

A Review Paper on Nutraceutical as Science

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Abstract: In this Review Paper, we have to study different types of Nutraceuticals also known as Bioceticals or alternative of pharmaceutical like Tocotrienols, Lecithin, Sphingolipids, Choline, Poly Unsaturated Fatty Acids (PUFA'S) , Cereals and Milk and Dairy Products with their health benefits as a functional food. We have found that all nutraceuticals that we have to study are very important and have more nutritive value over pharmaceutical with lesser side effects and used for many cardiac (Hypertension), neuronal (Alzheimer's), atherosclerosis, obesity, diabetes and other diseases (Cancer, Inflammation). Act as antioxidants, restoring healthy digestion and dietary habit, detoxifying the body, avoiding vitamin as well as mineral deficiencies. So we can say that nutraceuticals have received considerable interest due to potential nutritional, safety and therapeutic effects.

Keywords: Nutraceuticals, Tocotrienols, Lecithin, Sphingolipids, Choline, Poly Unsaturated Fatty Acids (PUFA'S) , Cereals and Milk and Dairy Products, functional food.

1. INTRODUCTION

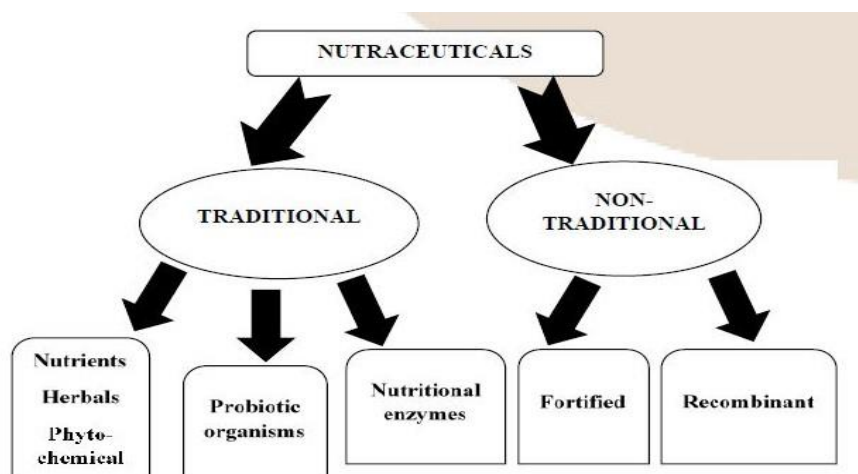
Introduction to Nutraceutical as Science:

The term 'Nutraceuticals' means nutritive and pharmaceuticals, we can say that nutraceuticals are the substances which provide health benefits or prevention or treatment of diseases. Nutraceuticals are very important as compare to medicines because it has no side effects.(1)

Few nutraceuticals detoxifying the body, avoiding vitamin and mineral deficiencies, and restoring healthy digestion and dietary habit.(2)

Health Benefits: (3)

1. Easily available
2. Cost effective
3. Increases health values
4. Avoid the unpleasant side effects



Functional Food:

Also known as nutraceuticals, functional foods are highly nutritious and associated with a number of powerful health benefits. For example, they may protect against diseases like Hypertention, Inflammation, Allergy, Alzheimer etc, prevent nutrient deficiencies (Vitamins and Minerals) and promote proper growth and development. Functional foods look like food and are modified for greater nutritional value. Foods or dietary components that may provide some health benefits.(4)

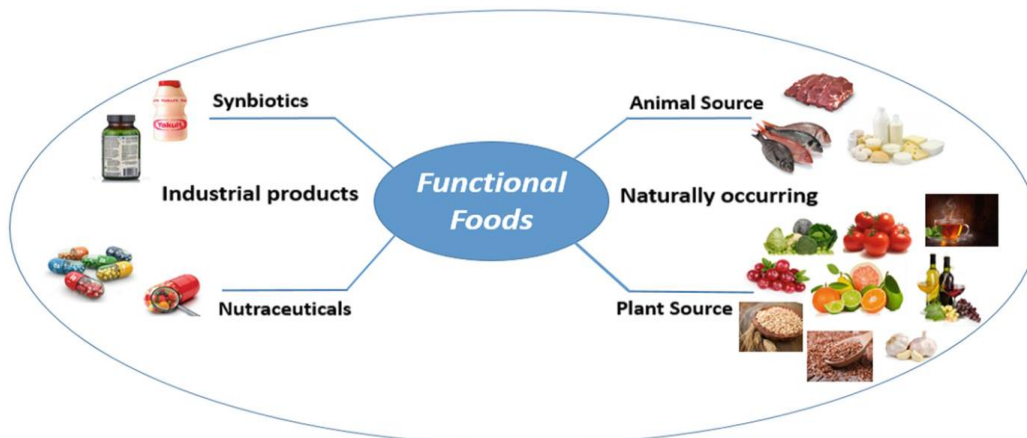
Functional foods are highly nutritious, natural or processed foods that contain biological active compounds. They provides health benefits, prevent diseases or its management.(5)

Functional foods like fruit juices, drinks which elevated antioxidant levels, yogurt, cereals and grains like wheat, oat, barley provides enhanced amount of dietary fibre. Other examples are milk, cheese enriched with omega 3-fattyacids

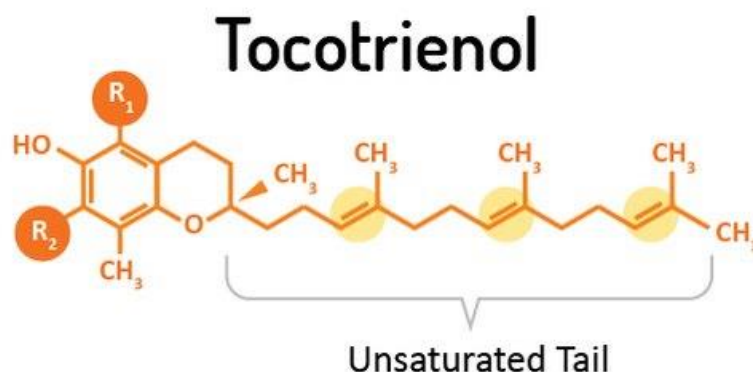
The concept of functional foods originated first time in Japan in the 1980s.(6)

Types of Functional food:

1. **Fortified products**- Fortified with additional nutrients like fruit juices fortified with vitamin C
2. **Enriched products**- Adding new nutrients or components probiotics, prebiotics
3. **Altered products**- Replace existing components with new beneficial component like ice-cream products
4. **Non altered products**- Food that naturally containing increased content like natural food
5. **Enhanced products**_ Food which one of the component has been naturally enhanced by using special growing conditions or new feed composition or genetic manipulation like egg with increased omega 3 content achieved by altered chicken feed.



Tocotrienols-



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It is a member of Vitamin E family. Vitamin- E family contains 4 Tocotrienols such as alpha, beta, gamma and delta.

Vitamin E is a fat soluble antioxidant which protects our body from oxidative stress and provides health benefits.

Vitamin-E supports immune system, prevents inflammation and reduces the risk of cancer.

Tocotrienols may help to manage blood pressure levels after 3 months of use

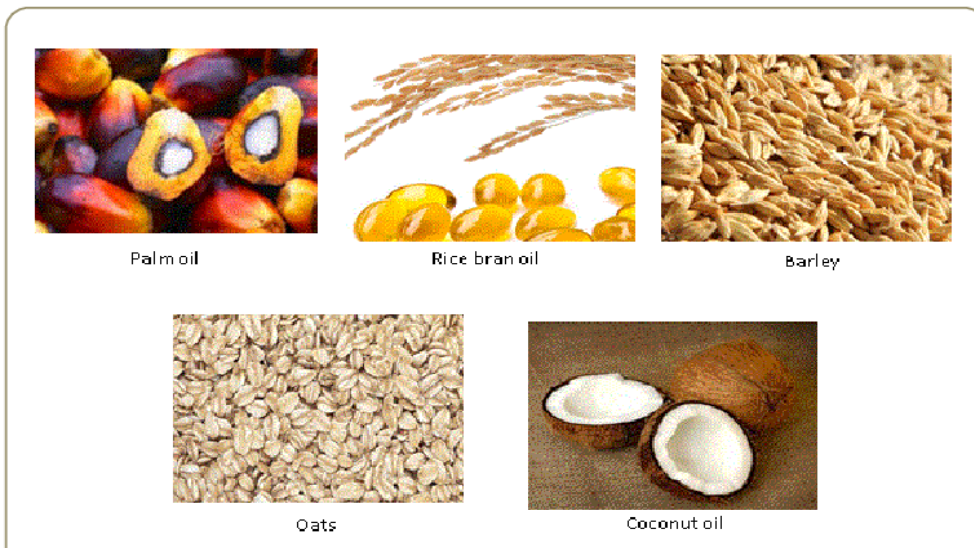
Tocotrienols may help to manage blood sugar levels

Tocotrienols may help to maintain normal heart function, reduces the deposits of plaque in the carotid artery.

Tocotrienols may help to manage the production of cholesterol by the liver like gamma tocoterinol is most important for this purpose.(7)

Health benefits of Tocotrienols as a functional food:

- Provide neuroprotection.
- Maintain cognitive health.
- Minimize strokes induced injuries.
- Slowdown progression of Alzhemier’s disease.
- Delay cognitive deadline.
- Reduces risk of Dementia.



Poly unsaturated fatty acids (PUFA):

Polyunsaturated hydrocarbon chains, processing two or more carbon double bonds, occurs in sunflower seed oil, safflower and corn oil, walnuts, pumpkin seeds, pine nuts, fatty fish and algae.

Have lower melting point; they have liquid consistency at room temperature. They both have exists anti-inflammatory and pro-inflammatory effect. Rate of oxidation is high as compared to monounsaturated fat. Reduces serum cholesterol levels and the production of both LDL and HDL cholesterol

For example: Omega-3 fatty acids and omega-6 fatty acids(8)

Health benefits of PUFA’S as a Nutraceuticals:(9)

- Reduces the risk of Arrythmia and cardiac diseases
- Maintaining Healthy Blood Pressure

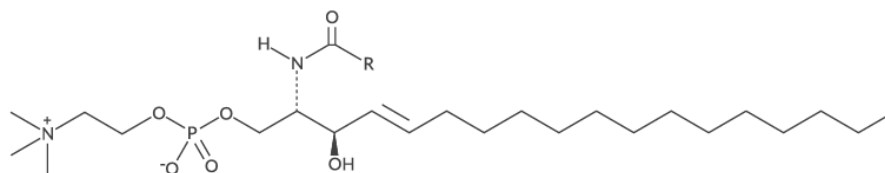
- Prevention of Dementia
- Reduces the risk of Alzheimer's diseases in early stage
- Brain and Visual developments in Infants
- Regulation of Triglycerides and Cholesterol
- Prevention of Idiopathic oligoasthenoteratozoospermia (10)

Sphingolipids:

Sphingolipids are phospholipids, that have an amide bond between a fatty acids and sphingosine, an 18 carbon alcohol.

Types of Sphingolipids:

- **Glycolipids**- Contain carbohydrate unit. Also known as cerebrosides because of their abundance in brain tissue. Also Glycolipids are essential components of plasma membrane (outer leaflet). They do not have phosphocholine group.
- **Sphingomyelin**- Contain phosphate and Choline group. It is found in a myelin sheath surroundings nerve cells.

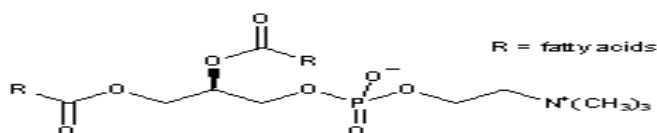


Sphingomyelin

Health Benefits of Sphingolipids as a Functional Food:

- Inactivation of toxins and bacteria
- Reduces the risk of Cancer
- Reduces the risk of Cardiovascular diseases
- Skin Homeostasis
- Cognitive function
- Useful in Brain development and Neurological diseases (11)

Lecithin:



Lecithin a kind of healthy fat that can be found in some foods or a component that is found in some vegetables, being toxic in high doses. (12)

Found in egg yolk and many plant and animal cells.

Commercially used as an emulsifier.

Used for the treatment of memory disorders like Dementia and Alzheimer's disease. It also treats gallbladder disease, liver disease depression, high cholesterol, anxiety and a skin disease called eczema.

Also used as a skin moisturizer.

Used in some eye medicines.

Diarrhea, nausea, abdominal pain, or fullness symptoms have been seen while using lecithin.

Avoid the use of lecithin during pregnancy and during breast feeding.

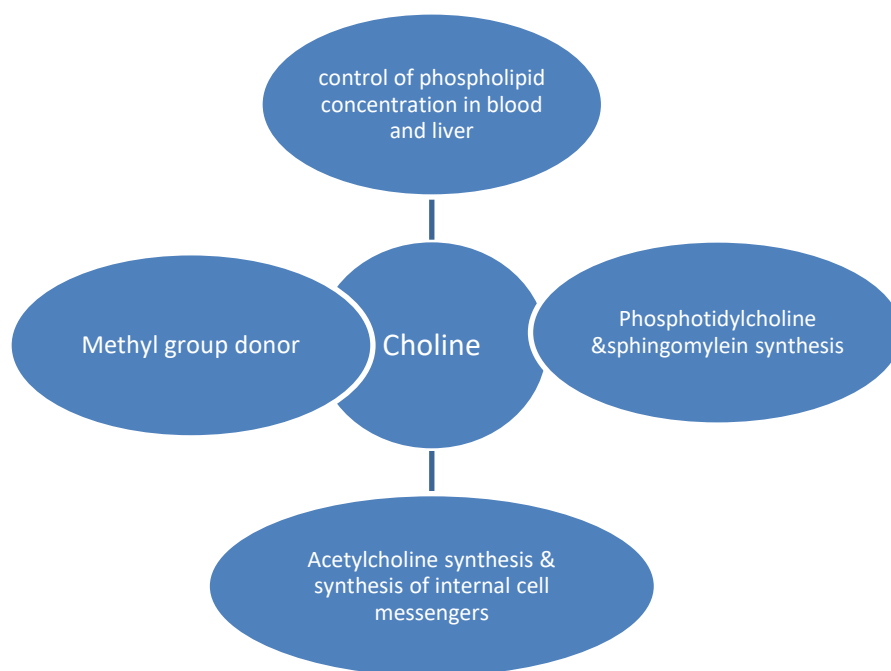
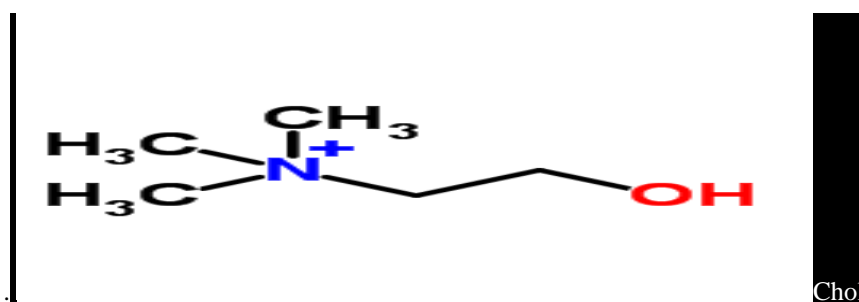
Health Benefits of Lecithin as a Functional Food:(13)

- Increases good cholesterol
- Improve fat digestion
- Reduce the risk of gallstones
- Improve memory
- Reduce the risk of fatty liver

Choline:

Choline is a structural quaternary ammonium compound, which plays an important structural role in membrane physiology.

Choline is a molecule, composed of 3 methyl groups covalently attached to the nitrogen atom of ethanolamine, which serves as the precursor molecules of several metabolites.(14)



Choline deficiency: (14)

1. Liver disease
2. Atherosclerosis
3. Possibly neurological disorder

Pharmaceutical uses of Choline: Choline used medically in the treatment of(15)

1. Liver disease
2. Hepatitis
3. Glaucoma
4. Atherosclerosis
5. Alzheimer’s disease
6. Neurological disorder
7. Choline has also proven to have a positive effect on those suffering from alcoholism

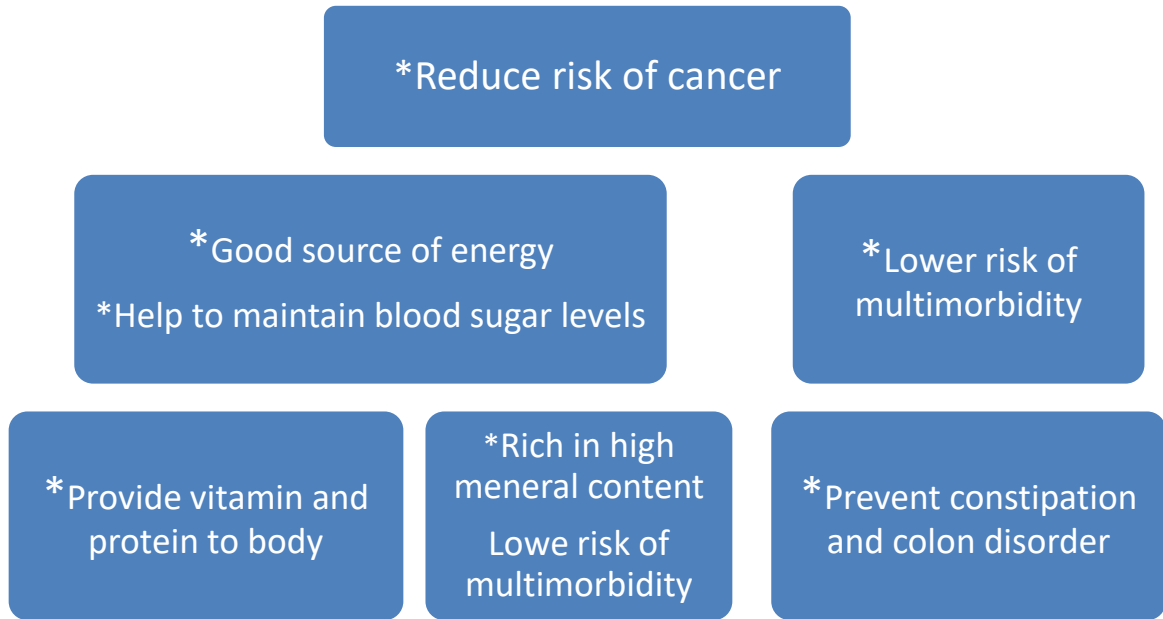


Cereal:

The term cereal is described as any cultivated grass, that produces the edible food. It is basically a grass whose starchy grains are used as the food to eat like wheat, rye, oat, maize, buckwheat, millet. Cereal composed of endosperm, germ and bran.(16)

Health Benefits of Cereal as a Functional Food: (17)

- Reduce the risk of Coronary Heart Disease
- Reduce tumour mass
- Reduce the risk of developing type 2 diabetes
- Have colon-cancer protective effects
- Reduce bacterial enzyme activities

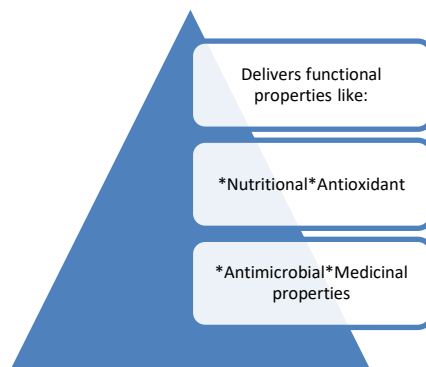
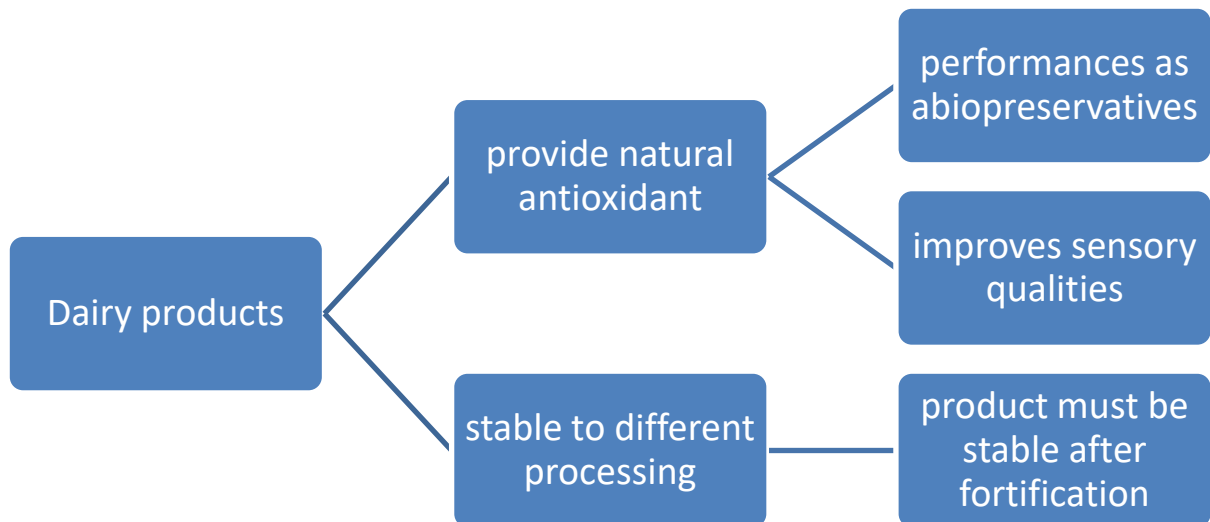


Milk and Dairy product as a functional food: (18)

Dairy products: Dairy products are commodities, which have been produced by primary processing of milk.

All mammals produce milk that have a correct balance of nutrients with which to feed their youngs.

The milk can also be produced and used commercially for example sheep, goat and cow milk.



Health Benefits of Dairy Products as a Functional Food: (19)

Dairy products contain **Protein** which

- Provides structure, growth and maintenance for the body
- Act as messengers
- Facilitates chemical reactions

Dairy products contain **Vitamin B12** which:

- Keeps body's nerve and blood cells healthy
- Help to making genetic material in all cells.

Dairy products contain **Calcium** which

- Plays essential role in muscle contraction
- Bone and teeth development
- Blood clotting
- Fluid balance
- Transmission

Dairy products contain **Phosphorous** which is:

- Component in bone, teeth, DNA and RNA.
- Also helps in activation of enzymes

Dairy products contain **Potassium** which:

- Balance the fluid
- Muscle contraction and nerve signal

Dairy products contain **Saturated Fat and Salts** which:

- Often considered as '**Nutrients of concern**' in Western diets.
- Overconsumption has been linked to a range of detrimental health impacts.

2. CONCLUSION

Nutraceuticals are the substances which provide health benefits or prevention or treatment of diseases. Nutraceuticals are very important as compared to medicines because it has no side effects and are more nutritive. Few nutraceuticals detoxifying the body, avoiding vitamin and mineral deficiencies, and restoring healthy digestion and dietary habit. Reduce the risk of many diseases such as cardiac diseases, Brain related diseases like Alzheimer's, Neuronal disease etc, so we can say that nutraceuticals are very important in our daily lifestyles and Nutraceuticals having more health benefits over pharmaceuticals with lesser side effects.

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