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Protein Foods and Nutrition Development Association of India

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Editorial

There is a lot of talk about junk foods going around. We specialise in aping the west. First we started consuming western style foods which not only include staples like cereals, bread and cakes, juices, steaks, baked vegetables and shakes but also the hamburgers, pizza, sandwiches and aerated soft drinks. Now because the activists in the west are castigating certain foods by calling them junk foods, we must go further and regulate them. It is really sad that we do not have our own mind and make regulations suitable for our foods.

Certain foods like soft drinks, fries, fried meat patties, pasta products have been referred to as junk foods and are supposed to cause the obesity problems in children. We only talk about foods and not any other factors that might contribute to the problem of overweight and obesity.

Schools used to have a big playground and most of the times they used to play physical games or do physical training (PT) but now most schools have reduced the area as well as amount of time students spend playing.

Earlier once the school was out, students used to spend a lot of time outdoors playing but now they have to do a lot of homework, attend tuitions or extra classes, and if there is any time left watch TV and play video games.

Even going to school, students would mostly walk or commute, but now they are dropped by cars, picked from their homes and dropped at school by school bus or they will go by autorikshaws. In short physical activity has drastically reduced.

Our diet patterns certainly have changed. Take for example the regular meals. Instead of having many vegetables and greens, we have potatoes as kids do not like greens. Pulses are also reduced and instead of parboiled rice we have polished rice and most households do not use millets and use breads instead of chapattis or rotis.

Yes, if one eats only hamburgers and soft drinks and nothing else there might be health problems but eating these foods should not be demonised as most children may not consume them regularly although certain do. There is no food which is bad or junk as there are different foods that make up our diet. It is the diet that should be evaluated rather than individual foods.

Even in our traditional thali, there used to be foods which would be high in sugar, high in salt and high in fat but if overall thali is considered it would be highly nutritious. Sugar, salt and fat are nutrients as any food and nutrition book will tell. The important thing is each ingredient has a limit beyond which it gives adverse effects. Same is true of even vitamins and minerals most of which may cause undesirable effects if taken in excess.

The government has started a new activity of regulating junk foods. As with any other problem, the easiest solution is banning them either in certain localities or as in certain cities in the west, in entire cities or put a tax on it. This does not solve the problem but it encourages the grey market and corruption increases. The solution is creating awareness about good nutrition and its effect on health. We should concentrate on such activities and have special emphasis in schools and on parents of children. Most of the time parents are partly or mostly responsible for what children eat. It is better to educate them.

There are also ways industry has been responding as many foods are now being fortified and enriched with nutrients and healthy ingredients. While giving the advantages of these, they also create awareness. People know more about cholesterol through advertisement than anything else. Both industry and government should act together and take up the awareness campaign for better health for children and adults.

With season's greetings,

Prof. Jagadish S. Pai.
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Hot World of Frozen Foods

Prof. Jagadish Pai

One of the best known frozen foods is ice cream. Right from childhood people get hooked on ice cream. Although ice cream is a standardised product, but many similar products like ice candy, ice lolly or popsicle, kulfi, frozen yoghurt, gelato, sorbet etc. come into the group of products which are very popular with not just children but everyone.

Ice creams are the most popular among frozen foods and account for about half of the total frozen food market. Ice cream global markets are expected to reach about 68 billion dollars whereas the total frozen food market is expected to reach about 136 billion dollars in 2015.

Most frozen foods are produced by organised sector and they include meat, fish, poultry, fruits and vegetables which are frozen after harvest and with some processing carried out like trimming, cleaning, blanching etc. In such forms these may be transported to avoid any loss of quality during transport. Other processing companies and also consumers may then buy them and prepare final food for consumption.

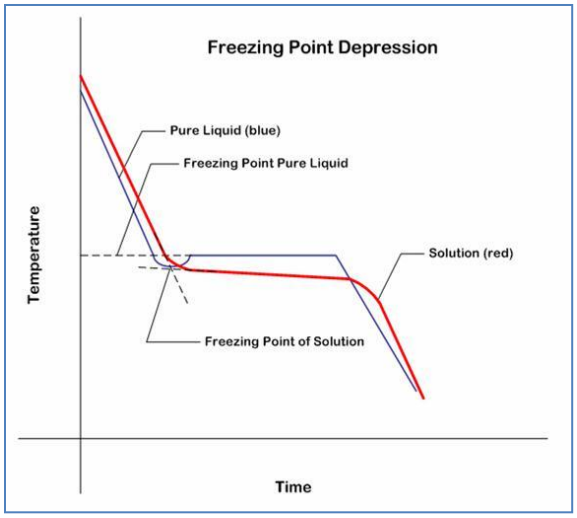
A large number of ready-to-cook and ready-to-eat products are now prepared by processing companies which are in frozen forms. Some of the frozen ready meals may just require heating in the oven or boiling water so it is ready for consumption. Many restaurants including fast food chains receive their raw materials in the form of frozen foods and then are prepared in a short time for customers to have burgers, pizza or other fast food items.

Indian markets are quite flooded with ice creams but other frozen foods are not yet that visible. Domestic consumer market is growing and also many fast food chains are giving a boost to this industry. Ice cream industry is around 300 million Rupees of which organised sector is almost two thirds and growing rapidly. However, large quantities of animal products, fish and seafood in the frozen form is being exported. Indian fish and seafood exports have already crossed 3.5 billion dollars with bulk being frozen shrimp in 2011 as per MPEDA. According to APEDA, export of animal products has been around 3.3 billion dollars and a large portion is due to buffalo meat, bulk of which is exported frozen.

Even a large number of frozen ready to cook and eat foods are entering the consumer market which is spurring this industry's growth. Cold chain has been one of the neglected sectors for a long time but it is improving rapidly so future is very bright for this industry.

Advantages of Freezing Foods

People prefer fresh foods. They feel that these are unprocessed, without any additives, without loss of nutrients and quality and so must be healthy. Freezing not only does not add any preservatives, the processing is very limited and most often preserves the nutrients and quality of foods almost as good as garden fresh. When one considers the foods to metro cities come from faraway places, must be often transported and stored under unfriendly conditions so by the time they reach the consumers after several days, their nutrients and quality are substantially reduced. Commonly frozen foods are prepared from raw materials harvested at peak of their quality, processed by lowering the temperature which slows or stops any microbial spoilage and loss of nutritive and sensory quality.



When foods are properly harvested, frozen using the best of freezing processes and stored under ideal conditions, they might at times show better quality than most fresh commodities in urban markets, although they will not be better than garden fresh produce which is harvested and consumed within a short time.

The advantages are seen more when one starts thinking about frozen mango pulp. Since mango season is short and people may want to have ice cream or juice, freezing comes very handy to have high quality frozen pulp. Even many vegetables and some fruits could be frozen and be made available at places and in seasons when they are not available.

Frozen desserts are quite popular so besides preservation, preparation of specialty foods is another advantage. Here not only desserts but even some prepared and partially prepared foods could be sold in frozen form. Partially fried French fries are available in frozen form which could be fried at home avoiding a lot of drudgery in preparation. There are fermented doughs that could be frozen so one has to simply bake it in the oven to get the freshly baked goods.

There are meals which are completely prepared and all that is needed is heating in the oven to make it ready to eat. This not only avoids drudgery of preparation but also the person does not need any skills of preparation to have a hot meal. Thus there are many advantages of frozen foods.

Freezing Process

Lowering the temperature of food slows down the deteriorative processes. Spoilage microbes grow slower at low temperature and almost stop growing when freezing temperatures are used. Even the chemical and enzymatic reactions are very slow when freezing temperatures are used. It was known even before the discovery of microbes that very low temperatures slow food spoilage and the foods last longer. Commercial freezing started in late 1800s with meat, fish and butter being preserved by freezing and handled as bulk commodities.

Fruit preservation began in early 1900s when small fruits and berries were frozen stored to be used in jams, jellies, ice cream, pies and other bakery products during out of season. Commercial freezing of vegetables followed around 1930 with the development of quick freezing process and equipment. Also around this time consumer-size packages became available helping these products to be accepted by people. Freezing not only bridged the seasons for fruits and vegetables and other produce, it reduced the variation in supply and demand of raw materials like meat, fish, butter, fruits and vegetables as well as made it possible to transport raw material over large distances without much deterioration of quality.

Food freezing is different and more complex from pure water because of the presence of both free and bound water. Bound water does not freeze even at very low temperatures. During freezing process, concentration of solids increases in unfrozen water, resulting in a further lowering of freezing point. Temperature at which first ice crystals appear is initial freezing temperature.

Food freezing method varies and will affect the quality of frozen food. Overall freezing process of food consists of three stages. In prefreezing stage, temperature of food drops till the initial crystals form. Second stage is freezing period where ice formation continues with slight lowering of temperature. In the final stage temperature keeps falling with no further formation of ice crystals.

Rate of Freezing

Freezing time and rate of freezing are important in designing freezing systems and equipment. Quality of frozen foods is affected by the rate of freezing. The rate will also affect the time of freezing which has commercial significance. Since some chemical and biochemical changes keep taking place in foods causing loss of quality and nutrients, faster freezing is beneficial as it will stop or slow down any further deterioration.

Freezing rate will depend on several factors including initial and final temperatures of product and the amount of heat removed as well as dimensions and shape of product, heat transfer process and temperature of cooling medium.

In order to expedite the freezing process, product can be brought to lower temperature elsewhere before putting inside the freezer so the initial product temperature is not very high. When product is getting cooler the cold air or fluid medium used gets warmer. The temperature of this medium is also very important so the difference between product and medium temperatures will drive the cooling process.

As product loses heat to medium, its temperature lowers depending on its specific heat or the heat needed to be removed per gram to lower its temperature by 1^0C which differs from product to product. So product with higher specific heat would need more heat removed to cool.

Besides the temperature, there are other ways in which cooling medium can affect freezing rate. If instead of still air, a cold air current is forced on product cooling is faster. Also cold water removes heat faster than air but it has limitation that it cannot be below zero unless salt is added. Metal plates are excellent conductors of heat and are used in plate freezers for faster freezing. Liquid nitrogen is used for cryogenic freezing for very high rates of freezing.

When food is frozen, ice may be formed from free water. The rate of freezing will determine the size of ice crystals and the smallest size is seen with cryogenic freezing. When size is large they may damage the cells of tissue. If cells contain large amount of water there may be damage to the texture e.g. in fruits and vegetables which will be seen when they are thawed when good amount of water will leach out. This problem also is seen when storage temperature is not properly regulated.

Freezing of Fruits and Vegetables

Fruits are difficult to freeze as they have plenty of moisture and when that turns to ice, texture is most affected. When thawed fruits are soft and mushy and lose a lot of juice. Hence only small fruits are frozen and also commonly fruits are packed in sugar or syrup to bind moisture and minimise ice formation.

Fruits have delicate flavor so heat treatment to destroy enzymes may also cause damage to flavour. Hence mostly additives are used to control enzyme that might cause discolouration. Stronger flavoured fruits like banana and mango can withstand blanching. Sugar added to control ice crystals also protects colour and flavour. Most berries

are sugar packed. Pineapple chunks are frozen with or without syrup. Ascorbic acid may also help reduce discolouration in many fruits.

Many fruits are frozen in pulp form. Banana, mango, guava, pineapple, papaya, passion fruit, orange and various berries are available in frozen pulp form. Since texture is not a problem it is easy to freeze these without sugar.

Vegetables are more common that fruits and a variety of vegetables like peas, corn kernels, okra, potato, carrots, beans, spinach, capsicum, cauliflower etc. are frozen for consumer market. Fruits are blanched in hot water after trimming to inactivate enzymes which would otherwise cause loss of flavour, colour, texture and nutrients. Since most vegetables are consumed after cooking blanching is quite acceptable.

Since vegetables have less moisture compared to fruits, the damage to texture by freezing is much less although faster freezing certainly improves the appearance and texture. Vegetables have been frozen using IQF and plate freezing techniques very successfully.

Frozen Animal Products

Beef, veal, lamb and pork are frozen. Cured meat such as ham and bacon can be kept frozen for a shorter time because of salt in them that hastens rancidity. Fresh meat needs to be chilled quickly before freezing to prevent souring and spoiling. Cuts before freezing may depend on whether for consumer pack or for further processing at different place. Freezing may be done in freezer room but IQF and tunnel freezer is sometimes employed. Thawing is done slowly to prevent loss of quality and nutrients. Poultry products are also frozen commercially.

Fish is frozen often to prevent spoilage after catching at sea. Larger trawlers now have a factory on board which catches fish, cleans and even debones before freezing it. Smaller ones ice them and then on reaching shore they are processed. It is very essential to stop any enzymatic and microbial spoilage after catching.

Large fish is cut into fillet or steak while many smaller fish are packed whole. They may be packed and frozen individually or may be packed in bunch like sardines and frozen. Sometimes they may be glazed for improved quality. Mackerel, trout, tuna, salmon, sardines, cod etc. are commercially frozen. Quite a large number of seafood including shrimp, lobster, scallop, crab and clams are frozen for export and consumer market.

Frozen Dairy Products

Although a small amounts of other dairy products are frozen but the largest single frozen product is ice cream, a dessert made with dairy products like milk, cream, sugar and often with fruits, nuts, or other flavours and ingredients. The mixture is stirred while cooling, incorporating air and avoiding formation of large ice crystals making it smooth textured.

Different varieties emerged like frozen dessert, frozen yogurt, sorbet, gelato and others which have also become quite popular. Even form in which it is sold makes for difference like in a cup, a cone, with soda, with fruit, with cake or other sweet and others.

Nutrition awareness is making further changes in composition. Instead of saturated dairy fats vegetable fats are used to make frozen desserts. Lower calorie product is prepared using lesser fat or low calorie sweeteners. Probiotics are added to make it healthier.

Changes in Frozen Foods

Since freezing involves water changing to ice which has larger volume, there are changes due to this. Cell walls rupture and liquid inside oozes out and mixes with other substances previously separated by cell walls. Texture is noticeably affected due to this. Even enzymes mix with their substrates causing changes in colour and flavour. All these changes are very slow at the temperature of frozen food which is typically -18^0C or lower but still not completely stopped.

The effect on texture is less if moisture in foods is less. If the moisture is bound by adding sugar or other water binding agents then these effects can be minimised. The damage to texture is also less if the crystal size is very small. Cryogenic freezing achieves extremely tiny crystals.

Most frozen food products can last for at least a year to 18 months if properly processed, packed and stored under recommended conditions.

Recent Developments

Freezing was originally used for the preservation of staples like fruits, vegetables, meat and fish. However, as the food industry realised the advantages of freezing, many convenience foods were prepared or partially prepared and frozen. Consumers could take them home and finish cook them in oven and they would be ready and hot for eating some speciality foods which are difficult or cumbersome to prepare. They also take out a lot of drudgery out of preparation and one does not have to be a good chef to prepare them. Even the prepared meals are now available in frozen form.

In India some of the ethnic delicacies are also now prepared including various types of parathas, samosas, cutlets, and vadas as well as the western foods like pizza, burger patties, French fries, onion rings and many others. The restaurant chains depend on central processing units preparing many of their foods just short of final finish frying or cooking and freezing them. Development of cold chains has helped them send these over hundreds of kilometres in frozen form to the restaurants where as per the customer demands the operators would finish them and serve them fresh and hot. This saves them a lot of time so service could be extremely fast.

Frozen foods are growing fast in numbers and quantities and better processing would also attempt to make these foods more nutritious trying to reduce the losses during processing and storing. Newer equipment design also helps this improvement in quality. Since freezing does not serve to remove the pathogens, some of the preliminary steps like trimming, grading, peeling and washing along with blanching along with high quality raw materials will have to be depended on for safety as no heat treatment or chemicals are used to control pathogens.

Scientific Panels and Committee: Role Distortion

By Dr. Joseph I. Lewis, Chairman, Regulatory Affairs Committee, PFNDAI

FSSA 2006 constituted several Scientific Panels and Committee to deliver the best scientific advice to the Food Authority in areas of food safety and public health. The Scientific Panels are responsible for risk assessment work including delivering scientific opinions. Each Panel focuses on a different area of food safety. The Scientific Committee has the task of supporting the work of the Panels on cross-cutting issues and scientific matters of a horizontal nature. It focuses on developing harmonised risk assessment methodologies. The Scientific Committee and the Panels comprise independent scientific experts selected only for their scientific excellence, including experience in risk assessment. Why then are they doing risk management when this function is not assigned to them under the Act?

Parliament in its wisdom thought it fit that Indian food regulations should be science based. It required the framing of rules be made following procedures of risk analysis. Additionally to remove any leeway for ambiguous interpretation it established in clear terms; the role, function and tasks and outputs of the various bodies constituted under the Act. Other international regulatory agencies follow a similar framework while making rules. Considering 4 years have passed since the implementation of the Act it is time to audit compliance lest wrongful practice becomes the 'regularized' one.

Correcting the Past

Historically Indian regulatory agencies and their internal departments engaged exclusively in making rules and standards irrespective of their intended roles**.** They assumed this role since specific assignments were not stated – for example under PFA**.** This role assumption is premised the belief of control unbounded by function or expertise.Accordingly the entire process was premeditated by issuance of a draft regulation prior to evaluating the evidence. Evidence or science was considered an annoying impediment to a predetermined decision. "I have made up my mind – don't confuse me with facts" seemed to be the policy.

There is a mindset about power that apparently steers behaviour; well illustrated by an American philosopher Abraham Kaplan: "I call it the law of the instrument and it may be formulated as follows: Give a small boy a hammer and he will find that everything he encounters needs pounding". A similar variation attributed to Maslow's is **"**if all you have is a hammer, everything looks like a nail.

The Act seeks to replace these ambiguous and capricious procedures authored by undefined roles with constituted bodies performing a specific functions and none other. It fundamentally shifts the regulatory process to a new platform – science based, open and transparent. However the moot question is – is this happening?

Risk Assessment and Risk Management

The first principle of rulemaking that the Act has done is to functionally separate risk assessment (is it a nail?) from risk management (needs a hammer?); two distinct disciplines. The purpose is obvious – to remove bias or influence while scientific evidence is being evaluated – this follows the principle that risk assessment should be done in an open transparent and objective manner. Secondly it required separately constituted bodies to perform these roles based on functional expertise. It recognises that not everyone can do risk assessment (needs vertical specialization) as also not everyone can do risk management (horizontal expertise). To mix the two results in either ill considered science or unreasoned regulations.

Fig 1: SCIENTIFIC PANELS

(*a*) food additives, flavourings, processing aids and materials in contact with food;

(*b*) pesticides and antibiotics residues;

(*c*) genetically modified organisms and foods;

(*d*) functional foods, nutraceuticals, dietetic products and other similar products;

(*e*) biological hazards;

(*f*) contaminants in the food chain;

(*g*) labelling ; and

(*h*) method of sampling and analysis.

The eight Scientific Panels (Fig 1) and Committee are tasked by mandate to perform risk assessments only. Section 14 of the Act clearly defines this role (Fig 2). The Authority in 2010 formally reiterated this functional separation in an important publication[1, 2] which notes "*Essentially the task of the Scientific Panels and Committee is that of risk assessment according to well laid out scientific procedures. Risk management and communication are basically the function of the Food Authority.*"

Functional separation of roles in not an exceptional feature of the Act – it is benchmark of regulatory excellence practiced by most international regulatory agencies to name a few; Codex, European Union, Australia New Zealand and the US. The Act in fact has borrowed these best practices to govern the manner in which regulations are made in the country.

The Scientific Committee (SC):

Secondly another anomaly in implementing the intent of the Act is the role of the Scientific Committee. Current practice suggests that the Scientific Panel outputs require the Scientific Committee's authentication, demur or supervision. Under Section 14 two functional roles are specified for the Scientific Committee:

- One is a horizontal role where the SC it is required to coordinate between Panels and ensure consistency of the scientific opinions procedures of the Panels. The Committee performs this horizontal function by the simple inclusion of all Panel Chairpersons – to get their inputs regarding consistency of process and cooperation in execution their roles. The role is administrative governance in terms of harmonizing procedures of all Panels.
- Besides this horizontal competence, the Scientific Committee is also entrusted with a purely scientific activity (vertical role): the provision of scientific opinions on (i) multi-sectorial issues falling within the competence of more than one panel and (ii) those issues which do not fall within the scope of the subject matter of any of the Panels, the Scientific Committee must set up a working group.

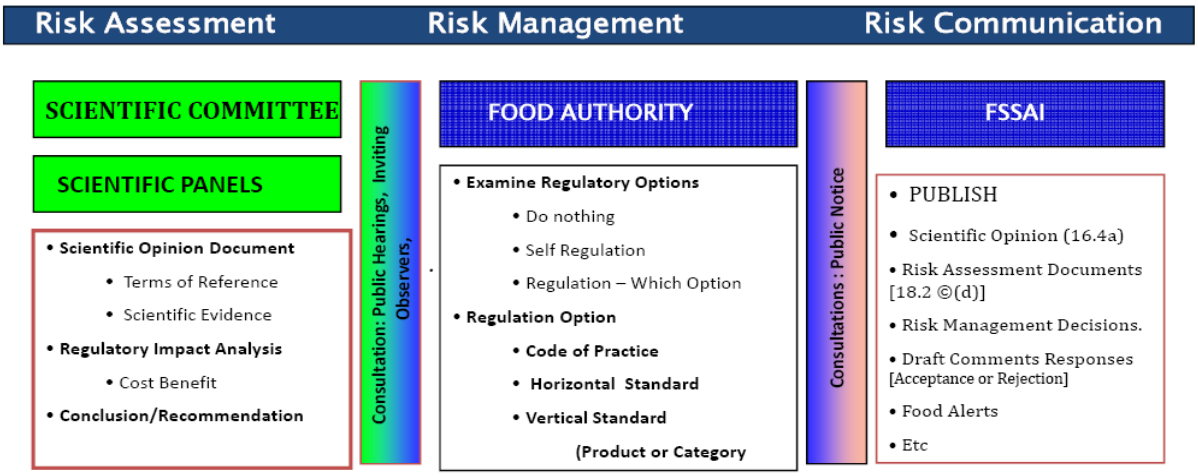
Nowhere in the language of the Act has a hierarchical role been conceived or proposed for the Scientific Committee over the Panels. The permit and practice of reviewing Panel deliberations (minutes, recommendations) by the Scientific Committee appears to be a presumption. If the Scientific Committee is adding significant scientific value to what the Scientific Panels turn out then the latter are incompetent for their role. The root of this misguided practice emanates perhaps from the erstwhile practice under PFA where the Central Committee of Food Standards (CCFS) was positioned as overlord of the several Sub Committees. Often such hierarchical structures delay forward movement with little or no value addition.

Eliciting a Scientific Opinion

The role of the every Scientific Panel and Committee is to deliver a Scientific Opinion on the query posed or the terms of reference provided by the Authority or any other source. Both Sections 14 and 15 of the Act elaborate on the delivery of Scientific Opinions in terms of consistency, working procedures, their harmonization and the manner in which tasks and requests for scientific opinion are assigned to the Scientific Committee and Scientific Panel.

The Authority once again has specified how the scientific opinion is to be delivered in documents published (Fig 3 & 4) – these have to be followed. The safety assessments under the controversial Product Approval process are a case in point – inconsistent with the Act as well as international practice.

FIG 2:FOOD SAFETY & STANDARDS AUTHORITY OF INDIA



These Panels and Committees are also being used routinely and unwisely. Not every matter requires to be sent to the Scientific Panels or Committee – the Authority is required to assess what the issue is and only refer those that require as scientific opinion with a specific term of reference.

CODEX STAN 192 - 1995

TABLE THREE

Additives Permitted for Use in Food in General, Unless Otherwise Specified, in Accordance with GMP

INS No	Additive	Functional Class	Year Adopted
260	Acetic acid, glacial	Acidity regulator, Preservative	1999
472a	Acetic and fatty acid esters of glycerol	Emulsifier, Sequestrant, Stabilizer	1999
1422	Acetylated distarch adipate	Emulsifier, Stabilizer, Thickener	1999
1414	Acetylated distarch phosphate	Emulsifier, Stabilizer, Thickener	1999
1451	Acetylated oxidized starch	Emulsifier, Stabilizer, Thickener	2005
1401	Acid treated starch	Emulsifier, Stabilizer, Thickener	1999

Let us take an example of how this works. The Codex General Standards on Food Additives (GSFA) provides a list of 178 food additives of very low risk (ADI not specified) which may be generally added to foods (an exception list appended) in accordance with good manufacturing practice (Fig 5 &6).

CODEX STAN 192 - 1995

ANNEX TO TABLE THREE

Food Categories or Individual Food Items Excluded from the General Conditions of Table Three

The use of additives listed in Table Three in the following foods is governed by the provisions in Tables One and Two.

Category Number	Food Category
01.1.1	Milk and buttermilk (plain) (EXCLUDING HEAT-TREATED BUTTERMILK)
01.2	Fermented and renneted milk products (plain) excluding food category 01.1.2 (dairy based drinks)[1]
01.4.1	Pasteurized cream (plain)
01.4.2	Sterilized and UHT creams, whipping or whipped creams, and reduced fat creams (plain)
01.6.3	Whey Cheese
01.6.6	Whey protein cheese
01.8.2	Dried whey and whey products, excluding whey cheese
02.1	Fats and oils essentially free from water
02.2.1	Butter
04.1.1	Fresh fruit
04.2.1	Fresh vegetables (including mushrooms and fungi, roots and tubers, pulses and legumes, and aloe vera), seaweeds, and nuts and seeds
04.2.2.1	Frozen vegetables (including mushrooms and fungi, roots and tubers, pulses and legumes, and aloe vera), seaweeds, and nuts and seeds
04.2.2.7	Fermented vegetable (including mushrooms and fungi, roots and tubers, pulses and legumes, and aloe vera), and seaweed products, excluding fermented soybean products of food categories 06.8.6, 06.8.7, 12.9.1, 12.9.2.1 and 12.9.2.3

The Authority should simply address a query (terms of reference) to the Scientific Panel on Food Additives namely:

> "*Assess if any safety issue arises from the adoption of food additives with ADI not specified to be added to foods in general in accordance with good manufacturing practice including any exceptions to foods where these may not be permitted"* and for clarity they may be referred to Table 3 of Codex GSFA.

The Scientific Panel would then have to deliver a Scientific Opinion in the specified format (see Authority Note) that either accepts or rejects the Codex Table 3 based on risk assessment. If the Scientific Panel provides an opinion that additives under Table 3 of GSFA are safe for use and submits its opinion to the Authority – the Authority would then issue a regulation regarding the same. These principles are laid down under Section 18(2) (a) & (b) where the Authority is obligated to make regulations based on risk assessment as well as international standards and practices where these exist.

While most countries worldwide have adopted this list of additives only Indian regulatory authorities insist on routine authorizations inspite of the safety assessments by Joint Expert Committee Food Additives - JECFA constituted by FAO/WHO. One wonders what the FSSAI means when it extols the virtues of harmonization with Codex. There is a yawning gap between the intent of the Act and delivery of that intent and unless this is remedied quickly it may reasonably be argued that science based regulations is going to be elusive, discreet or absent. Are stakeholders committed to governance by principles laid down in the Act?

Reading References:

1. Working Procedures of Issues to Scientific Panels and Committee: 2010
2. FSSAI's approach to Drawing up/Revision of Food Standards, 2010

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Dr. Sham Padgaonkar Passes Away

After a brief illness Dr. Sham Padgaonkar passed away in May 2013. He got his Ph. D. in the Food Technology department at the Institute of Chemical Technology, Mumbai (formerly known as UDCT) and joined industry in various technical capacity in many food and pharma companies where he developed many products. He was quite knowledgeable in nutraceuticals and health ingredients and was advising many companies develop these foods. He also wrote many articles in these subjects which were published in many prestigious magazines as well as in PFNDAI Bulletin.

He was a Governing Board member of PFNDAI for many years and worked as Hon. Treasurer for some years. He also contributed valuably as a member of Endorsement Committee, Publication Committee. He was a well known personality in many professional associations. In AFST Mumbai Chapter he was office bearer for many years and one of the most hardworking organizer of conferences and quite relied upon for his ability to collect funds and resources.

PFNDAI has lost a long-standing member and a dear well-wisher and will always miss his pleasant interactions. The Association conveys heartfelt condolences to the family for their loss. We pray to God for resting his soul in peace.

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Research in Health & Nutrition

Study finds link between blood levels of omega-3s and longevity

WebMD News from Health Day, April 1, 2013

Regularly eating fish rich in omega-3 fatty acids might lengthen your life, new research suggests.A study of more than 2,600 older adults found those with the highest blood levels of omega-3 fatty acids -- found in salmon, mackerel, herring, lake trout and albacore tuna -- lived more than two years longer on average than those with lower blood levels.

"This is not a study of fish oil supplements, it's a study of blood omega-3 levels related to diet," said researcher Dr. DariushMozaffarian, an associate professor of epidemiology at the Harvard School of Public Health in Boston.The study, published April 1 in the journal Annals of Internal Medicine, doesn't prove that eating fish will increase longevity, but it does suggest a connection."Blood levels of omega-3s are related to lower risk of death, especially cardiovascular death," Mozaffarian said.

Mozaffarian found that people with the highest levels of omega-3s reduced their overall risk of death from any cause by up to 27 percent compared to those with the lowest levels. And they had about a 35 percent lower risk of dying from heart disease. Fish contains heart-healthy protein and fatty acids, and other studies have found diets rich in fish lower the risk of heart disease death. But the effect on death from other causes has not been clear, Mozaffarian said.

Rather than relying on self-reported intake as some other researchers have, Mozaffarian's team measured actual blood levels of the fatty acids. At the study's start, the researchers analyzed blood samples, did physical exams and asked about lifestyle. None of the participants, who were 74 years old on average, took omega-3 supplements at the time.

During the 16-year follow up, 1,625 people died, including 570 from cardiovascular causes. The higher the omega-3 blood levels, the lower their risk of death during the follow-up, the study found.

Alice Lichtenstein, director and senior scientist at the Cardiovascular Nutrition Laboratory at Tufts University in Boston, emphasized that although the research noted an association, it did not establish a cause-and-effect relationship."The results of this study support a relationship between higher fish intake and lower risk of total mortality, particularly death from coronary heart disease," said Lichtenstein, who was not involved in the study.

The researchers, however, cannot determine whether the omega-3 levels were directly responsible for the reduced risk of death or simply a marker for a healthier lifestyle, she cautioned.For instance, those who had the highest levels of omega-3 also ate more vegetables and fruit than those in the lower level groups, Lichtenstein said, which suggests that simply taking a fish oil supplement may not produce the same effects.The American Heart Association recommends eating two 3.5-ounce servings of fatty fish, such as salmon, each week.

If you're currently not a fish eater, don't despair. "Going from zero to some intake seems to be where you get most of the benefit for your blood levels," Mozaffarian said.

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Nutrition, Activity Improve Students Brain Function

March 29, 2013 Food Product Design

Just 20 minutes per day of exercise improves students' brain activity, according to neurological research. A new report issued by the GENYOUth Foundation, a partnership between the National Dairy Council (NDC) and the

National Football League (NFL) highlights the effects of healthy nutrition couples with physical activity on students' learning potential.

The report, “The Wellness Impact: Enhancing Academic Success Through Healthy School Environments," collated the results of numerous studies, including brain imaging research showing the brains of aerobically fit children may exhibit superior executive-function control. In addition, school breakfast programs contribute to the quality of food children eat and highlight the correlation between diet quality and academic performance.

A recent survey cited in the report found 62% of students did not eat breakfast on all seven days before the survey, and 13% of students never ate breakfast during that time. In fact, more than half of all teens do not eat breakfast each day. Also, nearly three-fourths of high school youth are not physically active for 60 minutes even days a week. Early research on fasting and cognition found that transient hunger in well-nourished school children negatively affected their performance on given tests.

Students who eat breakfast have higher consumption of key nutrients than breakfast skippers and those who skip breakfast do not make up for those missed nutrients from other meals.

One reason for the importance of school breakfast programs, says the report is food insecurity, which affected approximately 16.6 million children in 2011, or 22.4% of the nation’s children who lived in food insecure homes.

Recent controlled studies involving brain imaging are casting new light on the effects of exercise and obesity on cognition, providing visual evidence of the neurophysiological impact of physical activity or lack thereof, on children. Obesity is linked to adverse cognitive performance in school-aged children and teens. In older adults, obesity is actually found to change brain structure.

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Fish peptide may inhibit cancer metastasis

A study published in the Proceedings of the National Academy of Sciences shows that a peptide derived from Pacific cod may inhibit prostate cancer and possibly other cancers from spreading.

Most people who succumb to cancer die because tumor cells invade the surrounding tissue and migrate into the nearby blood and lymph vessels, a process known as metastasis. For example, prostate cancer typically spreads to the bones, lungs, and liver. Cancer cells that metastasize to other parts of the body grow new blood supplies and eventually overcome the person’s organ systems.

This study explores the therapeutic utility of a bioactive cod TFD-containing glycopeptide to inhibit prostate cancer from progressing. The TFD (Thomsen-Friedenreich disaccharide) antigen in the fish protein is hidden in normal human cells but is exposed on the surface of cancer cells and is believed to play a key role in how cancer spreads. The research team developed a special form of TFD, called TFD100, purified from Pacific cod.

Using animal models, the researchers found that TFD100 binds to galectin-3, a protein that is overexpressed in prostate cancer cells, and blocks its interaction with the TFD antigen found on the surface of the cells. Galectin-3 (gal3) enables cancer cells to adhere to the walls of blood vessels and also kills activated T-cells, a type of white blood cell, which helps the cancer cells to spread throughout the body and evade the immune system. The researchers observed that TFD100 prevents cancer cells from attaching to the vessel walls, suppresses T-cell death, and boosts the immune response.

"Because the gal3-TFD interaction is a key factor driving metastasis in most epithelial cancers, this high-affinity TFD100 should be a promising anti-metastatic agent for the treatment of various cancers, including prostate adenocarcinoma," the researchers conclude in the study.

Additional research is needed to develop a dietary supplement from the cod peptide that could complement chemotherapy and other standard treatments.

IFT Weekly April 3, 2013

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Black tea may help lower blood pressure

A study published in the American Journal of Clinical Nutrition shows that drinking black tea may reduce the rate of blood pressure variation, which can be a more serious indication that there's something wrong with the cardiovascular system. A sudden fluctuation in blood pressure can be an early warning sign of a stroke or even heart disease.

The difference between black tea and other types of tea—like white and green—is that black is more oxidized, a result of the leaves having been aged longer. In the past, black tea has been shown to improve mental alertness, prevent Parkinson's disease, and relieve hardening arteries.

The researchers conducted an experiment involving 111 men and women who showed signs of prehypertension. Participants were asked to drink three cups of black tea a day and had their blood pressure monitored three times in the span of six months.

The results of the study showed that drinking three cups of black tea a day altered blood pressure variation by about 10%. The effects of drinking black tea were noticeable after the first day and continued over the course of the six months. The researchers believe there is an ingredient in black tea—not caffeine—that accounts for this positive effect.

IFT Weekly April 10, 2013

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Obesity in early adulthood may lead to kidney disease later in life

A study published in the Journal of the American Society of Nephrology shows that being overweight starting in young adulthood may significantly increase individuals' risks of developing kidney disease by the time they become seniors. The findings emphasize the importance of excess weight as a risk factor for chronic kidney disease (CKD).

The researchers analyzed information from the Medical Research Council National Survey of Health and Development, a sample of children born in one week in March 1946 in England, Scotland, and Wales. A total of 4,584 participants had available data, including body mass index at ages 20, 26, 36, 43, 53, and 60–64 years.

The researchers found that participants who were overweight beginning early in adulthood (ages 26–36) were twice as likely to have CKD at age 60–64 compared with those who first became overweight at age 60–64 years or never became overweight. The link between overweight and CKD was only in part explained by taking diabetes

and hypertension into account. Larger waist-to-hip ratios ("apple-shaped" bodies) at ages 43 and 53 years were also linked with CKD at age 60–64 years.

"We estimated that 36% of CKD cases at age 60–64 in the current U.S. population could be avoided if nobody became overweight until at least that age, assuming the same associations as in the analysis sample," said Dorothea Nitsch, London School of Hygiene & Tropical Medicine. "To our knowledge we are the first to report how age of exposure to overweight across adulthood may affect kidney disease risk."

It is unclear whether the timing of overweight onset or the duration of being overweight drives the link with CKD seen in the study. Either explanation suggests that preventing excess weight gain in early adulthood could have a considerable effect on the prevalence of CKD. Doing so appears to have a larger effect than any treatment for CKD known to date, the researchers said.

IFT Weekly April 10, 2013

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Western Diet Linked To Early Death, Cognitive Decline

April 18, 2013 **Food Product Design**

Following a Western-style diet rich in fats and sugars may lead to early death and an increased risk of cognitive decline, according to a new study published in the American Journal of Medicine.

"The impact of diet on specific age-related diseases has been studied extensively, but few investigations have adopted a more holistic approach to determine the association of diet with overall health at older ages," said lead investigator TasnimeAkbaraly, PhD, Inserm, Montpellier, France. "We examined whether diet, assessed in midlife, using dietary patterns and adherence to the Alternative Healthy Eating Index (AHEI), is associated with aging phenotypes, identified after a mean 16-year follow-up."

Researchersanalyzed findings from the British Whitehall II cohort study, which suggest that following the AHEI can double the odds of reversing metabolic syndrome. The researchers sought to identify dietary factors that can not only prevent premature death, but also promote ideal aging.

They followed 3,775 men and 1,575 women from 1985-2009 with a mean age of 51 years from the Whitehall II study. Using a combination of hospital data, results of screenings conducted every five years, and registry data, investigators identified mortality and chronic diseases among participants. They classified the results into five groups—ideal aging, defined as free of chronic conditions and high performance in physical, mental and cognitive functioning tests (4%); non-fatal cardiovascular event (12.7%); cardiovascular death (2.8%); non-cardiovascular death (7.3%); and normal aging (73.2%).

Participants with low adherence to the AHEI increased their risk of cardiovascular and non-cardiovascular death. Those who followed a "Western-type diet" consisting of fried and sweet food, processed food and red meat, refined grains and high-fat dairy products, lowered their chances for ideal aging.

"We showed that following specific dietary recommendations such as the one provided by the AHEI may be useful in reducing the risk of unhealthy aging, while avoidance of the 'Western-type foods' might actually improve the possibility of achieving older ages free of chronic diseases and remaining highly functional," Akbaraly said. "A better understanding of the distinction between specific health behaviours that offer protection against diseases

and those that move individuals toward ideal aging may facilitate improvements in public health prevention packages."

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Don't ignore white veggies

When it comes to nutrient content, don't judge a veggie by its color alone, said a panel of leading food and nutrition scientists at an American Society for Nutrition (ASN) pre-annual meeting session on April 19. Vegetables that are white in color are often overlooked as significant sources of key nutrients recommended in dietary guidelines, such as potassium and dietary fiber, two nutrients that Americans don't get enough of but that are critical to good health.

Co-chaired by Johanna Dwyer, Tufts University Professor, and Mario G. Ferruzzi, Professor of Food and Nutrition Science at Purdue University, the symposium highlighted emerging research and innovations that enhance the nutritional impact of white vegetables, especially the potato, in a healthy, well-balanced diet.

Ferruzzi, on behalf of Eric A. Decker, University of Massachusetts-Amherst, presented a comprehensive review of innovations in food chemistry and processing that enhance the nutrient profile of the white potato in all forms, including French fried potatoes, and highlighted the use of new food technologies that improve potato resistant starch content to reduce glycemic response and increase dietary fiber content; fat reduction techniques for fried potatoes; and leveraging the nutritional content of potato skins into processed products.

Joanne Slavin, University of Minnesota, offered a review of the science-based evidence on the health benefits of carbohydrates and dietary fiber, which are generally protective against disease; the role of resistant starch in achieving adequate intake of dietary fiber, a shortfall nutrient; and misdirected efforts to reduce consumption of white potatoes that may result in reduced intake of these important, under-consumed nutrients. Slavin also gave a historical account of how nutrient and food recommendations are translated into dietary guidance, provided insight into current food classifications for white vegetables, and discussed why the use of color is often used an indicator of a vegetable's nutrient value but is not the sole measure of nutrient content.

Cheryl Anderson, University of California-San Diego, outlined the critical role of dietary potassium in promoting health, especially in light of the fact that less than 3% of the U.S. population consumes the recommended daily intake of 4,700 mg/day. She cited the volume of evidence showing potassium's contribution to blood pressure reduction and emerging studies addressing the nutrient's role in cardiovascular, kidney, and bone health, and discussed the role of potassium-rich white vegetables like potatoes in contributing to increases of intake levels.

Stella Lucia Volpe, Drexel University, presented an overview of the role of magnesium in disease prevention and overall health, detailed the amount of this nutrient found in white vegetables and other food sources, and highlighted the promising research in this area, including studies showing a connection between magnesium intake and reduction of stroke risk.

IFT Weekly April 24, 2013

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Lift Weights to Lower Blood Sugar? White Muscle Helps Keep Blood Glucose Levels Under Control

Apr. 7, 2013 Science Daily

Researchers in the Life Sciences Institute at the University of Michigan have challenged a long-held belief that whitening of skeletal muscle in diabetes is harmful.In fact, the white muscle that increases with resistance training, age and diabetes helps keep blood sugar in check, the researchers showed.

In addition, the insights from the molecular pathways involved in this phenomenon and identified in the study may point the way to potential drug targets for obesity and metabolic disease.
"We wanted to figure out the relationship between muscle types and body metabolism, how the muscles were made, and also what kind of influence they have on diseases like type 2 diabetes," said Jiandie Lin, Life Sciences Institute faculty member and associate professor at the U-M Medical School.Lin's findings are scheduled to be published online April 7 inNature Medicine.

Much like poultry has light and dark meat, mammals have a range of muscles: red, white and those in between. Red muscle, which gets its color in part from mitochondria, prevails in people who engage in endurance training, such as marathon runners. White muscle dominates in the bodies of weightlifters and sprinters -- people who require short, intense bursts of energy."Most people are in the middle and have a mix of red and white," Lin said.

When you exercise, nerves signal your muscles to contract, and the muscle needs energy. In response to a signal to lift a heavy weight, white muscles use glycogen to generate adenosine triphosphate (ATP) -- energy the cells can use to complete the task. While this process, called glycolysis, can produce a lot of power for a short time, the glycogen fuel soon depletes.

However, if the brain tells the muscle to run a slow and steady long-distance race, the mitochondria in red muscles primarily use fat oxidation instead of glycogen breakdown to generate ATP. The supply of energy lasts much longer but doesn't provide the burst of strength that comes from glycolysis.People with diabetes see whitening of the mix of muscle.
"For a long time, the red-to-white shift was thought to make muscle less responsive to insulin, a hormone that lowers blood sugar," Lin said. "But this idea is far from proven. You lose red muscle when you age or develop diabetes, but is that really the culprit?"To find out, the team set out to find a protein that drives the formation of white muscle. They sifted through microarray data sets from public databases and identified a list of candidate proteins that were prevalent in white muscle but not in red.

Further studies led the team to focus on a protein called BAF60c, a sort of "zip code" mechanism that tells the cells when and how to express certain genes. The Lin team made a transgenic mouse model to increase BAF60c only in the skeletal muscle. One of the first things they noticed was that mice with more BAF60c had muscles that looked paler."That was a good hint that we were going in the white-muscle direction," said lead author Zhuo-xianMeng, a research fellow in Lin's lab.

They used electron microscopy to see the abundance of mitochondria within the muscle, and confirmed that muscle from BAF60c transgenic mice had less mitochondria than the normal controls."We saw predicted changes in molecular markers, but the ultimate test would be seeing how the mouse could run," Lin said.

If the BAF60c mice could run powerfully for short distances but tired quickly, the scientists would be able to confirm that the BAF60c pathway was a key part of the creation of white muscle.
Using mouse treadmills, they compared the endurance of BAF60c mice to a control group of normal mice, and found that the BAF60c transgenic mice could only run about 60 percent of the time that the control group could before tiring.

"White muscle uses glycogen, and the transgenic mice depleted their muscles' supplies of glycogen very quickly," Lin said.After some follow-up experiments to figure out exactly which molecules were controlled by BAF60c, Lin and his team were confident that they had identified major players responsible for promoting white muscle

formation. Now that they knew how to make more white muscle in animals, they wanted to determine whether white muscle was a deleterious or an adaptive characteristic of diabetes.

The team induced obesity in mice by feeding them the "Super Size Me" diet, Lin said. On a high-fat diet, a mouse will double its body weight in two to three months. They found that obese mice with BAF60c transgene were much better at controlling blood glucose."The results are a bit of a surprise to many people," Lin said. "It really points to the complexity in thinking about muscle metabolism and diabetes."

In humans, resistance training promotes the growth of white muscle and helps in lowering blood glucose. If future studies in humans determine that the BAF60c pathway is indeed the way in which cells form white muscle and in turn optimize metabolic function, the finding could lead to researching the pathway as a drug target."We know that this molecular pathway also works in human cells. The real challenge is to find a way to target these factors," Lin said.
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New Link Between Heart Disease and Red Meat: New Understanding of Cardiovascular Health Benefits of Vegan, Vegetarian Diets

Apr. 7, 2013 Science Daily

A compound abundant in red meat and added as a supplement to popular energy drinks has been found to promote atherosclerosis -- or the hardening or clogging of the arteries -- according to Cleveland Clinic research published online this week in the journal Nature Medicine.

The study shows that bacteria living in the human digestive tract metabolize the compound carnitine, turning it into trimethylamine-N-oxide (TMAO), a metabolite the researchers previously linked in a 2011 study to the promotion of atherosclerosis in humans. Further, the research finds that a diet high in carnitine promotes the growth of the bacteria that metabolize carnitine, compounding the problem by producing even more of the artery-clogging TMAO.

The research team was led by Stanley Hazen, M.D., Ph.D., Vice Chair of Translational Research for the Lerner Research Institute and section head of Preventive Cardiology & Rehabilitation in the Miller Family Heart and Vascular Institute at Cleveland Clinic, and Robert Koeth, a medical student at the Cleveland Clinic Lerner College of Medicine of Case Western Reserve University.

The study tested the carnitine and TMAO levels of omnivores, vegans and vegetarians, and examined the clinical data of 2,595 patients undergoing elective cardiac evaluations. They also examined the cardiac effects of a carnitine-enhanced diet in normal mice compared to mice with suppressed levels of gut microbes, and discovered that TMAO alters cholesterol metabolism at multiple levels, explaining how it enhances atherosclerosis.

The researchers found that increased carnitine levels in patients predicted increased risks for cardiovascular disease and major cardiac events like heart attack, stroke and death, but only in subjects with concurrently high TMAO levels. Additionally, they found specific gut microbe types in subjects associated with both plasma TMAO levels and dietary patterns, and that baseline TMAO levels were significantly lower among vegans and vegetarians than omnivores. Remarkably, vegans and vegetarians, even after consuming a large amount of carnitine, did not produce significant levels of the microbe product TMAO, whereas omnivores consuming the same amount of carnitine did.

"The bacteria living in our digestive tracts are dictated by our long-term dietary patterns," Hazen said. "A diet high in carnitine actually shifts our gut microbe composition to those that like carnitine, making meat eaters even more susceptible to forming TMAO and its artery-clogging effects. Meanwhile, vegans and vegetarians have a

significantly reduced capacity to synthesize TMAO from carnitine, which may explain the cardiovascular health benefits of these diets."
Prior research has shown that a diet with frequent red meat consumption is associated with increased cardiovascular disease risk, but that the cholesterol and saturated fat content in red meat does not appear to be enough to explain the increased cardiovascular risks. This discrepancy has been attributed to genetic differences, a high salt diet that is often associated with red meat consumption, and even possibly the cooking process, among other explanations. But Hazen says this new research suggests a new connection between red meat and cardiovascular disease.
"This process is different in everyone, depending on the gut microbe metabolism of the individual," he says. "Carnitine metabolism suggests a new way to help explain why a diet rich in red meat promotes atherosclerosis."

While carnitine is naturally occurring in red meats, including beef, venison, lamb, mutton, duck, and pork, it's also a dietary supplement available in pill form and a common ingredient in energy drinks. With this new research in mind, Hazen cautions that more research needs to be done to examine the safety of chronic carnitine supplementation.

"Carnitine is not an essential nutrient; our body naturally produces all we need," he says. "We need to examine the safety of chronically consuming carnitine supplements as we've shown that, under some conditions, it can foster the growth of bacteria that produce TMAO and potentially clog arteries."
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Smartphone Way to Lose Weight

Apr. 15, 2013 Science Daily

Your smartphone could be a key tool to losing weight according to scientists at the University of Leeds. Their study is the first to evaluate a smartphone app as the sole method for monitoring weight loss, with researchers creating My Meal Mate to trial against similar products for monitoring food intake, an online food diary and the traditional paper version.

The My Meal Mate app allows users to monitor their food intake and exercise, set a weight loss target and sends a weekly update on progress via text message. The smartphone app was used on average every other day in the trial, whilst the average use of the website and paper diary was about once a week. As a result, over the 6 months of the study those using the app lost on average 4.6kg (10lbs), compared with the 2.9kg (6.5lbs) and 1.3kg (3lbs) lost by the paper-based and online diary users, respectively.
The results of the pilot trial have been published in the Journal of Internet Medical Research.
The Department of Health has calculated the direct costs of obesity on the NHS to be £5.1bn a year and an estimated 40,000 people die annually from conditions attributable to being overweight or obese.
"Smartphone technology could be harnessed to promote health; generally people don't know how many calories they are eating daily. My Meal Mate really helped people monitor their food intake and resulted in an important amount of weight loss," said Professor Janet Cade, from the School of Food Science and Nutrition, who lead the project.
"The labelling on food packaging can help people to identify sensible food choices but it doesn't enable them to understand the cumulative effects of the foods they eat. Keeping a food diary allows us to see where we might be eating too much and the app has proved to be the most effective tracking method by far," added Professor Cade.
Unlike other currently available smartphone apps that are aimed at helping people monitor food intake and lose weight, My Meal Mate is the first free app to contain a large UK-based food database. This allows users to map their eating habits easily to the products they consume. It is also the first such app to be hosted for download on the NHS Choices website.

The pilot trial consisted of 128 overweight volunteers, split into three groups with each group using a different monitoring method. Their use of each method and their weight and other body measurements were monitored over six months.
"Whilst we wouldn't expect people to use My Meal Mate daily for the rest of their lives, it gives them the skills and education to monitor their diet themselves -- to have a better understanding of portion sizes, nutritional content and the effect of exercise," said Michelle Carter, the lead author on the paper, who conducted the study as part of her PhD at the University of Leeds.
It is now available to download for Android smartphones from the NHS Choices website and from the Google Play Store.
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Drinking Cup of Beetroot Juice Daily May Help Lower Blood Pressure

Apr. 15, 2013 Science Daily

A cup of beetroot juice a day may help reduce your blood pressure, according to a small study in the American Heart Association journalHypertension.

People with high blood pressure who drank about 8 ounces of beetroot juice experienced a decrease in blood pressure of about 10 mm Hg. But the preliminary findings don't yet suggest that supplementing your diet with beetroot juice benefits your health, researchers said.

"Our hope is that increasing one's intake of vegetables with a high dietary nitrate content, such as green leafy vegetables or beetroot, might be a lifestyle approach that one could easily employ to improve cardiovascular health," said Amrita Ahluwalia, Ph.D., lead author of the study and a professor of vascular pharmacology at The Barts and The London Medical School in London.
The beetroot juice contained about 0.2g of dietary nitrate, levels one might find in a large bowl of lettuce or perhaps two beetroots. In the body the nitrate is converted to a chemical called nitrite and then to nitric oxide in the blood. Nitric oxide is a gas that widens blood vessels and aids blood flow.

"We were surprised by how little nitrate was needed to see such a large effect," Ahluwalia said. "This study shows that compared to individuals with healthy blood pressure much less nitrate is needed to produce the kinds of decreases in blood pressure that might provide clinical benefits in people who need to lower their blood pressure. However, we are still uncertain as to whether this effect is maintained in the long term."

The study involved eight women and seven men who had a systolic blood pressure between 140 to 159 millimeters of mercury (mm Hg), did not have other medical complications and were not taking blood pressure medication. The study participants drank 250 mL of beetroot juice or water containing a low amount of nitrate, and had their blood pressure monitored over the next 24 hours.
Blood pressure is typically recorded as two numbers. Systolic blood pressure, which is the top number and the highest, measures the pressure in the arteries when the heart beats. Diastolic blood pressure, the bottom and lower number, measures blood pressure in the arteries between heart beats.

Compared with the placebo group, participants drinking beetroot juice had reduced systolic and diastolic blood pressure -- even after nitrite circulating in the blood had returned to their previous levels prior to drinking

beetroot. The effect was most pronounced three to six hours after drinking the juice but still present even 24 hours later.

In the United States, more than 77 million adults have diagnosed high blood pressure, a major risk factor for heart diseases and stroke. Eating vegetables rich in dietary nitrate and other critical nutrients may be an accessible and inexpensive way to manage blood pressure, Ahluwalia said.
Getting people to eat more fruits and vegetables is challenging, but results of the study offer hope, she said. "In the U.K., the general public is told that they should be eating five portions of fruit or vegetables a day but this can be hard to do. Perhaps we should have a different approach to dietary advice. If one could eat just one (fruit or vegetable) a day, this is one more than nothing and should be viewed as positive."

The USDA recommends filling half your plate with fruits and vegetables, and the American Heart Association recommends eating eight or more fruit and vegetable servings every day.
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Mushrooms Can Provide as Much Vitamin D as Supplements

Apr. 22, 2013 Science Daily

Researchers from Boston University School of Medicine (BUSM) have discovered that eating mushrooms containing Vitamin D2 can be as effective at increasing and maintaining vitamin D levels (25-hydroxyvitamin D) as taking supplemental vitamin D2 or vitamin D3. These findings will be presented at the American Society for Biochemistry and Microbiology annual meeting in Boston on April 22 and also concurrently appear in Dermato-Endocrinology on line open access.

Vitamin D is crucial for good bone health and muscle strength; adequate amounts help the body maintain bone density reducing the risk of fracture, osteomalacia, osteoarthritis and osteoporosis. The nutrient also plays an integral role in modulating the immune system to help fight infections like the flu and reduces the risk of many common diseases including cancer, cardiovascular disease, depression and diabetes.

The study to be presented consisted of 30 healthy adults who were randomized to take capsules containing 2000 International Units (IU) of vitamin D2, 2000 IU of vitamin D3 or 2000 IU of mushroom powder containing vitamin D2 once a day for 12 weeks during the winter. Baseline serum 25-hydroxyvitamin D [25(OH)D], a measure to determine a person's vitamin D status, were not significantly different among the groups. The serum 25(OH)D levels among the three groups gradually increased and plateaued at seven weeks and were maintained for the following five weeks. After 12 weeks of the vitamin D supplements, serum 25(OH)D levels were not statistically significantly different than those who ingested 2000 IU of vitamin D2 in mushroom powder.

"These results provide evidence that ingesting mushrooms which have been exposed to ultraviolet light and contain vitamin D2, are a good source of vitamin D that can improve the vitamin D status of healthy adults. Furthermore we found ingesting mushrooms containing vitamin D2 was as effective in raising and maintaining a healthy adult's vitamin D status as ingesting a supplement that contained either vitamin D2 or vitamin D3," said Michael F. Holick, PhD, MD, the principal investigator of the abstract. The study is available on line concurrently in the journal Dermato-Endocrinology. "These results confirm other studies that have demonstrated that ingesting vitamin D2 either from fortified orange juice, a supplement or a pharmaceutical formulation were all capable of increasing total circulating 25(OH) D concentrations for at least 3 months, and up to 6 years," added Holick, the senior author of the study.

According to Holick and his coauthors ingesting mushrooms containing vitamin D2 can be an effective strategy to enhance a persons' vitamin D status. "The observation that some mushrooms when exposed to UVB light also

produce vitamin D3 and vitamin D4 can also provide the consumer with at least two additional vitamin Ds," he added.

In a second poster presentation, the researchers were able to determine how mushrooms make vitamin D2 and found that the process is similar to what occurs in human skin after sun exposure. They were also able to show that mushrooms not only produce vitamin D2, but can produce vitamin D3 and vitamin D4.

"Although it has been previously reported that mushrooms have the ability to produce both vitamin D2 and vitamin D4, through our own research we were able to detect several types of vitamin Ds and provitamin Ds in mushroom samples including vitamin D3 which is also made in human skin," added Holick.

According to the researchers these abstracts as well as the on line published study demonstrate that mushrooms are another good natural food source for vitamin D that can easily be found in ones' local grocery store.
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Mild Iodine Deficiency in Womb Associated With Lower Scores On Children's Literacy Tests

Apr. 30, 2013 Science Daily

Children who did not receive enough iodine in the womb performed worse on literacy tests as 9-year-olds than their peers, according to a recent study accepted for publication in The Endocrine Society's Journal of Clinical Endocrinology & Metabolism (JCEM).Iodine is absorbed from food and plays a key role in brain development. Even mild deficiency during pregnancy can harm the baby's neurological development.

"Our research found children may continue to experience the effects of insufficient iodine for years after birth," said the study's lead author, Kristen L. Hynes, PhD, of the Menzies Research Institute at the University of Tasmania in Australia. "Although the participants' diet was fortified with iodine during childhood, later supplementation was not enough to reverse the impact of the deficiency during the mother's pregnancy."

The longitudinal study examined standardized test scores of 228 children whose mothers attended The Royal Hobart Hospital's antenatal clinics in Tasmania between 1999 and 2001. The children were born during a period of mild iodine deficiency in the population. Conditions were reversed when bread manufacturers began using iodized salt in October 2001 as part of a voluntary iodine fortification program.

The study found inadequate iodine exposure during pregnancy was associated with lasting effects. As 9-year-olds, the children who received insufficient iodine in the womb had lower scores on standardized literacy tests, particularly in spelling. However, inadequate iodine exposure was not associated with lower scores on math tests. Researchers theorize iodine deficiency may take more of a toll on the development of auditory pathways and, consequently, auditory working memory and so had more of an impact on students' spelling ability than their mathematical reasoning ability.

"Fortunately, iodine deficiency during pregnancy and the resulting neurological impact is preventable," Hynes said. "Pregnant women should follow public health guidelines and take daily dietary supplements containing iodine. Public health supplementation programs also can play a key role in monitoring how much iodine the population is receiving and acting to ensure at-risk groups receive enough iodine in the diet."
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Mangos Help Regulate Blood Sugar Levels Among Obese People

28 Apr 2013 Medical News Today

The positive health effects of Mangos have been recently explored and presented by researchers at the Federation of American Societies for Experimental Biology (FASEB). They found that mangos have properties that can help regulate blood sugar levels among people suffering from obesity.

The study, which was led by Edralin Lucas, Ph.D., evaluated what effect eating mangos everyday would have on a total of twenty obese adult people. The participants ate 10 grams of freeze-dried mango everyday for 12 weeks.

At the end of the study period they found that the blood sugar levels of the participants were much lower than at the start of the study.

Among both genders there wasn't any substantial change in body composition, however, BMIs (body mass indexes) went up among the female participants. The authors noted that these results are only from a single study and that more research is necessary to fully understand the health effects of mango consumption among obese people.

Obesity is a serious public health issue in the U.S., where a total of twelve states have 30+% obesity rates today, compared to just one in 2007. Since 1995, obesity rates have risen by 90+% in 10 states and have doubled in another 7.According to the Centers for Disease Control and Prevention (CDC), obesity is a main cause of: type 2 diabetes, breast and colon cancer, coronary heart disease, stroke, hypertension, liver and gallbladder disease and high cholesterol.

Researchers have long been looking for factors that can help prevent the health effects of obesity. This study, along with others, shows promise for those suffering from the condition. According to Dr. Lucas: "The results of this study support what we learned in our recent animal model, which found that mango improved blood glucose in mice fed a high fat diet. Although the mechanism by which mango exerts its effects warrants further investigation, we do know that mangos contain a complex mixture of polyphenolic compounds. Research has shown that several other plants and their polyphenolic compounds, such as isoflavone from soy, epigallocatechingallate from green tea , and proanthocyanidin from grape seed , have a positive effect on adipose tissue."

An average mango has an energy value per 100g of approximately 60 kcal, they have numerous health benefits and nutrients, they are naturally high in prebiotic dietary fiber (substances that encourage the growth of beneficial bacteria, not to be confused with probiotics), vitamin C, and antioxidant vitamins A and C, as well as vitamin B6. Mango contains triterpene and lupeol, which have been found to be an effective inhibitor in laboratory models of

prostate and skin cancer.

The health benefits of mango consumption have been explored in previous studies,. Texas AgriLife Research food scientists found that mango able to prevent or stop certain colon and breast cancer cells in the lab.

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Hepatic Encephalopathy Reduced By Probiotics

28 Apr 2013 Medical News Today

Probiotics could emerge as a treatment plan to manage hepatic encephalopathy (HE) therapy after a new study announced at the International Liver Congress™ 2013 found they significantly reduced development of the notoriously difficult-to-treat disease.

The study analysed the efficacy of probiotics in preventing the development of HE in 160 cirrhotic patients over a period of approximately nine months and found significant improvements in reducing patients' arterial ammonia levels after three months of treatment with probiotics.

Ammonia, produced by gut bacteria, is thought to be one of the main mediators of cerebral dysfunction in HE. Probiotics work by enriching the gut flora with a non-urease producing microorganisms, which decrease ammonia production. Probiotics are live microorganisms (mostly bacteria) that produce a health benefit on the host when administered in adequate amounts.

Twice as many patients taking a placebo developed overt HE (the study's primary endpoint) compared to patients taking probiotics in the form of a capsule.

EASL's Treasurer, Prof. Mauro Bernardi welcomed the findings and said they would provide a positive impact for cirrhotic patients at risk of developing HE for whom the prognosis is typically very poor.

Prof.Bernardi said: "Hepatic encephalopathy is an insidious disease that's caused by an accumulation of toxins in the blood that are normally removed by the liver. Treatment normally involves the use of antibiotics or laxatives to suppress the production of toxic substances in the intestine but there is still a great deal of room for improvement so it will be exciting to see the results of further studies to determine if clinicians have a new form of treatment on the cards."

Hepatic encephalopathy is a spectrum of neuropsychiatric abnormalities including personality changes, intellectual impairment and reduced levels of consciousness in patients with liver failure, after exclusion of other known brain disease.

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The Benefits Of Eggs, Even For Those At Cardiovascular Risk

25 Apr 2013 Medical News Today

This week at Experimental Biology (EB) 2013, scientists from around the world are gathering to share research on a variety of topics, including nutrition and health. Given the growing global burden of chronic disease, there is particular interest in the important role of diet and nutrition in overall health. Several studies presented at the conference looked specifically at the role of whole egg consumption in high-risk groups, including those with metabolic syndrome and heart disease, as well as the satiating effects of high-protein breakfast consumption for overweight adolescents.

Evidence to Support Eggs as Part of a Heart Healthy Diet

Research from Yale University explored the impact of daily whole egg consumption in men and women with coronary heart disease(1). The subjects were randomized to consume either two eggs, ½ cup of egg substitute or a high-carbohydrate breakfast for six weeks as part of their typical diet. The subjects who ate either whole eggs or egg substitute did not experience any negative impact in total cholesterol, blood pressure, body weight or endothelial function. The researchers concluded that whole eggs can be a part of a heart healthy diet, even in those with existing coronary heart disease.

Whole Egg Consumption Promotes Favorable Lipid Changes in those with Metabolic Syndrome

Research from the University of Connecticut suggested that daily whole egg consumption may have a positive effect on the function and composition of HDL cholesterol in adults with metabolic syndrome. Subjects followed a carbohydrate-restricted diet, and consumed either three eggs per day or an equivalent amount of egg substitutes(2). After 12 weeks, subjects consuming whole eggs experienced improvements in HDL (good cholesterol) composition and ability to remove cholesterol from the blood.

Those eating three whole eggs daily also had HDL that was lower in triacylglycerol and higher in a beneficial component of egg yolks (phosphatidylethanolaime)(2). "Taken together with previously established benefits of egg intake on HDL profiles, these findings further support the notion that eggs serve as a functional food to reduce cardiovascular disease risk in individuals with metabolic syndrome," says Catherine Andersen, lead study author and PhD candidate at the University of Connecticut.

High Protein Breakfast Results in Decreased Daily Calorie Intake

Researchers at University of Missouri presented data comparing the effects of a normal-protein cereal breakfast (15% meal calories), high-protein egg and pork breakfast (40% meal calories) and no breakfast on satiety in overweight/obese adolescents who normally skip breakfast(3). The group that consumed the high protein egg and pork breakfast reported a decrease in hunger and an increase in fullness compared to the normal protein and breakfast-skipping group. The individuals eating a high protein breakfast also voluntarily reduced their intake by more than 400 calories per day over the 12-week study. No significant differences were seen in weight between groups; however, breakfast skippers were found to have significant increases in percent body fat mass compared to those who ate the normal and high protein breakfasts. This study supports the benefits of a high protein breakfast as a weight management strategy among overweight and obese adolescents(3).

"This year's EB program showcased cutting-edge nutrition research with wide-reaching public health implications," says Mitch Kanter, PhD, Executive Director of the Egg Nutrition Center. "Furthermore, many studies underscore a positive role for eggs in the current chronic disease challenges we face."

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The forgotten vitamin: 'K2 has not even begun to realise its potential'

Is 2013 the year for vitamin K2 in the US? A breakthrough study and growing awareness over deficiency point to progress, but consumer awareness is still growing in baby steps for 'the most fascinating of all vitamins', says a leading supplier.

Vladimir Badmaev, MD, PhD, Head of R&D for NattoPharma ASA, told NutraIngredients-USA that the market for natural vitamin K2 is already significant, approaching several tons in the US and 1.5 tons in EU – "and with this it has not even begun to realize its potential.

"Asia, with the exception of India, has only begun promoting vitamin K2 for health purposes," said DrBadmaev, "and the smaller but developing markets in South America, such as Brazil, have yet to begin.

"However, growing epidemiological evidence indicates that a burgeoning percent of the global population, which otherwise appears healthy, is deficient in vitamin K2; this has far-reaching consequences for overall health, well-being and economies of many countries."

Despite the "far-reaching consequences", the number of dietary supplements launched containing vitamin Kremains small, according to data obtained this week from Mintel. A spokesperson for the market researcher told NutraIngredients-USA that, in 2010, only 4% of new vitamin and dietary supplement products launched in the US contained vitamin K. This fell by half to 2% of new vitamin and dietary supplement products launched in the US for both 2011 and 2012.

K forms

There are two main forms of vitamin K: phylloquinone (vitamin K1) which is found in green leafy vegetables such as lettuce, broccoli and spinach, and makes up about 90% of the vitamin K in a typical Western diet; and menaquinones (vitamins K2), which make up about 10% of Western vitamin K consumption and can be synthesized in the gut by the microflora.Menaquinones (MK-n: with the n determined by the number of prenyl side chains) can also be found in the diet; MK-4 can be found in animal meat, MK-7, MK-8, and MK-9 are found in fermented food products like cheese, and natto is a rich source of MK-7.

The most fascinating of all vitamins

NattoPharma'sDrBadmaev recognizes the pioneering research on vitamin K's new applications by researchers at Maastricht University in The Netherlands."Vitamin K has been re-discovered by science as a versatile vitamin only in recent years and it is a natural course of events that there is a relative quiet while new applications of vitamin K are being confirmed in pre-clinical and clinical tests," he said.

"The researchers from Maastricht University noted that vitamin K came from a relative obscurity as a single function 'homeostasis vitamin' to be re-discovered as a 'multi-functional vitamin' and arguably the most fascinating of all vitamins."

As reported by NutraIngredients-USA last week, vitamin K2 was back in the headlines with a 'breakthrough' study, published in Osteoporosis International, which indicated that vitamin K2 supplements may reduce bone loss and improve bone impact strength in postmenopausal women.

DrCees Vermeer, lead investigator for the study from Vita K at Maastricht University, said: “These demonstrated improvements in clinical outcomes are extremely important.

“Despite reports on small or insignificant effects on bone health after clinical interventional studies on vitamin K2 – lasting up to one year – we have documented that MenaQ7 supplementation over three years prevents bone loss in postmenopausal women, confirming that bone health benefits of vitamin K2 is best demonstrated over longer periods than previously thought.The dose of 180 mcg of MenaQ7 per day significantly decreases age-related loss in bone mass and thereby exerts improvements in bone strength.”

Today, NattoPharma also announced a new publication of data from a human trial, which indicated MenaQ7 is a potent inhibitor of anticoagulant activity, a strong indicator of the protective benefits of natural K2 for vitamin k-dependent proteins.The trial also showed that vitamin K2 is “much more potent than K1”, said the company.

The calcium issue

Beyond bones, vitamin K has been linked to improvements in cardiovascular health. The benefits of the vitamin become ‘particularly obvious’ in view of growing number of studies that link supplemental calcium to detrimental effects on cardiovascular health, said DrBadmaev.“These epidemiological findings suggest that guidelines for calcium supplements may have to be revised, and calcium and vitamin D supplements may need to be complemented with vitamin K2 intake for efficient delivery of calcium to ensure effective performance of the body’s physiological functions,” he said.

“Therefore the evolving knowledge brings vitamin K2 to the forefront of supplemental vitamins that are needed to maintain health and prevent cardiovascular disease.”There is also a potential role for the vitamin for sports nutrition, with studies reporting that vitamin K may improve our body’s ability to utilize oxygen, and reducing the risk of muscle cramping, said DrBadmaev.The wider benefits of vitamin K were also highlighted in a 2009 study by Joyce McCann, PhD, and Bruce Ames, PhD, from Children's Hospital Oakland Research Institute.

Educating consumers

Despite a growing list of potential health benefits, and scientific studies to back these up, consumer awareness of vitamin K is “growing at baby steps”.“Most of us may be vitamin K deficient or insufficient without knowing,” said DrBadmaev. “Recent epidemiological studies suggest that most adults, apparently healthy, may be sub-clinically K2 deficient – which results in 10-40% of K2-dependent proteins not carboxylated and therefore rendered biologically inactive. “Thus, although the intake of vitamin K in Western countries is sufficient for maintaining homeostasis, it might be insufficient to maintain post-translational modification of the vitamin K-dependent proteins, and thus insufficient to prevent osteoporosis, vascular calcification, atherosclerosis and cardiovascular disease, and other diseases related to chronic inflammation.

“While the ‘breakthrough’ studies may bring more awareness for vitamin K supplementation, even less awareness exists among manufacturers and end customers on the proper form and quality of vitamin K needed in supplements,” he said.“NattoPharma has undertaken another ‘breakthrough’ project in the field of manufacture and technology of natural vitamin K. This led to the development of the MenaQ7 Crystals brand.

“What is probably the most significant technological breakthrough in the MenaQ7 Crystals manufacture is a proprietary multi-step process of purification, condensation and crystallization of fermentation-derived K2.MenaQ7Crystals fermentation-process starting materials and excipients are soy free and hypoallergenic,” added DrBadmaev.“This innovative process leads to an end product that is more than 95% pure natural menaquinone-7 or MK-7 (100% trans-form), with less than 0.5% (traces) of menaquinone-6 (MK-6), a marker of natural menaquinone-7 technology (note: MK2-6 is not present in a synthetic MK-7 product).”
NutraIngredients USA 03 Apr 2013

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Green tea extracts show promise for people with metabolic syndrome

Nutra Ingredients USA 02-Apr-2013

Drinking green tea or taking a supplement containing green tea extracts may improve the body's antioxidant protection in people with the metabolic syndrome, says a new study.

Eight weeks of consumption of a green tea beverage or green tea extracts were associated with significant increases in blood antioxidant capacity and glutathione levels, compared with controls, according to findings published in Nutrition Research.

Metabolic syndrome (MetS) is a condition characterized by central obesity, hypertension, and disturbed glucose and insulin metabolism. The syndrome has been linked to increased risks of both type 2 diabetes and cardiovascular diseases.Researchers from Oklahoma State University and the University of Oklahoma noted that MetS actively contributes to obesity and diabetes and is also "associated with elevated oxidative stress and impaired antioxidant status".

"To our knowledge, this is the first clinical investigation of the effects of green tea supplementation in endogenous antioxidant markers in obese participants with the metabolic syndrome," wrote researchers from Oklahoma State University and the University of Oklahoma."Glutathione is an essential constituent of the endogenous antioxidant defense system," they explained. "Reduced glutathione acts as the electron donor to the enzyme GPx that efficiently scavenges hydrogen peroxide, thus preventing cellular oxidative damage. Reduced glutathione is primarily synthesized in the liver; and its deficiency has been implicated in aging, cardiovascular disease, and cancer."

Tea benefits

The study adds to an ever-growing body of science supporting the potential benefits of green tea and its constituents, most notably EGCG (epigallocatechingallate). To date green tea has been linked to a reduced risk of Alzheimer's and certain cancers, improved cardiovascular and oral health, as well as benefits in weight management.

Green tea contains between 30 and 40 per cent of water-extractable polyphenols, while black tea (green tea that has been oxidized by fermentation) contains between 3 and 10 per cent. Oolong tea is semi-fermented tea and is somewhere between green and black tea. The four primary polyphenols found in fresh tealeaves are epigallocatechingallate (EGCG), epigallocatechin (EGC), epicatechingallate (ECG), and epicatechin (EC).The new study follows earlier work from the same research group , which indicated that green tea may reduce levels of a protein called amyloid alpha linked to heart disease.

Study details

The Oklahoma-based scientists recruited 35 obese people with MetS and randomly assigned them to one of three groups: The first group received four cups of green tea per day; the second group received four cups of water per day plus two capsules containing green tea extracts; and the third group received four cups of water per day.

After eight weeks, the researchers observed a significant increase in plasma antioxidant capacity in both tea groups, compared with control, as well as the increases in glutathione levels. However, no changed were observed in in blood carotenoid and tocopherol levels, nor in the activities of glutathione peroxidase andcatalase.

"Significant effects were observed in both green tea beverage and extract supplementation, when compared with the control group, in elevating whole blood glutathione concentrations and plasma antioxidant capacity in obese participants with the metabolic syndrome," wrote the researchers.

"In addition, plasma iron was significantly reduced when compared with the baseline in the green tea extract group. "Thus, our study provides novel evidence on the role of green tea catechins in increasing endogenous

antioxidant capacity by selectively modulating endogenous antioxidant markers in the metabolic syndrome," they concluded.
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Omega-3 backed to boost immune response, not just battle inflammation

Nutra Ingredients USA 02-Apr-2013

Long chain omega-3 fatty acids may help to boost the immune system by enhancing the functioning of immune cells, according to new research.

The study, published in the Journal of Leukocyte Biology, suggests that instead of supressing the immune system by reducing inflammation, consumption of DHA and EPA-rich fish oil may actually enhance the function of immune B cells.Led by Dr Jenifer Fenton from Michigan State University, USA, the research team noted that while DHA and EPA are widely believed to help prevent disease by reducing inflammation, until now, many scientists were not completely certain of any immune enhancing effects.

But new findings now show that DHA-rich fish oil enhances the activity of white blood cells known as B cell – so challenging the idea that fish oil is only immunosuppressive."These results support the hypothesis and an emerging concept that fish oil enhances B cell function in vivo," confirmed the researchers.This work confirms similar findings on fish oil and B cells from our lab, and moves us one step closer to understanding the immune enhancing properties of EPA and DHA," said Dr S. RazaShaikh from East Carolina University – also involved in the work.Fenton also suggest that the findings hint at possible immune enhancing properties of fish oil, "that could benefit immune-compromised individuals."

Study details

The team used two groups of mice, fed either a control diet, or a diet supplemented with DHA-rich fish oil for five weeks. B cells were then harvested from several tissues and stimulated in culture.
Fenton and her team then looked for markers of B cell activation on the cell surface, in addition to alterations in cell membranes and cytokine production."This study tested the hypothesis that DHA from fish oil is incorporated into the B cell membrane to alter lipid microdomain clustering and enhance B cell function," the team said.

They found that DHA-enriched fish oil enhanced B cell activation and select antibody production – somethingFenton and her colleagues suggested may aid immune responses associated with pathogen clearance, while possibly dampening the totality of the inflammatory response.
DHA supplementation was found to enhance LPS-induced B cell secretion of immune cytokines IL-6 and TNF-alpha and increase expression of CD40 compared with the control diet.

Supplementation also increased lymphoid tissue B cell populations and surface markers of activation, they said – adding that mice fed with DHA had significantly higher plasma IL-5, IL-13, and IL-9 (Th2-biasing cytokines) and cecal IgA compared with the control diet mice.
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'Far-reaching benefits': DHA omega-3 may boost memory for healthy young people

Nutra Ingredients 28-Mar-2013

Supplements of DHA (docosahexaenoic acid) may improve memory and reaction times for healthy young people, says a new study that could 'translate into far-reaching benefits'.

Young women had greater improvements in episodic memory, while men experienced greater improvements in reaction times of working memory following six months of supplementation with 1.16 grams of DHA per day, according to findings published in the American Journal of Clinical Nutrition.Indeed, reaction times for men increased by 20% - or completing working memory tasks 223 ms faster – compared to men in the placebo group.

"This study showed, for the first time to our knowledge, that DHA supplementation improved memory and RTs of memory in healthy young adults whose habitual diet was low in DHA, and sex modulated the response," wrote the researchers, led by WelmaStonehouse from Massey University in New Zealand."These memory-related cognitive domains are the building blocks of more-complex cognitive functions or behaviors that are common in everyday life. Thus, young healthy adults may cognitively benefit from an increased consumption of DHA."

Spread the word

The research was welcomed by Harry Rice, PhD, VP of regulatory & scientific affairs for the Global Organization for EPA and DHA Omega-3s (GOED). "Given that low intake of omega-3s is a global concern, the present findings could translate into far-reaching benefits," he told us.
"For years, many people have scoffed at the potential cognitive benefits of DHA in this age group (younger healthy adults). Now that we have the piece of the puzzle for which we've been looking, it's time to spread the word."

Study details

Stonehouse and her co-workers, which included scientists from the University of East Anglia and Northumbria University in England, recruited 176 healthy adults aged between 18 and 45 to participate in their randomized, placebo-controlled, double-blind study. Participants were randomly assigned to receive either DHA supplements (1.16 g/d) or placebo for six months.
The supplements and placebo were supplied by Efamol Ltd and Health & Herbs International Ltd. A battery of computerized cognitive tests indicated that DHA supplements improved reaction times of episodic and working memory for the general group, compared with placebo, but the benefits were more pronounced for women for episodic memory, while men benefited more for reaction times of working memory.

Genotypes

The researchers also examined the potential influence of genes, and the apolipoprotein E genotype (ApoE) in particular. "ApoE is a major genetic risk factor for Alzheimer's disease with carriers of the APOE4 allelic variant (about 25% of whites) at several-fold increased risk," they explained. No general differences between the ApoE status and cognitive performance were observed. However, men who were both APOE4 carriers and non-carriers benefited from DHA supplements for reaction times of working memory, compared with the placebo group, said the researchers, with the effect "considerably greater in APOE4 carriers".
"A similar effect was seen in male APOE4 carriers for reaction times of attention with an improvement in theDHA group and worsening in the placebo group, which resulted in a significant difference between groups," they added.
"More-robust randomized control trials that are long enough (longer than six months) and take into account the habitual intake of long chain omega-3 PUFAs are needed to confirm the findings of this study and to determine the most effective dosage of DHA for optimal cognitive function," they concluded.
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Sorghum is celiac-safe

Food Navigator USA 04-Apr-2013
The cereal grain sorghum is a safe food for consumers with celiac disease and therefore ideal for gluten-free formulations, new research finds.

The study published in the American Chemical Society's Journal of Agriculture and Food Chemistry found strong biochemical and genetic evidence that the grain lacks the proteins toxic to people with celiac disease."These analyses provide molecular evidence for the absence of toxic gliadin-like peptides in sorghum, confirming that sorghum can be definitively considered safe for consumption by people with celiac disease," the Italian researchers wrote.

Sorghum – traditionally used as animal feed in developed nations – has emerged as an alternative grain for people with celiac disease and comes highly recommended given its nutrient value, they said. The researchers claim this is the first time biochemical and genetic analyses has been done on the grain, even though it is already considered celiac-safe after immunochemical, in vivo and in vitro research."The nutritional qualities of food-grade sorghum are excellent. Food-grade sorghums should be considered as an important option for all people, especially celiac patients."

But... it must be food-grade sorghum

However, the researchers made clear that the analysis exclusively covered food-grade sorghum cultivars that do not contain condensed tannins like regular sorghum – which can reduce the digestibility of dietary proteins."The modern, food-grade sorghum cultivars described in this paper do not contain condensed tannins and were developed for use as ingredients in food products for human consumption."

Nearly 40% of global sorghum production is used for human food consumption in Africa and India but elsewhere it is not widely consumed – instead used for animal feed. However, in recent years farmers in the US have begun producing sorghum hybrids for wheat-free foods for persons with celiac disease.

Nutritional, low cost gluten-free

The study said sorghum has a number of desirable attributes for use in gluten-free products. It is highly nutritional – characterized by high total lipid levels. It is also light in color with a bland, neutral taste and inexpensive."Moreover, new technologies aimed at enhancing the nutritional and functional values of sorghum proteins in industrial-scale processes have been developed," they said.
The researchers called for further studies into food-grade sorghum to support the cultivation and consumption of these varieties in new environments like Mediterranean countries.

Study details

Sorghum plant cultivars were sowed during 2010 with varieties evaluated during the spring/summer period.The team then milled a 500g sample of dried grain to obtain fine flour for testing. Proteins were then extracted using a vortexing process. Genome and biochemical analysis was conducted on the flour to assess protein profiles.
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Black tea compounds show blood pressure benefits

Nutra Ingredients USA 05-Apr-2013

Three cups of flavonoid-rich black tea per day may reduce the variability in blood pressure at night, says a new clinical trial.

With blood pressure variation linked to cardiovascular disease, the results of the new study indicate that compounds found in black tea may offer heart health benefits."We have shown, for the first time to our knowledge, that the consumption of black tea can lower rates of systolic and diastolic blood pressure variation at nighttime," wrote researchers in the American Journal of Clinical Nutrition.

"These effects were immediate and sustained during regular black tea consumption over 6 months. The results show that simple dietary changes can influence BP variation, and a component of black tea solids, other than caffeine, is responsible."

The study was performed by researchers from the University of Western Australia, Flinders University (Australia), Unilever Research and Development (Netherlands), the Russian Cardiology Research Center (Russia) and BakerIDI Heart and Diabetes Institute (Australia).

Tea

The study adds to the list of potential health benefits of tea and the compounds it contains. The majority of science on tea has looked at green tea, with benefits reported for reducing the risk of Alzheimer's and certain cancers, improving cardiovascular and oral health, and helping with weight management.

Green tea contains between 30 and 40% of water-extractable polyphenols, while black tea (green tea that has been oxidized by fermentation) contains between 3 and 10 per cent. Oolong tea is semi-fermented tea and is somewhere between green and black tea.

Study details

The researchers recruited 111 men and women with systolic blood pressure between 115 and 150 mmHg. The participants were randomly assigned to one of two groups: The first group consumed three cups per day of black tea, and the second group received the same number of cups of a flavonoid-free caffeine-matched beverage.

Results showed that after six months of consuming the beverages the tea group displayed "lower rates of systolic and diastolic blood pressure variation by about 10% during nighttime", said the researchers. Such effects were observed from the very first day of the study, they added, and maintained for the whole six month study.

Commenting on the potential mechanism, the researchers noted that "there is mounting evidence that black tea flavonoids can improve vascular health via effects on nitric oxide status, endothelial function, and arterial stiffness.

"Acute and short-term improvements in arterial stiffness may contribute to reduced blood pressure variation. An additional possibility is that tea might improve sleep quality via effects on neurocognitive function or autonomic regulation," they added.

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Mayo Clinic review links L-Carnitine to multiple heart health benefits

Nutra Ingredients 23-Apr-2013

A systematic review by the Mayo Clinic has said that L-Carnitine can reduce mortality, abnormal heart rhythms and angina development in patients experiencing a heart attack.

The review comes shortly after a study by Koethet al. in Nature Medicine suggested L-Carnitine may contribute to cardiovascular disease risk.

Systemic review and meta-analysis

The Mayo Clinic reviewed 13 controlled trials involving 3629 people and concluded that L-Carnitine had multiple cardiovascular benefits for heart attack sufferers.

"Compared with placebo or control, L-carnitine is associated with a 27% reduction in all-cause mortality, a 65% reduction in ventricular arrhythmias, and a 40% reduction in anginal symptoms in patients experiencing an acute myocardial infarction.

"Further study with large randomized controlled trials of this inexpensive and safe therapy in the modern era is warranted," said the researchers. L-Carnitine is a compound found in red meat such as beef and is used in supplements. While the researchers found multiple benefits in their review, they failed to find an association between the compound and a reduced risk of heart failure and myocardial reinfarction (repeat heart attacks).

How were the studies chosen

Studies published between 1973 and 2012 were identified through searches on three scientific journal databases: Ovid MEDLINE, PubMed and Embase.

The researchers chose those which were comparative trials of adults (over 18) receiving L-Carnitine compared with a placebo or control with outcomes of all-cause mortality, cardiovascular events (including myocardial reinfarction), and development of heart failure and ventricular arrhythmias, which are abnormal heart rhythms.

The literature review yielded 153 studies, but only 18 were reviewed in full and 13 were deemed eligible for inclusion.

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Omega-3 ethyl esters may make blood vessels more elastic

Nutra Ingredients USA 19-Apr-2013

Supplements of omega-3 fatty acids in the ethyl ester form may reduce the stiffness in arteries and reduce the risk of cardiovascular disease in obese people, says a new study from Australia.

Using the Lovaza/Omacor product, researchers noted that 12 weeks of supplementation with four grams per day in combination with a weight loss diet resulted in increases in arterial elasticity of about 20%. These changes were not observed in people only adhering to the weight loss diet.
Writing in the Journal of Nutrition , researchers from the University of Western Australia and Sir Charles Gairdner Hospital in Perth note that adding omega-3s to the weight loss diet produced greater improvements in systolic blood pressure, heart rate, and triglycerides.

"Our data suggest that the combination of omega-3 fatty acid ethyl esters (FAEEs) and weight loss not only corrects dyslipidemia, insulin resistance, and hypertension but also improves [artery elasticity]," wrote the researchers, led by Annette Wong."In light of the recent evidence suggesting the association between arterial elasticity and incidence of future coronary and peripheral artery diseases, our new data also support the addition of omega-3 FAEEs to weight loss to improve arterial elasticity."

Caution

Commenting independently on the study, Harry Rice, PhD, VP of regulatory & scientific affairs for the Global Organization for EPA and DHA Omega-3s (GOED), urged caution when interpreting the results."Results from this research should be considered preliminary in nature. Given the low number of subjects combined with an absence of a placebo control, these results need to be interpreted with caution," Dr Rice told us.

Study details

Wong and her co-workers recruited 25 obese individuals to participate in their randomized, single-blind trial. All the participants were assigned to a 25% energy deficit weight loss diet, with 13 of these also receiving addition omega-3 supplements (4 grams per day of Lovaza/Omacor, providing 46% EPA and 38% DHA). After 12 weeks of interventions, the researchers noted that, in the weight loss diet-only group, body weight decreased by 3%, waist circumference decreased by 4%, systolic and diastolic blood pressures both decreased by 3%, triglyceride levels fell by 25%, and insulin resistance (as measured by the homeostasis model assessment (HOMA)) decreased by 12%. HDL cholesterol levels increased by 9%, they added.

The weight loss diet-only group did not experience any significant changes in measures of arterial elasticity. Adding omega-3 supplements to the diet produced significant improvements in arterial elasticity, said Wong and her co-workers.

In addition, the omega-3 group displayed significantly greater improvements in systolic blood pressure, heart rate, and triglyceride levels, compared to the weight loss diet-only group.
Commenting on the potential mechanisms, the researchers made three proposals: The omega-3 ethyl esters may enhance the production of the vasodilating molecule nitric oxide (NO); it may displace the pro-inflammatory omega-6 arachidonic acid (AA) from cell membranes and offer anti-inflammatory activity; or the anti-inflammatory effects may directly influence a vasodilatory effect in smooth muscle cells.
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Food Science & Industry News

New DNA test identifies ingredients in foods

Ingredients Network.Com 01 April 2013

Scientists at Mainz University developed a novel screening procedure for accurately determining the amount of animal, plant, and microbial substances in foods

Almost all foodstuffs contain the genetic material of those animal and plant species that were used in their preparation. Scientists at the Institute of Molecular Genetics, Genetic Security Research and Consulting at Johannes Gutenberg University Mainz (JGU) have developed a novel screening procedure that provides for highly sensitive, quantifiable analysis of animal, plant, and microbial substances present in foodstuffs. For this, the researchers have adapted the latest techniques of DNA sequencing, which are otherwise currently employed in human genetics to unravel the genetic information of thousands of patients.

"The innovative aspect in comparison with conventional DNA detection methods such as polymerase chain reaction, or PCR for short, is that by means of bioinformatic analysis of all biological DNA data available worldwide we can identify the presence of material from species that we would not otherwise expect," said molecular geneticist Professor Dr. Thomas Hankeln, who developed the method in collaboration with bioinformaticist Professor Bertil Schmidt and colleagues at the German and Swiss food control authorities.

"And, using a simple digital method of counting short snippets of DNA, we will also probably be able to determine the relative incidence of individual species-related material more precisely than was previously the case."

In pilot studies, the researchers were able to use the new DNA method to detect the presence of a 1% content of horse meat in products and to determine the actual amount with a high level of precision. The Mainz researchers even found slight traces of the DNA of added mustard, lupin, and soy in a test sausage prepared for calibration purposes, something that could also be of interest with regard to allergy testing of foods.

Because of its potential, the method – dubbed 'All-Food-Seq' by its developers – has already attracted the attention of food inspection experts. "This method is very interesting in connection with efforts to promote the molecular traceability of food," said Hermann Broll of the German Federal Institute for Risk Assessment in Berlin and Dr. René Köppel of the Zurich Cantonal Laboratory in Switzerland. The method developed by the Mainz scientists is thus to be validated in comparison with conventional detection techniques in the near future.

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Researcher Cuts 50% of Fat in Chocolate Using Fruit Juice

April 8, 2013Food Product Design

COVENTRY, United Kingdom—Chocolate lovers might have find a new lowfat option if food manufacturers take advantage of a newly discovered method to replace up to 50% of the fat content in chocolate with fruit juice. The process retains the chocolaty mouthfeel lent by the fatty ingredients, according to a study published last August in the Journal of Materials Chemistry and presented this weekend at the American Chemical Society (ACS) meeting in New Orleans, La.

Chemists at the University of Warwick removed much of the cocoa butter and milk fats used in chocolate bar manufacture, substituting them with tiny droplets of juice measuring less than 30 microns in diameter, as Food Product Design news reported last year. At ACS Stefan A. F. Bon, Ph.D., research leader said the smaller droplets are key to imparting the smooth mouthfeel desired in chocolate. In addition, suspension of those droplets is also key. His team blended an anticaking agent plus chitosan into a slightly acidified water base to achieve “an emulsion more like a jelly, so the water droplets don’t sink" explains Bon. Known as a Pickering emulsion it involves the same principle used to manufacture mayonnaise.

What it creates is essentially a “hybrid confectionery" says Bon. Bon says his team used fruit juice because a slightly acidic fluid is necessary for the process, however water mixed with some ascorbic acid could substitute for the fruit juice. Fruit juice will impart some flavor however Bon says because the juice is dispersed into the fat matrix, the flavor sensation is “not that pronounced."

The use of chitosan, says Bon, “gives it a new twist and makes it processable." Chitosan is derived from chitin, a substance found in the shells or exoskeletons typically from shellfish. Chitosan may cause an allergic reaction in people allergic to shellfish.

The chocolate retains its mouthfeel because the new technique maintains the Polymorph V content, the substance in the crystal structure of the fat that gives chocolate its glossy appearance, firm and snappy texture, but also allows it to melt smoothly in the mouth.

Bon said even under storage conditions, his team did not note any “chocolate bloom" or the discoloration caused by fat migration that can appear on stored chocolate.

This process could help highlight the more beneficial aspects of dark chocolate in particular. Bon explained chocolate’s high fat and sugar content is a downside, compared to its high levels of healthful plant-based antioxidants or flavonoids. A 2-ounce serving of premium dark chocolate may contain 13 grams of fat—20 percent of the total daily fat recommended for a person who eats 2,000 calories per day.

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Using Nanotechnology to Kill Listeria in Foods

April 3, 2013Food Product Design

Scientists have developed a new method to kill deadly pathogenic bacteria, including Listeria, in food handling and packaging. The discovery represents an alternative to the use of antibiotics or chemical decontamination in food supply systems, according to research published in the journal Scientific Reports.

Researchers at Rensselaer Polytechnic Institute successfully attached cell lytic enzymes to food-safe silica nanoparticles, and created a coating with the demonstrated ability to selectively kill deadly bacteria, including Listeria, on contact, within a few minutes without affecting other bacteria. The lytic enzymes also can be attached to starch nanoparticles commonly used in food packaging.

The new method is modular, and by using different lytic enzymes, could be engineered to create surfaces that selectively target other deadly bacteria such as anthrax, said Jonathan Dordick, vice president for research and the Howard P. Isermann Professor at Rensselaer, who helped lead the study.

"In this study, we have identified a new strategy for selectively killing specific types of bacteria. Stable enzyme-based coatings or sprays could be used in food supply infrastructure—from picking equipment to packaging to preparation—to kill Listeria before anyone has a chance to get sick from it," said co-researcher Ravi Kane, the P.K. Lashmet professor of chemical and biological engineering. "What's most exciting is that we can adapt this technology for all different kinds of harmful or deadly bacteria."

This most recent study builds upon the research team's success in 2010 of creating a coating for killing methicillin resistant Staphylococcus aureus (MRSA), the bacteria responsible for antibiotic resistant infections. While the previous coating was intended for use on surgical equipment and hospital walls, the development of a Listeria-killing coating had the extra challenge of needing to be food-safe.

The researchers found their answer in lytic enzymes. Viruses that affect bacteria, called phages, inject their genetic material into healthy cells. The phage takes over a healthy cell, and in effect transforms the host cell into a little factory that creates more phages. Near the end of its life cycle, the original phage creates and releases lytic enzymes that break down and make holes in cell walls of the infected bacteria. The manufactured phages escape through these holes and go on to infect other healthy cells.

Nature used lytic enzymes to break out of bacterial cells, Dordick said, and the researchers worked for years to exploit the same lytic enzymes to break into bacteria such as MRSA and Listeria.

To stabilize the Listeria-killing lytic enzymes, called Ply500, the researchers attached them to FDA-approved silica nanoparticles to create an ultra-thin film. The researchers also used maltose binding protein to attach Ply500 to edible starch nanoparticles commonly used in food packaging. Both Ply500 formulations were effective in killing within 24 hours all Listeria at concentrations as high as 100,000 bacteria per milliliter—a significantly higher concentration than normally found in food contamination situations.

"Starch is an inexpensive, edible material often sprayed into the packaging as a powder layer on meat product. We took advantage of the natural affinity of a maltose binding protein fused to Ply500, and biologically bound Ply500 to starch as a non-antibiotic, non-chemical agent for reducing the threat of Listeria to our food supply," said Linda Schadler, the Russell Sage Professor and associate dean for academic affairs for the Rensselaer School of Engineering.

The research team plans to continue investigating new methods for harnessing the power of lytic enzymes to selectively kill harmful bacteria.

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Hexane-Free Rice Protein Extraction Method

April 4, 2013Food Product Design

CULVER CITY, Calif.—Axiom Foods leads the way for allergen-friendly, hexane-free whole grain brown rice ingredients with its natural rice protein extraction method, developed to help food, beverage and nutraceutical product manufacturers boast clean and allergen-free nutritional ingredients lists for their consumers.

The company's proprietary method for extracting protein from all layers of the whole grain rice including bran, germ and endosperm, is a low-heat, enzymatic process that's hexane-free. Ingredients are tested throughout growing, harvesting and processing for various certifications from organic and gluten-free to testing for meeting

California Prop 65 standards. Its methodologies for extracting are also applied to other plant proteins such as pea, sachainchi, flax and other superfoods.

"Hexane is a chemical solvent, most parts of which are gasoline and used in the creation of glues for footwear and roofing, to extract oil and grease from water and soil and come from the refining of crude oil," said David Janow, Axiom CEO. "The toxicity of hexane in humans is well known and chronic exposure can result in extensive nervous system damage." The chemical is on the U.S. Toxic Inventory list.

As a founding member of the World Rice Alliance, Axiom works to source rice that is low in naturally occurring heavy metals from areas like Thailand, Cambodia, Vietnam, China, Argentina and California.

Additionally, in a clinical trial Axiom's signature, hexane-free and non-GMO Oryzatein® rice protein, showed that plant-based rice protein rivals dairy-based whey for muscle building, fat reduction and muscle repair on March 9, 2013.

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Reducing food waste: A key element in feeding billions more people

John Floros, former IFT President and Dean of Agriculture & Director of KSRE at Kansas State University, shared insight in how to reduce food loss in the keynote talk at the 245th National Meeting & Exposition of the American Chemical Society.

“We will need another ‘Green Revolution’ to feed the world by 2050,” said John Floros, referring to the development of high-yield, disease-resistant breeds of grain and other agricultural innovations that took root in the 1960s. “That will mean scientific innovations, such as new strains of the big three grains—rice, wheat, and corn—adapted for a changing climate and other conditions. It also will require action to reduce a terrible waste of food that gets too little attention.”

Floros cited estimates that in many developing countries up to half of the food harvested from farmers’ fields is lost before reaching consumers. That waste can occur due to spoilage from improper storage of grain during transportation or from pests. Rats and mice alone eat or spoil 20% of the world’s food supply due to contamination with their urine and feces.

“A different kind of waste occurs in the United States and some other developed countries,” said Floros. “Developed countries have much more efficient systems for preserving, storing, transporting, and protecting food from spoilage and pests. But as a nation—households, supermarkets, restaurants, other foodservice providers—we throw away about 4 out of every 10 lbs of food produced each year.”

Government studies show, for instance, that the average family in the United States throws away 20 lbs of food a month, more than $2,000 worth every year for a family of four. It includes food that has gone uneaten and spoiled in refrigerators and on pantry shelves, as well as food that people throw away after cooking. Uneaten food actually rivals paper, plastic, and other refuse as the number one material in some municipal landfills.

Several other food-related challenges lie ahead, Floros explained. Water, for instance, is becoming scarcer, as is fertile farmland. Global climate change may stress those resources even further. The demand for sustainable energy may divert more cropland to production of crops for biofuel production. Economic conditions threaten less investment in agricultural research and development. Drought and other extreme weather could impact food

production. And consumption of too much food and less nutritious foods underpins epidemics in obesity and type 2 diabetes.

"We're not doing enough to resolve these complex issues that are critical for providing 9–10 billion people with a nutritious diet," said Floros. "Consumers, industry, universities, and governments all need to pitch in. The first step is more awareness of these issues and the need for action on multiple levels of society."

IFT Weekly April 10, 2013

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Irradiation of Tomatoes and Peppers Approved Down Under

April 16, 2013Food Product Design

CANBERRA, Australia —Food Standards Australia New Zealand (FSANZ) has announced the approval of irradiation of tomatoes and peppers as a quarantine treatment for fruit flies and other pests of concern to Australia and New Zealand.

FSANZ received Application A1069 , "Irradiation of Tomatoes & Capsicums," from the Department of Agriculture, Fisheries and Forestry (DAFF) Queensland3 in association with the New Zealand Fresh Produce Importers Association (NZFPIA) to permit treatment by irradiation of tomatoes and capsicums as a phytosanitary measure because the use of the chemicals formerly employed for this purpose, dimethoate and/or fenthion, has been restricted.

FSANZ concluded available studies indicate that irradiating tomatoes and peppers does not pose a significant human health risk for consumers because:

- No toxicological hazards have been identified with the use of food irradiation up to a maximum of 1 kGy.
- Differences in the levels of irradiation sensitive vitamins or provitamins (ie. vitamins A & C and beta-carotene) in tomatoes and capsicums are within the range of the vitamin losses that normally occur during the storage or processing of non-irradiated fruit.
- Any potential effects of irradiation on vitamin levels are smaller than effects associated with other food handling or processing steps, such as cooking, drying, freezing, storage time and ripeness.
- Estimated mean dietary intakes of the irradiation-sensitive vitamins A and C following irradiation remain above Estimated Average Requirements even for the worst case scenario (loss of 15% following irradiation of fresh tomatoes, capsicums and tropical fruits (with existing irradiation permissions)).
- Assessment of the combined cumulative nutritional impacts of both the currently permitted irradiated foods and irradiated fresh tomatoes and capsicums on population intakes of vitamin A and C led to an estimated decrease of less than 2% for all scenarios.

FSANZ requires mandatory labeling and record-keeping requirements for all irradiated foods, therefore, no additional labeling of irradiated tomatoes and capsicums will be needed.

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Revealing the Scientific Secrets of Why People Can't Stop After Eating One Potato Chip

Apr. 11, 2013 Science Daily

The scientific secrets underpinning that awful reality about potato chips -- eat one and you're apt to scarf 'em all down -- began coming out of the bag today in research presented at the 245th National Meeting & Exposition of the American Chemical Society.

Tobias Hoch, Ph.D., who conducted the study, said the results shed light on the causes of a condition called "hedonic hyperphagia" that plagues hundreds of millions of people around the world."That's the scientific term for 'eating to excess for pleasure, rather than hunger,'" Hoch said. "It's recreational over-eating that may occur in almost everyone at some time in life. And the chronic form is a key factor in the epidemic of overweight and obesity that here in the United States threatens health problems for two out of every three people."

The team at FAU Erlangen-Nuremberg, in Erlangen, Germany, probed the condition with an ingenious study in which scientists allowed one group of laboratory rats to feast on potato chips. Another group got bland old rat chow. Scientists then used high-tech magnetic resonance imaging (MRI) devices to peer into the rats' brains, seeking differences in activity between the rats-on-chips and the rats-on-chow.

With recent studies showing that two-thirds of Americans are obese or overweight, this kind of recreational over-eating continues to be a major problem, health care officials say.Among the reasons why people are attracted to these foods, even on a full stomach, was suspected to be the high ratio of fats and carbohydrates, which send a pleasing message to the brain, according to the team. In the study, while rats also were fed the same mixture of fat and carbohydrates found in the chips, the animals' brains reacted much more positively to the chips.

"The effect of potato chips on brain activity, as well as feeding behavior, can only partially be explained by its fat and carbohydrate content," explained Tobias Hoch, Ph.D. "There must be something else in the chips that make them so desirable," he said.

In the study, rats were offered one out of three test foods in addition to their standard chow pellets: powdered standard animal chow, a mixture of fat and carbs, or potato chips. They ate similar amounts of the chow as well as the chips and the mixture, but the rats more actively pursued the potato chips, which can be explained only partly by the high energy content of this snack, he said. And, in fact, they were most active in general after eating the snack food.

Although carbohydrates and fats also were a source of high energy, the rats pursued the chips most actively and the standard chow least actively. This was further evidence that some ingredient in the chips was sparking more interest in the rats than the carbs and fats mixture, Hoch said.

Hoch explained that the team mapped the rats' brains using Manganese-Enhanced Magnetic Resonance Imaging (MEMRI) to monitor brain activity. They found that the reward and addiction centers in the brain recorded the most activity. But the food intake, sleep, activity and motion areas also were stimulated significantly differently by eating the potato chips.

"By contrast, significant differences in the brain activity comparing the standard chow and the fat carbohydrate group only appeared to a minor degree and matched only partly with the significant differences in the brain activities of the standard chow and potato chips group," he added.

Since chips and other foods affect the reward center in the brain, an explanation of why some people do not like snacks is that "possibly, the extent to which the brain reward system is activated in different individuals can vary depending on individual taste preferences," according to Hoch. "In some cases maybe the reward signal from the food is not strong enough to overrule the individual taste." And some people may simply have more willpower than others in choosing not to eat large quantities of snacks, he suggested.

If scientists can pinpoint the molecular triggers in snacks that stimulate the reward center in the brain, it may be possible to develop drugs or nutrients to add to foods that will help block this attraction to snacks and sweets, he said. The next project for the team, he added, is to identify these triggers. He added that MRI studies with humans are on the research agenda for the group.

On the other hand, Hoch said there is no evidence at this time that there might be a way to add ingredients to healthful, albeit rather unpopular, foods like Brussels sprouts to affect the rewards center in the brain positively.
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Ready for Debut: Fruit-Juice-Infused Chocolate With 50 Percent Less Fat

Apr. 7, 2013 Science Daily

Already renowned as a healthy treat when enjoyed in moderation, chocolate could become even more salubrious if manufacturers embraced new technology for making "fruit-juice-infused chocolate," a scientist said at a conference in New Orleans on April 7.The presentation was part of the 245th National Meeting & Exposition of the American Chemical Society.

Stefan A. F. Bon, Ph.D., who led the research, explained that the technology would allow manufacture of chocolate with fruit juice, vitamin C water or diet cola replacing up to 50 percent of the fat. The juice is in the form of micro-bubbles that help chocolate retain the lush, velvety "mouth-feel" -- the texture that is firm and snappy to the bite and yet melts in the mouth. The process also prevents "sugar bloom," the unappetizing white film that coats the surface of chocolate that has been on the shelf for a while.

"We have established the chemistry that's a starting point for healthier chocolate confectionary," Bon said. "This approach maintains the things that make chocolate 'chocolatey', but with fruit juice instead of fat. Now we're hoping the food industry will take the next steps and use the technology to make tasty, lower-fat chocolate bars and other candy."

Chocolate's high fat and sugar content is a downside, compared to its high levels of healthful plant-based substances termed antioxidants or flavonoids, Bon explained. A 2-ounce serving of premium dark chocolate may contain 13 grams of fat — 20 percent of the total daily fat recommended for a person who eats 2,000 calories per day. Much of that fat is the unhealthy saturated variety. Substituting fruit juice or cola also reduces the overall sugar content of the candy.

The technology works with dark, milk and white chocolate. Bon's team at the University of Warwick in the United Kingdom has made chocolate infused with apple, orange and cranberry juice.
"Fruit-juice-infused candy tastes like an exciting hybrid between traditional chocolate and a chocolate-juice confectionary," he said. "Since the juice is spread out in the chocolate, it doesn't overpower the taste of the chocolate. We believe that the technology adds an interesting twist to the range of chocolate confectionary

products available," according to Bon. "The opportunity to replace part of the fat matrix with water-based juice droplets allows for greater flexibility and tailoring of both the overall fat and sugar content."

Bon's team used fruit juices and other food-approved ingredients to form a Pickering emulsion, named for British chemist Percival Spencer Umfreville Pickering. In 1907, Pickering discovered a new way to stabilize emulsions — combinations of liquids like the egg yolk and oil in mayonnaise that normally would not mix together. Chocolate is an emulsion of cocoa butter and water or milk combined with cocoa powder. Lecithin appears on the ingredient label in many chocolates because it is an emulsifier that fosters the process. Pickering's method used solid particles rather than an emulsifier, and Bon's team embraced that century-old approach in their work.
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Food Safety & Regulatory News

More Efforts Needed to Regulate Dietary Supplements, Experts Urge

Apr. 18, 2013 Science Daily

Dietary supplements accounted for more than half the Class 1 drugs recalled by the U.S. Food and Drug Administration from 2004-12, meaning they contained substances that could cause serious health problems or even death, a new study from St. Michael's Hospital has found.The majority of those recalled supplements were bodybuilding, weight loss or sexual enhancement products that contain unapproved medicinal ingredients, including steroids, said the study's lead author, Dr.ZivHarel.

Almost one-quarter of the substances are manufactured outside of the United States, he said in the study published online in the journal JAMA Internal Medicine.Unlike pharmaceutical products, dietary supplements do not require FDA approval before they can be sold. The FDA defines a dietary supplement as a product taken by mouth that contains a "dietary ingredient" such as vitamins, minerals, herbs, other botanicals, amino acids or substances such as metabolites. There are about 65,000 dietary supplements on the market consumed by more than 150 million Americans.

Of the 465 drugs subject to a Class 1 recall in the U.S. between Jan. 1, 2004, and Dec. 19, 2012, 237 or 51 per cent were dietary supplements. The majority of recalls occurred after 2008 for reasons unknown, the researchers said.Supplements marketed as sexual enhancement products were the most commonly recalled dietary supplements (95, or 40 per cent).

Dr.Harel, a nephrologist whose research focus is patient safety, said that when the FDA learns of an adulterated dietary supplement, it is required to contact the manufacturer to trace the source of the product and initiate a recall. However, a recent investigation by the Office of the Inspector general determined that the FDA does not possess accurate contact information for 20 per cent of supplement manufacturers.

The FDA has recently introduced a number of initiatives aimed at mitigating the impact of the most common adulterated supplements, including the creation of multinational enforcement groups and widespread media campaigns focusing on improving awareness. "Despite these initiatives, products subject to Class I recalls continue to be readily available for sale, which may be due to an increasingly complex distribution network associated with these products, as well as ineffective communication by the FDA to consumers," Dr.Harel said.

"We also found a number of recalled products to be manufactured outside of the U.S. where manufacturing practices may not be subject to the same oversight and regulation required of domestic companies."Dr.Harel said increased efforts are needed to regulate this industry. "Keeping the status quo may taint the dietary supplement industry as a whole."

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Serving Size Is What Drives How Much We Eat More Than Anything Else

21 Apr 2013 Medical News Today

Large servings make us eat more, even when we are taught about the impact of portion size on consumption, according to investigators from the University of New South Wales, Australia.

People who learned how to engage in mindful - instead of mindless - eating still ate much more food than those given smaller servings with no orientation regarding mindful eating.The researchers explained in the Journal of Health Psychology that we need to find new ways to reduce the impact of portion size on overeating.Author, Dr. Lenny Vartanian, a senior lecturer in the UNSW School of Psychology and an author of the paper, said:If no effective approaches are found, it may be necessary to develop policy-related changes to provide a healthier food environment for people."

Most experts believe that portion sizes at home and in restaurants, which have increased considerably over the last 40 years, have contributed to the obesity explosion.DrVartanian said "Studies have consistently shown that increases in portion sizes for a wide range of foods and beverages result in increased energy intake. And the impact is not affected by factors such as hunger or the taste of the food."

The authors say that their study, which involved 96 women, is the first to examine the effectiveness of educating people about this phenomenon. The women were randomly selected to be served one of two portion sizes of macaroni with tomato sauce for lunch:

- Large portion - 600 grams
- Smaller portion - 350 grams

Half the women in either group were placed in a "mindfulness group", they were given a brochure about how external factors, including portion size, social and cultural influences, advertising, and mood can contribute to overeating. They were then asked to write about how such factors affected their food consumption in the past.

The participants in the mindfulness group were taught how to concentrate on the internal sensations, such as the feelings of hunger and satiety, as well as the taste of food, before being given their pasta meal.

DrVartanian said:"Neither of these brief exercises reduced the effects of portion size. Overall, participants in the larger portion group consumed about a third more pasta - 69 grams - than those in the smaller portion group."The participants in the large portion group consumed 87 more calories than the ones in the smaller portion group.

In March 2012, Dutch researchers explained in the journal Flavour that strong aromas lead to smaller bite sizes, and might also help control portion size.
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EU Margarine industry sets stricter trans fat standards

The trade association representing margarine and vegetable fats makers in the EU has tightened its Code of Conduct for the third time since 1995, in an effort to reduce trans fat levels in foods and fats at retail.

The International Margarine Association of the Countries of Europe (IMACE) says that voluntary measures to reduce trans fat in margarines sold to food manufacturers already have led to an average 76% reduction since 2004, from 7.1% to 1.7%. The organisation also supports mandatory labelling of trans fatty acids from all sources for retail products.

"The IMACE Code of Practice is a successful example of concerted and joint efforts by a sector to offer the best possible products to consumers," it said in a statement.Its initial 1995 standards recommended that all margarines and vegetable fat spreads, whether sold at retail or as ingredients, should contain less than 5% trans fat – about the level of butter. The Code of Conduct was updated in 2003 and again in 2007, and now recommends that spreads and margarines should contain no more than 2% trans fatty acids at retail.

For food manufacturers using vegetable fats as ingredients, the organisation said the new Code of Conduct is intended to prompt members to do more to actively encourage food companies to limit trans fats to less than 2% of total fat content.It added that food companies should ensure saturated fat levels do not rise as a result of reformulation.

Evidence has mounted over the past 20 years that artificial trans fats raise low-density lipoprotein (LDL, or "bad" cholesterol) and lower high-density lipoprotein (HDL, or "good" cholesterol), thereby clogging arteries and causing heart disease. However, trans fats in the form of partially hydrogenated oils are attractive to food manufacturers, as they are solid at room temperature, extend product shelf life, are stable at high temperatures, and are inexpensive alternatives to other solid fats.
Food Navigator 19 Mar 2013

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Probiotic beads show potential for 'friendly bugs' to move beyond dairy

NutraIngredienst USA 01-Apr-2013

Using salmon eggs as their inspiration, Brazilian food scientists have developed probiotic beads for use in an expanded range of foods, including oriental cuisine.

Writing in the Journal of Functional Foods, researchers from the Universidade Federal do Rio de Janeiro report that the probiotic beads "maintained the recommended microorganism counts for a period that allows its industrialization and commercialization.This product may, thus, represent an opportunity for the introduction of non-dairy probiotics, especially in oriental cuisine, which is characterized by the consumption of raw fish and often involved in food borne disease outbreaks," they added.

Asia

Probiotic product launches are on the rise, according to market research firm Mintel. The dairy category still accounts for the bulk of probiotic launches worldwide, while the presence of probiotic products in other categories is limited and is not growing much.
According to Laura-Daisy Jones, global food science analyst for Mintel, the Asia Pacific regional continues to lead in terms of proboitic product launches. Almost 45% of product launches in the 2008-2012 timeframe were in this region. Europe is next with 34%, with North America a distant, but growing third.

From salmon eggs to probiotic beads

Because fish eggs are commonly used in oriental cuisine, the Rio-based scientists used the extrusion encapsulation technique with calcium alginate to develop probiotic beads similar to fish eggs. Beads were prepared using Lactobacillus rhamnosusGG ATCC 53103 and BifidobacteriumanimalisDN-173 010.

Measurements showed the beads were about 2.8 mm in diameter, and were stable to pH 3.0. In addition, beads containing L. rhamnosushad higher viability when stored for 30 days under refrigeration, they said."The probiotic product developed showed an 82.2% acceptability index of overall characteristics and good market potential as a new probiotic product," wrote the researchers.
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Majority of coloured foods in India illegal

Confectionery News 05-Apr-2013

Researchers are calling for a review of food colors in India after finding that the majority found in popular products exceed legal limits and almost a fifth of products contain illegal colors.

Sumita Dixit et al. published a study in the Journal of Food Science where they analyzed 2,409 samples of milk-based sweets, cereal based sweets and savory products that are commonly consumed in India based on surveys.

Over half of colors exceed legal limits

83.6% of samples contained permitted colors, but 58% of these were over the maximum allowable concentration limit of 100 mg/kg. 16.4% of the samples tested used non-permitted colors. The most common was Rhodamine B followed by Orange II and Metanil Yellow. This took the total number of adulterated products; whether by exceeding permitted limits or using non-permitted colors to 64.8%.

'Cause of concern' for children

The researchers conducted food frequency questionnaires involving 791 people to assess how often Indian consumers ate color-containing products at a national level. They found that children and adolescents had higher average daily consumption of such foods than adults, potentially posing a health risk.
"On the basis of average consumption of food commodities and average levels of detected colors, the intake of Sunset Yellow FCF saturates the acceptable daily intake limit to a maximum of 47.8% in children, which is a cause of concern," said the researchers.Sunset Yellow has previously been linked to hyperactivity in children and permitted levels were lowered inEurope by the European Food Safety Authority (EFSA) from 2.5 mg/kg to 1.0 mg/kg bodyweight per day in2009. Tartrazine, a lemon yellow color, was the most common permitted color. An earlier study found ADI limits were exceeded in 36% of food use in India.

Authors call for rule changes

The Food Safety and Standards Authority of India permits eight synthetic colors in specified foods at a uniform level of 100 mg/kg, while the acceptable daily intake ADI for food colors varies from 0.1 to 25 mg/kg body weight per day. The researchers said that rules needed to be reviewed.
"The saturation of ADI limits in these commodities up to 48% in a single color is a cause for concern.The uniform maximum permissible limit of synthetic colors at 100 mg/kg under the Indian rules thus needs to be reviewed and should rather be governed by the technological necessity and the consumption profiles of food commodities so that the vulnerable population should not unnecessary be exposed to excessive amounts of synthetic colors to pose health risks," said the researchers.
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Stealth sodium reduction? Consumers are attracted to low sodium claims on foods, says new analysis

Food Navigator USA, 18-Apr-2013
Advertising sodium reduction claims on food labels may increase a consumer's purchasing intentions, says a new study from Canada that contradicts the industry strategy of 'stealth' sodium reduction.

According to Christina Wong and her co-workers at the Universities of Toronto and Guelph, the food industry "believes the advertisement of reductions in sodium will lead to lower sales because of misconceptions over the poor taste of lower-sodium products".
This stance may be reinforced by high profile examples, such as the move by Campbell's Soup in 2011 to add some salt back into its Select Harvest soup range in an attempt to revive flagging sales.
Speaking with FoodNavigator-USA at the time, Beverly Murray, founder of branding agency R&M, told us that Campbell's move should be noted as a cautionary tale. Campbell's problem, she said in the summer of 2011, was that the company didn't just dip its toe in the water with some stealthy, under-the-radar sodium reduction, it went for it all guns blazing.

Times may be a-changing

However, new findings published in the American Journal of Clinical Nutrition, challenge these perceptions. "Data from our study showed that consumers were attracted to and considered sodium claims useful and influential in their intended purchasing decisions," wrote Wong and her co-workers.
"Thus, our results suggested that, as public health efforts continue to promote dietary sodium reduction, there would be a benefit to the industry in communicating the sodium content on the labels of their low-sodium food products, which may also stimulate the reformulation or introduction of additional lower-sodium products in the market place."
The Canada-based scientists used four mock, but professionally-designed packages to evaluate how different types of sodium claims affected consumer attitudes.
The study, which included 506 Canadian consumers with and without hypertension, surveyed their attitudes to four different types of claims: Three claims related specifically to sodium (disease risk reduction, function, and nutrient-content claims), while a fourth – 'tastes great' – acted as the control product.
Results showed that all three sodium-related claims resulted in "more-positive attitudes toward the claim, overall product healthfulness, and purchasing intentions than did the taste claim (control), although all mock packages were identical in nutritional composition and labeling except for the tested claims", wrote Wong et al. "The fact that all sodium claims elicited higher purchasing intentions than did the control tastes great claim contradicts the often-stated industry strategy of the use of a stealth approach to sodium reduction in food products," they added.
"There is great public health significance in the investigation of sodium claims to help inform labeling and sodium reduction food policy because these types of claims are present in the market place and can be used to propel population dietary sodium reductions forward," they concluded.
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