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Protein Foods and Nutrition Development Association of India

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Editorial

Lunch box is an important urban concept. School children proudly take their lunch boxes to school along with a water bottle. There are many different colours and designs for the boxes and mothers spend a lot of time with their children selecting. In fact lunch is an important meal but school children may not be eaten the food packed in the lunch boxes during lunch time as many schools have shifts so some children go to school early in the morning and come home around lunch time whereas some may leave around lunch and may come home by evening. However, the food packed in the lunch boxes is important even when it is eaten during the recess that may not be around lunch time as children need to be fed sometime during the school timing of 5 to 6 hours or longer.

Several surveys have been done in different places here as well as abroad on the contents of the lunch boxes. Although some mothers pack nutritious foods there are children who bring to school some of the things that they like which may include sweets, candies, cakes, potato wafers, biscuits and cookies of numerous varieties, energy bars, pizza, sandwiches as well as traditional items like chapattis with vegetables and meat or fish.

Children love to eat snack items which are tasty and to make them take stew or dal along with rice preparations is not only resisted but very inconvenient to take in a lunch box. There are some agencies in south which have started service of delivering lunch boxes taking a cue from Mumbai's dabbawalas. These meals would be nutritious as well as tasty so it would not only unburden mothers of planning and preparing food for lunch boxes but also these boxes would not come back with a lot of uneaten food.

Children are more difficult with respect to eating nutritious food which may not be very tasty. Adults would at least realise the importance of nutrition and would consume vegetables and greens although not very palatable. But children will not accept foods that are not tasty. Parents who do not have time and patience to argue and convince their wards as they themselves have to go to work, find it convenient to pack lunch boxes with foods that children like. Sometimes children themselves pack their lunch boxes.

There are also many nutritionists and diet experts who have started putting greater emphasis on taste along with nutrition since without acceptability nutrition will be difficult to achieve. There are also books that have appeared which make the tasty foods more nutritious by tweaking them a little by adding healthy ingredients that would elevate nutritional status of these foods. Rather than fighting with the kids and banning them from eating certain foods, it is easier to make these foods nutritious.

Of course, the best way would be to make them aware of nutrients and their effect on health but it may take some time to convince them. In the meanwhile it is better to sneak in nutrition into tasty foods.

With season's greetings,

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Protein Market – Where are the Real Performers?

In the sports nutrition market, high protein supplements have progressed from post training drinks to bodybuilders, to a range of mainstream muscle building products.

High protein diets and protein supplements have always been central to the bodybuilding market, but over the last 20 years the high protein concept has become mainstream. In the exercise sector, the explosion of the men's health form of muscle building products has been a key mainstream driver. Maximuscle was one of the first European companies to see the value of this sector and grew from a small start-up in 1995 to sales of € 190 million in 2010. In the late 1990s, there was also an explosion in interest in proteins from the wider population, as the Atkins Diet hit the headlines. This was found to deliver superior fat loss to conventional weight loss diets and the appetite suppressing effects of protein were central to its effectiveness. A wealth of studies now show benefits from increasing protein intakes above the RDA, both for muscle building and fat loss, providing the protein industry with its scientific bedrock.

All Created Equal

It is potentially very useful to have a reliable method to compare their nutritional value of the different dietary proteins. The Biological Value (BV) is commonly reported in the muscle-building sector on packaging and in marketing literature. BV measures the nitrogen retained in the body relative to that consumed from protein. Clearly this cannot exceed that consumed hence the highest possible BV is 100%. However, many companies selling whey proteins report BVs above this value e.g. "104+". In these circumstances, the BV is in fact measured relative to egg protein, which is assumed to have a BV of 100%.

It is extremely difficult to perform accurate nitrogen retention studies in humans, so most investigations are performed on rodents, or cattle. Although pigs often provide a useful animal model for humans, it is questionable if they accurately reflect human metabolism during periods of physical activity, or weight loss. These are the exact conditions that have direct relevance to consumers who exercise and/or are attempting to reduce body fat.

Many other methods have been used to assess protein quality, some of which are outlined in table 1. Since 1989, the Food and Agriculture Organisation (FAO) had adopted the Protein Digestibility Corrected Amino Acid Score (PFCAAS) to measure protein quality. However, the FAO have recently acknowledged that there are limitations to the PDCAAS and this should be abandoned. The dairy industry have highlighted PDCAAS as having artificially narrow differences between high and low quality protein; highly and poorly digestible proteins and overestimates the quality of proteins containing anti-nutritional factors. Instead they propose that the Digestible Indispensable Amino Acids Score (DIAAS) should be adopted. This measures the amino acid digestibility in the small intestine, rather than extrapolating from faecal matter protein content. Despite this, the DIAAS method still has serious limitations when extrapolating nutritional value to functional benefits. Therefore the measurement of real world functional effects is the only objective way to assess the nutritional value of proteins. Such as approach is necessary because the functional effects of protein are application dependent. For example, one protein might be particularly effective for fat loss, but might provide poor results when used to support muscle growth.

Not All in the Pricing

In 2000, the American Heart Association (AHA) advised that soy protein provided benefits against coronary artery disease. Even though the AHA revised their view in 2006, this did little to damage soy's health halo with mainstream consumers. Whey protein initially built its reputation with research, showing its digestive

characteristics helped maximise protein synthesis. Other investigations indicated that whey could provide advantages relative to other protein sources for promoting fat loss. This resulted in a huge demand for whey, both for sports nutrition and fat loss products, so whey concentrates now command prices of € 7 per kilo. After colostrums, this makes whey the most expensive protein ingredient (table 2). Instability in pricing and high costs led some product manufacturers to use whey as a "headline ingredient," but to blend it with cheaper proteins. For example, Maximuscle, who under founder Zef Eisenberg championed whey protein, now use soy protein and collagen in its flagship Promax products.

Protein and EFSA Claims

EU Member States requested that the European Food Safety Authority (EFSA) provide opinions relating to protein and a range of health claims. EFSA categorised the claims in relation to:

1. "Protein and increase in satiety leading to a reduction in energy intake,"
2. "Contribution to the maintenance or achievement of a normal body weight,"
3. "Maintenance of normal bone" and
4. "The growth or maintenance of muscle mass.

The panel rejected the claims relating to satiety and energy intake and the maintenance of normal body weight. This is surprising as protein is widely recognised as being the most satiating macronutrient and there is a wealth of scientific evidence to support this view. Increasing dietary protein content above the RDA was found to be more effective than carbohydrate for maintaining lean body mass, while simultaneously reducing body fat. Therefore these and many other studies could be used to demonstrate that protein contributes to the maintenance and achievement of normal body weight.

Accepted Claims

Claims relating protein intake and "maintenance of normal bone" and "the growth or maintenance of muscle mass" were accepted by EFSA. Protein manufacturers welcomed the latter claim because protein is a primary ingredient in muscle building products. Furthermore the terms "growth" and "muscle mass" have significant consumer appeal in the muscle building sector and their use on pack helps drive sales. However, the EFSA panel wording does not extend to benefits of protein and muscle recovery, which has much greater appeal for products targeting endurance athletes.

The EFSA opinion states that foods that bear the claim should be a source of protein as per Annex EC1924/2006. This stipulats that the protein content should provide at least 12% of the total energy, but importantly there is no minimum protein requirement. Therefore such products should legitimately carry the EFSA "muscle growth" health claim, even if the protein content is too low to make them effective.

In light of the diversity of dietary protein sources and ingredients available, it is surprising that the EFSA panel reported "protein is sufficiently characterised". There are major differences in the amino acid composition, bioactive content, metabolism and functional effects of different protein sources. If fact these differences between proteins are as diverse as the varying functionality of probiotics, for which EFSA previously requested very detailed characterisation. In saying that "protein is 'sufficiently characterised'," EFSA put all protein sources on an equal marketing footing. This should be a concern to consumers and food regulators alike. In humans, soy and dairy proteins have proven muscle-building effects, but this is not the case for collagen or gelatine. Furthermore

based on their amino acid composition and digestibility, it is questionable if gelatine or collagen could facilitate muscle growth.

The EFSA opinion denies consumers access to the information that could help them achieve body composition objectives. In contrast, it provides proteins of unproven efficacy a platform to make health claims. This coupled with EFSA's failure to set a minimum absolute protein content for foods bearing the claim relating to "muscle maintenance and mass," exposes consumers to products that cannot deliver the claimed effects.

Looking Forward

High protein products provide a core component of the weight loss market, taking the form of high protein bars, meal replacement drinks and even desserts. In the sports nutrition market, high protein supplements have progressed from post training drinks for bodybuilders, to a range of mainstream muscle building products. For example, many pre-workout formulations are high in protein, as are night recovery drinks.

However, by far the biggest area of change and growth in the sports nutrition has occurred with products for endurance sports. The marketing of these products has become more sophisticated than "hydrates better than water" and "gives you energy". This is reflected in the formulations, which typically contain protein and additional amino acids. Endurance sport participants now recognise the value of having high protein drinks after training.

In the 1990s, UK company Science in Sport (SIS) pioneered a range of protein recovery drinks for the endurance market. They provided products to take immediately after training that were based on soy (Rego Recovery) and whey (Rego Rapid), together with a night recovery drink based on casein (Rego Nocte). These once niche products are now mainstream.

A growing trend in the protein market is online suppliers of proteins direct to the consumer and Bulk Powders is one of the biggest in the UK. Their mail order business is based on providing high quality ingredients at the most affordable prices, which has led to incredible growth. This is part reflects a maturing of sports nutrition consumers, who look for better value products as they become more knowledgeable. This moves them away from high profile brands as they search for specific ingredients, which they know support their training needs. Bulk Powders also provides education, introducing their customers to new ingredients long before they reach the mainstream. One example is pea protein, which is significantly cheaper than milk and soy (table 2), but still provides high levels of BCAAs.

The increase in protein source availability to the food industry has spurned a range of new product formats. Once again pea protein is at the cutting edge and together with soy has been used to boost the protein content of bread. Two slices of Dr. Zac's bread contains 30g of protein, around 4 to 8 times more than white bread.

With a €6 price tag, it is more than five times the price of a regular loaf, Dr. Zac's are keen to point out their bread represents a low cost source of protein compared to bars and protein shakes. It is unclear if the format and protein sources used in Dr. Zac's bread will provide the same level of consumer appeal as conventional high protein products, however.

Article by Dr. Robert Child in The World of Food Ingredients Oct/Nov 2013

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Soy Industry: FAO Protein Findings Only Useful in Malnourished Populations

The European soy sector says a UN report that found dairy proteins offer a superior amino acid profile to plant proteins is only meaningful for the malnourished.

The European Natural Soyfoods Association (ENSA) – which has 10 member companies including Alpro, Hain Celestial, Triballat (Sojasun) and Life Food as members – said dairy protein may be more abundant in amino acids like lysine – but this was a non-issue for most people in developed countries.

The UN Food and Agriculture Organisation (FAO) report recommended changing the protein measurement system to something called Digestible Indispensable Amino Acids Score (DIAAS), which showed dairy protein could deliver up to 30% more amino acids than plant sources like soy isolates.

"DIAAS could be useful in developing countries which suffer from malnutrition in order to identify the protein source which could help to compensate for shortages of certain amino acids, e.g. where consumption of grain is high, the essential amino acid 'lysine' is in short supply," ENSA said.

"However, in western countries there is no shortage of specific amino acids thanks to the varied diet; therefore the new proposed method is not that relevant. In Western diet, it is important to maintain a varied balanced diet including protein from different sources."

ENSA said the DIAAS method was also compromised by the fact it is typically relied on animal data. The Brussels-based group said plant proteins also had a better record, "in terms of water use, land use and carbon footprint".

ADM scientists Fernandez and Flickinger said, "According to FAO, the ileal digestibility (DIAAS based method: is subject to very important limitations under specific conditions. This method cannot be used with confidence in the development of policies, unless the assumptions are properly controlled. Indeed, the Expert Consultation itself states that 'currently available data are insufficient to support the application in practice of true ileal amino acid digestibility in the calculation of DIAAS'. The DIAAS method is not yet ready to replace PDCAAS in practice and this is the important aspect for consumers."

Dairy Welcomes DIASS

The dairy and dairy ingredients sectors welcomed the FAO recommendation to abandon the Protein Digestibility Corrected Amino Acid Score (PFCAAS) testing method it had referenced since 1989. As part of its report to promote sustainable diets, FAO said, "limitations of PFCAAS have been recognised".

DIAAS is said to be more accurate because it measures amino acid digestibility in the small intestine rather than extrapolating from faecal matter protein content. "This limitation contributes to narrow the differences between high and low quality proteins, highly and poorly digestible proteins, and it overestimates the quality of proteins containing anti-nutritional factors," said Suzanne Leser, nutrition manager in lifestyle nutrition at UK dairy protein supplier Volac.

Lysine

She said the findings would promote greater use of high quality proteins and entered the lysine debate by saying: "Lysine is essential for healthy growth in children, for calcium absorption, and to form collagen for healthy connective tissues, but it is significantly destroyed during food processing – however this is not the case in diary

processing." The report called on its findings to the considered by Codex, the UN organ that makes food law recommendations. It has been sent to two Codex Committees: Food Labelling and Nutrition & Foods for Special Dietary Uses.

Laser added, "The focus now needs to be in supporting the FAO to adopt the new method. Volac will be working alongside the global dairy industry to achieve this. We would be ideally expect DIAAS to be adopted under Codex guidelines, for example labelling guidelines, before we begin discussions with European legislators." Such changes may include changing the criteria for 'source of protein' to differentiate between varying protein sources.

Arla Foods Ingredients' Madsen said, "This is about how to use resources in the best way. The population is growing so fast you need to optimise resource efficiently to feed them all. This shows that with dairy proteins you can use less and gain a higher nutritional value. If you look at the developing world there is increased demand for dairy proteins – the entire Asian region for instance. This report will help focus that attention."

Article by Shane Starling in Nutra Ingredients 7 March 2013

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Nutrition Week Activity 2013 in Delhi

Report by Ms. Ummeayman R., Nutritionist, PFNDAI

This year PFNDAI celebrated the Nutrition Activity not only in Mumbai but also in Delhi to encourage students towards a Healthy Lifestyle. The Nutrition Activity was organized on 27th September 2013 at Lady Irwin College, New Delhi.

Beverage market is on the rise and with youngsters' most preferred choice being beverages, it was the ideal topic to discuss in the seminar on 'Healthy & Safe Beverages'. The students participated by presenting their ideas on 'Food Safety' through posters and writing slogans on 'Nutritional Anaemia'. The Posters and Slogans were judged by Dr. Ravinder Chadha, Dr. Manisha Sabharwal and Dr. Neena Bhatia, each of the distinguished judges are professors and well known experts in the field of Food Science, Dietetics and Nutrition.

Seminar on 'Healthy & Safe Beverages' was organized in the afternoon. A brief of the presentations is as follows.

Dr. Anupa Sidhu, Principal Lady Irwin College, welcomed the delegates with a brief note on the safety aspect of foods. Safety is the main objective of FSSAI regulations, when it switched from Prevention of Food Adulteration to Food Safety and Standards Authority. She gave an insight into the labelling aspects of food products and one should read the labels carefully before selecting a product, take into considerations the nutritional values that are mentioned on the labels.

Dr. Prabhakar Kanade, Mother Dairy, also a Governing Board member of PFNDAI, represented the Association and in his inaugural address on 'Indian Efforts in Promoting Healthy and Nutritious Beverages', enlightened about the various beverage categories. Also healthy beverages contribute a lot to nation as we drink a lot of tea and coffee with milk. Thus fortification of these beverages with functional ingredients can be a good source of nutritional improvement. Traditional beverages which are good source of various minerals and nutrients need to be developed so that they are available for the consumers such as coconut water, neera etc. these are highly nutritious but need much work to be done by industry. Today we have lot of probiotic bacteria containing drinks in market which are gut friendly, there needs to be more awareness created for them too. India has lots of herbs and there

are lots of herbal products in market that can be good for non-communicable diseases, thus we need to give a boost to this section of products too.

When we talk of any beverage, the first thing that comes to our mind is water. Water being not only a beverage, it is life fluid. Today there are concerns of safe drinking water for rural population. It should be our major concern to look at solving this problem on priority.

Role of Ingredients for Healthy Beverages was presented by Mr. Purnachand, DuPont Nutrition & Health. Globally there is demand for healthy beverages and companies are taking care to meet these demands through various innovations. There are products which have strong health messages displayed on the packs, like organic, natural, highlighting the way in which milk is obtained has come to the fore more and more, as consumers desire transparency and more natural products. Companies are promoting the geographical location of the cows or the type of feed they are given. There are drinks in market that contain the powerful antioxidant EGCG, which reduces the risk of cancer, heart disease and diabetes, stimulates metabolism for faster calorie burning and fat oxidation.

India has also entered the arena of 'Health &Wellness' and consumers are not only aware of their internal wellbeing but are more conscious of their physique and appearance too. Other than the professional sports persons, there are consumers who are gym going, occasional active persons and weight manages who are conscious of their wellbeing and are looking towards sports drinks to meet their requirement.

Dr. B.L. Satyanarayana, Tetra Pak, presented 'Aseptic packaging for safety & nutrition'; he gave an insight into the UHT (Ultra-High Temperature) technology being utilized for milk packaging. UHT enables safety against spores by maximum destruction of the spores and there is minimal loss of vitamins. It can be utilized for packaging of milk as well as juices without the use of preservatives.

Nutritional Importance of Fruit Juices & Beverages, *Mr. Vijay Bhaskar Reddy*, Dabur, enlightened about the health and nutritional aspects of juices. Juices are good for health as they are rich in vitamins and minerals that are essential for our body, bone development, vision improvement and nourish our beauty. At times these juices are fortified with vitamins and minerals to have a greater impact on nutritional status and correspond to Recommended Daily Allowances (RDA) , however , they are not completely 100% RDA levels , as that will give a medicinal note and flavor delivery is difficult.

Nutritional Profiling: A tool for communicating healthy Food choices by *Dr. Pulkit Mathur*, Prof Lady Irwin Colleges, in her presentation, she stressed on the need for understanding what the labels mention. When we talk of Nutrient profiling, it is scientific method for assessing the nutrient quality of food. It is used to promote public health dietary goals, regulate marketing of foods to children. Although nutrition labelling alone is likely to offer limited success as it is only applied to pre-packaged foods. Also poor nutrition knowledge makes it difficulty in interpreting the nutrition information provided. Thus nutrition labelling ought to be supplemented by other nutrition education strategies.

Such informative blend of knowledge supply was very much appreciated by all and this was possible by the support of companies such as Dabur India, Tetra Pak, Mother Dairy and DuPont Nutrition & Health.

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Research in Health & Nutrition

Drinking Wine May Lower Depression

September 3, 2013 Food Product Design

Drinking two to seven glasses of wine a week may lower depression, according to a new study published in the journal BMC Medicine.

"The results of the study suggest that only moderate amounts of alcohol, consumed preferably in the form of wine, you can get protective effects against depression similar to similar to that observed for primary cardiovascular disease: coronary heart disease," said Miguel A. Martinez-Gonzales, director of the multicenter study.

The researchers followed 5,505 men and women, between the ages of 55 to 80, who participated in the PREDIMED Trial for seven years. Participants were free of depression and did not have any history of alcohol-related problems. Factors such as alcohol, mental health and lifestyle were assessed and repeated on a quarterly basis. The assessment consisted of medical examinations and a 137-item food frequency questionnaire that was administered by a dietitian.

Moderate alcohol intake within the range of 5 to 15 g/day was significantly associated with lower risk of incident depression (hazard ratio (HR) and 95% confidence interval (95% CI) = 0.72 (0.53 to 0.98) versus abstainers). Specifically, wine consumption in the range of two to seven drinks/week was significantly associated with lower rates of depression (HR (95% CI) = 0.68 (0.47 to 0.98)).

Similar studies have shown that sipping a pint of beer may improve heart health.

Martinez-Gonzales concludes that "small amounts of alcohol intake may exert a protection similar to what has been observed for coronary heart disease. Indeed, it is thought that depression and heart disease share several common casual mechanisms."

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Dark Chocolate May Reduce Hypertension

September 6, 2013 Food Product Design

Adults who consume 75 g of dark chocolate a day may have better control of their blood pressure than those who don't, according to a new study from the Federal University of Rio de Janeiro. For seven days, 21 hypertensive subjects, aged 40-65, were asked to consume 75 g a day of dark chocolate. They were included in the prospective study that measured blood pressure (BP), brachial flow-mediated dilation (FMD), peripheral arterial tonometry and central hemodynamic parameters.

Patients were divided according to the response in FMD: responders (n=12) and nonresponders (n=9). The responder group presented lower age, Framingham risk score (FRS), values of peripheral and central pulse

pressure (PP). FMD response showed negative correlation with FRS, baseline FMD, baseline reactive hyperemia index, and central PP.

After linear regression analysis, only FRS and baseline RHI were associated with FMD response.

One-week dark chocolate intake significantly improved endothelial function and reduced BP in younger hypertensive individuals with impaired endothelial function in spite of lower cardiovascular risk. A similar study published in June 2012 demonstrated a 30% lowered risk of strokes and heart attacks in individuals who consumed dark chocolate.

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Sleep Deprivation Linked to High-Calorie Food Choices

September 5, 2013 Food Product Design

There's more science to support the notion that getting a good night's is best for your health. A new study published the journal *Obesity* found people who were deprived of one night's sleep purchased more calories and grams of food in a mock supermarket on the following day.

Sleep deprivation also led to increased blood levels of ghrelin, a hormone that increases hunger, on the following morning; however, there was no correlation between individual ghrelin levels and food purchasing, suggesting that other mechanisms—such as impulsive decision making—may be more responsible for increased purchasing.

Researchers at Uppsala University investigated whether sleep deprivation may impair or alter an individual's food purchasing choices based on its established tendency to impair higher-level thinking and to increase hunger.

"We hypothesized that sleep deprivation's impact on hunger and decision making would make for the 'perfect storm' with regard to shopping and food purchasing—leaving individuals hungrier and less capable of employing self-control and higher-level decision-making processes to avoid making impulsive, calorie-driven purchases," said first author Colin Chapman, MSc, of Uppsala University.

On the morning after one night of total sleep deprivation, as well as after one night of sleep, the researchers gave 14 normal-weight men a fixed budget (approximately $50). The men were instructed to purchase as much as they could out of a possible 40 items, including 20 high-caloric foods and 20 low-calorie foods. The prices of the high-caloric foods were then varied to determine if total sleep deprivation affects the flexibility of food purchasing. Before the task, participants received a standardized breakfast to minimize the effect of hunger on their purchases.

Sleep-deprived men purchased significantly more calories (+9%) and grams (+18%) of food than they did after one night of sleep. The researchers also measured blood levels of ghrelin, finding that the hormone's concentrations were higher after total sleep deprivation; however, this increase did not correlate with food purchasing behavior.

"Our finding provides a strong rationale for suggesting that patients with concerns regarding caloric intake and weight gain maintain a healthy, normal sleep schedule," said Chapman.

This study supports a link between sleep loss and obesity. Findings from a study published in the journal *Nature Communications* that found losing sleep can make you more likely to crave junk foods rather than healthy foods. Other studies have linked poor sleeping habits to increased appetites. Results from the study show that sleep deprivation significantly decreased activity in appetitive evaluation regions within the brain during food

desirability choices, combined with increased activity of the amygdala. This change in brain activity is further associated with an increase in the desire for weight gain promoting high-calorie foods following sleep deprivation.

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Compound in Broccoli May Prevent Osteoarthritis

September 4, 2013 Food Product Design

Eating broccoli may prevent or slow the progression of osteoarthritis, according to a new study published in the journal *Arthritis & Rheumatism*. The findings suggest sulforaphane, a compound found naturally in broccoli, can benefit joint health.

The new research, led by the University of East Anglia, shows that sulforaphane slows down the destruction of cartilage in joints associated with osteoarthritis by blocking the enzymes that cause joint destruction by stopping a key molecule known to cause inflammation. Previous research has suggested that sulforaphane has anti-cancer and anti-inflammatory properties, but this is the first major study into its effects on joint health.

“This is an interesting study with promising results as it suggests that a common vegetable, broccoli, might have health benefits for people with osteoarthritis and even possibly protect people from developing the disease in the first place," said Arthritis Research UK’s medical director Prof. Alan Silman. While broccoli is a primary source of sulforaphane, the compound is also released when eating cruciferous vegetables, such as Brussels sprouts and cabbage.

The study involved researchers from UEA’s schools of Biological Sciences, Pharmacy and Norwich Medical School, along with the University of Oxford and Norfolk and Norwich University Hospital. The results were determined using mice fed a diet rich in the sulforaphane compound, who showed significantly less cartilage damage and osteoarthritis than those that were not.

Researchers from the School of Biological Sciences and Norwich Medical School are now embarking on a small scale trial in osteoarthritis patients due to have knee replacement surgery, to see if eating broccoli has similar effects on the human joint.

Lucky for consumers, sulforaphane can be found in frozen broccoli. At one time, the extreme heat from the blanching method used to prepare broccoli that was soon-to-be frozen destroyed the enzyme myrosinase, which is needed to form sulforaphane. According to a study published in the *Journal of Food Science*, researchers experimented with blanching broccoli at a slightly lower temperature instead of at the current industry standard which is 86 °C. Researchers used a temperature of 76 °C and found that 82% of the enzyme myrosinase was preserved without compromising food safety and quality.

“Until now research has failed to show that food or diet can play any part in reducing the progression of osteoarthritis, so if these findings can be replicated in humans, it would be quite a breakthrough," Silman said. "We know that exercise and keeping to a healthy weight can improve people's symptoms and reduce the chances of the disease progressing, but this adds another layer in our understanding of how diet could play its part."

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3 Servings of Fruit a Day Lowers Diabetes Risk

September 4, 2013 Food Product Design

Eating 3 servings of fruit a day, particularly blueberries, grapes and apples, significantly lowers an individual's risk of developing type 2 diabetes, according to a new study published in the *British Journal of Medicine*. The findings also suggest greater fruit juice consumption was associated with an increased risk.

Researchers from the Harvard School of Public Health conducted the study to determine whether individual fruits are differentially associated with risk of type 2 diabetes. Together with colleagues from Brigham and Women's Hospital and Harvard Medical School they examined data from three studies—the Nurses' Health Study (1984-2008), the Nurses' Health Study II (1991-2009), and the Health Professionals Follow-up Study (1986-2008)—that involved 187,382 participants and included food frequency questionnaires that were answered every two years. The team analyzed the participants' diet including intake of grapes, raisins, peaches, plums, apricots, prunes, bananas, cantaloupe, apples, pears, oranges, grapefruit, strawberries, blueberries and watermelon. During the 24-year follow-up, 6.5% of the participants developed type 2 diabetes. Participants who ate 3 servings per week of blueberries, grapes, raisins, apples or pears reduced the risk of type 2 diabetes by 7%. They also found higher consumption of fruit juice increase the risk of developing diabetes.

Most of these associations were quite consistent among three cohorts. Additionally, differences in the glycemic index/glycemic load values of fruits did not account for the association of specific fruits with risk of type 2 diabetes. Moreover, greater fruit juice consumption was associated with an increased risk, and substitution of whole fruits for fruit juice was associated with a lower risk, except for strawberries and cantaloupe.

Just last month, a study published in the journal *Circulation* found eating more than 2 servings of fruit a day lowers the risk of abdominal aortic aneurysm by as much as 25% compared to those who eat the least amount of fruit a day. The findings suggest high levels of antioxidants in fruits might protect against abdominal aortic aneurysm by preventing oxidative stress that can promote inflammation.

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Baker' yeast ingredient may support athletes' immune system

A study published in the *Journal of Dietary Supplements* shows that the ingredient *Wellmune WPG* may help athletes stay well after intense exercise. *Wellmune*'s ability to support the immune system may help athletes stay healthy after intense workouts and competitions, enabling them to train harder and longer.

The article focuses on results from two clinical studies conducted with *Wellmune WGP*, a beta 1,3/1,6 glucan from a proprietary strain of baker's yeast. Researchers found that *Wellmune* made a statistically significant reduction in the incidence of post-competition upper respiratory tract infection symptom days and also boosted mucosal immunity, the first line of defense against respiratory challenges.

One of the two studies was conducted among marathon runners and found that in contrast to the placebo group, those taking *Wellmune* had a higher degree of immune support before and after exercise as measured by the incidence of upper respiratory tract infection symptoms for 28 days post marathon. In addition, runners taking *Wellmune* for four weeks post-race reported a 37% reduction in the number of cold/flu symptom days post marathon.

The other study, conducted among stationary cyclists exercising in a heat-stress lab, measured changes in mucosal immunity. Subjects had been supplemented for 10 days with either *Wellmune* or placebo. It found that subjects taking *Wellmune* had a 32% increase in salivary immunoglobulin (Ig-A) at two hours post exercise.

"While many dietary interventions have been used to combat post-exercise immune suppression and are largely ineffective, the clinical research results with *Wellmune* demonstrate that its use can positively impact the immune

system and help athletes to stay well," said Brian McFarlin, lead investigator and Assistant Professor, Dept. of Kinesiology, Health Promotion and Recreation, University of North Texas.

IFT Weekly September 11, 2014

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Skipping breakfast may increase coronary heart disease risk

A new study from Harvard School of Public Health (HSPH) shows that men who regularly skipped breakfast had a 27% higher risk of heart attack or death from coronary heart disease than those who did eat a morning meal. Non-breakfast-eaters were generally hungrier later in the day and ate more food at night, perhaps leading to metabolic changes and heart disease. The study was published in the American Heart Association (AHA) journal *Circulation*.

The researchers analyzed food questionnaire data and health outcomes from 1992–2008 on 26,902 male health professionals, ages 45–82. During the study, 1,572 of the men had cardiac events. Even after accounting for diet, physical activity, smoking, and other lifestyle factors, the association between skipping breakfast and heart disease persisted.

"Skipping breakfast may lead to one or more risk factors, including obesity, high blood pressure, high cholesterol, and diabetes, which may in turn lead to a heart attack over time," said lead author Leah Cahill, Postdoctoral Research Fellow in HSPH's Dept. of Nutrition.

While the study group was composed mostly of white men, the results are likely to apply to women and other ethnic groups, but additional studies should be conducted, the researchers said.

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Red Grapes, Blueberries May Enhance Immune Function

Sep. 17, 2013 Science Daily

In an analysis of 446 compounds for their the ability to boost the innate immune system in humans, researchers in the Linus Pauling Institute at Oregon State University discovered just two that stood out from the crowd -- the resveratrol found in red grapes and a compound called pterostilbene from blueberries.

Both of these compounds, which are called stilbenoids, worked in synergy with vitamin D and had a significant impact in raising the expression of the human cathelicidin antimicrobial peptide, or CAMP gene, that is involved in immune function.

The findings were made in laboratory cell cultures and do not prove that similar results would occur as a result of dietary intake, the scientists said, but do add more interest to the potential of some foods to improve the immune response.

The research was published today in *Molecular Nutrition and Food Research*, in studies supported by the National Institutes of Health.

"Out of a study of hundreds of compounds, just these two popped right out," said Adrian Gombart, an LPI principal investigator and associate professor in the OSU College of Science. "Their synergy with vitamin D to increase CAMP gene expression was significant and intriguing. It's a pretty interesting interaction."

Resveratrol has been the subject of dozens of studies for a range of possible benefits, from improving cardiovascular health to fighting cancer and reducing inflammation. This research is the first to show a clear synergy with vitamin D that increased CAMP expression by several times, scientists said.

The CAMP gene itself is also the subject of much study, as it has been shown to play a key role in the "innate" immune system, or the body's first line of defense and ability to combat bacterial infection. The innate immune response is especially important as many antibiotics increasingly lose their effectiveness.

A strong link has been established between adequate vitamin D levels and the function of the CAMP gene, and the new research suggests that certain other compounds may play a role as well.

Stilbenoids are compounds produced by plants to fight infections, and in human biology appear to affect some of the signaling pathways that allow vitamin D to do its job, researchers said. It appears that combining these compounds with vitamin D has considerably more biological impact than any of them would separately.

Continued research could lead to a better understanding of how diet and nutrition affect immune function, and possibly lead to the development of therapeutically useful natural compounds that could boost the innate immune response, the researchers said in their report.

Despite the interest in compounds such as resveratrol and pterostilbene, their bioavailability remains a question, the researchers said. Some applications that may evolve could be with topical use to improve barrier defense in wounds or infections, they said.

The regulation of the CAMP gene by vitamin D was discovered by Gombart, and researchers are still learning more about how it and other compounds affect immune function. The unique biological pathways involved are found in only two groups of animals -- humans and non-human primates. Their importance in the immune response could be one reason those pathways have survived through millions of years of separate evolution of these species.

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Amino Acid With Promising Anti-Diabetic Effects

Sep. 9, 2013 Science Daily

New experiments conducted by researchers from the University of Copenhagen show that the amino acid arginine -- found in a wide variety of foods such as salmon, eggs and nuts -- greatly improves the body's ability to metabolise glucose. Arginine stimulates a hormone linked to the treatment of type 2 diabetes, and works just as well as several established drugs on the market. The research findings have just been published in the scientific journal Endocrinology.

More than 371 million people worldwide suffer from diabetes, of whom 90% are affected by lifestyle-related diabetes mellitus type 2 (type 2 diabetes). In new experiments, researchers from the University of Copenhagen working in collaboration with a research group at the University of Cincinnati, USA, have demonstrated that the amino acid arginine improves glucose metabolism significantly in both lean (insulin-sensitive) and obese (insulin-resistant) mice.

"In fact, the amino acid is just as effective as several well-established drugs for type 2 diabetics," says postdoc Christoffer Clemmensen. He has conducted the new experiments based at Faculty of Health and Medical Sciences, University of Copenhagen. He is currently conducting research at the Institute for Diabetes and Obesity at Helmholtz Zentrum München, the German Research Centre for Environmental Health in Munich.

To test the effect of the amino acid arginine, researchers subjected lean and obese animal models to a so-called glucose tolerance test, which measures the body's ability to remove glucose from the blood over time.

"We have demonstrated that both lean and fat laboratory mice benefit considerably from arginine supplements. In fact, we improved glucose metabolism by as much as 40% in both groups. We can also see that arginine increases the body's production of glucagon-like peptide-1 (GLP-1), an intestinal hormone which plays an important role in regulating appetite and glucose metabolism, and which is therefore used in numerous drugs for treating type 2 diabetes," says Christoffer Clemmensen, and continues:

"You cannot, of course, cure diabetes by eating unlimited quantities of arginine-rich almonds and hazelnuts. However, our findings indicate that diet-based interventions with arginine-containing foods can have a positive effect on how the body processes the food we eat."

The research findings were recently published in the American scientific journal *Endocrinology* under the heading *Oral l-arginine Stimulates GLP-1 Secretion to Improve Glucose Tolerance in Male Mice.*

Hormone plays key role

Researchers have known for many years that the amino acid arginine is important for the body's ability to secrete insulin. However, the latest findings show that it is an indirect process. The process is actually controlled by arginine's ability to secrete the intestinal hormone GLP-1, which subsequently affects insulin secretion.

"Mice without GLP-1 receptors are not affected to the same extent by arginine. There is no perceptible improvement in glucose metabolism or insulin secretion, confirming our hypothesis of a close biological connection between GLP-1 and arginine," says Christoffer Clemmensen, who conducted the biological experiments in the USA using a special animal model where the receptor for GLP-1 is genetically inactivated.

The new findings provide optimism for better and more targeted drugs for treating type 2 diabetes; the outlook is long-term, but promising.

"This exciting result has raised several new questions which we want to investigate. Can other amino acids do what arginine does? Which intestinal mechanisms 'measure' arginine and lead to the release of GLP-1? Finally, there is the more long-term perspective -- the question of whether the findings can be transferred from mice to humans and be used to design drugs that will benefit diabetes patients," says Professor Hans Bräuner-Osborne , who is continuing work on the project in the research group at the Department of Drug Design and Pharmacology at the University of Copenhagen.

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Low Omega-3 Could Explain Why Some Children Struggle With Reading

Sep. 13, 2013 Science Daily

An Oxford University study has shown that a representative sample of UK schoolchildren aged seven to nine years had low levels of key Omega-3 fatty acids in

their blood. Furthermore, the study found that children's blood levels of the long-chain Omega-3 DHA (the form found in most abundance in the brain) 'significantly predicted' how well they were able to concentrate and learn.

Oxford University researchers explained the findings, recently published in the journal *PLOS One*, at a conference in London on 4 September.

The study was presented at the conference by co-authors Dr Alex Richardson and Professor Paul Montgomery from Oxford University's Centre for Evidence-Based Intervention in the Department of Social Policy and Intervention. It is one of the first to evaluate blood Omega-3 levels in UK schoolchildren. The long-chain Omega-3 fats (EPA and DHA) found in fish, seafood and some algae, are essential for the brain's structure and function as well as for maintaining a healthy heart and immune system. Parents also reported on their child's diet, revealing to the researchers that almost nine out of ten children in the sample ate fish less than twice a week, and nearly one in ten never ate fish at all. The government's guidelines for a healthy diet recommend at least two portions of fish a week. This is because like vitamins, omega-3 fats have to come from our diets -- and although humans can in theory make some EPA and DHA from shorter-chain omega-3 (found in some vegetable oils), research has shown this conversion is not reliable, particularly for DHA, say the researchers.

Blood samples were taken from 493 schoolchildren, aged between seven and nine years, from 74 mainstream schools in Oxfordshire. All of the children were thought to have below-average reading skills, based on national assessments at the age of seven or their teachers' current judgements. Analyses of their blood samples showed that, on average, just under two per cent of the children's total blood fatty acids were Omega-3 DHA (Docosahexaenoic acid) and 0.5 per cent were Omega-3 EPA (Eicosapentaenoic acid), with a total of 2.45 per cent for these long-chain Omega-3 combined. This is below the minimum of 4 per cent recommended by leading scientists to maintain cardiovascular health in adults, with 8-12 per cent regarded as optimal for a healthy heart, the researchers reported.

Co-author Professor Paul Montgomery said: 'From a sample of nearly 500 schoolchildren, we found that levels of Omega-3 fatty acids in the blood significantly predicted a child's behaviour and ability to learn. Higher levels of Omega-3 in the blood, and DHA in particular, were associated with better reading and memory, as well as with fewer behaviour problems as rated by parents and teachers. These results are particularly noteworthy given that we had a restricted range of scores, especially with respect to blood DHA but also for reading ability, as around two-thirds of these children were still reading below their age-level when we assessed them. Although further research is needed, we think it is likely that these findings could be applied generally to schoolchildren throughout the UK.'

Co-author Dr Alex Richardson added: 'The longer term health implications of such low blood Omega-3 levels in children obviously can't be known. But this study suggests that many, if not most UK children, probably aren't getting enough of the long-chain Omega-3 we all need for a healthy brain, heart and immune system. That gives serious cause for concern because we found that lower blood DHA was linked with poorer behaviour and learning in these children. 'Most of the children we studied had blood levels of long-chain Omega-3 that in adults would indicate a high risk of heart disease. This was consistent with their parents' reports that most of them failed to meet current dietary guidelines for fish and seafood intake. Similarly, few took supplements or foods fortified with these Omega-3.'

The current findings build on earlier work by the same researchers, showing that dietary supplementation with Omega-3 DHA improved both reading progress and behaviour in children from the general school population who were behind on their reading. Their previous research has already shown benefits of supplementation with long-chain omega-3 (EPA+DHA) for children with ADHD, Dyspraxia, Dyslexia, and related conditions. The DHA Oxford Learning and Behaviour (DOLAB) Studies have now extended these findings to children from the general school population.

'Technical advances in recent years have enabled the measurement of individual Omega-3 and other fatty acids from fingerstick blood samples. 'These new techniques have been revolutionary -- because in the past, blood samples from a vein were needed for assessing fatty acids, and that has seriously restricted research into the blood Omega-3 status of healthy UK children until now,' said Dr Richardson.

The authors believe these findings may be relevant to the general UK population, as the spread of scores in this sample was within the normal population range for both reading and behaviour. However, they caution that these findings may not apply to more ethnically diverse populations as some genetic differences can affect how Omega-3 fatty acids are metabolised. Most of the children participating in this study were white British.

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Diet During Pregnancy and Early Life May Affect Children's Behaviour and Intelligence

Sep. 13, 2013 Science Daily

The statement "you are what you eat" is significant for the development of optimum mental performance in children as evidence is accumulating to show that nutrition pre-birth and in early life "programmes" long term health, well being, brain development and mental performance and that certain nutrients are important to this process.

Researchers from the NUTRIMENTHE project have addressed this in a five-year study involving hundreds of European families with young children. Researchers looked at the effect of, B-vitamins, folic acid, breast milk versus formula milk, iron, iodine and omega-3 fatty acids, on the cognitive, emotional and behavioural development of children from before birth to age nine.

The study has found that folic acid, which is recommended in some European countries, to be taken by women during the first three months of pregnancy, can reduce the likelihood of behavioural problems during early childhood. Eating oily fish is also very beneficial, not only for the omega-3 fatty acids they which are 'building blocks' for brain cells, but also for the iodine content which has a positive effect on reading ability in children when measured at age nine.

A long-term study was needed as explained by Professor Cristina Campoy, who led the project "Short term studies seem unable to detect the real influence of nutrition in early life," explained Prof Cristina Campoy, "NUTRIMENTHE was designed to be a long-term study, as the brain takes a long time to mature, and early deficiencies may have far-reaching effects. So, early nutrition is most important."

Many other factors can affect mental performance in children including; the parent's educational level, socio-economic status of the parents, age of the parents and, as discovered by NUTRIMENTHE, the genetic background of the mother and child. This can influence how certain nutrients are processed and transferred during pregnancy and breastfeeding and in turn, affect mental performance.

In giving advice to parents, Cristina Campoy explained, "it is important to try to have good nutrition during pregnancy and in the early life of the child and to include breastfeeding if possible, as such 'good nutrition' can have a positive effect on mental performance later in childhood." She went on to explain, "however, in the case of genetics, future studies should include research on genetic variation in mothers and children so that the optimum advice can be given. This area is relatively new and will be challenging!"

The knowledge obtained by NUTRIMENTHE will contribute to the science base for dietary recommendations for pregnant women and children for improving mental performance.

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A Snack Helps Reduce Cardiovascular Risk in Obese Children

Sep. 23, 2013 Science Daily

Researchers at the Universitat de València, Universitat Politècnica de València (UPV), Doctor Peset University Hospital and the Institute of Agrochemistry and Food Technology of CSIC have designed and tested the effectiveness of a new apple snack impregnated with tangerine juice that reduces the risk of cardiovascular disease in obese children and improves their physiological well-being. The snack, developed at laboratory scale at the premises of the Institute of Food Engineering for Development of the Universitat Politècnica de València stands out for its high antioxidant and anti-inflammatory potential.

According to the researchers, forty grams of this product provide the bioactive components of a glass of fresh tangerine juice. The results of this work have been published recently in the journal *International Journal of Food Sciences and Nutrition*, *Nutrición hospitalaria* and *Innovative Food Science and Emerging Technologies*.

To analyse the properties and functional value of the snack, a study was conducted involving 48 obese children aged 9 to 15 who were being treated at the Department of Paediatrics of the University Hospital Doctor Peset. Specifically, they evaluated the effect of the incorporation of the snacks to a low-energy diet, which the children followed during four weeks.

From this study, researchers found that the incorporation of the functional food to the children's diet improved systolic blood pressure and lipid profile (types of fats in the blood); also increased antioxidant defences and decreased markers associated with oxidative DNA damage and inflammation, all cardiovascular risk factors.

"It is not a product that induces weight loss in children, but it would help improve their quality of life. The modification of oxidative stress in adipose tissue (or fat tissue) can help in the prevention of cardiovascular risk associated with childhood obesity and in the long term prevent diseases such as atherosclerosis (hardening and narrowing of the arteries caused by the accumulation of fat, cholesterol and other substances)," said Dr. Pilar Codoñer, head of the Department of Paediatrics, University Hospital Doctor Peset and professor in the Department of Paediatrics at the Universitat de València.

To obtain the snack, researchers enriched apple slices with mandarin juice using a technology of impregnation developed and patented by the UPV team that allows incorporating additional ingredients to the structure of porous foods, as in the case of fruits and vegetables.

"After several years of work the product is ready to be marketed by private companies. Our snack has all the properties of two products as healthy as apples and tangerine and has no added ingredient. It is an alternative to snacks that exist in the market that contain oils and saturated fats and therefore are high in calories," says Noelia Betoret, principal researcher and professor at the School of Agricultural Engineering and Natural Environment.

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What are the benefits of ginger?

Ginger is an herb that is used as a spice and also for its therapeutic qualities. The underground stem (rhizome) can be used fresh, powdered, dried, or as an oil or juice. Ginger is part of the *Zingiberaceae* family, as are cardamom, turmeric and galangal.

This information article on ginger highlights the history of the herb, its therapeutic benefits, and some important precautions you should be aware of before taking the herb. According to the National Library of Medicine[1], part of the NIH (National Institutes of Health), ginger is widely used throughout the world for treating loss of appetite, nausea and vomiting after surgery, nausea resulting from cancer treatment, flatulence, stomach upset, colic, morning sickness and motion sickness.

Some people find ginger helps them with the symptoms of upper respiratory tract infection, bronchitis, cough, menstrual cramps, arthritis and muscle pain. In some parts of the world, ginger juice is applied to the skin to treat burns. Ginger is also used as a flavoring by the food and drinks industry, as a spice and flavoring in cooking, and for fragrance in soaps and cosmetics. Ginger contains a chemical that is used as an ingredient in antacid, laxative and anti-gas medications.

According to Kew Gardens[2], England's horticultural royal center of excellence, ginger has a long history of usage in South Asia, both in fresh and dried form. The University of Maryland Medical Center[3] writes that ginger has been used in China for over 2,000 years to help digestion and treat diarrhea, nausea and stomach upsets.

The Mahabharata (circa 4th century BC), one of the two major Sanskrit epics of ancient India, describes a stewed meat meal which includes ginger. Ginger has also been a key plant in Ayurvedic medicine, a system of traditional medicine native to the Indian subcontinent. Approximately 2000 years ago, ginger was exported from India to the Roman empire, where it became valued for its therapeutic as well as culinary properties.

Ginger continued to be traded in Europe after the fall of the Roman empire, where its supply was controlled by Arab traders for hundreds of years. During medieval times it became a popular ingredient in sweets. During the 13th and 14th centuries ginger and black pepper were commonly traded spices. By the sixteenth century one pound in weight of ginger in England would cost the equivalent of one sheep.

What are the therapeutic benefits of ginger?

Inflammation of the colon

A study carried out at the University of Michigan Medical School found that Ginger Root Supplement administered to volunteer participants reduced inflammation markers in the colon within a month. The study was published in the journal *Cancer Prevention Research*. Experts say that inflammation of the colon is a precursor to colon cancer. Co-researcher Suzanna M. Zick, N.D., M.P.H., explained that by reducing inflammation in the colon a person reduces their risk of developing colon cancer.

Zick said "We need to apply the same rigor to the sorts of questions about the effect of ginger root that we apply to other clinical trial research. Interest in this is only going to increase as people look for ways to prevent cancer that are nontoxic, and improve their quality of life in a cost-effective way."

Muscle pain caused by exercise

A study involving 74 volunteers carried out at the University of Georgia found that daily ginger supplementation reduced exercise-induced muscle pain by 25%. Patrick O'Connor, a professor in the College of Education's department of kinesiology, and colleagues carried out two studies on the effects of 11 days of raw and heat-treated ginger supplementation on exercise-induced muscle pain.

The volunteers consumed the ginger supplements for 11 consecutive days. On the 8th day they performed 18 extensions of the elbow flexors with a heavy weight. The aim was to induce moderate muscle injury to the arm. Each participant's arm function, inflammation, and pain levels were assessed before exercise and three days

afterwards. The researchers noted that the pain-reducing effect was not enhanced by heat-treating the ginger. The study was published in *The Journal of Pain*.

Nausea caused by chemotherapy

Ginger supplements administered alongside anti-vomiting medications can reduce chemotherapy-induced nausea symptoms by 40%, a PhaseII/III study carried out at the University of Rochester Medical Center found. Lead researcher, Dr Julie Ryan, presented the study findings at the American Society of Clinical Oncology meeting in Orlando, Florida, in 2009. Dr. Ryan explained that about 70% of cancer patients who receive chemotherapy experience nausea and vomiting. The vomiting is usually easy to control with effective medications. However, the nausea tends to linger. Dr. Ryan said "By taking the ginger prior to chemotherapy treatment, the National Cancer Institute-funded study suggests its earlier absorption into the body may have anti-inflammatory properties."

Ovarian cancer

A study found that exposing ovarian cancer cells to a solution of ginger powder resulted in their death in every single test. The cancer cells either died as a result of apoptosis (they committed suicide) or autophagy (they digested/attacked themselves). The researchers, from the University of Michigan Comprehensive Cancer Center added that the ginger solution also prevented the cancer cells from building up resistance to cancer treatment. The study findings were presented at the American Association for Cancer Research annual meeting in Washington D.C., 2006.

Asthma symptoms

A team at Columbia University carried out a study to determine what effects adding specific components of ginger to asthma medications might have on asthma symptoms. Team leader, Elizabeth Townsend, PhD, explained "In our study, we demonstrated that purified components of ginger can work synergistically with β-agonists to relax ASM (airway smooth muscle)." The scientists took ASM tissue samples and exposed them to acetylcholine, a compound that causes bronchoconstriction (narrowing of the airways).

They then mixed the β-agonist isoproterenol (asthma medication) with three different components of ginger:

- 6-gingerol
- 8-gingerol
- 6-shogaol

Contracted ASM tissue samples were exposed to each of the three mixtures as well as isoproterenol on its own. The team found that ASM tissues exposed to isoproterenol combined with the purified ginger components exhibited greater relaxation than those treated with just isoproterenol. Ginger component 6-shogaol had the greatest impact in enhancing the effects of isoproterenol.

Dr. Townsend said "Taken together, these data show that ginger constituents 6-gingerol, 8-gingerol and 6-shogaol act synergistically with the β-agonist in relaxing ASM, indicating that these compounds may provide additional relief of asthma symptoms when used in combination with β-agonists. By understanding the mechanisms by which these ginger compounds affect the airway, we can explore the use of these therapeutics in alleviating asthma symptoms." The study findings were presented at the American Thoracic Society International Conference 2013 in Philadelphia, Pennsylvania.

Liver damage caused by acetaminophen

Acetaminophen, known more commonly as "Tylenol" in the USA and "paracetamol" elsewhere, is a popular painkiller and antipyretic (reduces fever). However, acetaminophen is also associated with a higher risk of chemically-driven liver damage (hepatotoxicity), especially among patients with liver disorders.

Scientists at the National Research Centre in Egypt wanted to determine whether ginger pretreatment might reduce the incidence of acetaminophen-induced liver damage in rats.

The researchers wrote in the *Journal of Dietary Supplements*[4] "Our results demonstrated that ginger can prevent hepatic injuries, alleviating oxidative stress in a manner comparable to that of vitamin E. Combination therapy of ginger and acetaminophen is recommended especially in cases with hepatic (liver) disorders or when high doses of acetaminophen are required."

High blood pressure (hypertension)

A study reported in the journal *Pharmaceutical Biology*[5] found that cassumunar ginger extract was more effective than prazosin hydrochloride in reducing blood pressure in hypertensive laboratory rats. The researchers, from Chiang Mai University in Thailand wrote "The cassumunar ginger extract exhibited the maximum decrease of mean arterial blood pressure at 39.83 ± 3.92%, which was 3.54-times that of prazosin hydrochloride."

Dysmenorrhea (painful menstruation)

Ginger can help reduce the symptoms of pain in primary dysmenorrhea (period pains), researchers from the Islamic Azad University in Iran reported in the *Journal of Pakistan Medical Association*[6]. Seventy female students were divided into two groups:

- The ginger group - they took capsules containing ginger
- The placebo group - participants took capsules containing placebo

The participants took their capsules for three days at the beginning of their menstruation cycles. The researchers found that the 82.85% of the women taking the ginger capsules reported improvements in pain symptoms compared to 47.05% of those on placebo.

Migraines

A study performed at the VALI-e-ASR Hospital in Iran and published in the journal *Phytotherapy Research*[7] found that ginger powder is as effective in treating common migraine symptoms as sumatriptan. Sumatriptan is a common medication for migraine treatment. The double-blind, randomized clinical trial involved 100 participants. They all suffered form acute migraine without aura. They were randomly selected to receive either sumatriptan or ginger powder.

The study authors concluded "Efficacy of ginger powder and sumatriptan were similar. Clinical adverse effects of ginger powder were less than sumatriptan. Patients' satisfaction and willingness to continue did not differ. The effectiveness of ginger powder in the treatment of common migraine attacks is statistically comparable to sumatriptan. Ginger also poses a better side effect profile than sumatriptan."

Precautions

According to the University of Maryland Medical Center[3], the use of herbs can interact with other herbs or medications. Therefore it's important to talk to your doctor before taking ginger.

You should not take ginger if you suffer from a bleeding disorder or take blood-thinning medications (such as warfarin or aspirin).

Side effects of consuming ginger are rare, but may include:

- Diarrhea
- Heartburn
- Stomach upset
- Mouth irritation

Written by Christian Nordqvist 11 September 2013 – Medical News Today

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Vitamin B Supplements May Help Prevent Stroke

Stroke and the devastating side effects that many aging people suffer as a result of a cerebrovascular event can transform normally productive lives and result in a wide range of life-altering changes that increase the risk of early mortality.

Homocysteine, a byproduct of human metabolism, is a non-protein amino acid that dramatically increases the risk of vascular inflammation, cardiovascular disease and stroke.

Homocysteine has been on the radar of the medical profession and nutrition scientists for nearly two decades, yet elevated levels detected by simple blood tests are typically ignored, placing millions at significantly increased risk of chronic vascular disease and death.

Researchers performing a meta-analysis of studies that examine B vitamin intake and homocysteine levels have **uncovered evidence that suggests vitamin B supplements could help to reduce the risk of stroke.**

Publishing in the prestigious journal**, *Neurology*, the scientists from** *Zhengzhou University* in China referenced prior studies showing that B vitamin supplementation was beneficial for many health issues, including stress, anxiety, depression, dementia, Alzheimer's disease, heart disease and stroke.

Full Spectrum Vitamin B Supplements, coupled with Betaine, dramatically lower Homocysteine Levels and Stroke Risk

Lead study author, Dr. Xu Yuming and his colleagues analyzed fourteen randomized clinical trials involving a total of 54,913 participants. All studies compared use of vitamin B supplements with a placebo, or a very low dosage of the vitamin, and all participants were then followed for a period of six months.

Researchers found that a total of 2,471 stroke events were recorded during the duration of all studies followed. **The study results showed that the participants taking the vitamin B supplements had a seven percent reduced risk of stroke, compared with those taking the placebo supplements or a low dosage of vitamin B.**

Interestingly, the scientists found that intake of vitamin B9, a B vitamin isomer frequently used to fortify many wheat-based cereals actually reversed the positive health effects of supplementation with the whole spectrum of B vitamins to negate their stroke lowering effect.

While a seven percent reduction in stroke risk may appear to be relatively small, the researchers confirmed a host of past studies that demonstrate that the methyl-group donor known as trimethylglycine (also known as Betaine), works synergistically along with B vitamins to dramatically lower stroke (and cardiovascular disease) risk by clearing excess levels of homocysteine from circulation in the blood.

Dr. Yuming concluded *"Based on our results, the ability of vitamin B to reduce stroke risk may be influenced by a number of other factors such as the body's absorption rate, the amount of folic acid or vitamin B12 concentration in the blood, and whether a person has kidney disease or high blood pressure."* Health-minded individuals will want to take a high potency, full spectrum vitamin B supplement daily, along with TMG (750 – 1,000 mg) to naturally lower homocysteine and risk of cardiovascular disease and stroke.

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Researchers Question Fructose's Role in Obesity & Brain Functioning

Increases in childhood obesity levels, in part due to high intakes of fructose, may also have a dramatic effect on brain functioning and academic performance, warn researchers.
Writing in *Nutrition Journal,* the research team noted that the incidence of obesity has increased dramatically over the past several years, and in parallel, so has the prevalence of type 2 diabetes (T2D) - adding that many studies have suggested that both obesity and T2D are associated with lower cognitive performance, cognitive decline, and dementia.
Led by Shaheen Lakhan from the US-based Global Neuroscience Initiative Foundation, the researchers , more than 60% of adults living in the U.S. and Europe are now classed as obese - with a body mass index (BMI) of greater than 30 kg/m2.
"Not only does midlife obesity increase the risk of developing late-life dementia, but also lower cognitive performance earlier in life is itself a risk factor for dementia later in life," said the team.
"With the rising trend in childhood obesity, causing children to be at risk of diabetes and metabolic syndrome, the potential contribution of fructose to lower academic performance in adolescents is becoming increasingly realised," they suggested. *"This raises concerns regarding the short and long-term effects of fructose in humans, and the possibility that fructose intake in childhood is associated with poorer academic performance and impaired cognitive function as an adult."*

Review details

Lakhan and colleagues focused on the emerging evidence that obesity and dietary intake of certain foodstuffs may have an effect on cognitive functions - noting that intakes of fructose, along with HFCS have increased over the past three decades.

"What has recently emerged is the association of obesity with cognitive decline and that intake of added sugars may mediate the influence of obesity on cognitive function," they said. *"Although obesity may not be enough to warrant concern among parents, the lower academic potential of obese adolescents strongly argues for early treatment of childhood obesity and comprehensive intervention, including a limitation of sweetened soft drinks."*

The team noted that 'equally important' to cutting out added sugar may be the exploration of the role dietary omega-3 fatty acids play, *"which appear to have beneficial effects on cognitive function and attenuate high-fructose associated cognitive decline."*
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Sesame seed may reduce cholesterol and aid with blood sugar control

African seed boosts blood sugar control in 3 weeks

Whether you're diabetic — or are just traveling down the road towards the devastating disease — you know that poor blood sugar control can leave you feeling dizzy, tired, and chugging water like a dehydrated elephant. But if you're looking to ditch diabetes for good, there may be some potent help on the way — and it's all thanks to one of the tiniest seeds our Creator ever sowed on this green earth.

An eye-opening new study recently published in the *Journal of Food Research* has found that the simple sesame seed, the delicious bagel topping that's been a staple of good health in Africa and other regions of the world for thousands of years, may have the power to improve your blood sugar, slash your cholesterol, and set you on the road to permanent good health.

And it goes to work in as little as just three short weeks!

Here's the deal. Researchers asked 20 volunteers with prediabetes and high cholesterol to spend six weeks supplementing with a special extract derived from sesame seeds. After just three weeks, the volunteers had lowered their total cholesterol and improved their fasting glucose levels, taking a sharp and perhaps permanent detour away from the road to diabetes.

As we've been telling you for years, sesame seeds are packed with the phytosterols that are proven to lower your cholesterol and give your ticker a new lease on life. In fact, one study from the *Journal of Agricultural and Food Chemistry* ranked 27 different nuts and seeds for phytosterol content and proved that sesame seeds are brimming with the good-for-you plant sterols.

Before you surrender to a life ruled by diabetes why not give one of Mother Nature's tiniest seeds a chance to make a huge difference? You could be just 21 days away from acing your next blood sugar test.

From: wrightnewsletter.com 2013/09/11

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Two studies accost resveratrol form 2 diabetes potential

Supplemental resveratrol should be deliberate as an accessory to customary anti-diabetic agents in the diagnosis of form 2 diabetes, according to dual studies conducted during a University of Medical Sciences in Iran and JSS University in India.

Resveratrol is a polyphenol and anti-fungal antioxidant many typically sourced from grapes and red wine.

The JSS University, India

57 participants with form 2 diabetes (T2DM) were given possibly verbal hypoglycemic agents in a control organisation or resveratrol (250mg/day) and verbal hypoglycemic agents in a involvement organisation over a duration of 6 months.

"Our executive commentary are that verbal supplementation of resveratrol along with antidiabetic agents is effective in improving vascular risk factors, namely physique weight, oxidative highlight and lipid form in form 2 diabetic patients," professor Moola Joghee Nanjan told NutraIngredients.

"The unsentimental implications of these commentary are that form 2 diabetic patients are famous to be some-more supportive to a decrease in their peculiarity of life since of a ongoing disease, related complications, choice treatment, diet limitation and lifelong diagnosis with tablets or insulin. Supplementation of resveratrol is approaching to urge their peculiarity of life."

Existing form 2 diabetes (T2DM) treatments extent their use since of side effects like weight gain, hypoglycaemia and contraindications. Furthermore, stream anti-diabetic treatments do not have any poignant impact on compared risk factors, explain a JSS University researchers.

"There is a need, therefore, for new therapies that might urge not usually hyperglycaemic outcome though also a compared problems," the researchers wrote. *"Resveratrol could, therefore, be used as an effective adjuvant therapy with compulsory hyperglycemic fast for a government of diabetes."*

The University of Medical Sciences, Iran

The design of a Iranian investigate was to inspect a efficiency of resveratrol in obscure blood glucose in and with customary anti-diabetic diagnosis of form 2 patients in a randomised, placebo-controlled, double-blinded together clinical trial.

The investigate concerned 66 participants with T2DM incidentally reserved to possibly an involvement resveratrol supplemented organisation (1 g/day for 45 days) or a control organisation that perceived remedy tablets.

"The executive commentary of investigate was that supplementation of resveratrol (along with customary anti-diabetic medication) for a brief tenure is profitable in obscure blood glucose and insulin in patients with form 2 diabetes," Dr Ali Movahed told NutraIngredients.

"If destiny trials also endorse a certain outcomes celebrated in a study, resveratrol could turn an accessory in diabetic medicine. "Newer treatments are compulsory to element and raise a efficiency of existent diabetic regimen."

The many new epidemiological information from a International Diabetes Federation (IDF) showed that diabetes affects around 371m people globally, of that 4.8m die each year. This latter investigate remarkable that a Islamic Republic of Iran is one of a countries carrying a top superiority of T2DM. The investigate summarized also that building countries will make adult 77.6% of those influenced by 2030.

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Food Science & Industry News

Pectin, inulin may replace fat in cakes

A study published in the *Journal of Food Science* shows that pectin and inulin are the most efficient fat replacers for the development of low-fat cakes. The researchers replaced the fat in cakes from 35–100% with maltodextrin, inulin, oligofructose, citrus pectin, and microparticulated protein.

The researchers found that fat replacement by 35% did not induce significant differences in general. However, replacing fat above 65% resulted in statistically significant decreased viscosity (except for pectin) that was followed by statistically significant decrease in air incorporation and broader bubble size distribution. The starch gelatinization temperature showed a statistically significant increase when fat was replaced by fructose oligosaccharides. In addition, the cakes experienced a statistically significant increase of hardness, elasticity, and decrease of volume development as fat replacement increased above 65%. Also, cakes with increased fat replacement received lower scores on taste and flavor, whereas at total fat replacement they were evaluated as not acceptable. Nevertheless, at 65% fat replacement, the samples presented acceptable textural, physical, and sensorial attributes.

The researchers concluded that fat replacement up to 65% resulted in cakes of acceptable properties. Pectin and inulin, which proved the most efficient fat replacers, can be used for the development of low-fat cakes.

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Global Frozen Food Market to Reach $294 Billion by 2019

September 10, 2013 Food Product Design

Driven by a growing demand for faster-to-prepare foods and new product launches in the market, the global frozen food market is expected to reach $293.75 billion by 2019, up from $224.74 billion in 2012, according to new market data from Transparency Market Research.

According to the "Frozen Food Market (Vegetables & Fruits, Potatoes, Ready-to-eat Meals, Meat, Fish/Seafood and Soups) - Global Industry Analysis, Size, Share, Growth, Trends and Forecast, 2013 - 2019," report, strong demand in emerging economies is another factor contributing to the market growth, whereas government intervention and regulations are major restraints.

The U.S. was the largest market in 2012 and accounted for more than 80% share in the frozen food market followed by Japan and Germany. Brazil is the most attractive market for frozen food due to availability of raw materials in abundant quantity which makes frozen food products more accessible and affordable for consumers. The Brazil market is expected to grow at a CAGR of 4.7% from 2013 to 2019. China, India, and Mexico also anticipate market opportunities for frozen food.

Frozen ready meals, including frozen pizza, desserts, snacks, entrees, etc., accounted for more than 30% of the total global market revenue in 2012. Expected CAGR is 3.9% from 2013 to 2019. Frozen food made with natural and organic ingredients have shown huge market opportunity for manufacturers. Advancements in freezing technologies is fueling the growth for frozen fruits and vegetables, which allows the manufacturers to preserve the

nutritional value of the vegetables and fruits for a longer time period and in some cases restore key nutrients once lost using prior freezing processes.

The frozen fruit and vegetable market is expected to grow at a CAGR of 4.3% from 2013 to 2019. The frozen potatoes market is expected to witness the highest growth rate in the future with an expected CAGR of 4.3% from 2013 to 2019.

The largest share in the global frozen food market in 2012 belonged to Europe (39.5%) and North America (26.3%) respectively, driven by increased preference toward convenience foods, food safety concerns and the busy lifestyle. Row is estimated to be the fastest growing region over the next six years, due to emergence of Brazil and Argentina as the new markets for frozen food. Expected CAGR is 4.3% from 2013 to 2019. The Asia Pacific market is another attractive market for frozen food due to a healthy growth rate and increasing consumer preference toward frozen food.

There are several brands available in the market for frozen food, although few have a significant market share. The market for frozen food is highly fragmented as the top six companies had less than 20% of the market share in 2012, along with the presence of a number of small- and medium-sized participants. Key market participants include Nestlé, who recently invested $53 million to focus on frozen foods, ConAgra, H.J. Heinz and McCain.

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Vitamin K2 Soars in Global Functional Foods Market

September 5, 2013 Food Product Design

The use of vitamin K2 in the global functional food market is on the rise, as new product launches containing vitamin K2 have almost doubled (+183%) globally over the past five years, according to new research from Mintel.

Comparatively, the more common vitamin K1 posted healthy, but slower growth (+90%) over the same review period. Considering all food, drink, vitamin and supplements launches globally containing either vitamin K1 or K2, vitamin K1 was used in the overwhelming 96% of products, with the remaining 4% containing vitamin K2.

“Vitamin K1 has a relatively short half-life and is cleared by the liver within eight hours," said Laura Jones, Mintel global food science analyst. "In comparison, vitamin K2 has a longer half-life of up to 72 hours, meaning it remains biologically active in the body for longer. Vitamin K2 is also absorbed better by the body compared with vitamin K1. These factors, along with the additional health benefits linked to vitamin K2, should encourage the use of vitamin K2 over K1 when trying to correct vitamin K deficiency."

Within recent food and drink launches containing vitamin K2, the most active categories are vitamins and dietary supplements, which accounted for the majority (76%) of new product launches globally in 2012, followed by baby formula (6%), beverage mixes (6%), flavored milk (6%) and soy-based drinks (6%). This year vitamins and dietary supplements are still the most popular launches with K2 (58%), while research has recorded a higher penetration of soy-based drinks (25%), drinking yogurts and cultured milk (8%).

“Vitamins and supplements continue to be the largest category in which vitamin K2 is used," Jones said. "However, ongoing research and ingredient companies’ promotion of vitamin K2 as a health ingredient will likely assist its uptake in more food and beverages. And while vitamin K2 has been traditionally associated with cardiovascular and bone health, its role could extend beyond these features with its growing list of health benefits such as a role in sports nutrition and possibly in the prevention of cancer."

Overall, the use of cardiovascular and bone health claims is growing globally, with food and drink products holding bone health claims almost tripling in the past five years (+330%) and cardiovascular claims posting a healthy 66% growth over the past five years. Vitamin K2 proved a viable supplement for bone health in a 3-year clinical trial where studies concluded vitamin K2 supplementation provided a statistically significant protection of the most vulnerable bone structures i.e. vertebrae and the hip, and has also been linked to increased bone health in elderly men in women.

"Increasing incidence of cardiovascular and osteoporosis issues, will mean bone and cardiovascular claims will continue to be a key focus for functional foods and supplements, with women in particular being the main target for bone health products, due their higher incidence of osteoporosis," Jones said. "The main bone health ingredients will continue to be calcium and vitamin D, but as consumers' awareness of vitamin K2 increases, its prevalence in food and supplements making a bone health claim will increase. Effective cardiovascular ingredients will be sought after too and vitamin K2's potential in cardiovascular health should be highlighted."

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Cilantro may help purify drinking water

A study presented at the 246th National Meeting & Exposition of the American Chemical Society shows that cilantro may be an inexpensive new way of purifying drinking water. The researchers say that cilantro—also known as coriander and Thai parsley—shows promise as a much-needed new "biosorbent" for removing lead and other potentially toxic heavy metals from contaminated water.

"Cilantro may seem too pricey for use in decontaminating large amounts of water for drinking and cooking," said Douglas Schauer, Program Chair and Associate Professor of Chemical Technology at Ivy Tech Community College of Indiana. "However, cilantro grows wild in vast amounts in countries that have problems with heavy-metal water pollution. It is readily available, inexpensive, and shows promise in removing certain metals, such as lead, copper, and mercury, that can be harmful to human health."

Conventional methods for removing heavy metals from water such as treatment with activated carbon (used in the filters in home water purification pitchers) or more advanced technology like ion-exchange resins are very effective. However, they can be too expensive for use in developing countries, especially in rural areas. The need for lower-cost, sustainable alternatives has fostered research on biosorbents. These natural materials, which range from microbes to plants, latch on to heavy metals in ways that include both absorption and adsorption.

"Our goal is to find biosorbents that people in developing countries could obtain for nothing," Schauer explained. "When the filter in a water purification pitcher needs to be changed, they could go outside, gather a handful of cilantro or some other plant, and presto, there's a new filter ready to purify the water."

Schauer and his students worked with scientists at the Universidad Politécnica de Francisco I. Madero in Hidalgo, Mexico. Mexico does not have a system to filter out heavy metals, said Schauer, noting that cilantro grows wild there. Their small-scale experiments suggested that cilantro may be more effective than activated carbon in removing heavy metals such as lead.

Cilantro's secret may lie in the structure of the outer walls of the microscopic cells that make up the plant. They have an architecture ideal for sorption of heavy metals. Other plants, including cilantro's cousins, parsley and culantro, have similar features and could potentially work as biosorbents, added Schauer.

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Edible coatings for ready-to-eat fresh fruits and vegetables

Friday 13 September 2013 – Medical News Today

The scientist who turned fresh-cut apple slices into a popular convenience food, available ready-to-eat in grocery stores, school cafeterias and fast-food restaurants, today described advances in keeping other foods fresh, flavorful and safe for longer periods of time through the use of invisible, colorless, odorless, tasteless coatings.

The overview of these edible films was part of the 246th National Meeting & Exposition of the American Chemical Society (ACS), the world's largest scientific society. The meeting, which continues through Thursday in the Indiana Convention Center and downtown hotels, features almost 7,000 presentations on advances in science and other topics.

Attila E. Pavlath, Ph.D., pointed out that the use of edible films has grown dramatically since the mid-1980s, when only 10 companies were in the business, to more than 1,000 companies with annual sales exceeding $100 million today. Ready-to-eat fruits and vegetables now account for about 10 percent of all produce sales, with sales exceeding $10 billion annually. The use of edible films likely will expand dramatically in the future - especially for fruits and vegetables - as health-conscious consumers look for more foods that require minimal preparation like cut fruit and premixed salads, he noted.

"Fruits and vegetables have skins that provide natural protection against drying out, discoloration and other forms of spoilage," Pavlath explained. He is with the U.S. Department of Agriculture's Western Regional Research Center in Albany, Calif. "Cutting and peeling remove that natural protection, allowing deterioration and spoilage to begin. It's visible within minutes for foods like apples and bananas, but occurs without any outward sign for other fruits and vegetables. Nature is a very good chemist and we are learning from that and sometimes improving on it with new edible coatings that protect the quality and nutritional value of food."

Those coatings consist of a thin layer of edible material applied to the surface of a food product to preserve freshness. Apples, for instance, lose some of their natural wax coating during washing after harvest. The replacement is a thin layer of carnauba wax, obtained from the leaves of palm trees. That wax also gives sugar-coated chocolate candy an appealing gloss. Other common edible coatings include starch, alginate, carrageenan, gluten, whey and beeswax.

Pavlath and his group invented the technology that enabled schoolchildren and other consumers to enjoy a new apple treat - refrigerated, packaged apple slices that last 2-3 weeks without turning brown or losing crispness. Apples ordinarily begin to turn brown within 30 minutes after cutting or peeling. Pavlath's process involves treating freshly cut apple slices with a form of vitamin C, resulting in the first commercial product that retains the desirable characteristics of fresh apples without leaving a detectable residue.

The ACS Kansas City Section honored Pavlath at the meeting with its Kenneth A. Spencer Award for Outstanding Achievement in Food and Agricultural Chemistry.

Pavlath pointed out that edible films are by no means a 21st century innovation. Edible films were used at least as early as the 1100s, when merchants in citrus-growing regions of southern China used wax to preserve oranges shipped by caravan to the Emperor's table in the North. People in Europe for centuries preserved fresh fruit with "larding," a coating of the melted fat from hogs. Those coatings sealed off the fruit, preventing the exchange of gases with the air, essential for sustaining good quality.

Today's edible films, however, allow that exchange of gases and have other features that maintain freshness, flavor, aroma, texture and nutritional value. They generally provide the same protection against bacteria as the natural

skin if the foods are handled under sterile conditions when they are cut in the factory, Pavlath said. Workers either spray on the films or immerse the foods in the liquid coating after cutting. The finished fruits and vegetables then go to consumers in sealed containers.

The great 21st century challenges in edible coating research and development? Pavlath cited two challenges. One involves bananas, America's favorite fruit, which people consume each year in quantities greater than apples and oranges combined: finding an edible coating that would make fresh-cut sliced bananas a commercial reality. The other is developing a coating for avocados, which are also notorious for discoloring quickly after peeling.

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Food Safety & Regulatory News

EU Commission approves cocoa flavanols health claim

Barry Callebaut, manufacturer of high-quality cocoa and chocolate products, has announced that the EU Commission approved its health claim submission on cocoa flavanols (Regulation No 851/2013), following the positive Scientific Opinion issued by the European Food Safety Authority (EFSA) in July 2012. The company received the right to use the health claim that "cocoa flavanols help maintain the elasticity of blood vessels, which contributes to normal blood flow"—the first in the cocoa and chocolate industry. Barry Callebaut was able to provide evidence that the daily intake of 200 mg of cocoa flavanols supports a healthy blood circulation by helping to maintain the elasticity of the blood vessels.

Barry Callebaut now has the proprietary right to use the cocoa flavanols claim within EU countries. The claim can be used for cocoa beverages (with cocoa powder) or for dark chocolate providing at least a daily intake of 200 mg of cocoa flavanols. Barry Callebaut will be able to use the claim for its *ACTICOA* cocoa and chocolate products which retain most of the cocoa flavanols naturally present in the cocoa bean.

"Receiving the right to use a health claim on cocoa flavanols by the EU Commission is most valuable for us as it is a great reward for long years of extensive research," said Peter Boone, Chief Innovation Officer at Barry Callebaut. "The health claim is opening up new market potential. Since we received the positive opinion from EFSA on our submitted health claim, we saw a lot of interest among our customers."

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Concerns Over Mercury Levels in Fish May Be Unfounded

Sep. 30, 2013 Science Daily

New research from the Children of the 90s study at the University of Bristol suggests that fish accounts for only seven per cent of mercury levels in the human body. In an analysis of 103 food and drink items consumed by 4,484 women during pregnancy, researchers found that the 103 items together accounted for less than 17 per cent of total mercury levels in the body.

Concerns about the negative effects of mercury on fetal development have led to official advice warning against eating too much fish during pregnancy. This new finding, published today in *Environmental Health Perspectives*, suggests that those guidelines may need to be reviewed.

Previous research by Children of the 90s has shown that eating fish during pregnancy has a positive effect on the IQ and eyesight of the developing child, when tested later in life. Exactly what causes this is not proven, but fish contains many beneficial components including iodine and omega-3 fatty acids.

After fish (white fish and oily fish) the foodstuffs associated with the highest mercury blood levels were herbal teas and alcohol, with wine having higher levels than beer. The herbal teas were an unexpected finding and possibly due to the fact that herbal teas can be contaminated with toxins.

Another surprise finding was that the women with the highest mercury levels tended to be older, have attended university, to be in professional or managerial jobs, to own their own home, and to be expecting their first child. Overall, however, fewer than one per cent of women had mercury levels higher than the maximum level recommended by the US National Research Council. There is no official safe level in the UK.

The authors conclude that advice to pregnant women to limit seafood intake is unlikely to reduce mercury levels substantially.

Speaking about the findings, the report's main author, Professor Jean Golding OBE, said:

'We were pleasantly surprised to find that fish contributes such a small amount (only seven per cent) to blood mercury levels. We have previously found that eating fish during pregnancy has many health benefits for both mother and child. We hope many more women will now consider eating more fish during pregnancy. It is important to stress, however, that pregnant women need a mixed balanced diet. They should include fish with other dietary components that are beneficial including fruit and vegetables.'

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