requirement of vitamin is necessary for prevention and treatment of vitamin B12 deficiency.

Another important combination highly marketed in Indian market is (Pregabalin and vitamin B12) and (Gabapentin and vitamin B12) for an indication of diabetic neuropathy in diabetes patients. Long-term diabetes causes nerve degeneration in patients, which

useful in endogenous hypertriglyceridemia as a supplement to diet when dietary measures alone are insufficient to produce an adequate response in type IV as monotherapy and in type IIb/III in combination with statins, when control of triglycerides is insufficient. Lovaza reduces the synthesis of triglycerides in the liver because EPA and DHA are poor substrates for the enzymes responsible for TG synthesis, and EPA and DHA inhibit esterification of other fatty acids.

Probiotics and prebiotics

Another widely used product is probiotics and prebiotics. Probiotics are 'living microorganisms, which upon ingestion in certain numbers exert health benefits beyond inherent basic nutrition.' Alternatively probiotics are loosely known as live microorganisms

belonging to natural biota with low or no pathogenicity, but with functions of importance to the health and wellbeing of the host. Probiotics may act by modulating the host's immune system, affecting other microorganisms directly or acting on microbial products, host products or food components. Probiotics have been shown to have applications in alleviating symptoms of allergies, cancer, AIDS, respiratory and urinary tract infections. Furthermore, various findings suggest that probiotics have beneficial effects in alleviating symptoms associated with ageing, fatigue, autism, and in reducing the risks of osteoporosis, obesity and possibly type II diabetes.

There are two gynaecological conditions, PMS (premenstrual syndrome) is a disorder having symptoms like breast pain, emo-

tional lability, depression, lethargy, which are mainly seen in second phase of menstrual cycle before ovulation and morning sickness (pregnancy induced nausea and vomiting) due to increased level of progesterone in pregnancy.

Treatment of PMS

Pyridoxine (vitamin B6) plays a prime role in treatment of these two conditions. Since last decade different medications have been used in treatment of PMS like contraceptive pills, NSAIDs, antidepressant. Pyridoxine usage in this condition has been increasing from last few years and it has been giving satisfactory result in treatment of this condition. It improves symptoms of PMS such as mastalgia (breast pain or tenderness) and PMS-related depression or anxiety in some patients.

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ican organisation located in Cranford, New Jersey.

The philosophy behind nutraceuticals is to focus on prevention, according to the saying by a Greek physician Hippocrates (known as the father of medicine) who said, "let food be your medicine." Their role in human nutrition is one of the most important areas of investigation, with wide-ranging implications for consumers, healthcare providers, regulators, food producers and distributors. The definition of nutraceuticals and related products generally depends on the source. They can be classified on the basis of their natural sources, pharmacological conditions, as well as chemical constitution of the products. Most often they are grouped in the following categories: dietary supplements, functional food, and medicinal food. Medicinal food is formulated to be consumed or administered internally, under the supervision of a qualified physician. Its intended use is a specific dietary management of a disease or condition for which distinctive nutritional requirements are established by the medical evaluation (on the basis of recognised scientific principle).

There is a fixed dose combination approved by Indian government (Metformin and vitamin

leads to significant burning pain at nerve site. Gabapentin and Pregabalin act as a neuronal analgesic which cause reduction in burning sensation while vitamin B12 induces regeneration of nerve growth so this combination having nutraceuticals is very much essential for treatment of diabetic neuropathy.

Oxidative degradation

Vitamin B12 supplements alone or in combination with other vitamin preparation are useful for varied conditions like neurodegenerative disorders, anaemia, cardiovascular disorders, energy boost up and so on. The antioxidant function of beta carotene is due to its ability to quench singlet oxygen, scavenge free radicals and protect the cell membrane lipids from the harmful effects of oxidative degradation.

Another important nutraceutical product Lovaza is Omega-3 acid ethyl esters (90%) comprising (Eicosapentaenoic acid (EPA) ethyl ester + Docosahexaenoic acid (DHA) ethyl ester) capsule is indicated as an adjuvant treatment in secondary prevention after myocardial infarction, in addition to other standard therapy (e.g. statins, antiplatelet medicinal products, betablockers, ACE inhibitors). In addition it is also

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"Introduce lot to lot checking of colours as done in US"

How big is the food colour industry in India? What are the types of food colours available in the market?

The population of India is around 1.20 billion and considering food is a daily necessity, the demand for food colour should be quite large. But considering penetration of packaged foods is still quite low and due to low per capita income, demand for packaged food is not as high as in the first world countries or even other Asian countries like Thailand, Indonesia. No statistics are available to quantify food colour consumption.

The following colours are allowed for food use in India

Name	BIS No
Tartrazine	IS 1694: 1994
Sunset Yellow	IS 1695: 1994
Erythrosine	IS 1697: 1994
Ponceau 4R	IS 2558: 1994
Carmoisine	IS 2923: 1995
Brilliant Blue	IS 6406: 1994
Indigo Carmine	IS 1698: 1994
Fast Green FCF	IS 6022: 1994
Mixtures of above	IS 5346: 1994

What are the functional aspects and challenges in natural colouring in food



Neelikon Dyestuffs was founded in 1983 by Mukund Turakhia and was incorporated into the present company in 1994 as Neelikon Food Dyes and Chemicals Ltd. Neelikon manufactures colours from its plants in Dhata. It also produces specialty fluorescent colours used in manufacturing of daylight fluorescent pigments and other specialty industrial applications. **SATYEN TURAKHIA**, director, Neelikon Food Dyes & Chemicals Ltd, in an email interaction with **ANURAG MORE** throws light on the current and future scenario in the Indian food colour industry. *Excerpts:*



and beverages?

Natural food colours are less stable and more expensive. For a country like ours where price is a key driver for any product, producers are required to keep costs low and hence due to technical challenges coupled with high prices, use of natural colours is very limited in our country.

What changes have you witnessed in consumer's taste and preferences?

Overall our market is very nascent. Still a lot of adulteration is noticed in the industry and even basic food products like milk, grains, etc. are, as you know, adulterated. With growth in the middle class, we notice

demand for branded packaged food is increasing. This is increasing demand for well-known producers like Neelikon who supply their food colours all over the world, meeting international quality.

Where does India stand compared to developed countries?

India today is the world's largest producer for synthetic food colours. Honestly, all types of quality exists in India; from excellent to very poor. One has to choose

their suppliers carefully to work with Indian food colour producers. Users should check factory setup by visiting manufacturers' production site to ensure they are working with responsible suppliers who have proper manufacturing and testing facilities as also adhere to local norms of effluent treatment, labour and taxation.

With current problems for Nestle's Maggi, what steps should be taken by companies with respect to their products?

Producers of food colours should have proper laboratory facilities with latest instruments, method of testing and trained manpower to check impurity profile in food colours. Top management should invest in these facilities and should not look at this as cost but as investment.

What are the expectations of industry players from the government?

Our request to GoI would be to introduce lot to lot checking of food colours as done by US FDA. Neelikon can help GoI, to set up laboratory with appropriate test methods and train chemists to check impurities correctly.

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Bone loss due to less activity

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Role of nutraceuticals is also proven in few neurodegenerative conditions like Parkinson's syndrome, Alzheimer's disease and ALS (Amyotrophic lateral sclerosis). This disorder, mainly due to generation of free oxidative radicals, damages central nervous system. Vitamin E, Coenzyme Q10 and a-lipoic acid are very useful in regeneration of antioxidant and prevention of neuro degeneration.

In old age groups or post-menopausal women there is increased risk of developing bone loss due to less activity and estrogen hormone deficiency. Vitamin D and calcium supplement in this age group is utmost requirement to prevent bone loss and regain mineralisation.

Source of folic acid is green leafy vegetables and vitamin

B12 is meat products. Indian population being vegetarian, there is increased chance of vitamin B12 deficiency. So supplement of vitamin B12 is extremely needed for this population.

Role of nutraceuticals has been increasing in various clinical aspects. A decade back it had been used as a placebo because the reason for its use was controversial and clinical studies with scientific evidences was not established. Still in the Indian market and in physicians, rationality of using nutraceuticals has not penetrated so of these products is really a prime step in improvising people's life.

(The author is medical consultant and editor-in-chief, IJM Today. For details, visit www.drjanjayagrwal.com)