Editorial

There have been endorsement of products from various organisations, both government, scientific and private, which endorsed all kinds of products including food products. What is an endorsement? The dictionary meaning of it is support, sanction, authorisation, approval etc. It also means a promotional statement or validation.

Endorsement indicates quality that is validated by a reputed organisation so consumers feel assured that they are getting something that is really of high quality. Our association also endorses food products of high quality especially from nutrition point of view. When we endorse a product, it means that the nutrient contents of the product are what they are supposed to be or claimed to be. Consumers when they buy these products, they feel reassured about the nutrient contents of the endorsed product. These products have our seal of approval.

Associations including Protein Foods & Nutrition Development Association of India have been endorsing quality products for a long time. There are some quality endorsements given by public sector organisations like Bureau of Indian Standards and AGMARK. They evolve standards of quality and companies manufacturing the products conforming to those standards would be eligible for endorsement for a charge. These standards would ensure that the products have very high quality and consumers can rely on the endorsement signified by their logo or insignia suggesting the same.

When there are many products and some products are of much higher quality than many others of the same category, it is important to highlight this fact. The consumers do not have the ability to do this investigation on their own neither it is cost effective to do so. The organisation endorsing the products conducts the analytical process ensuring that the quality is what the products purport it to be by taking samples from the market and getting it analysed by certified laboratories. When there are discrepancies the manufacturers are compelled to carry out the improvements in order to meet the standards requirements. This ensures that the quality always remains high as expected by consumers.

While endorsements are okay, there are some rules that should not be overlooked. While most professional organisations can endorse food products, PFA does not allow certain endorsements on food product labels. Rule 39 clearly states that “There shall not appear in the label of any package containing food for sale the words “recommended by the medical profession” or any words which imply or suggest that the food is recommended, prescribed or approved by medical practitioners or approved for medical purpose.”

Endorsements are valuable information for consumers and good and legible marketing strategy by manufacturing companies. This certainly promotes high quality products.

Dr. J. S. Pai, Executive Director
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Trans Fats: Dr. J. S. Pai

Many bakery products use fats that are solid. These bakery fats yield products with highly desirable properties for examples, cakes and doughnuts are very spongy and soft, biscuits are crunchy, cookies are crumbly etc. These products were earlier produced by animal fats like lard or butter etc. However, these animal fats became expensive and less available and so a new fat was available in the early part of last century that was cheaper and also had properties similar to animal fats or sometimes even better.

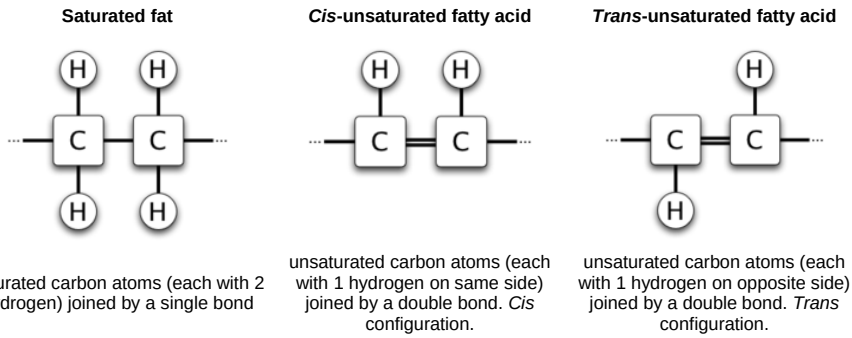
Vegetable oils are liquid at room temperature and are not very suitable for many bakery products. The fatty acids present are mostly unsaturated making them liquid. Liquid fats do not produce cakes and doughnuts that are spongy and light. Also liquid oils with more unsaturated fatty acids are more prone to oxidation and rancidity. German chemist Normann produced more solid fats from liquid oils by hydrogenating them i.e. by adding hydrogen into their double bonds using metal catalysts. During the process, trans fatty acids formed that helped making the fat more solid. This made them more stable towards rancidity and gave better properties. Thus cheaper oils could be converted into more valuable solid fats and used in bakery products.

During the last decade, the health implications of trans fats were highlighted. Harvard School of Public Health estimated that between 30,000 and 100,000 deaths due to cardiac arrests were attributable to trans fats in the US. There were many studies that followed to confirm the dangers of trans fats to human health and strict regulations started right from declaration on label the trans fat contents to outright banning in some countries the manufacture and sale of products containing trans fats.

Chemistry of trans fats

Fats are triglycerides or esters of glycerol and fatty acids. Fatty acids are either saturated or unsaturated based on number of hydrocarbon atoms in the fatty acid part. Each carbon atom carrying two hydrogen atoms except the end carbon that carries three. When less than the maximum number of hydrogen atoms is present, fatty acids are called unsaturated. In monounsaturated, two hydrogen atoms are less (one on each of adjacent carbons) giving one double bond, while in polyunsaturated, 4 or more hydrogen are less giving two or more double bonds. When a double bond is present, each carbon in the double bond will carry one hydrogen atom. In nature, hydrogen atoms of a double bond will orient on same side of the bond (cis), whereas, while industrial hydrogenation is being carried out, large number of hydrogen atoms in double bonds orient on either side of the bond i.e. trans configuration, so these fatty acids are called trans fatty acids and fats containing them are called trans fats.

During hydrogenation especially at high temperature and with certain metal catalysts, the formation of trans fatty acids is more pronounced as some of the unsaturated bonds are getting saturated by hydrogen. When all the unsaturated bonds are converted to saturated, there is no cis or trans. These two configurations are only seen in unsaturated fatty acids. Thus trans fatty acids are present only in partially hydrogenated fats.



saturated carbon atoms (each with 2 hydrogen) joined by a single bond

unsaturated carbon atoms (each with 1 hydrogen on same side) joined by a double bond. *Cis* configuration.

unsaturated carbon atoms (each with 1 hydrogen on opposite side) joined by a double bond. *Trans* configuration.

Trans fats have certain advantages also. Unsaturated fatty acids with cis-type double bond is not linear but is bent at the point of unsaturation. This lowers the melting point giving them liquid property. With saturated fatty acids, the configuration of molecule is linear so molecules can nicely stack up giving them solid properties. Trans fatty acid also is somewhat linear because of orientation of hydrogen atoms on either side of the bond, so they also behave more like saturated fatty acids and give solid properties to fat. Thus in spite of being unsaturated, these fats are solid and are quite useful in bakery products.

Applications in Food Products

The animal fats were not keeping up with demands when hydrogenated vegetable oils were developed. These were also very cost effective compared to animal fats or semi-solid fats of plant origin like palm kernel oil. There are certain sects of vegetarians that would not consume certain or all animal fats so the fat derived from vegetable oil with properties of animal fats would be quite useful under these circumstances too.

The understanding of process of hydrogenation developed further. The properties of hydrogenated fat with respect to the food product quality in which it was used were studied and that led to further improvements in the hydrogenation process. Specialised fats were developed with specific applications in bakery products. Soon the products like cakes, pastries, doughnuts, and other bakery products were produced with sensory properties especially the textural properties that were far superior to those possible using animal fats.

The hydrogenated fats were also more stable than vegetable oils to oxidative rancidity. This was another advantage so many fried products were produced using hydrogenated fats as they would resist deterioration. Another advantage was also in fried products. Foods fried in these fats were less greasy or oily because after frying when food cools down, fat solidifies and appears less oily.

Another advantage is that products formulated using hydrogenated fats such as margarine can be easy to use when taken from refrigerator. Butter is quite hard when just taken from fridge but margarine can be designed to be easily spreadable even when just taken from fridge.
Thus with several advantages the hydrogenated vegetable oils production and consumption became quite high until the adverse effects of trans fats were beginning to appear. Because of their health risks several countries have either restricted consumption of trans fats in processed foods or made it mandatory to declare their content in foods.

Trans Fat Containing Foods

Some trans fat occurs naturally. Milk from the ruminant animals (cattle, sheep etc.) contains a type of trans fat at a level of 2 to 5% of total fat. Natural trans fats have conjugated linoleic acid and vaccenic acid that originate from the rumen of these animals. The naturally occurring trans fatty acids do not seem to have effect on lowering of HDL cholesterol. Their content in milk fat is quite low. Their contributions to the CVD risk if any seem to be insignificant. Hence most countries have only enacted legislation to control the intake of industrially produced trans fats.

Most baked goods may contain significant amounts of trans fats. Some of the foods along with their trans fat and saturated fat contents are given below as per the FDA Consumer magazine published by US FDA in 2003 & 2004.

Product	Serving Size	Total Fat g	Sat. Fat g	Trans Fat g	Sat.+Trans Fat g
French Fried Potatoes (Fast Food)	Medium (147 g)	27	7	8	15
Margarine, stick	1 tbsp	11	2	3	5
Margarine, tub	1 tbsp	7	1	0.5	1.5
Shortening	1 tbsp	13	3.5	4	7.5
Potato Chips	Small bag (42.5 g)	11	2	3	5
Doughnut	1	18	4.5	5	9.5
Cookies (Cream Filled)	3 (30 g)	6	1	2	3
Candy Bar	1 (40 g)	10	4	3	7

Cake, pound	1 slice (80 g)	16	3.5	4.5	8

A National Diet and Nutrition Survey carried out in UK in 2000/01 indicated that significant amounts of trans fat in UK diets came from cereal products (biscuits, buns, cakes, pastries etc.), meat products (burgers, kebabs, meat pies etc.), fat spreads (margarines & spreads), potato and savoury snacks (chips & other snacks). Many manufacturers have since reformulated their products and claim to have much less or no trans fats in their products.

Nutrition and Health Significance

Metabolic studies have shown trans fats to have adverse effects on blood cholesterol levels. They not only increase LDL (bad) cholesterol but also decrease HDL (good) cholesterol. This combined undesirable effect on the ratio of LDL/HDL is almost double that of saturated fats. Thus the effect of trans fats on coronary heat disease is worse than the saturated fats.

Some studies have shown that C-reactive protein, another indicator of risk of heart disease, is elevated sizeably increasing the risk substantially due to high consumption of trans fats. Trans fats have also been associated with increased risk of coronary heart disease in epidemiologic studies.

There are many other studies continuing to gauge the effect of trans fats on cancer, diabetes, obesity, liver dysfunction and infertility although some preliminary results indicate adverse effects.

Animal fats and milk contain small amounts of trans fatty acids. These have been shown to behave differently than the industrially produced synthetic trans fatty acids. Two fatty acids are predominantly found as natural trans fatty acids namely vaccenic acid and conjugated linoleic acid (CLA). Vaccenic acid has been shown in a recent study to lower LDL cholesterol in rats. CLA has been shown to have anti-cancer properties although there are some other undesirable side-effects like lowering insulin sensitivity. These need to be studied further before any recommendations are made with their respect.

Regulation of Trans Fats in Foods

Australian government wants to pursue policy of reducing trans fats from fast foods. Canada requires that food labels list the amount of trans fat on food labels. It is trying to reduce the intake of trans fats. City of Calgary banned trans fats from restaurants and fast food chains. Denmark became the first country to introduce laws to strictly regulate sale of trans fat containing foods. It has restricted fats and oils to have not more than 2% trans fats, effectively restricting partially hydrogenated oils. Switzerland followed Denmark in banning trans fats. UK encouraged self regulation by industry. Sainsbury became first UK major retailer to ban all trans fat from their own brand foods.

US FDA did not approve nutrient content claims such as “trans fat free” or “low in trans fat” as they could not determine safe daily intake that could be taken. However, they made it mandatory to declare trans fat content on labels, allowing contents less than 0.5g per serving to be declared as 0g on food label unlike other countries. FDA also defines trans fats as containing one or more trans linkages that are not in conjugated system. Thus naturally occurring trans fatty acid like conjugated linoleic acid is not considered as trans for label purpose whereas the industrially produced trans fatty acids are considered.

New York city has barred restaurants from using frying and spreading fats containing artificial trans fats above 0.5g per serving from July 1, 2007 and gave one year for compliance. Many other cities in the US are also putting similar restrictions.

Indian government has notified amendment to PFA to include the declaration of trans fat content of certain foods. There are many challenges in front of Indian food industry.

Effects in Industry

Manufacturers have started producing low trans fat bakery fats and shortening. One company has reformulated it using solid saturated palm oil mixed with soybean oil and sunflower oil. This blend gives similar properties of

original shortening but zero gram trans fat per tablespoon compared to original 1.5g per tablespoon. Others have started marketing product line of non-hydrogenated oils, margarines and shortenings made from various oils.

Some major food chains have chosen to remove or reduce trans fats in their products. Many fast food chains have reduced or eliminated trans fats from their products including fried chicken, French fries etc.

Major reformulation challenge is avoiding simple substitution of trans fat with saturated fats that might have properties to make better looking products but may still have adverse health effects although not as bad as trans fats.

USDA scientists have shown that altering conditions of hydrogenation will have an effect on extent of trans fat formation. Instead of standard process being carried out at a pressure of 20 psi, they used 200 psi to lower the trans fat content from about 40% to about 17% in soybean oil.

Future

Scientists are ingenious and developed fats from vegetable sources to produce food products that surpassed the ones prepared using animal fats. Given some time they will come up with solutions to avoid use of trans fats in these foods as these have been proven harmful. Use of newer sources, newer processes of preparing fats and food products, using different or newer ingredients, they will produce the desirable properties in foods like cakes, doughnuts, other bakery products and fried foods. Until then people may have to watch their trans fat intake.

Packages That Are Changing the Face of Food Processing

The discovery of food containers during the era of Napoleon's rule is credited to Parisian Nicholas Appert for coming up with the technique of using glass containers for packing food. Napoleon's world conquest plans that had faced suspension due to lack of safe food for his army could surge on ahead supported by an innovative food packaging system. World exploration in the late 18th and early 19th centuries would not have been possible without developments in food preservation and packaging brought forward by Louis Pasteur and Peter Durand.

Although, at present, there are feelings of a slowdown in the rate of technological change in food packaging in the past couple of decades, shows like the Pack Expo and Food Processing Machinery Expo and a handful of end-of-year packaging award programs have proved that packaging innovation does live on. In the case of the three packages picked for this article, packaging is revolutionizing the food inside and the way it's being marketed.

Milk in a rainbow of flavors

Milk as "nature's perfect food" was considered such a critical commodity that the government-established standards of identity that ensured its purity and homogeneity restrained it from stretching out into new directions for years.

While packaging of milk advanced from glass to paper to plastic, some argued that those advances set back its freshness in taste and shelf life. Chocolate and strawberry were established flavors while egg nog was viable economically only in short run for the holidays. Flavors were more or less restricted because processors could not economically make them in short runs and retailers could not sell enough of them in the traditional 14-day shelf life that milk has.

Could shelf life of milk be increased for months to a year? For decades, Europe sold a large percentage of milk in shelf-stable aseptic boxes, dating back to the time when there was less prevalence of refrigeration from distribution channels to consumers' homes. It was chilled before use and shelf life of milk was typically 6 months. However, subjecting the milk to higher temperatures in order to sterilize it would give it a cooked or even burnt taste. While the US made attempts at similar packaging and processing methods, it never caught on.

However, declining milk consumption in the US spawned category-wide marketing programs. Not only were numerous benefits of gallon-milk re-established, but single-serve milk was promoted as a viable and 'hip' beverage option. One of the early obstacles was to take single-serve milk out of the unresaleable, unattractive little gabletop cartons and put it in sleek, resaleable plastic bottles.

In a convergence of two technologies, four European machinery-makers created systems to take European-inspired shelf stable milk and put it in American-inspired single-serve plastic bottles. Dean Foods took up the task of proving to the FDA that milk packaged in single-serve plastic bottles was safe. This billion-dollar national milk company, with contracts to bottle Hershey's milk and shakes and Folgers Jakada coffee-milk drink, applied for FDA approval to distribute and sell its milks, warm or cold, within 180 days shelf life. Both products are in high-density polyethylene bottles with special barrier layers. The approval came in 2002. The aseptic packaging of Hershey's milks and Folgers Jakada is providing them a much needed lift in the competition.

As other dairies with similar filling and packaging technology may be moving toward officially stated 180-day shelf life as well as unusual flavors, the day may arrive soon when purchasing a 24-bottle case of single serve milk bottles in a rainbow of flavors may be kept unrefrigerated in the garage until just before use.

The end of the age of cans?

Cans, the premier food package from the early 1800s, face ouster from the new Recart retortable carton from Tetra Pak, Vernon Hills, Ill. This cross between the retort pouch and Tetra Pak's groundbreaking aseptic box is a six-layer, cardboard laminate structure incorporating polyester and foil. The Institute of Food Technologists (IFT) views the Recart as a development representing a significant advance in the application of food science and technology to food production and has honored the Recart retortable carton packaging system with the Industrial Achievement Award.

The Austin, Minn., processor of Hormel Foods Corp. has finished test marketing its Stagg and Hormel brands of chili in the Tetra Recart and is now converting all its chili products from metal cans to retortable cartons under the name “Smart Pak.” Laser-perforated for easy opening, these chili cartons can be handled easily, are stackable and space-efficient, and are shelf-stable for 24 months. Although chili from these cartons can be easily transferred to a microwaveable bowl or stove-top heating pan, the carton itself is not microwaveable. However, the carton can be reclosed to refrigerate unused portions.

According to Steve Hellenschmidt, General Manager of the Recart line, an empty carton weighs 18 grams as compared to an empty can at 56 grams. For the retailer and consumer, three cartons fit in the space of two cans, providing both shipping and storage benefits.

These cartons can also be recycled in existing milk carton/juice box recycling streams.

Cans fight back: The Dot Top can was discovered in Brazil by Silgan Containers, which was its US vendor. This can does not require a can opener; the lid has a slight vacuum seal which can be snapped back on the can with a little downward pressure. The first company to use the Dot Top can is Hirzel Canning, Toledo, Ohio, for its Dei Fratelli Presto brand of pizza sauce and Italian dip.

Stand-up pouches’ shotgun approach

Starting off as an innovative package for Kraft’s Capri Sun juice drink, stand-up pouches (SUPs) have remained relatively novel with consumers and increasingly familiar with food and beverage processors. SUPs possess a unique, consumer-appealing appearance, the ability to incorporate eye-catching, billboard-type graphics, recloseability and easy portability. Their customized construction makes them adaptable to a range of temperature tolerances including retort processing.

For clear SUP applications, FlexiBowl by Kapak Corp., Minneapolis, is adaptable for both retort and non-retort products. It can satisfy specific product needs by offering the ability to be custom-produced in a range of laminations and barrier structures, and can also be printed in up to eight colors. Precise laser scoring makes removing the peel-strip easier without using knives, scissors or other utensils.

Despite their lighter-weight, freight cost-saving and other benefits, their inability to be stacked during shipment, storage and in-store shelf display has led to the introduction of FlexCans, a product of Amcor Flexibles in collaboration with German packaging machinery manufacturer Rovema. These stand-up pouches can be easily opened and are reclosable, having flat-top nestable/stackable panels. It is already being used by Sundora to package dried fruits.

Chicken of the Sea was the first to pouch shellfish, including crab, imitation crab, shrimp, clams, and smoked oysters.

The fastest-growing segment of the pouch market, SUPs are increasing at an average rate of 15 percent per year through 2008 to $1.3 billion according to a study conducted by Freedonia Group, Cleveland. Currently representing 5 percent of all packaging, SUPs are, according to the study, projected to reach $5.2 billion in 2008.

Condensed Article from FoodProcessing.com

Iron and Zinc Fortification

Animal products provide less of zinc and iron. Although plant-based foods are good sources of these minerals, not much is readily absorbed for functional use by the body. Cereals, nuts and beans, although rich in the minerals, are poor sources due to high contents of phytates. Polyphenols like tannic acid in tea, coffee, red wine, soy are also powerful inhibitors of plant-based iron absorption. Since these minerals are essential for healthy growth and development, children are especially at risk.

Iron compounds normally allowed for fortification include, elemental iron, ferrous salts of ascorbate, carbonate, citrate, fumarate, gluconate, lactate and sulphate, ferric salts of ammonium citrate, choride, citrate, pyrophosphate and sulphate. Although many compounds are allowed, each has some complication or limitation for functionality.

Iron salts, ferrous sulphate, gluconate and lactate are water-soluble and highly bioavailable. But they are highly reactive and can alter taste and nutritional quality of foods by causing oxidative degradation. They are normally used for fortification of dehydrated foods like infant formulae. Other forms like ferrous fumarate, succinate and saccarate although less reactive and highly bioavailable, tend to become reactive during storage and exposure to high humidity, conditions prevailing in most manufacturing units. Ferric orthophosphate, ammonic orthophosphate or pyrophosphate and elemental iron powder may seem to be logical choice, but these have poor bioavailability.

For food fortification programme, several factors need consideration like the choice of food vehicle and iron compound, fortification level and ways to enhance bioavailability. Cereal products are difficult to fortify due to flavour and colour changes developing during storage and preparation.

Zinc is important in hundreds of functions in body. It has integral role in muscle growth, injury healing and immunity building. FDA requires iron enrichment to refined flours but zinc is not regulated. Like iron, zinc from meat is better absorbed than zinc from plant sources. Absorption is further made difficult in foods high in fibre and phytate. Zinc also competes with iron for absorption when the two are eaten together.

According to Dr. Grider of University of Georgia, there are several ways to improve absorption and bioavailability of iron and zinc. Instead of increasing fortificant which does not result in significant increases, reducing the anti-nutritional factors in the food may help. Adding ascorbic acid enhances iron absorption from food with high levels of phytate. Zinc absorption can be enhances by adding enzyme phytase to degrade phytates. There are other methods of degrading phytic acid.

Oxides of iron and zinc are used as fortificants in spite of poor absorption because they do not affect shelf life, texture and taste of food products. Sulphites even though easily absorbed tend to cause rancidity reacting with other food components. Chloride, gluconate, oxide, stearate and sulphate of zinc have been given GRAS status by US FDA.

Gluconate is better absorbed than sulphate and oxide. Amino acid chelates (stable complex with amino acid) have different absorption and have been shown to be better absorbed than their inorganic counterparts. Iron bis-glycinate in bread is absorbed at twice as rapidly as iron sulphate. Zinc methionine chelate has superior absorption than zinc sulphate or oxide. Zinc picolinate chelate is absorbed better than gluconate or citrate. Chelate absorption is difficult to compare because suppliers use proprietary processes to prepare chelates and forming wide range of results. Similarly, different methods of evaluation of bioavailability give conflicting results making comparison meaningless.

Lactate and citrate ligands of zinc and iron are become popular due to enhanced bioavailability. Calcium citrate malate is a proprietary ligand product used in fruit juices to provide dietary calcium with no influence on zinc and iron uptake, which is a common problem of calcium. Kraft Foods have recently applied for GRAS status for sodium iron EDTA for use in iron fortified powdered soft drinks at 2.5 mg iron/200 ml beverage.

Microencapsulation is an innovative way to supplement iron, due to which poly-glycerol mono-stearate (PGMS) of iron can be added to flours. Without encapsulation iron PGMS provokes rancidity due to long storage and exposure to humid conditions. With smaller particle size iron absorption is also high.

Since one mineral affects absorption of the other, it is necessary to determine if products should have both minerals in balance and if so each mineral should be added adequately. Enhancement of mineral functionality is also explored by ingenious ways using compounds like superoxide dismutases and metallothionein for zinc. Flavonoids and other phytochemicals like lycopene also help increase concentration of minerals.

Iron and zinc can also be toxic at high levels. It is necessary to ensure fortification is accurate and appropriate. Mineral content of premix should be easy to measure for control. Some mineral compounds should be used within specified periods or else their degradation or alteration can cause changes in texture, taste and appearance of finished products.

Condensed from article by Dr. K. Shelke & Dr. D. Feder in Wellness Foods, Food Processing.Com 2008

Flavours – From the Natural Source

Dr Hormaz Patva

Sensient India Private Limited

Flavour is the sensory impression of a food or other substance, and is determined mainly by the chemical senses of taste and smell. The "trigeminal senses", which detect chemical irritants in the mouth and throat, may also occasionally determine flavor.

Natural Flavours are not new and many of the earliest essences used widely were from extracted sources. Today, however Natural Flavours are closely defined and are making a comeback. This with increase in consumer interest in the foods and beverages that can be claimed as 100% Natural, has added to the value to Natural Flavours.

Natural Flavours

Natural flavours in the past were typically based on materials such as fruit juice volatiles, essential oils, (citrus based), and even concentrated fruit juices, Such starting materials were often and are still used for fractionation by simple liquid-liquid extraction and then enhanced by the most limited range of true aroma chemical e.g. vanillin The resulting products would then be dispersed into an appropriate solvent.

Today, there is a very wide range of aroma chemicals available that enables flavourists to make natural flavours by simple compounding techniques that are direct analogous to the way nature-identical aroma chemicals have always been made, however there are natural botanical extracts available using a range of technologically advanced low temperature processing techniques, giving unique products of high concentration and purity for applications in flavours as well as fragrances.

These natural botanical concentrated extracts are an exact replica of Natures creativity and denotes the pleasing alternation and variety of flavour/aroma tones as they succeed each other in total profile.

These are extracted using single or series of complex extraction processes to ensure the purity, integrity as well as minimum thermal degradation. from original botanical materials such as seeds, roots, leaves, berries and flowers. These processes include low temperature extractions with solvents, molecular distillations, cold press expressions, liquid carbon dioxide extractions, the results of the extracts are essential oils, absolutes or concretes, depending on the type of extraction.

Extraction Techniques:

Liquid Carbon Dioxide extraction

Freshly milled raw material is packed into stainless steel extraction columns, and treated to a dynamic flow of carbon dioxide in liquid form, at pressures of 40 to 60 atmospheres, and low temperatures between 0 and 10 ^{0}C. The liquefied carbon dioxide dissolves the lower molecular weight organoleptically active components of the botanical raw material, leaving behind the higher molecular weight unwanted materials such as heavier fats, waxes, pigments, sugars, starches and tannins. The solution of product in CO_2 emerging from the extraction columns is passed to a sophisticated heat exchanger. This leaves a pure extract of the product which is tapped from the process under pressure, still below ambient temperature.

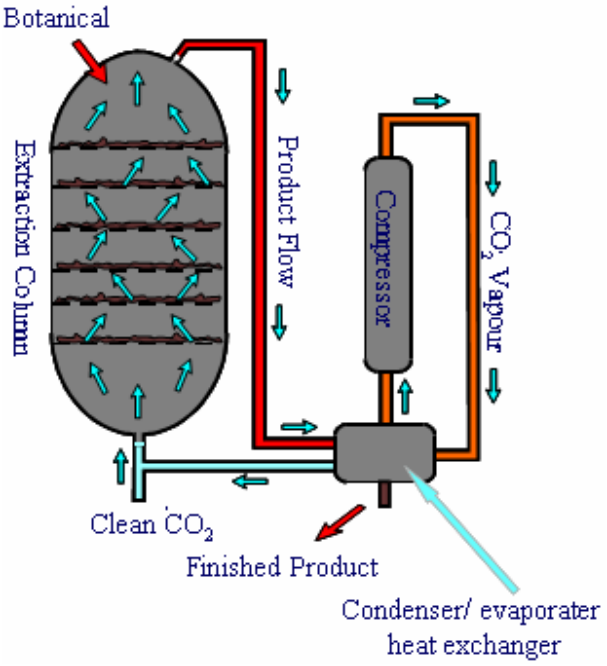


Fig1: Liquid CO_2 Extraction

In order to have much more selective extraction for raw materials having low oil content, ethyl alcohol is used as an entrainer at a low level into the flow of CO_2 prior to extraction. This unique selective solvent mixture gives an extract in alcohol solution which captures the flavour and aroma.

Counter Current Extraction:

Citrus oils in hydrocarbon solvent are continuously fed into a specially-designed column containing many compartments and this complex mixer, in which a counter-flow of ethanol containing a small amount of water extracts the flavour and aroma molecules, leaving the terpenes to emerge from the opposite end of the column. The process takes advantage of the different chemistry and molecular structure of the hydrocarbon terpenes, which after removal form a valuable by-product.

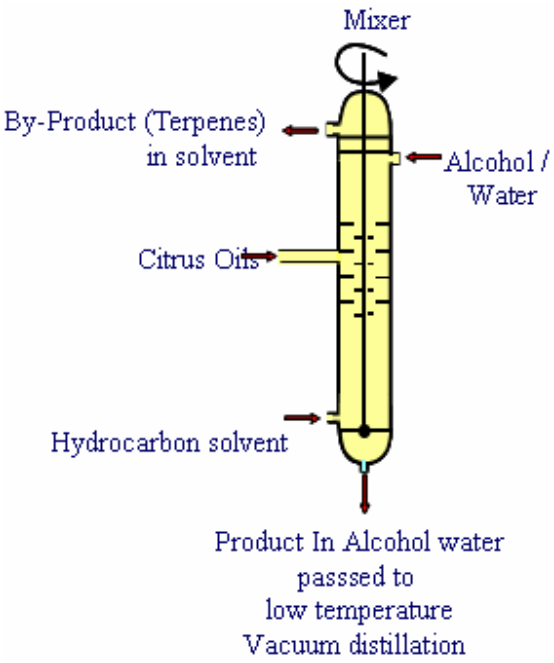


Fig 2: Counter current Extraction

Vacuum Distillation

This is one of the simple techniques for concentration of essential oils before molecular distillation and for concentration/rectification of oils. The raw material or crude oil is heated under vacuum at precisely controlled temperatures, turning the components into vapour, which is then cooled and condensed to a purified liquid product.

Molecular distillation

This distillation technique employs a complex still which subjects the material to heat for the briefest possible time, while at the same time allowing a very high vacuum to be achieved, which lowers the vaporizing temperature, contributing further to the limited exposure to heat. The Molecular, or Falling-Film Short-Path Still, uses a different design to traditional batch distillation allowing a continuous feed of liquid to enter the still and pass down the inside of a heated jacket, wiped into a thin film by the centrifugal force of rotating rollers, and falling by gravity. The key use for the Molecular distillation process is to refine further products and also de-colour them.

Solvent Extraction:

Solvent extraction, as a technique routinely uses water, alcohol, and their azeotropic mixtures under a range of conditions to produce extracts in solutions. The process involves a combination of static cold extraction and/or dynamic flowing extractions at slightly higher temperatures. Individual products are created by varying the time, temperature, static or flowing conditions.

Alcohol Co-Distillation:

A number of products are manufactured by distillation process involving the addition of pure alcohol to the botanicals which are first treated with water, followed by atmospheric pressure or low-vacuum distillation of the alcohol and some water which co-distils the more volatile components to yield a high aroma product

Some of the advantages associated with these type of natural products are clean label, 100% Natural, enhanced functionality, product differentiation and true to nature.

Regulatory News

"Total Body" Drink Recall After Adverse Reactions

FDA is advising consumers not to purchase or consume Total Body Formula in the flavors of Tropical Orange and Peach Nectar, or Total Body Mega Formula in the Orange/Tangerine flavor. The liquid dietary supplement products may cause severe adverse reactions, including significant hair loss, muscle cramps, diarrhea, joint pain and fatigue.

The Total Body Formula products are sold in 8-oz. and 32-oz. plastic bottles. The Total Body Mega Formula is sold in 32-oz. plastic bottles. Both products are distributed by Total Body Essential Nutrition of Atlanta. The company is the sole distributor of the products and has voluntarily recalled the products in question.

The Florida Department of Health recently provided reports to FDA on 23 individuals who experienced serious reactions to these products 7 to 10 days after ingestion. In all cases, the reactions included significant hair loss, muscle cramps, diarrhea, joint pain and fatigue. FDA subsequently learned and is investigating a report that some individuals in Tennessee using the same products have experienced similar reactions.

FDA laboratories are analyzing samples of the products to identify the cause of the reactions, including the possibility that the products contain excessive amounts of selenium, which is known to cause symptoms such as those described in the adverse events reported to the agency. Selenium, a trace mineral, is needed only in small amounts for good health. The products have been distributed in Alabama, California, Florida, Georgia, Kentucky, Louisiana, Michigan, Missouri, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Texas and Virginia.

FDA is advising consumers in all states to avoid using the products immediately and to discard the products by placing them in a trash receptacle outside of the home. Consumers who have been taking the products and have experienced adverse reactions should consult their health-care professional. Consumers and health-care professionals can also report adverse events to the FDA's MedWatch program at 800/FDA-1088 or online. FDA is working with the Florida Department of Health in its investigation.

From: Food Product Design March 28, 2008

FDA Releases New Labeling Guide

FDA and the Center for Food Safety and Applied Nutrition have published a new guidance document, "A Food Labeling Guide," to help manufacturers deal with any issues that might arise during label creation. This guide replaces an earlier version published in Sept. 1994 (and subsequently updated in 1999).

The guide's introduction notes that it is not attempting to answer every food-labeling question that might arise. However, "most frequently raised questions have been addressed by using a 'question and answer' format. We believe the vast majority of food labeling questions are answered."

The document goes on to note that "FDA receives many questions from manufacturers, distributors and importers about the proper labeling of their food products. This guidance is a summary of the required statements that must appear on food labels under these laws and their regulations. To help minimize legal action and delays, it is recommended that manufacturers and importers become fully informed about the applicable laws and regulations before offering foods for distribution in the United States."

For complete details, see the complete text of the document. A complete list of Food and Cosmetic Guidance Documents is also available online.
From: Food Product Design April 9, 2008

Europe Bans GM-Contaminated Rice From China

Beware Chinese rice. That's the message following the discovery of rice consignments containing an experimental genetically modified strain called Bt63. From 15 April, all rice imported from China into the European Union must be certified as free of

Bt63.

European food importers and regulatory authorities have been told to test Chinese rice imports at random to check that documentation is not fraudulent. Products already on sale in Europe which contain Chinese rice will also be spot-checked for contamination.

But does the rice really pose a hazard? Bt63 is a bacterial protein made by GM rice to kill insect pests. The UK-based Friends of the Earth lobby group cites studies in the US and Cuba which suggest that GM rice strains containing similar proteins caused allergy-like responses in farm workers.

The UK's Food Standards Agency says that the rice has been officially declared "unsafe" as no one anywhere has certified it safe to eat. "Our primary concern is that it is unauthorised, and so it shouldn't be in the food chain," said a spokeswoman for the FSA. "There's only limited data available, so our default assumption is that it's unsafe."
From: http://www.soyatech.com/news_story.php?id=7717

Research Highlights

Dark Chocolate + Sterols = Better Cardio Health

A recent study from the University of Illinois, Urbana-Champaign has demonstrated that eating a daily dose of sterol-fortified dark chocolate can help people with elevated cholesterol levels improve their cardiovascular health. The results of this research were published in the April issue of the *Journal of Nutrition*.

The researchers note that previous studies have shown that plant sterols and cocoa flavanols can help people maintain cardiovascular health. They sought to take this one step further by determining if the sterols and/or flavanols can help improve the cardiovascular health of individuals with elevated cholesterol levels.

Recruited study participants, all with elevated cholesterol levels, began by following an “AHA style” diet for two weeks. They were then divided into two groups: one that would daily consume two dark-chocolate bars fortified with 1.1 grams sterol esters per bar, or two bars not fortified with sterols.

Analysis of serum lipids and other cardiovascular markers showed that regular consumption of the sterol-containing chocolate bar resulted in reductions of both serum total (2.0%) and low-density lipoprotein (5.3%) cholesterol. Consumption of cocoa flavanols reduced systolic blood pressure. This led the researchers to conclude that “regular consumption of chocolate bars containing plant sterols and cocoa flavanols as part of a low-fat diet may support cardiovascular health by lowering cholesterol and improving blood pressure.”
From: By **Douglas J. Peckenpaugh in** Food Product Design March 25, 2008

New Evidence Suggests Eating Soyfoods in Puberty Protects Against Breast Cancer

Evidence is growing from animal and human studies that genistein, a potent chemical found in soy, protects against development of breast cancer - but only if consumed during puberty, says a Georgetown University Medical Center researcher in the British Journal of Cancer published online today. The challenge now, she says, is for scientists to understand precisely why soy appears to provide a shield against the most common cancer in women.

"Timing seems to be vitally important in use of this bioactive food, and if we can figure out why that is so, then we may be able to help prevent breast cancer in the widest sense possible," says the researcher, Leena Hilakivi-Clarke, Ph.D., a professor of oncology at the Lombardi Comprehensive Cancer Center at Georgetown.

Although there are a number of tantalizing theories to explain the connection, "at the present time no convincing explanation can be offered as to why the breast cancer-risk reducing effect of genistein might be strongest during childhood and early adolescence," she says.

Hilakivi-Clarke is a senior author of a review article published in the journal that sums up the state of knowledge concerning the role of early life genistein exposures in modifying breast cancer risk. She has long studied the link between soy use and breast cancer, as have her three co-authors, all Finnish researchers.

There have only been three human studies that tracked soy use during puberty and later breast cancer development, and two of them focused on Asian females, who eat soy in their traditional diet. But these studies suggest soy offers a very strong protective effect – a 50 percent or more reduction in the risk of breast cancer - when soy is eaten during childhood and adolescence.

The strongest evidence for genistein's protective effect comes from studies in mice and rats, Hilakivi-Clarke says. For example, numerous studies in rats show that the data regarding prepubertal exposure to genistein are very consistent in showing a reduction in mammary cancer risk, she says. Exposure to soy in fetal development or in adult life does not have the same protective effect.

Further examination of experimental versus control rats demonstrated that use of genistein in puberty cut the number of so-called "terminal end buds" in the breast. These are the structures that lead to growth of the mammary epithelium, which are the cells lining milk ducts, etc., and it is in these epithelial cells that breast cancer originates. But Hilakivi-Clarke says it is not clear if a mere reduction in the number of these structures could reduce cancer risk, or why.

Other studies suggest that genistein controls expression of genes in terminal end buds that regulate cell growth, repair and death. For example, the chemical could be controlling the ability of stem cells, found on these buds, to reproduce themselves or to differentiate into more specialized cells. "There is evidence that suggests that the more stem cells there are on these structures, the greater the risk of breast cancer development," she says. This evidence supports the theory that breast cancer arises from stem cells that have lost growth control.

Other associated research has found that the genes that genistein appears to activate in developing mammary glands are well known --- BRCA1, p53, and PTEN tumor suppressors, Hilakivi-Clarke says. These genes repair genetic damage and control cell survival and death, and they may also help control stem cell reproduction, she says, and genistein apparently "up-regulates" these genes, boosting production of their beneficial proteins.

What is perhaps most intriguing, she says, is that the same process that protects the breast from excess growth during pregnancy seems to be at work during puberty. "In pregnancy, BRCA1 is also up-regulated, perhaps in order to control the fate of stem cells, allowing them to make more cells for milk production, for example, but not more of themselves."

So Hilakivi-Clarke favors the notion that genistein is acting as a breast cancer protective just as an early first pregnancy in women is known to protect against later development of the cancer:

"If malignancies occur in breast stem cells, then it is better that many of these cells are differentiated earlier rather than later. Pregnancy hormones do that, so the shorter time there is between puberty and pregnancy, the greater that protection may be," she says. "Genistein may also help control the fate of stem cells in the same way."

"We think this is the mechanism by which genistein works, but we really don't know and we need to find out," Hilakivi-Clarke says. "The findings will matter."
From: Soyatech eNews April 10, 2008

Caffeine Protects Against Cholesterol, Alzheimer's

As noted in a press release last week, researchers from the School of Medicine & Health Sciences at the University of North Dakota recently studied the effects of caffeine on the interrelationship between elevated cholesterol levels and Alzheimer's disease. What they discovered was that the caffeine levels typically found in just one daily cup of coffee—in the study, 3 mg per day, fed to rabbits—might be enough to help prevent the negative effects of consuming a high-fat diet, thereby helping prevent neurological diseases like Alzheimer's. The results of this research were published online in the *Journal of Neuroinflammation*.

Lead author Jonathan Geiger, Ph.D., points to previous research that has indicated a high-cholesterol diet can lead to the breakdown of the blood-brain barrier, potentially exposing the nervous system to contamination. But caffeine might hold promise as an agent in preventing such blood-brain barrier "leakage," as it is sometimes called.

"Caffeine appears to block several of the disruptive effects of cholesterol that make the blood-brain barrier leaky," says Geiger. "High levels of cholesterol are a risk factor for Alzheimer's disease, perhaps by compromising the protective nature of the blood-brain barrier. For the first time, we have shown that chronic ingestion of caffeine protects the blood-brain barrier from cholesterol-induced leakage."

Although these findings are quite promising, the researchers note that further detailed studies are now warranted to determine the detailed mechanisms by which caffeine protects against blood-brain barrier disruption, and if similar effect will hold true for human subjects.

From: Food Product Design 8 April 2008

Omega 3 for Depression

Cedars-Sinai researchers are working to determine if there is a measurable benefit.

According to the Substance Abuse and Mental Health Services Administration's latest National Survey on Drug Use and Health (Nov. 15, 2005), depression is one of the leading causes of disability in the U.S. In 2004, 8% of adults aged 18 or older—an estimated 17 million adults—reported having experienced at least one major depressive episode (MDE) during the year. Among adults aged 18 or older who experienced at least one MDE during the past year, 65% reported having received treatment for depression during the year.

While there are many pharmaceutical treatments for depression, researchers at Cedars-Sinai Medical Center's Department of Psychiatry and Behavioral Neurosciences in Los Angeles, CA, are two years into a five-year clinical trial designed to examine whether two polyunsaturated omega 3 fatty acids—docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA)—might be effective treatments for depression. DHA and EPA, found naturally in fish oil, flaxseed and walnuts, have anti-inflammatory properties and help stabilize brain cell membranes, both of which play a role in mood regulation. While previous studies have documented omega 3 fatty acids to be effective treatments for depression, this is the first study to systematically test these two specific fatty acids against each other and against placebo in a large sample of people with major depression.

Mark Hyman Rapaport, MD, the research team's lead principal investigator and department chair, explained that there is a real need to develop new and safer treatments for Major Depression (MDD). "One area of interest is the role of n-3 fatty acids (alpha linolenic acid, or ALA, and EPA and DHA) as an intervention in MDD because of the confluence of several lines of data—data suggesting that some people with MDD have increased levels of the same pro-inflammatory cytokines increased in heart disease; the symptom of depression is a risk factor for the development of cardiovascular disease; and increasing n-3 fatty acids has been shown to decrease production of pro-inflammatory cytokines and reduce the risk of heart disease," he said.

The National Institutes of Health (NIH)-sponsored study, held in collaboration with Massachusetts General Hospital, is in the midst of recruiting 300 adults, aged 18-80, who are experiencing significant symptoms of major depressive disorder and are in good health. "Major Depression" consists of two weeks or more of feeling sad/blue most of the day, loss of interest in usual activities/or pleasurable activities, feeling helpless/hopeless, problems with concentration, sleep, appetite, irritability, anxiety, suicidal thoughts and dysfunction at work or socially. Ideal participants are those afflicted by one of the first two symptoms and four of the other symptoms, plus dysfunction. They will also be medication-free so researchers can study the effect of the omega 3 fatty acids from a monotherapy perspective, as well as determine the safety, effectiveness and tolerability of DHA and EPA against each other and a placebo. Participants will receive 1 gram per day of one of the two drugs or a placebo for 8 weeks in a randomized, double-blind manner.

"We want to discern if n-3 fatty acids represent a reasonable treatment approach for some people with MDD," said. Dr. Rapaport. "Our study will be large enough to discern if EPA or DHA is effective versus placebo, and if there is a relationship between the n-3 fatty acids and changes in pro-inflammatory cytokines and n-3 ratios in red blood cell membranes."

OmegaBrite is the omega 3 supplement that will be used in this study. It comes from Omega Natural Science, Inc., Waltham, MA. OmegaBrite, as described by the company's Carol Locke, MD, president and founder, is a "super high 90% concentrate of pure omega 3…the first high EPA omega 3 with 70% pure EPA and creating the first pharmaceutical grade omega 3 supplement."

"The reported side effects of omega 3 treatments have been mild and include upset stomach and a fishy taste in the mouth. There do not appear to be risks to the liver or adverse interactions with most other medications," reported Dr. Rapaport, though he added that people who have bleeding disorders or who are taking blood thinners

should not use omega 3 fatty acids. “This study is one of several investigations of alternative and complementary medicine that our department has pursued over the past decade. Expanding our psychiatry studies to include natural treatments has shown promising benefits to patients suffering from a variety of mental illnesses.”

From: News Article by **Joanna Cosgrove in** Nutraceuticals World April 2008

Cyclodextrins as antimicrobial carriers in produce

These researchers looked at if the high relative humidity of packaged fresh-cut fruits or vegetables that is associated with spoilage can be used as an advantageous way to deliver antimicrobial compounds using cyclodextrins as carriers. Cyclodextrins can function as antimicrobial delivery systems as they can release antioxidant and antimicrobial compounds (guest molecules) as the humidity levels increase in the headspace.

Hydrophobic antimicrobial guests can be complexed with cyclodextrins due to the amphiphatic nature of the host. Then, at high relative humidity, due to the water–cyclodextrin interaction, host–guest interactions are weakened; then the antimicrobial molecule is released and may protect the product against the microbial growth. The group looked at possible applications to preserve fresh-cut produce and future research in this area. (IFT Newsletter April 08)

Trans Fats Linked to Breast Cancer Risk

Trans fats, which are being phased out of food products due to anxieties over their possible role in heart disease, could also increase the risk of getting breast cancer. This is the finding of research by two groups based at INSERM (Institut National de la Santé et de la Recherche Médicale) and the Institut Gustave Roussy in France.

Véronique Chajès and her colleagues assessed the association between serum phospholipid fatty acids as biomarkers of fatty acid intake and breast cancer risk among women in the E3N Study (1989-2002). This is the French component of the European Prospective Investigation into Cancer and Nutrition. The cohort involved 19,934 women who had completed dietary questionnaires and provided blood samples between 1995 and 1998. Controls were randomly matched to cases by age, menopausal and fasting status at blood collection, date, and collection centre. During 7 years of follow up, 363 cases of breast cancer were identified.

Results showed that an increased risk of breast cancer was associated with increasing levels of the trans-monounsaturated fatty acids, palmitoleic acid and elaidic acid. Indeed, there was a near doubling of the risk for those women with the highest serum concentrations of these trans fatty acids. Examination of other studies carried out in North America and other European countries showed some protective effect against breast cancer amongst women with higher intakes of omega-3 fatty acids. However, such a protective effect could not be measured in this French study probably, the authors suggest, because the women's consumption of fish (a source of omega-3 fats) was not high enough. The results also indicated that cis-monounsaturated fatty acids were unrelated to breast cancer risk.

The authors say that a high serum level of trans-monounsaturated fatty acids, presumably reflecting a high intake of industrially processed foods, is probably one factor contributing to increased risk of invasive breast cancer in women. Trans fatty acids are likely to be found in processed foods including bread, pastries, pizzas, cakes, chips, etc.

From: http://www.soyatech.com/news_story.php?id=7888

Improved flavonoid extraction methods

While determining the best method to recover flavonoids from spinach, a group of researchers from the Univ. of Arkansas learned new information about the plant extractives. For example, ethanol and water (70/30%) extracted more of the flavonoids effectively, using a higher temperature band, than plain water. Pressurized liquid extraction was used, and the researchers found that the large molecular weight fractions browned more quickly as the temperatures of processing increased.

Because spinach is an easily-grown, deep green leafy vegetable that contains plentiful phenolic compounds, more effective extraction methods could add their biological activities, such as anti-inflammatory, antiproliferative, anticarcinogenic, and antimutagenic properties to food products. The normal method of extracting polyphenols uses large amounts of hydro-organic solvents (methanol, ethanol, and acetone), which are, at the least, expensive and environmentally unfriendly. Pressurized fluid extraction (PLE) offers an alternative method that combines elevated temperature and pressures with liquid solvents. The final color and oxygen radical-absorbing capacity were found to be as good as those in products extracted using more expensive methods. (IFT Newsletter April 08)

Vitamin K2, Found in Natto, Linked to Lower Prostate Cancer Risk: European Study

An increased intake of vitamin K2 may reduce the risk of prostate cancer by 35 per cent, suggest results from the European Prospective Investigation into Cancer and Nutrition (EPIC). The findings, based on dietary intake from 11,319 men taking part in the EPIC Heidelberg cohort, are published in this month's issue of the American Journal of Clinical Nutrition.

The study, by Katharina Nimptsch, Sabine Rohrmann and Jakob Linseisen, adds to a growing body of science supporting the potential health benefits of vitamin K2, most notable for bone and blood health. In this recent study, dietary intake of vitamin K2 was linked to an inverse association with prostate cancer, while vitamin K1 intake did not offer any prostate benefits, report the researchers from the German Cancer Research Centre in Heidelberg.

Dr. Anne Bjornebye Vik, Vice President R&D for NattoPharma, says: " The potential anti-tumor effect of vitamin K2, in this case specifically prostate cancer, adds to the great potential for NattoPharma's natural vitamin K2, MenaQ7(TM), one of the more documented derivatives in the group of vitamin K2's or the so called long-chain menaquinones. As this interesting field of nutrition and cancer now also include vitamin K2, we are excited that NattoPharma's natural menaquione-7, branded as MenaQ7(TM), shows to be the optimal form of vitamin K2."

The study has also been welcomed by leading vitamin K researcher Cees Vermeer, PhD, from the VitaK and Cardiovascular Research Institute CARIM at the University of Maastricht. Commenting on the research, Dr. Vermeer says: "the beneficial effect of the long-chain menaquinones has previously been reported for cardiovascular disease; this specific form of vitamin K2 is characterized by preferential transport (via LDL) to extra-hepatic tissues (such as prostate and arterial vessel wall), and by very long half-life times (three days versus 1.5 hours) as compared to vitamin K1 and the short-chain menaquinone-4.

"I am highly pleased by this paper, which underpins the (widely underestimated) importance of long chain menaquinones for disease prevention," Dr. Vermeer says. "It also supports my opinion that intake of vitamin K2 supplements may have a significant contribution to public health."

Study details

Nimptsch, Rohrmann and Linseisen from the Division of Cancer Epidemiology at the German Cancer Research Centre state that epidemiologic studies of dietary vitamin K intakes have not been conducted in relation to prostate cancer risk. According to the European School of Oncology, over half a million new cases of prostate cancer are diagnosed every year worldwide, and the cancer is the direct cause of over 200,000 deaths. More worryingly, the incidence of the disease is increasing with a rise of 1.7 per cent over 15 years.

A food frequency questionnaire was used to assess habitual dietary intakes at the start of the study, with vitamin K intakes divided into phylloquinone (vitamin K1) and menaquinones (vitamin K2) and total and advanced prostate cancer in the Heidelberg cohort of the European Prospective Investigation into Cancer and Nutrition. The researchers documented 268 incident cases of prostate cancer during the 8.6 years of follow-up. Of these, 113 cases were classified as advanced prostate cancer. While no reduction in the risk of prostate cancer was observed for vitamin K1 (phylloquinone), an increased intake of all menaquinones (vitamin K2) was associated with a 35 per cent reduction in risk. However, the researchers stated that this association was "non-significant".

Furthermore, a strong association was documented when they considered only advanced prostate cancer, with increased intake of menaquinones linked to a 63 per cent reduction in risk. While dietary sources of menaquinones include meat and fermented food products like cheese, and natto, Nimptsch and co-workers report that menaquinones from dairy had a stronger inverse

association with advanced prostate cancer than did menaquinones from meat.

"Our results suggest an inverse association between the intake of menaquinones, but not that of phylloquinone, and prostate cancer," concluded the researchers. "Further studies of dietary vitamin K and prostate cancer are warranted."

Source: American Journal of Clinical Nutrition April 2008, Volume 87, Number 4, Pages 985-992 "Dietary intake of vitamin K and risk of prostate cancer in the Heidelberg cohort of the European Prospective Investigation into Cancer and Nutrition (EPIC-Heidelberg)" Authors: K. Nimptsch, S. Rohrmann, J. Linseisen NattoPharma, Norway offers a natural vitamin K2 under the trade name MenaQ7.
From: http://www.soyatech.com/news_story.php?id=7825

Oligofructose effect low-fat probiotic ice cream

A group in Turkey studied the effects of supplementation of oligofructose or inulin on the rheological characteristics and survival of Lactobacillus acidophilus and Bifidobacterium animalis in low-fat ice cream.

Addition of oligofructose or inulin to ice cream mix significantly increased apparent viscosity and overrun and developed the melting properties in ice cream during storage. Some textural properties have also improved especially by the end of storage. Freezing process caused a significant decrease in the viability of Lactobacillus acidophilus La-5 and Bifidobacterium animalis Bb-12. Oligofructose significantly improved the viability of L. acidophilus La-5 and B. animalis Bb-12 in ice cream mix. Although the viable numbers for both bacteria decreased throughout the storage, the minimum level of 106 CFU/g was maintained for B. animalis Bb-12 in only ice cream with oligofructose during storage. (IFT Newsletter April 08)

Canola Extract May Help Prevent, Treat Melanoma: New Study Shows

A new study presented at the Experimental Biology Annual Meeting shows that a proprietary blend extracted from canola, Dermytol(TM), produces a pronounced reduction of malignant melanoma cell growth. Dermytol(TM), a proprietary compound developed by KGK Synergize Inc., a biotechnology company in Ontario Canada, is designed to protect skin cells from damage that may lead to skin cancer.

Mal Evans, DVM, MSc, PhD, KGK Synergize Inc.'s Scientific Director, said, "Skin cancer rates have been rising, and we are likely to see that continue as the population ages. The National Cancer Institute (NCI) estimates that more than 62,000 Americans will be diagnosed with melanoma and one million Americans will be diagnosed with non-melanoma skin cancer this year. NCI expects more than 8,000 deaths from melanoma and less than 1,000 deaths from non-melanoma cancers this year.

"Dermytol(TM) has the potential to be used in anti-aging and sun-protection products to reduce damage to skin. Results of preclinical trials in animals have been promising leading to human trials now running in both Canada and the United States.

In the most recent study, male mice were fed either a Dermytol(TM)-canola oil mixture or just canola oil. In a separate part of the study, researchers applied either a Dermytol(TM) cream or a placebo cream onto the shaved skin of a different group of mice. After seven days of treatment, all of the mice were injected with malignant melanoma tumor cells. Dermytol(TM) or placebo treatments continued for 25 days.

The mice in both Dermytol(TM) groups benefited from their treatments. Compared to the controls, the orally treated mice showed an average decrease in tumor size by about 45 percent. The mice receiving the topical treatment benefited even more with a 61 percent decrease in tumor volume.

In this study and previous preclinical studies, Dermytol(TM) produced no adverse effects. In a laboratory cell culture study, Dermytol(TM) inhibited the proliferation of human cancer cells. In another study, dietary supplementation with Dermytol(TM) moderately delayed the onset of skin tumors and significantly reduced tumor growth rate in mice treated to induce non-melanoma skin cancers.

A trial involving 45 subjects with actinic keratoses -- precancerous skin lesions -- is underway. "The current treatment for actinic

keratoses is removal by freezing which can be painful or the application of a cream that causes inflammation and blistering of the skin," said Evans. "We expect Dermytol(TM) to be a welcome option."
From: Soyatech eNews April 7, 2008

In The News

Survey Shows Most U.S. Parents Unaware of DHA Benefits

A recent Children's Nutrition Survey indicates that a majority of U.S. parents aren't aware of the critical benefits DHA offers in the development of their children.

The survey was conducted online within the U.S. by Harris Interactive, Rochester, NY, on behalf of Stremicks Heritage Foods, Santa Ana, CA, between March 20-25, 2008 among 1244 U.S. adults ages 18+ who are parents or legal guardians of children under the age of 18.

Research reveals that 68% of U.S. parents are not sure what omega 3 DHA (docosahexaenoic acid) does, and 59% of parents are not aware of the benefits of DHA to their child's health.

Though nearly three in four (72%) survey respondents said that they make a conscious effort to include certain vitamins and nutrients such as vitamin C (55%) and calcium (53%) in their child's daily diet, only 7% are consciously including omega 3 DHA. While about one in five are aware of the importance of DHA before (19%) and during pregnancy (22%), less than one in five recognize the importance of this nutrient to a newborn (18%) or infant (18%). Even fewer know that DHA is especially important to the health of toddlers (16%) and preschool-aged children (14%).

DHA is an omega 3 fatty acid found throughout the body, with significant amounts found in the heart, retinas and brain, where it accounts for up to 20% of total brain mass. DHA is important for brain and eye development and function throughout the lifecycle, but is particularly important between birth and five years of age, when the brain increases approximately three-and-a-half times in mass, and DHA content increases from 1 gram to approximately 4.5 grams. DHA also is the primary structural fat in both the brain and retina, and ensures that cells in the brain, retina, heart and other parts of the nervous system develop and function properly.

While FDA does not have a regulation establishing a recommended daily intake for DHA, the agency has not objected to the use of 160 mg as a daily value for DHA for children older than four years and adults. Many leading health authorities and pediatricians recommend 150 mg/day for children. The average U.S. child, ages from one to five years old, is shown to have DHA intakes ranging from only 20 to 30 mg/day.

From: Nutraceuticals World April 2008

Will Current Food Crisis Reduce Opposition to Genetically Modified Food Crops?

High food prices and global grain shortages may force governments from China to Britain to rethink opposition to genetically modified crops, analysts say. Asian manufacturers are buying genetically modified corn for food stuffs, U.S. wheat growers look to biotechnology to boost yields and European agricultural leaders view engineered crops as a way to alleviate the strain on the worldwide agriculture market, The New York Times reported Monday.

Genetically modified crops that are disease resistant or drought tolerant could provide an alternative to alleviate the global stress.

"I think it's pretty clear that price and supply concerns have people thinking a little bit differently today," Steve Mercer with the U.S. Wheat Associates told the Times. The re-evaluation comes as riots were reported in bread lines in Egypt and other regions, European livestock face critical feed shortages and biofuels strain the market.

Some global leaders aren't convinced genetics provide the answer, Hans Herren, co-chairman of an agriculture forum at the

World Bank, told the Times. "What farmers really are struggling with are water issues, soil fertility issues and market access for their products," he said.

From: http://www.soyatech.com/news_story.php?id=7958

Review Supports Safety of Moderate Caffeine Intake

As noted recently by the International Food Information Council (IFIC), Washington, D.C., a recent report from the group provides a comprehensive update of the research on caffeine and health. The report notes that while the average person consumes 120 mg of caffeine per day, moderate intake of up to 300 mg per day does not have adverse effects on health. However, the report notes that people with some heath conditions, like hypertension, and the elderly might be more prone to negative effects from caffeine. The report also highlights some of the health benefits connected to caffeine intake.

“Caffeine and Health: Clarifying the Controversies,” clarifies some common misperceptions about caffeine pertaining to dehydration, osteoporosis, miscarriage, heart disease and heartburn, showing that moderate amounts of caffeine do not cause these conditions. The review also highlights caffeine’s potential to reduce risks of certain types of cancer, atrial fibrillation, type 2 diabetes, Parkinson’s disease, cirrhosis of the liver and chronic liver disease. “The purpose of this review was to answer as many questions about caffeine and health as possible in a single document,” said Lindsey Monroe, director of food ingredient communications, IFIC. “We hope the review is helpful to health professionals, journalists and anyone who is charged with communicating the latest research on this popular and sometimes controversial food ingredient.”
From: Food Product Design April 23, 2008

Vitamin E May Help Alzheimer's Patients Live Longer

People with Alzheimer's disease who take vitamin E appear to live longer than those who don't take vitamin E, according to research that will be presented at the American Academy of Neurology 60th Anniversary Annual Meeting in Chicago, April 12–19, 2008.

For the study, researchers followed 847 people with Alzheimer's disease for an average of five years. About two-thirds of the group took 1,000 international units of vitamin E twice a day along with an Alzheimer’s drug (a cholinesterase inhibitor). Less than 10 percent of the group took vitamin E alone and approximately 15 percent did not take vitamin E. The study found people who took vitamin E, with or without a cholinesterase inhibitor, were 26 percent less likely to die than people who didn't take vitamin E.

"Vitamin E has previously been shown to delay the progression of moderately severe Alzheimer’s disease. Now, we've been able to show that vitamin E appears to increase the survival time of Alzheimer's patients as well," said study author Valory Pavlik, PhD, with Baylor College of Medicine’s Alzheimer’s Disease and Memory Disorders Center in Houston, TX, and member of the American Academy of Neurology. “This is particularly important because recent studies in heart disease patients have questioned whether vitamin E is beneficial for survival.”

In addition, the study found vitamin E plus a cholinesterase inhibitor may be more beneficial than taking either agent alone. "Our findings show that people who took a cholinesterase inhibitor without vitamin E did not have a survival benefit,” said Pavlik. “More research needs to be done to determine why this may be the case.”

In addition to vitamin E supplements, some vegetables oils, nuts, and green leafy vegetables are main food sources of vitamin E. Some fortified cereals in the United States also contain vitamin E. “The daily amount of vitamin E taken by patients in this study was much higher than what is currently recommended for the general population,” said Pavlik.

From: Soyatech eNews April 18, 2008