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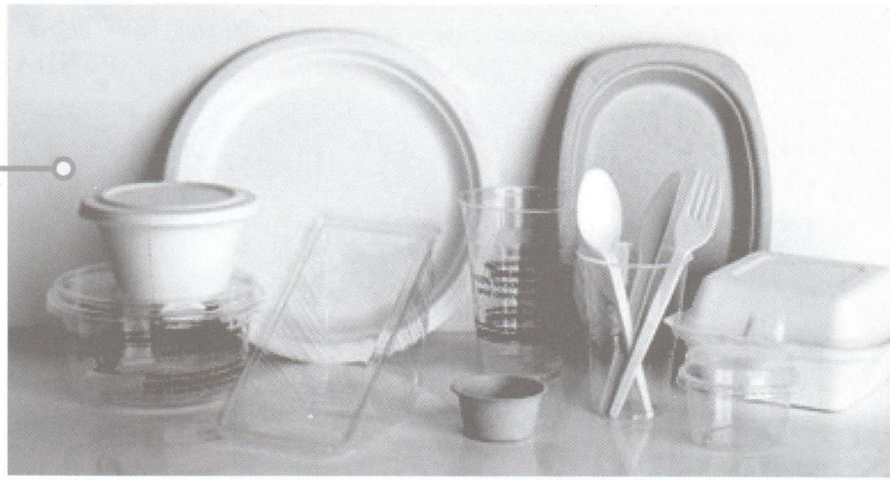
Protein Foods and Nutrition Development Association of India

22, Mahalaxmi Chambers, Bhulabhai Desai Road , Mumbai-400 026
Tel: +91 022 23538858
Email: pfndai@pfndai.org
Web: http://www.pfndai.com

Editorial



Recently a high court order has been passed stating that all the 'junk foods' will be packed only in biodegradable packaging material. This was in response to the pollution caused by junk foods which are eaten and then the packaging is thrown around which would litter with plastic material and cause all kinds of problems including clogging.

This kind of efforts were done in many metro cities also where in monsoon severe water clogging took place and then authority banned plastic carry bags as well as packing street and loose food in such bags. It was observed for some time and then everyone forgot about the problem.

Our authorities usually resort to banning as solution to all problems rather than solving the problems. Banning does not give the permanent solution but it only assuages the tempers of the petitioners. Is it really possible to pack all biscuits, savouries, sweets, soft drinks and other foods identified by the court as the 'junk foods' without considering whether there are packaging materials that would give adequate packing including the safety to the products. Packaging does not just give food a convenient handling and marketing benefit but there are many other useful advantages including safety aspects that need to be considered before banning any material and suggesting an alternative.

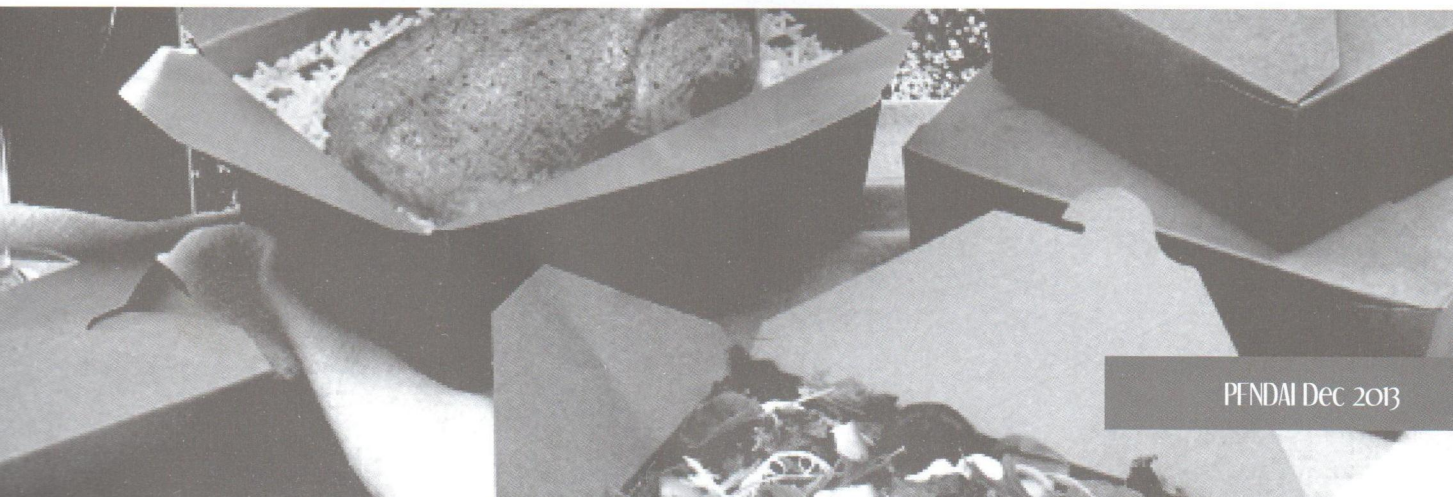
There are some biodegradable materials which are being developed which are at present very expensive and also not available commercially in adequate quantity. Trying to force industry to use such materials would be disastrous both the manufacturers as well as for consumers. Court probably thinks that these foods are not really necessary and making it difficult or very expensive probably is the real reason for such petition.

We do use a lot of non-biodegradable packaging material for all kinds of goods not just foods. We dump the material without sorting and all of it goes to dumping sites along with degradable materials. We use this for landfills and just create mountains of waste and cause of a lot of hygienic problems.
We need to have proper system of sorting waste as well as collection systems. In the western countries where the waste generated is even much more but they have been handling it systematically so the problems are less there. A lot of emphasis is given on recycling which we hardly do except for rag-pickers who recover these useful plastic materials.

In the west, even manufacturers have systems for return of bottles or jars for some monetary compensation. This also needs to be considered. Industry also should contribute to developing solutions rather than just depend on government to get rid of waste and if there are some difficult solutions then complain about it.

With season's greetings,

Prof. Jagadish S. Pai,
Executive Director
executivedirector@pfndai.org



Nutrition Improvement in traditional fermented food

Dr. Malathy V., Food Technologist, PFNDAI

Fermented foods have always been part of our tradition. This was one of the methods for preservation of food. Fermentation processes are believed to have been developed over the years by women, in order to preserve food for times of scarcity, to impart desirable flavour to foods, and to reduce toxicity. Preservation and safeguarding of foods and beverages remain the principal objectives of fermentation, with wholesomeness, acceptability and overall quality, having become increasingly valued features to consumers, especially in rural areas where old traditions and cultural particularities in food fermentations are generally well maintained.

A diversity of fermented products, including porridges, beverages (alcoholic and non-alcoholic), breads and pancakes, fermented meat, fish, vegetables, dairy products and condiments; are produced from both edible and inedible raw materials in many countries. Fermentation of both cereals and fruits and vegetables, can make otherwise inedible food stuffs safe, nutritious, and palatable, improving digestibility of protein and carbohydrates, removing natural toxins, and decreased cooking times

Some are consumed uncooked such as dahi or yogurt and some others are cooked before eating such as Idli.

Some examples of fermented cereals of India with the microorganisms responsible are

Name of product	Ingredients	Microorganism	Appearance
Idli	Rice, black gram	*L. mesenteroides* *S. fecalis* *T. candida* *T. pullulans*	Steamed cake
Dosa	Rice, black gram	*L. mesenteroides* *S. fecalis* *T. candida* *T. pullulans*	Pancake
Dhokla	Rice, Bengal gram	*L. mesenteroides* *S. fecalis* *T. candida* *T. pullulans*	Steamed cake
Jalebi	Wheat flour	*S. bayanus*	Pretzel like confection
Naan	Wheat flour	*Saccharomyces, Lactic acid bacteria*	Flat bread

Among fermented food consumed without cooking important ones are soy based and milk based food.

Traditional fermented soy foods include tempeh, miso, soy sauces, natto and fermented tofu and soymilk products. The bland soybean is traditionally fermented with different microorganisms to obtain a flavourful product.

Some examples are:

Name of product	Origin	Microorganism	Appearance
Tempeh	Indonesia	Rhizopus oligosporus	Chewy cake-like held together by the mycelia of the fungus with meat like flavour
Miso	Japan and South East Asia	Aspergillus oryzae	a white, brown or reddish-brown soybean paste
Soy sauce	China	Aspergillus oryzae	Soybean paste pressed to a liquid Koji is the solid portion
Natto	Japan	Bacillus natto	Sticky paste like appearance

Yogurt is the most popular fermented dairy product relished by people throughout the world. Traditionally mixed starter culture is used which is inoculated from an earlier batch.

Examples of fermented dairy products are:

Name of product	Process	Microorganism	Appearance
Commercial yoghurt	Milk fermented with starter culture	*Lactobacillus bulgaricus and Streptococcus thermophilus.*	Semisolid
Sour cream	Cream fermented with starter culture	*Lactobacillus bulgaricus* and *Streptococcus thermophilus.*	Coagulated cream
Kefir	Milk fermented with kefir grains	*Lactobacillus species* .and non-pathogenic *Streptococcus spp.,* yeasts such as *Saccharomyces delbrucki* and *S. cerevisiae*	Grainy
Cheese	Milk coagulated with rennet and Lactobacillus	*Lactobacillus species* .and microbial rennet	Solid
Cheese ripening	Cheese treated with microorganisms for typical flavour	*Lactobacillus , Streptococcus* or *Leuconostoc species*	Solid

Nutritional improvement due to fermentation

Cereal based fermented food

The presence of high concentrations of phytic acid in cereals and legumes is of nutritional concern because of its apparent ability to bind and thus reduce bioavailability of minerals

particularly divalent cations such as calcium, zinc, magnesium and iron. Fermentation results in the production of phytase enzyme which helps to release the minerals from phytates.
During fermentation of Idli, reported changes include an increase in free sugar, non-protein nitrogen, free nicotinic acid, methionine and choline. Breakdown of phytate up to 50% was observed due to phytase production by *Lactobacillus* species. In bread dough breakdown of phytate, release of free sugars, xylooligosaccharide production due to xylanases in the cereal has been reported. Breakdown of trypsin inhibitors in certain fermented legume preparations are known. These changes during fermentation are highly significant for nutritional point of view. An increase in methionine, a limiting essential amino acid in legumes, greatly improves protein value. The vitamins content of idli batter per 100 g are 0.59 mg riboflavin, 0.59 mg thiamine and 0.76 mg folic acid.
Fermentation decreased the resistant starch content in all the fermented products studied containing legumes. Decrease of about 88 to 90% in resistant starch content of idli and about 71 to 80% in dhokla has been reported. The polyphenols content was also reported to reduce by 44, 50 and 52% in black gram wadies, green gram wadies and idli, respectively as a result of fermentation.

Fermented soybeans

Niacin and riboflavin are known to have been increased due to fermentation of soybean. The proteases enzymes also degraded anti nutritional factors from the food.
A 30 fold increase in vitamin B_{12} has been observed in tempeh attributed due to the natural flora of soybean which was able to grow during fermentation.

Soy sauce contains the following nutrients on dry weight basis per table spoon (18 grams).: manganese 4.5%, vitamin B3 4.4%, protein 3.7% phosphorous 3,3% Some of the peptides formed as a result of fermentation act to inhibit the activity of angiotensin I-converting enzyme (ACE) that is needed to constrict our blood vessels therefore using for reduction of high blood pressure.

Natto has received keen attention because of its natural enzyme, Nattokinase, discovered by Dr. H. Sumi at University of Chicago in 1980. Nattokinase is now commercially extracted and sold as a blot clot dissolving enzyme. Natto also contains poly-glutamic acid and poly-saccharide, fructan. The characteristic aroma similar to ripened cheese is due to pyrazine.

Soybean koji provides large amount of enzymes from koji mold, *Aspergillus oryzae* such as protease and amylase which are reported to be useful for accelerating fish sauce fermentation.

Fermented dairy products

About 20 to 30% of the lactose in the yogurt base is broken down to glucose and galactose, and the glucose is converted to lactic acid during yogurt fermentation

Whey proteins and peptides are recognized as being of very high nutritional quality. They are easily digested and the essential amino acid profile meets or exceeds all the nutritional requirements of the FAO/WHO.

There is also increasing evidence that some of the therapeutic benefits of yogurt cultures may be linked to the proteins. Bioactive peptides, produced during fermentation, were effective in decreasing cell proliferation in a cell culture model system. When the proteins were separated and fermented, α-lactalbumin inhibited cell division, but ß-casein did not. The effect is a hypothesized explanation for the association between the reduced incidence of colon cancer and yogurt consumption.

Lactoferrin, a milk protein that is now being commercially isolated from whey, has been identified as one of the most interesting nutraceutical food ingredients. It is reported to stimulate intestinal cell growth and the growth of bifidobacteria. Lactoferrin is also a selective antimicrobial agent. Through its ability to chelate free iron, it controls the organisms that need iron for growth.

It can be converted by digestive proteases to lactoferricin, a peptide that is active against Gram negative bacteria and yeast. The iron binding ability and the ability to transport iron are other recognized benefits of lactoferrin.

Lactoperoxidase is another nutraceutical component of milk and whey products. The lactoperoxidase/thiocynate/hydrogen peroxide (LP) system in raw milk has been recognized for its antibacterial properties. The LP-system is known to have an overall bacteriostatic effect (predominantly inhibitory) and a bactericidal effect against some gram negative bacteria i.e., *Pseudomonas* and *E.coli.* The system needs hydrogen peroxide for activation which is produced by Lactobacillus during aerobic fermentation in initial stages. In a study microbeads prepared with core consisting of substrates glucose and thiocyanate embedded in gum arabic and coated with lactoperoxidase and glucose oxidase was found to inhibit *Listeria* species.

In synbiotic fermented milks, the strains of *Lactobacillus* species and *Bifidobacterium* species are widely used as probiotic, whereas fructo-oligosaccharides, galacto-oligosaccharides, lactulose and inulin-derived products are widely used as prebiotics. Galactooligosaccharides produced due transgalactosylase activity of β-galactosidases are known to improve bowel function.

Exopolysaccharides produced by lactic acid bacteria are known to have. immunomodulatory properties in addition to contribution to texture of the fermented product. A significant increase in calcium absorption due to galactooligosaccharides has been reported especially in post menopausal women. The increase in calcium absorption was not accompanied by increased urinary calcium excretion.

A preparation of enteral product or products containing indigestible oligosaccharides such as fructooligosaccharides, fructosans, xylooligosaccharides and galactooligosaccharides has been patented These products were provided for reducing the incidence of otitis media in infants

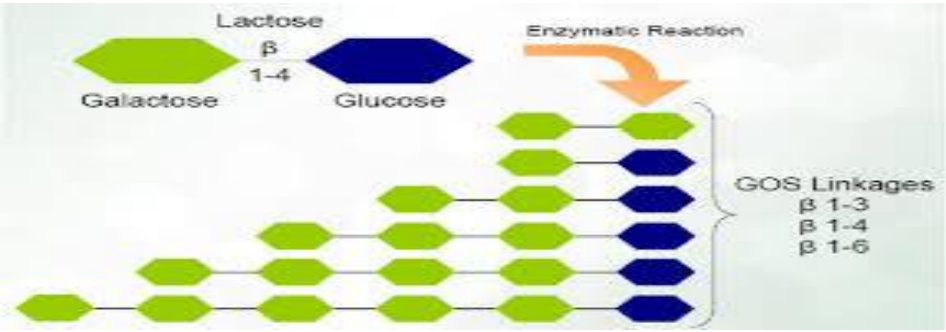
and young children. The indigestible oligosaccharides have been suggested for administration in the form of a nutritional product, candy, tablets, chewing gums, lozenges, milk products, yogurts.

Structure of galactooligosaccharides

Galactose -Glucose

Galactose –Galactose - Glucose

Galactose –Galactose –-Galactose Glucose



Traditional fermentation processes were developed largely as an art, rather than through scientific principles, and although procedures and equipment used by these processes are relatively simple, microbiological and biochemical aspects of a number of these processes are complicated and not fully understood. Today the benefits are being studied and understood. As a result fermented foods have gained considerable commercial importance with major industries investing money for commercial manufacture of many fermented food.

Nutritional labelling and Claims

Dr. V. Sudershan Rao, National Institute of Nutrition, Hyderabad

The production, sale and consumption of pre-packaged foods have witnessed a major surge in the recent years in India. Food labelling is one of the important population-based approaches that can help consumers make healthy food choices by providing the necessary information about the food on the pack. Packed foods hitherto sold in many Indian markets were only labelled with the product name, manufacturer's name and address, amount of product in the package, its ingredients and date of expiration. Nutrition labelling has been made mandatory nearly on all pre-packaged foods. Nutrition labelling is a description intended to inform the consumer of nutritional properties of food. Besides providing the information on nutrients, many claims are being made on the food products.

***Nutrition labelling*:** As per the Food Safety and Standards (Packaging and Labeling) Regulations 2011, Nutrition information or nutrition facts per 100gr or 100 ml or per serving of the product needs to be given on the label and should contain, energy value in Kilo calories, amount of protein, carbohydrate (quantity of sugar should be specified) and fat in grams. In case any claim is made with regard to amount of fatty acids or type of fatty acids or amount cholesterol, the amount of saturated fatty acids, monounsaturated fatty acids, polyunsaturated fatty acids should be given grams. Cholesterol should be given in milligrams. Quantity of trans fats also needs to be given. If a claim is made with regard to trans fat like "trans fat free", it should be less than 0.2g per serving of food. Similarly, to claim that food is free from saturated fat, it should be less than 01.gram per 100ml or gram of food. If the food claimed to be enriched with any nutrients like minerals, proteins, vitamins, amino acids etc, quantities of such added nutrients should be given. Nutrition information is not mandatory for the products like rice, wheat, tea. coffee, spices, spice mixtures, papads and single ingredient products etc.

It is expected that the quantities of nutrients declared on label should be present in the foods when analysed. However due consideration will be given for the variations expected due to shelf life, storage and inherent nature of the food. The food industry takes these factors into consideration accordingly adds surplus (overages) to maintain the actual amount declared on the label.

Nutritional claims: Nutrition Claims means any representation which states, suggests or implies that a food has particular nutritional properties including but not limited to the energy value & to the content of protein, carbohydrate & fat, as well as the content of vitamins and minerals and they should be consistent with National Nutrition Policy. Nutritional claims can be three types: 1. Nutrition content claim, 2.Nutrient comparative claim and 3. Nutrient function claim.

***Nutrition content claim*:** Nutrition content claim describes the level of a nutrient contained in a food, i.e. High fibre, Low fat, Source of Calcium etc. Codex alimentarius commission, an international body working under the aegis of World Health Organisation (WHO) & Food and Agriculture Organisation (FAO), a referral body for food standards, provides some guidelines for these claims. When a claim is made that a particular pre packaged food has "high calcium", how much calcium it should have to qualify for such claim, similarly low fat etc. The table 1 provides conditions for such claims.

Table 1. CONDITIONS FOR NUTRIENT CONTENTS(Codex)

Component	Claim	Conditions *Not more than*
Energy	Low	40 Kcal/ 100g (solids)
		20 Kcal/100 ml (liquids)
	Free	4 Kcal/100ml (liquids)
Fat	Low	3 g/100g (solids)
		1.5g/100ml (liquids)
	Free	0.5g/100ml (liquids)
Saturated fat	Low	1.5g/100g (solids)
		0.75g/100ml (liquids)
	Free	0.1g/100 g or ml
Cholesterol	Low	0.02g/100g (solids)
		0.01g/100ml (liquids)
	Free	0.005g/100g or ml

Table 2 CONDITIONS FOR NUTRIENT CONTENTS (Codex)

Component	Claim	Conditions *Not more than*
Sugars	Free	0.5g/100g or ml
Sodium	Low	0.12 g/100g
	Very low	0.04 g/100g
	Free	0.005 g/100g
		Not less than
Vitamins & Minerals	Source	15% of NRV /100g (solids)
		7.5% of NRV /100ml (liquids)
	High	2 times the value for "source"

For the purpose of nutritional labelling and claims, Codex provides nutrient reference values and these values represent amount of nutrient required on an average daily basis for adequate

physiological function and prevention of deficiency and chronic disease prevention. Nutrient Reference values are given in table 2.

Table. 3 NUTRIENT REFERENCE VALUES (Codex)

Nutrients	Quantity
Vitamin A	800ug
Vitamin D	5ug
Vitamin C	60mg
Thiamin	1.4mg
Folic acid	200ug
Iron	14mg
Zinc	15mg
Calcium	800mg

Nutrient comparative claim: It compares the nutrient and or /energy values of two or more foods. Then comparative claim should be between different versions of same food or similar foods and food being compared should be easily identifiable.

***Nutrient function claim*:** A nutrition claim that describes the physiological role of the nutrient in growth, development and normal functions of the body.

Research in Nutrition & Health

Short-term energy deficits increase factors related to muscle degradation

Medical News Today 3 December 2013

New research in *The FASEB Journal* suggests that a high protein diet suppresses protein breakdown by slowing the activity of the ubiquitin proteasome system.

Building upon the discovery that a high-protein diet reduces muscle loss when dieting, a new research report published online in *The FASEB Journal* now helps explain why. Protein consumption slows the ubiquitin proteasome system, which is primarily responsible for degrading skeletal muscle.

"Reductions in muscle mass are often an unintended consequence of weight loss, and can have negative health consequences," said Stefan M. Pasiakos, Ph.D., study author from the Military Nutrition Division at the US Army Research Institute of Environmental Medicine in Natick, MA. "It is our hope that the findings from this well-controlled study will significantly contribute to the development of nutritional interventions designed to aid in the preservation of muscle mass during weight loss."

Pasiakos and colleagues assigned young men and women controlled diets for 31 days that provided dietary protein at three different levels: 1) Institute of Medicine's (IOM) RDA, 2) twice IOM's RDA, and 3) three times IOM's RDA. Volunteers were given adequate total calories to maintain constant body weight for the first 10 days to allow their metabolism to adapt to the dietary protein level. For the next 21 days, weight loss was induced by restricting the total calories consumed and increasing daily exercise to elicit an average two pound weight loss per week. Study measures were collected in the fasted state and following consumption of a protein-containing mixed-meal, at the end of both the stable weight maintenance and weight loss phases of the study. All meals were prepared and administered by research staff and exercise was highly controlled and supervised.

"A lot of diets and fitness programs focus on losing weight without regard to the type of weight you are losing, whether it be fat, muscle or water," said Gerald Weissmann, M.D., Editor-in-Chief of *The FASEB Journal* . "Fortunately, it appears that by simply having a high protein intake, you can minimize the amount of muscle you lose during your weight loss effort."

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New study suggests low vitamin D causes damage to brain

Science Daily December 2, 2013

A new study led by University of Kentucky researchers suggests that a diet low in vitamin D causes damage to the brain. In addition to being essential for maintaining bone health, newer evidence shows that vitamin D serves important roles in other organs and tissue, including the brain. Published in *Free Radical Biology and Medicine*, the UK study showed that middle-aged rats that were fed a diet low in vitamin D for several months developed free radical damage to the brain, and many different brain proteins were damaged as identified by redox proteomics. These rats also showed a significant decrease in cognitive performance on tests of learning and memory.

"Given that vitamin D deficiency is especially widespread among the elderly, we investigated how during aging from middle-age to old-age how low vitamin D affected the oxidative status of the brain," said lead author on the paper Allan Butterfield, professor in the UK Department

of Chemistry, director of the Center of Membrane Sciences, faculty of Sanders-Brown Center on Aging, and director of the Free Radical Biology in Cancer Core of the Markey Cancer Center. "Adequate vitamin D serum levels are necessary to prevent free radical damage in brain and subsequent deleterious consequences."

Previously, low levels of vitamin D have been associated with Alzheimer's disease, and it's also been linked to the development of certain cancers and heart disease. In both the developed world and in areas of economic hardship where food intake is not always the most nutritious, vitamin D levels in humans are often low, particularly in the elderly population. Butterfield recommends persons consult their physicians to have their vitamin D levels determined, and if low that they eat foods rich in vitamin D, take vitamin D supplements, and/or get at least 10-15 minutes of sun exposure each day to ensure that vitamin D levels are normalized and remain so to help protect the brain.

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Omega-3 dietary supplements pass blood-brain barrier

Science Daily December 4, 2013

New research from Karolinska Institutet in Sweden shows that omega-3 fatty acids in dietary supplements can cross the blood brain barrier in people with Alzheimer's disease, affecting known markers for both the disease itself and inflammation. The findings are presented in the Journal of Internal Medicine, and strengthen the evidence that omega-3 may benefit certain forms of this seriously debilitating disease.

"Earlier population studies indicate that omega-3 can protect against Alzheimer's disease, which makes it interesting to study the effects of dietary supplements containing this group of fatty acids in patients who have already developed the disease," says the study's lead author Dr Yvonne Freund-Levi.

Omega-3 and other essential polyunsaturated fatty acids accumulate in the central nervous system (CNS) during gestation. It has been assumed that these acids are continually replaced throughout life, but little is known about how this occurs and whether changes in diet can affect the transport of important fatty acids across the blood-brain barrier. The blood-brain barrier serves to protect the brain from harmful chemicals existing naturally in the blood, but also blocks the delivery of drug substances to the brain.

Several diseases can affect the fatty acid profile of the CNS; in patients with Alzheimer's disease, for example, previous research has observed lower than normal brain concentrations of docosahexaenoic acid (DHA), an omega-3 fatty acid.

In the present study, part of the larger OmegAD project, scientists examined whether omega-3 dietary supplements change the fatty acid profile of the CNS in patients with mild Alzheimer's disease. Thirty-three patients participated in the study, 18 of whom received a daily omega-3 supplement and 15 a placebo for six months. The results show that the first group had higher levels of both DHA and eicosapentaenoic acid (EPA, another omega-3 fatty acid) in their cerebrospinal fluid (which surrounds the CNS) and blood. No such change was seen in the placebo group.

Moreover, they also found that levels of DHA correlated directly with the degree of change in Alzheimer's disease and inflammatory markers in the cerebrospinal fluid. Researchers in the field have long been interested in this link between Alzheimer's disease and inflammation, but attempts to treat the disease using traditional anti-inflammatory drugs have failed to produce any improvements in memory function.

"In animals, DHA dietary supplements can lead to an increase in DHA concentrations in the CNS," says Professor Jan Palmblad, who initiated the study. "Here we show that the same applies to humans, which suggests that omega-3 fatty acids in dietary supplements cross the blood-brain barrier. However, much work remains to be done before we know how these fatty acids can be used in the treatment of Alzheimer's disease to halt memory loss."

The study was financed with grants from the Capio Research Foundation, the Dementia Association, the Gamla Tjänarinnor Foundation, the Swedish Alzheimer's Society, Oddfellows Sweden, the Swedish Nutrition Foundation, the Gun and Bertil Stohne Foundation, the Swedish Society of Medicine, Lions Sweden, the Norwegian Omega-3 producer Pronova Biocare A/S, and Stockholm County Council through its ALF funding agreement with Karolinska Institutet.
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Study finds parental stress linked to obesity in children

Science Daily December 6, 2013

Parental stress is linked to weight gain in children, according to a new study from St. Michael's Hospital. The study found that children whose parents have high levels of stress have a Body Mass Index, or BMI, about 2 per cent higher than those whose parents have low levels of stress. Children with higher parental stress also gained weight at a 7 per cent higher rate during the study period than other children.

Those figures may sound low, said lead author Dr. Ketan Shankardass, but they're significant because they are happening in children, whose bodies and eating and exercise habits are still developing. Plus, if that weight gain continues and is compounded over a lifetime, it could lead to serious obesity and health issues.

Dr. Shankardass, a social epidemiologist with the hospital's Centre for Research on Inner City Health, studied data collected during the Children's Health Study, one of the largest and most comprehensive investigations into the long-term effects of air pollution on the respiratory health of children.

The childrens' BMI was calculated each year. Their parents were given a questionnaire to measure their perceived psychological stress that asked how often in the last month they were able or unable to control important things in their life and whether things were going their way or their difficulties were piling up so high they could not overcome them.

Dr. Shankardass said he believes this is the first study to link parental stress to weight gain in such young children. His research was published today in the journal *Pediatric Obesity*. Dr. Shankardass, who is also an assistant professor in psychology at Wilfrid Laurier University, said it was not clear why the link between stress and obesity exists.

He said parents could change their behavior when they are stressed, to reduce the amount of physical activity in the household or increase the amount of unhealthy food available. Parental stress could also create stress for the children, who cope by eating more or exercising less, or whose stress leads to biological changes that cause weight gain, he said.

Dr. Shankardass said that rather than focusing only on getting parents to change their behavior, it would be useful to focus on interventions that can support families living in challenging conditions, such as making sure they have a reliable supply of healthy food, an opportunity to live in a nice neighbourhood and other financial or service resources to help cope with stress.

"Childhood is a time when we develop inter-connected habits related to how we deal with stress, how we eat and how active we are," Dr. Shankardass said. "It's a time when we might be doing irreversible damage or damage that is very hard to change later."

Dr. Shankardass noted that more than half the students followed in the California study were Hispanic, and that the effect of stress on their BMI was greater than children of other ethnic backgrounds. He said this was consistent with other research which has suggested that Hispanic children may be more likely to experience hypherphasia (excessive hunger or increased appetite) and sedentary lifestyle. Future research should consider other reasons that Hispanic children are more susceptible to parental stress, including differences in how Hispanic parents respond to stress or how Hispanic children perceive stressors or cope with stress.

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Strong nutrition education can lead to healthier food choices among low-income families

Science Daily December 9, 2013

"One of the most important findings from this study is that families want to eat healthy foods, even if they have limited resources," said the study's project director. "Education efforts that help individuals and families make healthy food choices are clearly an important part of our overall health, and can make a big difference for families with young children all the way to our senior citizens."

Well-designed nutrition education programs can lead to healthier food choices among low-income families who participate in the Supplemental Nutrition Assistance Program (SNAP), according to a study conducted by Altarum Institute and RTI International.

The study, SNAP Education and Evaluation Study (Wave II), was funded by the Food and Nutrition Service of the U.S. Department of Agriculture (USDA). It evaluated the impact of several nutrition education programs on fruit and vegetable consumption among low-income elementary school children and seniors.

"One of the most important findings from this study is that families want to eat healthy foods, even if they have limited resources," said Altarum Institute's Loren Bell, the study's project director. "Education efforts that help individuals and families make healthy food choices are clearly an important part of our overall health, and can make a big difference for families with young children all the way to our senior citizens."

The study evaluated three SNAP programs in three different states and found that children participating in certain nutrition education programs increased their daily fruit and vegetable consumption at home by a quarter- to a third-cup, and were more likely to choose low-fat or fat-free milk. Participating seniors consumed about a half-cup more fruits and vegetables daily.

"The findings from this study demonstrate the important role that evidence-based, outcome-driven interventions play in helping consumers improve their dietary intake," said Sheryl Cates, the RTI project director.

Two of the programs studied for this report provided nutrition education lessons in schools, take-home materials and activities to low-income elementary-aged children. Researchers found that the design, content, and messages of the programs were well-received by school staff members. The most successful intervention used a variety of methods to educate students

while engaging parents and caregivers through take-home materials that helped to address concerns about providing healthy foods on a tight budget.

The third program provided direct nutrition education, take-home materials and other materials to low-income adults aged 60 to 80 at senior sites and other gathering centers. Researchers found that participants that completed take-home activities adopted healthier behaviors and were more engaged in discussions about overcoming the challenges and barriers to purchasing, preparing and consuming fruits and vegetables.

The study demonstrates that effective nutrition education programs, like those supported by the Nutrition Education and Obesity Prevention Grant Program, or SNAP-Ed, can impact SNAP participants' willingness to try, buy and eat more healthy foods. The program, which was recently updated through the Healthy, Hunger-Free Kids Act, emphasizes evidence-based, outcome-driven interventions, with a focus on preventing obesity and coordinating with other programs for maximum impact and cost-effectiveness.

"The results of this study reiterate the critical role of nutrition education and promotion in improving the healthfulness of SNAP purchases," said USDA Under Secretary Kevin Concannon. "USDA and our partners continue to explore a wide-ranging set of strategies that support families as they purchase, prepare and eat more healthy foods."
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Call for action on cutting sugar

Science Daily December 9, 2013

A study by Newcastle University researchers into the effects of sugars on our oral health recommends cutting down on the sweet additive as part of a global initiative to reduce tooth decay.
Since 1990 the World Health Organization (WHO) has recommended that intake of "free sugars" should be less than 10% of total energy (calorie) intake. Free sugars are sugars that are added to foods by the manufacturer, cook, or consumer; plus those naturally present in honey, syrups, fruit juices and fruit concentrates.

The Newcastle University study, commissioned by the WHO and published today in the *Journal of Dental Research* recognizes the benefit of this threshold, by showing that when less than 10% of total calories in the diet is made up of free sugars there are much lower levels of tooth decay. And the research findings go even further, suggesting that halving this threshold for sugars to less than 5% of calories -- around five teaspoons a day -- would bring further benefits, minimizing the risk of dental cavities throughout life.

Halve the sugars to keep teeth for life

Professor Moynihan, Professor of Nutrition and Oral Health at Newcastle University said: "People now expect to keep their teeth into old age and given that the effects of sugars on our teeth are lifelong then limiting sugars to less than 5% of the calories we eat would minimize the risk of dental caries throughout life.

"In the past, judgements on recommended levels of free sugars intake were made based on levels associated with an average of three or fewer decayed teeth in 12 year olds. However, tooth decay is a progressive disease -- by looking at patterns of tooth decay in populations over time, we now know that children with less than three cavities at age 12, go on to develop a high number of cavities in adulthood.

"Part of the problem is that sugary foods and drinks are now staples in many people's diet in industrialized countries, whereas once they were an occasional treat for a birthday or Christmas. We need to reverse this trend."

Considering the studies which examined the influence of fluoride, the experts found that while it does protect teeth, people living in areas with fluoridated water and or using fluoride toothpaste still got dental caries. Professor Moynihan explained: "Fluoride undoubtedly protects the teeth against decay but it does not eliminate tooth decay and it does not get rid of the cause -- dietary sugars. Moreover, not everyone has good exposure to fluoride through drinking water and or toothpastes containing fluoride."

Funded by Newcastle University's Centre for Oral Health Research, Professor Paula Moynihan, Professor of Nutrition and Oral Health at Newcastle University and Dr Sarah Kelly (now at Cambridge University) scrutinized all the studies which had looked at relationships between amount of sugars consumed and levels of dental caries (tooth decay). They found 55 relevant studies worldwide, dating back to 1950.

The robust systematic review considered the overall quality of evidence using the GRADE process (Grading of Recommendations Assessment Development and Evaluation system GRADE working group 2004) which takes into consideration factors including the consistency of results across the available studies, the size of effect, evidence of a dose response and the strength of association. Combined analysis of the data was limited because of the variation in how the data were reported but there was strong consistency across studies and evidence of a large size effect.

Professor Moynihan added: "The public need better information on the health risks of sugary foods and drinks and there needs to be clearer information on the levels of sugars in our foods and drinks. We need to make it easier for people to make healthier choices when it comes to

sugars by ensuring that options lower in added sugars are made widely available in schools, shops and the workplace."

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Right amount of fat, protein, key to babies

Science Daily December 10, 2013

The early childhood diet and that of the mother during pregnancy determines the health of a child later life. This is the claim that the EU-funded research project Early Nutrition is trying to substantiate by the time it is due to be completed in 2017. Hans van Goudoever, professor of paediatrics and chair of the department of paediatrics at VU University Medical Centre, Amsterdam, the Netherlands, talks to youris.com about his hopes to drastically improve the health of future generations by giving nutritional advice to pregnant women and young mothers.

Has the project produced any surprising results so far?

We have found a relation between nutrition in the first stages of life and a staggering amount of afflictions including obesity, heart diseases, high blood pressure, cholesterol levels, as well as connections to IQ. And we are now close to practical application. For instance, we found that young infants with a low-protein diet are far less likely to suffer from obesity in later life. So we have developed bottle feeding with less protein and we are tested it on piglets. The results are excellent and tests on humans are about to start.

Why do we need to study early nutrition?

Epidemiological studies, which go back as far as 25 years, have shown that birth and infant weight have an effect on the occurrence of cardiac problems later in life. But that is just a description of a relation, not a scientific proof. These days we want hard evidence. One group of children will get nutrition type A, another group will get type B. Then, we'll keep following them in order to prove there is a specific effect. That's what the project is all about.

At what stage is it possible to influence child nutrition most?

Nutrition during pregnancy and the first months of life is key. Later on, there is still an influence but it gets smaller with time. After birth, the choice between breast feeding and bottle feeding is very easy, from a nutrition perspective. Breast feeding is at least ten miles ahead. I know there are many reasons why sometimes breastfeeding is impossible; the mother may not have the opportunity, or she is taking medicines. But if at all possible every effort should be taken to choose breast feeding. It is logical after all. Bottle feeding is made from cow milk, and cows are different from people.

What advice could you give to mothers of very young children?

Above all, avoid excess proteins and fat. Special care should be taken to make sure babies have a diet wherein the protein and fat content is just right. Not too little, but certainly not too much.

If you have a normal diet, you do not need anything else. Just forget about extra vitamins and minerals, as long as your diet is balanced. That is not easy these days. The groups where we see the most problems include, quite often, the people from the lower social classes, who are rather difficult to reach with information or nutrition campaigns. What I do hope is that we can ultimately get the message across to the hard-to-reach public.

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You are what your father eats: Father's diet before conception plays crucial role in offspring's health, study suggests

Science Daily December 10, 2013

Research shows for the first time that the father's folate levels may be just as important to the development and health of their offspring as are those of the mother. The study suggests that fathers should pay as much attention to their lifestyle and diet before they set out to conceive a child as mothers do.

Mothers get all the attention. But a study led by McGill researcher Sarah Kimmins suggests that the father's diet before conception may play an equally important role in the health of their offspring. It also raises concerns about the long-term effects of current Western diets and of food insecurity.

The research focused on vitamin B9, also called folate, which is found in a range of green leafy vegetables, cereals, fruit and meats. It is well known that in order to prevent miscarriages and birth defects mothers need to get adequate amounts of folate in their diet. But the way that a father's diet can influence the health and development of their offspring has received almost no attention. Now research from the Kimmins group shows for the first time that the father's folate levels may be just as important to the development and health of their offspring as are those of the mother. Indeed, the study suggests that fathers should pay as much attention to their lifestyle and diet before they set out to conceive a child as mothers do.

"Despite the fact that folic acid is now added to a variety of foods, fathers who are eating high-fat, fast food diets or who are obese may not be able to use or metabolize folate in the same

way as those with adequate levels of the vitamin," says Kimmins. "People who live in the Canadian North or in other parts of the world where there is food insecurity may also be particularly at risk for folate deficiency. And we now know that this information will be passed on from the father to the embryo with consequences that may be quite serious."

The researchers arrived at this conclusion by working with mice, and comparing the offspring of fathers with insufficient folate in their diets with the offspring of fathers whose diets contained sufficient levels of the vitamin. They found that paternal folate deficiency was associated with an increase in birth defects of various kinds in the offspring, compared to the offspring of mice whose fathers were fed a diet with sufficient folate.

"We were very surprised to see that there was an almost 30 per cent increase in birth defects in the litters sired by fathers whose levels of folates were insufficient," said Dr. Romain Lambrot, of McGill's Dept. of Animal Science, one of the researchers who worked on the study. "We saw some pretty severe skeletal abnormalities that included both cranio-facial and spinal deformities."

The research from the Kimmins' group shows that there are regions of the sperm epigenome that are sensitive to life experience and particularly to diet. And that this information is in turn transferred to a so-called epigenomic map that influences development and may also influence metabolism and disease in the offspring in the long-term. (The epigenome is like a switch, which is affected by environmental cues, and is involved in many diseases including cancer and diabetes. The epigenome influences the way that genes are turned on or off, and hence how heritable information gets passed along).

Although it has been known for some time that there is a massive erasure and re-establishment that takes place in the epigenome as the sperm develops, this study now shows that along with the developmental map, the sperm also carries a memory of the father's environment and possibly even of his diet and lifestyle choices.

"Our research suggests that fathers need to think about what they put in their mouths, what they smoke and what they drink and remember they are caretakers of generations to come," said Kimmins. "If all goes as we hope, our next step will be to work with collaborators at a fertility clinic so that we can start assessing the links in men between diet, being overweight and how this information relates to the health of their children."

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Malnourished children still have hope beyond first 1,000 days

Science Daily December 11, 2013

Children who are malnourished during their first 1,000 days (conception to age 2) often experience developmental setbacks that affect them for life. To that end, philanthropic groups have funded massive global health initiatives for impoverished infants and pregnant women around the world. While money flows justifiably to this cause, programs for children past the 1,000-day mark are seen as having little hope, and garner less support.

But new research from Brigham Young University is finding that global health workers should not give up on impoverished children after that critical time frame. In a longitudinal study of 8,000 children from four poverty-laden countries, BYU health science assistant professor Ben Crookston and colleagues found that the developmental damage of malnutrition during the first 1,000 days is not irreversible.

"The first 1,000 days are extremely critical, but we found that the programs aimed at helping children after those first two years are still impactful," Crookston said. Specifically, the study found that nutritional recovery after early growth faltering might have significant benefits on schooling and cognitive achievement.

The data for the study, which comes from the international "Young Lives" project led by the University of Oxford, tracked the first eight years of life of children from Ethiopia, Peru, India and Vietnam.

Initially, Crookston and his colleagues found what they expected with the data: Children who had stunted growth (in this case, shorter than expected height at 1 year of age) ended up behind in school and scoring lower on cognitive tests at 8 years of age. However, kids who experienced "catch-up growth," scored relatively better on tests than those who continued to grow slowly and were in more age-appropriate classes by the age of 8.

Yale professor Rafael Perez-Escamilla, the director of the Office of Public Health Practice at the Yale School of Public Health, called the study "well-designed" and "robust" in an editorial accompanying the research published in the December issue of the *American Journal of Clinical Nutrition*.

"The findings from Crookston are in general agreement with previous empirical evidence suggesting the brain is a highly plastic organ with remarkable ability to improve its function, even when interventions start after exposure to nutritional insults during the first 1,000 days of life," Perez-Escamilla wrote.

BYU's Crookston said he hopes the study informs better policy and practice so that programs such as preschool lunch (which improves nutrition for preprimary and primary school age children) receive continued support.

"The first 1,000 days is the most critical window, but nutrition should still be a life focus," he said. "We shouldn't give up on those kids and we should continue programs because we can still have modest, but meaningful returns."

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Caution to pregnant women on red meat diabetes link

Science Daily December 12, 2013

Pregnant women and women planning to become pregnant can make use of the holiday season to adjust their diets and reduce the risk of gestational diabetes, according to researchers at the University of Adelaide's Robinson Institute.

The recommendation comes at a time when there is increasing evidence to suggest that red meat is linked with a higher rate of gestational diabetes in pregnant women, which poses risks to the health of both the mother and the baby.

In a commentary published in this month's journal *Evidence-Based Nursing*, author Philippa Middleton says the latest international research shows that women who eat a lot of red and processed meats even before they become pregnant have a significant risk of developing gestational diabetes.

"There have been several reports linking red meat with increased risk of type 2 diabetes, and now the work of a number of research teams worldwide is showing this link for diabetes during pregnancy," says Ms Middleton, who is one of the Robinson Institute's research leaders.

"While this news is alarming, there are also some positives. The latest research from the United States has shown that eating fish and poultry does not increase the risk of gestational diabetes, and consuming more vegetable and non-meat protein is associated with a reduction in risk. For example, just over half a serving of nuts per day can reduce the risk of gestational diabetes by 40%."

Ms Middleton says although the link between red meat and diabetes is strengthening, scientists still don't understand the underlying mechanisms that cause it. "More research is needed to better understand why this is happening and how to adapt women's diets and other lifestyle behaviors to prevent both gestational and type 2 diabetes," she says.

"Based on current evidence, pregnant women or women planning to become pregnant should consider eating more vegetable protein, and nuts, and replacing some red meat with fish and poultry. Midwives, dieticians and others involved in pregnancy care can help women to make these dietary changes in the hope of reducing poor outcomes for the mother and the baby," Ms Middleton says.

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Diet, physical activity may affect risk of developing kidney stones

Science Daily December 12, 2013

Even small amounts of physical activity may decrease the risk of developing kidney stones, according to a study appearing in an upcoming issue of the Journal of the American Society of Nephrology (JASN). The study also found that consuming too many calories may increase risk.

Over the last 10 to 15 years, research has revealed that kidney stones are more of a systemic problem than previously thought. Their links with obesity, diabetes, metabolic syndrome, and cardiovascular disease demonstrate that the process of stone formation involves more than just the kidneys. As the prevalence of kidney stones has increased dramatically, especially in women, efforts to decrease the risk of stone formation have become even more important.

Mathew Sorensen, MD (University of Washington School of Medicine, and the Puget Sound Department of Veterans Affairs) and his colleagues conducted a study to evaluate whether energy intake and energy expenditure relate to kidney stone formation. They studied 84,225 postmenopausal women participating in the Women's Health Initiative, which has been gathering information such as dietary intake and physical activity in women since the 1990s.

After adjusting for multiple factors including body mass index, the researchers found that physical activity was associated with up to a 31% decreased risk of kidney stones. "Even small amounts of exercise may decrease the risk of kidney stones -- it does not need to be marathons, as the intensity of the exercise does not seem to matter," said Dr. Sorensen. Women could get the maximum benefit by performing 10 metabolic equivalents per week, which is the equivalent of about three hours of average walking (2-3 mph), four hours of light gardening, or one hour of moderate jogging (6 mph).

The team also discovered that consuming more than 2200 calories per day increased the risk of developing kidney stones by up to 42%. Obesity was also a risk factor for stone formation.

"Being aware of calorie intake, watching their weight, and making efforts to exercise are important factors for improving the health of our patients overall, and as it relates to kidney stones," said Dr. Sorensen.

In an accompanying editorial, John Lieske, MD (Mayo Clinic) noted that because this study only included postmenopausal women, it will need to be replicated in other populations. He added that it is also possible that women who exercise regularly have other healthy habits that decrease stone risk. "Nevertheless, conservative (nonpharmacologic) counseling for patients with stones often centers almost exclusively on diet, stressing increased fluid intake, normal dietary calcium, lower sodium, moderate protein, and reduced dietary oxalate. The results of Sorensen et al. suggest that a recommendation for moderate physical activity might reasonably be added to the mix," he wrote.

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What are the health benefits of green tea?

Medical News Today 1 December 2013

Green tea, native to China and India, has been consumed and hailed for its health benefits for centuries globally, but has only recently gained popularity in the US.

Tea is considered the most consumed beverage in the world behind water, however 78% of the tea consumed worldwide is black and only about 20% is green. All types of tea except herbal tea are brewed from the dried leaves of the *Camellia sinensis* bush. The level of oxidation of the leaves determines the type of tea.

Green tea is made from un-oxidized leaves and is the least processed type of tea and therefore contains the most antioxidants and beneficial polyphenols. Green tea was used in traditional Chinese and Indian medicine to control bleeding and heal wounds, aid digestion, improve heart and mental health and regulate body temperature.[4] Recent studies have shown green tea can potentially have positive effects on everything from weight loss to liver disorders to type 2 diabetes.

This MNT Knowledge Center feature is part of a collection of articles on the health benefits of popular foods. It provides a nutritional breakdown of green tea and an in-depth look at its possible health benefits, the different forms of green tea, and some precautions when consuming green tea.

Nutritional breakdown of green tea

Unsweetened brewed green tea is a zero calorie beverage. The caffeine contained in a cup of tea can vary according to length of infusing time and the amount of tea infused.

In general, green tea contains a relatively small amount of caffeine (approximately 20-45 milligrams per 8 oz cup), compared with black tea which contains about 50 milligrams and coffee with 95 milligrams per cup.

Green tea is considered one of the world's healthiest drinks and contains the highest amount of antioxidants of any tea. The natural chemicals called polyphenols in tea are what are thought to provide its anti-inflammatory and anti-carcinogenic effects.

Epigallocatechin-3-gallate (EGCG) is the most studied and bioactive polyphenol in tea and has been shown to be the most effective at eliminating free radicals. Green tea is approximately 20% to 45% polyphenols by weight, of which 60% to 80% are catechins such as EGCG.

Possible health benefits of green tea

Cancer:

According to the National Cancer Institute, the polyphenols in tea have been shown to decrease tumor growth in laboratory and animal studies and may protect against damage caused by ultraviolet UVB radiation. In countries where green tea consumption is high cancer rates tend to be lower, but it is impossible to know for sure whether it is the green tea that prevents cancer in these specific populations or other lifestyle factors.

One large-scale clinical study compared green tea drinkers with non-drinkers and found that those who drank the most tea were less likely to develop pancreatic cancer, particularly women, who were 50% less likely to develop the disease. Studies have also shown the positive impacts of green tea on breast, bladder, ovarian, colorectal, esophageal, lung, prostate, skin and stomach cancer.

Researchers believe that it is the high level of polyphenols in tea that help kill cancerous cells and stop them from growing, however the exact mechanisms by which tea interacts with cancerous cells is unknown. Other studies have shown a lack of preventative effects of tea on cancer. The amount of tea required for cancer-preventive effects has also varied widely in studies - from 2- 10 cups per day.[1]

In 2005, the FDA stated that "there is no credible evidence to support qualified health claims for green tea consumption and a reduced risk of gastric, lung, colon/rectal, esophageal, pancreatic, ovarian, and combined cancers."

Heart Disease:

A 2006 study published in the Journal of the American Medical Association concluded that green tea consumption is associated with reduced mortality due to all causes, including cardiovascular disease. The study followed over 40,000 Japanese participants between the ages of 40 and 79 for 11 years, starting in 1994.

The participants who drank at least 5 cups of green tea per day had a significantly lower risk of dying (especially from cardiovascular disease) than those who drank less than one cup of tea per day. Another study found that consuming 10 cups of green tea per day can lower total cholesterol, however, consuming 4 cups or less had no effect on cholesterol levels.

Type 2 Diabetes:

Studies concerning the relationship between green tea and diabetes have been inconsistent. Some have shown a lower risk of developing type 2 diabetes for green tea drinkers than for those who consumed no tea, while other studies have found no association between tea consumption and diabetes at all.

Weight Loss:

Green tea may promote a small, non-significant weight loss in overweight and obese adults; however, since the weight lost in the studies were so minimal; it is unlikely that green tea is clinically important for weight loss.

Other studies have found that green tea is helpful in preventing dental cavities, stress, chronic fatigue, treating skin conditions and improving arthritis by reducing inflammation.

Recent developments on the benefits of green tea from MNT news

Green tea or coffee may reduce stroke risk. Drinking green tea or coffee on a regular basis is associated with a reduced risk of stroke, according to a study published in the journal *Stroke: Journal of the American Heart Association.*[5]

Green tea may help fight prostate cancer. British researchers have scientifically proven that broccoli, turmeric, green tea and pomegranate help fight the most common cancer in men in the United States and the United Kingdom - prostate cancer.

Forms of green tea

Green tea is available bottled and sweetened with sugar or an artificial sweetener, in single tea bags, loose-leaf, and in instant-powder. Green tea supplements are sold in capsule form or liquid extracts. According to 2010 research presented at the American Chemical Society, bottled teas are not equivalent to brewed teas as some 16-oz bottled teas can contain fewer polyphenols than one cup of brewed tea. Green tea extract ointments have been approved by the FDA to topically treat genital warts.

Precautions and risks

There are little to no known side effects or contraindications to drinking green tea for adults. Those with severe caffeine sensitivities could experience insomnia, anxiety, irritability, nausea or upset stomach. Those taking anticoagulant drugs such as Coumadin/warfarin should drink green tea with caution due to its vitamin K content. If taken with stimulant drugs, green tea could possibly increase blood pressure and heart rate.

Green tea supplements however, contain high levels of active substances that can trigger side effects and interact with other herbs, supplements, or medications.[4] Green tea supplements are unregulated by the FDA and may also contain other substances unsafe for health or with unproven health benefits. Always check with a physician before starting any herb or supplement regimen. In particular, pregnant or breastfeeding women, those with heart problems or high blood pressure, kidney or liver problems, stomach ulcers, or anxiety disorders should not take green tea supplements or extracts.

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Energy drinks alter heart function, study shows

Medical News Today 2 December 2013

Energy drinks have become a multi-billion dollar industry that continues to grow, yet regulation of this enterprise remains largely unchecked. Now, a new study shows that healthy adults who consume energy drinks have "significantly increased" heart contraction rates an hour later.

The research was recently presented at the annual meeting of the Radiological Society of North America (RSNA). The study authors, including Dr. Jonas Dörner from the University of Bonn, Germany, note that although the largest consumers of energy drinks have traditionally been teens and young adults, people from all demographics have begun to consume such drinks in recent years. "Until now, we haven't known exactly what effect these energy drinks have on the function of the heart," says Dr. Dörner.

Meanwhile, a 2013 report from the Substance Abuse and Mental Health Services Administration revealed that from 2007 to 2011 in the US, energy drink-related emergency department visits doubled, climbing from 10,068 to 20,783.

The researchers note that most of these cases occurred in patients between the ages of 18 and 25, but this was followed by patients aged 26 to 39. Dr. Dörner talks about the contents of these drinks: "Usually energy drinks contain taurine and caffeine as their main pharmacological ingredients. The amount of caffeine is up to three times higher than in other caffeinated beverages like coffee or cola."

He adds that side effects associated with consuming a large amount of caffeine include a rapid heart rate, palpitations, rise in blood pressure and even seizures or death.

Energy drinks prompted increased strain in left ventricle

For their recent study, which is currently ongoing, the researchers measured the effect of energy drinks on heart function using cardiac magnetic resonance imaging (MRI). Study participants consist of 15 healthy men and three healthy women, with an average age of 27.5 years. The team took cardiac MRIs of the participants both before and 1 hour after they consumed an energy drink, which contained 400 mg/100 ml taurine and 32 mg/100 ml caffeine.

Results show that compared with the images taken before the participants consumed the energy drinks, the post-beverage MRIs showed that they had increased peak strain and peak systolic strain rates in the heart's left ventricle.

The researchers note that the left ventricle receives oxygenated blood from the lungs, which it then pumps to the aorta for distribution to the rest of the body. Though the team observed this significant change, they say they do not yet know whether it impacts daily activities or athletic performance. "We need additional studies to understand this mechanism and to determine how long the effect of the energy drink lasts," says Dr. Dörner.

Contractility changes could trigger arrhythmias

The team notes that they did not find any major differences in heart rate, blood pressure or the amount of blood pumped from the left ventricle after the participants consumed the energy drink. However, Dr. Dörner says their results show that consuming energy drinks does have a "short-term impact on cardiac contractility."

The researchers say further studies are needed to assess the long-term effects of energy drink consumption, as well as any effects these drinks have on people with heart disease.

Despite the lack of knowledge about long-term risks, the team recommends that children and people with cardiac arrhythmias refrain from consuming energy drinks, as contractility changes could trigger arrhythmias. A popular drink on the nightclub scene mixes energy drinks with alcohol, and Dr. Dörner warns that additional studies are needed to analyze the risks posed by such combinations.

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No need to delay introduction of food allergens to high-risk babies, paediatricians advise

Medical News Today 3 December 2013

Babies who are at high-risk of developing a food allergy can be exposed to potential food allergens as early as 6 months of age, according to a joint statement by the Canadian Paediatric Society (CPS) and Canadian Society of Allergy and Clinical Immunology (CSACI).

"Delaying dietary exposure to potential allergens like peanuts, fish or eggs will not reduce your child's risk of developing a food allergy," said Dr. Edmond Chan, paediatric allergist and co-

author of the statement. "However, once a new food is introduced, it is important to continue to offer it regularly to maintain your child's tolerance."

Babies are considered at high risk of developing a food allergy if they have a parent or sibling with an allergic condition, such as atopic dermatitis, a food allergy, asthma or allergic rhinitis. The statement says that while these foods can be introduced to high-risk babies, the decision about when should be individualized and based on the parents' comfort level. The CPS advises parents who are unsure to talk to their physician.

"We also don't recommend avoiding milk, egg, peanut or other foods while pregnant or breastfeeding," said Dr. Carl Cummings, co-author of the statement and chair of the CPS Community Paediatrics Committee. "There is no evidence to support the theory that avoiding certain foods during this time will prevent allergies in children."

Food allergies affect approximately 7 per cent of Canadians. Some research suggests food allergy in babies is increasing, affecting over 10 per cent of one-year-olds. The statement is endorsed by Dietitians of Canada.

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Vitamin D 'reduces pain and depression' in type 2 diabetic women

Medical News Today 5 December 2013

Type 2 diabetes has long been linked to higher risk of depression in women, and previous research has associated both of these conditions with pain. But a new study suggests that vitamin D supplementation can reduce both depression and pain in women with type 2 diabetes.

A team of researchers, led by Todd Doyle of the Department of Psychiatry and Behavioural Neurosciences at the Loyola University Chicago Stritch School of Medicine, presented their findings at a research conference at Loyola's Health Sciences Campus.

The investigators note that there are limited studies looking at how pain could affect the treatment of depression in individuals who have type 2 diabetes, and they say that so far, studies have not determined how vitamin D supplementation may play a role in the association of pain and depression with type 2 diabetes.

With this is mind, the team conducted a study looking at how vitamin D supplementation affected women with type 2 diabetes who were also suffering from depression.

At the baseline of the study, 61% of women reported neuropathic pain, such as shooting or burning pain in their legs and feet, and 74% reported sensory pain - numbness and tingling in their hands, fingers and legs. The women were required to take a 50,000 IU vitamin D2 supplement every week for a period of 6 months.

Depression and pain 'improved' with vitamin D

At the end of the study period, the women's depression levels significantly improved following vitamin D2 supplementation.

Furthermore, women who suffered neuropathic and/or sensory pain at the beginning study also saw their symptoms decrease at 3 and 6 months following vitamin D2 supplementation.

Commenting on the findings, Todd Doyle says: "Pain is a common and often serious problem for women with type 2 diabetes and depression. While further research is needed, D2 supplementation is a promising treatment for both pain and depression in type 2 diabetes."

The investigators say they have now received funding from the National Institute of Nursing Research - a part of the National Institutes of Health (NIH) - which will enable them to conduct a trial looking at how two different doses of vitamin D3 supplements may affect the health outcomes of women with type 2 diabetes.

"Vitamin D has widespread benefits for our health and certain chronic diseases such as type 2 diabetes," says Sue Penckofer, co-author of the study and professor at the Loyola University Chicago Marcella Niehoff School of Nursing.

"This NIH grant will allow us to shed greater light on understanding the role that this nutrient plays in managing the health of women with diabetes."

The benefits of vitamin D

Vitamin D has many important functions in the body. It helps to regulate the amount of calcium and phosphate in the body, which are needed to maintain bone and teeth health. Previous research has suggested that vitamin D deficiencies may negatively impact our health. *Medical News Today* recently reported on a study suggesting that low vitamin D levels may damage the brain.

Other research has linked vitamin D deficiency to increased risk of anemia in children and faster aging of bones. The body gets the majority of its vitamin D from the sun, but the UK's National Health Service (NHS) notes that many foods are good sources of vitamin D. These include:

- Oily fish, such as salmon, sardine and mackerel
- Eggs
- Fortified fat spreads
- Fortified breakfast cereals
- Powdered milk.

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Food and Health Sectors Need to Work Together to Battle Global Nutrition Meltdown: WHO

15-Nov-2013 Nutra Ingredients

Contemporary food systems need to change – and the health and food sectors need to work more closely together - if more than half the world's population that don't eat enough, over eat, or eat poorly, are to be helped, the WHO has said.

Dr Hans Troedsson, executive director of WHO's Director-General's Office, said baby-to-elderly dietary interventions were a major way of tackling global disease.

Diet-based solutions

"If we, in the past, were mainly challenged by malnutrition in children, we are today facing an epidemic of poor diets and low physical activity, leading to high blood pressure, cardiovascular diseases, diabetes and overweight," Troedsson said. *"The nutrition and health threats have actually expanded and worsened and this will not go away by itself. We need to address it urgently now and in the future. The health sector and the food sector need to work together."*

Scale of the problem

The drastic call came at a meeting of the World Health Organization (WHO) and Food and Agriculture
Organization (FAO) in Rome this week where director general of the FAO, José Graziano da Silva, said, *"It is clear that the ways in which food is managed today are failing to result in sufficient improvements in nutrition."*
"The most shocking fact is that over 840 million people still suffer from hunger today, despite the fact that the world already produces enough food for all, and wastes one-third of it."

In Europe, Roberto Ridolfi, European Union Commission Director for Sustainable Growth and Development said the EU was pushing for, *"measurable and time-bound targets"* to reduce child stunting and other consequences of malnutrition. In addition to the 100s of millions that go hungry every day, another 2 billion suffer micronutrient deficiencies. Another 7 million children die before their fifth birthday every year, 162 million children under five are stunted while at the same time, 500 million people are obese.

"The total amount of food produced but not consumed would be enough to feed an additional two billion. The truth of the matter is that, today, consumers are not receiving the right signals from current policies about how to eat healthily. That is what we need to address," Graziano da Silva added.

The International Fund for Agricultural Development (IFAD) and the World Food Programme (WFP) are also working toward the inclusion of a stand-alone goal on food security and nutrition in the post-2015 Development Agenda, as recommended by the High Level Consultation on Hunger, Food Security and Nutrition held in Madrid in April.

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Have Starch From Grains and Fat, but not Fructose, Been Significant Contributors to Obesity?

01-Nov-2013 Food Navigator

Increased energy intakes primarily from starch in grains and fat may have significantly contributed to sky rocketing obesity rates in the US, but not fructose, according to a new analysis of 40 years-worth of data from the USDA.

Obesity rates have risen from about 13% in 1970 to about 35% in 2009, with changes in the composition of food debated extensively by academia and industry. Dietary fructose has been blamed by many as a possible contributor to obesity rates, but a new analysis found that total fructose availability in the US did not increase over the four decades between 1970 and 2009.

Trevor Carden and Timothy Carr from the Department of Nutrition and Health Sciences at the University of Nebraska used the USDA Loss-Adjusted Food Availability Database in combination

with the USDA Nutrient Database for Standard Reference to elucidate if fructose consumption has increased sufficiently in the US to contribute significantly to the prevalence of obesity.

Writing in the open-access *Nutrition Journal,* they report that the availability of carbohydrates has increased more than any other macronutrient in the US food supply over the last 40 years. Compared to 1970, 32.3 grams more of carbohydrates were available per day in 2009. Other studies have reported that fructose consumption increased 18% between 1970 and 2004, but the new analysis of Carden and Carr found fluctuations in fructose availability over 40 years, with an overall result of no net change in total fructose availability.

"Despite the current findings showing a lack of association between total fructose availability and obesity prevalence, one should not regard fructose as a benign nutrient that can be consumed without consequence, particularly if over-consumed," wrote the researchers.
"Fructose is a lipogenic nutrient and metabolized differently than glucose. The current study suggests that the unique lipogenic properties of fructose may have been of minor importance to the rise in obesity due to the small contribution of dietary fructose relative to glucose and total energy availability."
"The present findings also cast doubt on the purported role of HFCS as a singly important dietary factor in promoting obesity. Despite increased usage of HFCS in the US food supply, no net change in total fructose availability occurred between 1970 and 2009 when analyzed using loss-adjusted data."

Total calories drive obesity rates

The new analysis, which was supported financially by the University of Nebraska Agricultural Research Division with funds provided through the Hatch Act, was welcomed by the Corn Refiners Association (CRA).
"This study confirms what the scientific evidence has shown for years. Consumption of fructose is not a unique factor in the rise in obesity rates in the US," said CRA in a statement. *"As the researchers conclude, claims that fructose is somehow uniquely responsible for our nation's obesity epidemic are not only wrong, they are counter-productive to finding effective solutions to this complex health crisis.*
"As the data shows, it is the increase in total calories that is driving the increase in obesity rates. Virtually all of these additional calories are in the form of grains and fats, whereas fructose-containing sweeteners such as sugar and high fructose corn syrup account for only 1.3% of the increased calorie consumption since 1970.
"High fructose corn syrup consumption has decreased steadily for more than 10 years. In 2012, Americans consumed 25% less of it than they did in 1999 while obesity rates continued to climb during this time period."

Study details

Carden and Carr analyzed food availability per capita for 132 individual food items, and results showed that total energy availability increased 10.7%, with zero net change in total fructose availability. Energy from carbohydrate, fat, and protein increased 9.8%, 14.6%, and 4.7%, respectively.

"The food categories that increased the most during this time were grains and fats/oils, having increased 24.2% and 25.3%, respectively," said the researchers. *"Caloric sweeteners (including both sucrose and HFCS) increased a modest 1.3%. "When expressed in terms of monosaccharides available for metabolic absorption, all carbohydrate food sources provided [greater than] 3-times more glucose than fructose. Moreover, total glucose availability increased 13.0% from 1970 to 2009, whereas total fructose availability did not change." "Our findings indicate that fructose per se was not a unique causal factor in promoting obesity during 1970-2009. Rather, we conclude that increased total energy intake, due to increased availability of foods providing glucose (primarily as starch in grains) and fat, to be a significant contributor to increased obesity in the US."*

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Intestinal Bacteria May Influence Food Transit through the Gut

25-Nov-2013 Nutra Ingredients USA

Food transit time though the gut may be controlled by a complex system of hormones released by our microbiota, according to new research.

Published in *Cell Host & Microbe*, the new research investigated how the gut microbiota affects the production of the glucagon-like peptide-1 (GLP-1) hormone by comparing germ-free and conventionally raised mice. Led by Anita Wichmann from the University of Gothenburg, Sweden, the team reported that bacterial species in the microbiota regulate the basal levels of GLP-1 – adding that increasing the levels of GLP-1 may be an adaptive response to insufficient energy availability in the colon.

"Surprisingly, we find that the absence of microbially produced short-chain fatty acids in germ-free colon results in significantly higher plasma GLP-1 levels," said the team. *"This colonic-derived GLP-1 has an important role in slowing small intestinal transit, which may be an adaptive response for promoting nutrient absorption."*

"We are continuously discovering new functions that are regulated by the gut microbiota, which highlight its incredibly important function for health and development of diseases," commented Professor Fredrik Bäckhed, senior author of the study.

Nutrient intake

The team noted that food transit through the small intestine affects the body's absorption of nutrients and, consequently, our health. One of the tasks of the gut microbiota, they noted, is to break down essential nutrients from our diet to provide a usable energy source in the colon. The discovery that food transit time is regulated by the GLP-1 hormone indicates new ways to increase the intestinal absorption of nutrients, and thus potentially treat malnutrition, said the authors.

"Food transit through the small intestine is a complex balancing act, in which the gut lining must be given time to absorb nutrients but without allowing pathogenic bacteria sufficient time to colonize the small intestine," said Wichmann. *"We have discovered that food transit through the small intestine is regulated by a specific hormone called GLP-1, which is linked to our glucose metabolism and appetite. We propose that colonic GLP-1 has an important function in slowing intestinal transit in response to insufficient energy availability in the colon,"* explained the research team.

They added that elevated GLP-1 levels and slower gastrointestinal transit times have previously been reported in patients with anorexia nervosa, "suggesting that this function may be conserved in humans."

"Our findings provide an example of how the microbial contribution to energy supply affects host gene expression and physiology in the gut."

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Krill Study Suggests Anti-aging Potential

14-Nov-2013 Nutra Ingredients

Supplementation with krill powder could help to prevent age-related declines in weight and energy by altering important metabolic pathways, according to new research in mice.

Published in the *Journal of Functional Foods*, the new study investigated the effects of 12 weeks supplementation with Aker BioMarine's Superba Krill Powder on the hepatic gene expression of mice. The team behind the study reported that supplementation of the powder - which contains a mixture of oil and protein from Antarctic krill modified the pathways of several metabolic processes - showing that glucose metabolism and the degradation of lipids and amino acids were down-regulated while energy metabolism was up-regulated.

Led by Dr Bodil Bjørndal from the University of Bergen, Norway, the team suggested that dietary supplementation with the krill-based formulation may have the potential to prevent

age-related declines in weight and energy due to the preservation of amino acids in combination with increased energy production.
"The findings of this study support further investigation into whether a lipid and protein combination product can have additional benefits over omega-3 supplementation alone; in particular, if a krill powder diet vs. a krill oil diet has an added effect on pathways involved in protein metabolism," said Bjørndal.
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Lowering Blood Sugar Could Help Prevent Cognitive Declines: Study

24-Oct-2013 Food Navigator
People with higher blood sugar levels are more likely to have memory problems, according to new research that suggests reducing levels of blood sugar could help to protect against cognitive declines.

Writing in the journal *Neurology*, the research team investigated whether raised blood glucose and glycosylated hemoglobin (HbA1c) levels have an impact on cognitive functions including memory performance and hippocampal volume and microstructure in a group of healthy, older, non-diabetic people without dementia. Led by Dr Agnes Flöel, of Charité University Medicine in Berlin, Germany, the team found that people with lower blood sugar levels were more likely to have better scores on the memory tests. Even for people who don't have diabetes or high blood sugar, those with elevated blood glucose levels are more likely to have memory problems, said the authors.

"These results suggest that even for people within the normal range of blood sugar, lowering their blood sugar levels could be a promising strategy for preventing memory problems and cognitive decline as they age," said Flöel. *"Strategies such as lowering calorie intake and increasing physical activity should be tested,"* she suggested.

Study details

The study involved 141 people with an average age of 63 who did not have diabetes or pre-diabetes, which is also called impaired glucose tolerance. People who were overweight, drank more than three-and-a-half servings of alcohol per day, and those who had memory and thinking impairment were not included in the study. The participants' memory skills were tested, along with their blood glucose, or sugar, levels. Participants also had brain scans to measure the size of the hippocampus area of the brain, which plays an important role in memory.

On a test where participants needed to recall a list of 15 words 30 minutes after hearing them, recalling fewer words was associated with higher blood sugar levels, Flöel and her team reported. For example, an increase of around seven mmol/mol of HbA1c (a long-term marker of glucose control) was associated with recalling two fewer words. People with higher blood sugar levels also had smaller volumes in the hippocampus, the team found.

"Our results indicate that even in the absence of manifest type 2 diabetes mellitus or impaired glucose tolerance, chronically higher blood glucose levels exert a negative influence on cognition, possibly mediated by structural changes in learning-relevant brain areas," said the authors. *"Therefore, strategies aimed at lowering glucose levels even in the normal range may beneficially influence cognition in the older population,"* they concluded.

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Vegetable Protein May Help Kidney Disease Patients Live Longer: Study

18-Nov-2013 Nutra Ingredients

Increased consumption of vegetable protein may be associated with increased survival among people with kidney disease, according to new research.

The findings, presented at ASN Kidney Week 2013, analysed data from 1,104 people suffering from chronic kidney disease (CKD) in the1988-1994 National Health and Nutrition Examination Survey III, and asked them about their animal and vegetable protein intake. Led by Xiaorui Chen from the University of Utah, the team noted that poor kidney function as found in CKD means toxins that are normally excreted in the urine can build up in the blood of individuals, with previous research suggesting that vegetable protein intake in patients is linked with lower production of such toxins when compared with animal protein.

However, until now, it remained unclear whether consuming more vegetable protein was able to improve survival of kidney disease by this mechanism. After controlling for a variety of factors including age, smoking, and BMI, Chen and his team found that for each 10 gram increase in vegetable protein intake per day, participants had a 14% lower risk of dying by the end of 2006. *"Interventional trials are needed to establish whether increasing vegetable protein will decrease mortality in the CKD population,"* they wrote.

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Intestinal bacteria may influence food transit through the gut

Food Navigator 25-Nov-2013

Food transit time though the gut may be controlled by a complex system of hormones released by our microbiota, according to new research. Published in Cell Host & Microbe, the new research investigated how the gut microbiota affects the production of the glucagon-like peptide-1 (GLP-1) hormone by comparing germ-free and conventionally raised mice.

Led by Anita Wichmann from the University of Gothenburg, Sweden, the team reported that bacterial species in the microbiota regulate the basal levels of GLP-1 – adding that increasing the levels of GLP-1 may be an adaptive response to insufficient energy availability in the colon.

“Surprisingly, we find that the absence of microbially produced short-chain fatty acids in germ-free colon results in significantly higher plasma GLP-1 levels,” said the team. “This colonic-derived GLP-1 has an important role in slowing small intestinal transit, which may be an adaptive response for promoting nutrient absorption.”

"We are continuously discovering new functions that are regulated by the gut microbiota, which highlight its incredibly important function for health and development of diseases," commented Professor Fredrik Bäckhed, senior author of the study.

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"We propose that colonic GLP-1 has an important function in slowing intestinal transit in response to insufficient energy availability in the colon," explained the research team. They added that elevated GLP-1 levels and slower gastrointestinal transit times have previously been reported in patients with anorexia nervosa, "suggesting that this function may be conserved in humans."

"Our findings provide an example of how the microbial contribution to energy supply affects host gene expression and physiology in the gut."

Probiota 2014

Invested in pre- and probiotics? Probiota 2014 will explore the prebiotic-probiotic scientific frontier, its evolution and commercial application in food, nutraceuticals, pharmaceuticals and cosmetics across the globe.

The 2-day, 2-stream event – formerly Probiotech and Microbiota - will be held in Amsterdam on February 4-5 next year. Will you be joining your peers there?

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Is the next generation of fruit functional?

Food Navigator 27-Nov-2013

Fruit may have its own stand alone functionality but Taura Natural Ingredients says fortification with milk and pea proteins, green coffee and grains will bring the ingredient into new areas. Ingredients firm Taura showcased its URC Fruit and Protein enriched with milk and pea proteins, Fruit and Energy with caffeine derived from green coffee and guarana and Fruit and Fibre from fruit and grains at FiE last week. The range can be added to applications such as cereal, breads, bars and confectionery.

Specific functionality

Peter Dehasque, chief executive officer at the company, said: “You could argue whether fruit is a functional product on its own, actually it is.” Yet he said: “It’s not just the vitamins, the fibers, the antioxidants. It’s a combination of all that that makes it [fruit] stand out, and on top of that we add some extras that are really directed in specific fields like protein for sports nutrition and weight management, fibers for digestive health and caffeine for energy and sustained energy.”

Dehasque told BakeryandSnacks.com that the protein-fortified fruit pieces have a “subtle milky and fruity” flavour. “Delivering a high dose of protein is not easy; it can be quite difficult to obtain a good texture. Protein bars can be very heavy; they can be not very good in flavour. If you combine fruit and protein it’s actually a new generation of potential snacks.”

Dehasque said the company was appealing to an energy trend by including natural sources of caffeine like green coffee and the South American climbing plant guarana on top of the “fruit matrix”.

He said that caffeine adds an “extra notch” onto the low GI of fruit, as well as giving an extra flavour element. “The real novelty here is the intrinsic of URC [Ultra Rapid Concentrated] being low GI and then adding on top of that some extra functionality like protein fibres and energy.”

Dehasque said the company is interested in playing on gut health claims with its inclusion of fiber. He told us that the company is currently working on fiber concepts. "Potentially you could have a digestive claim supported by EFSA."

Stands on its own two feet

Earlier this year the European Food Safety Authority (EFSA) determined that manufacturers who substitute at least 30% of glucose or sucrose with fructose can claim that: “Consumption of foods containing fructose leads to a lower blood glucose rise compared to foods containing sucrose or glucose.” When asked how this development has affected the company’s ability to play to these functional foods markets, Dehasque said that fruit does not necessarily need an EFSA claim.

“We actually focus on those functional benefits where you can potentially make a claim. On the other hand fruit does the talking for itself; fruit is seen as healthy whether you have a claim or not from EFSA. Fruit doesn’t need a claim from EFSA, it stands on its own feet because of the holistic goodness of fruit,” he said.

Niche positioning

He said that these ingredients were “definitely at the premium end of the market. It’s for those products where you want to differentiate yourself with a more niche positioning, where you can claim high fruit content, where you can actually claim ‘better for you’,” Dehasque said.
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Food Science & Industry News

Scientists find vast new freshwater sources under the sea

Medical News Today 6 December 2013

Scientists have discovered huge reserves of freshwater kilometres out to the sea, providing new opportunities to stave off a looming global water crisis. A new study, published in the international scientific journal *Nature*, reveals that an estimated half a million cubic kilometres of low-salinity water are buried beneath the seabed on continental shelves around the world.

The water, which could perhaps be used to eke out supplies to the world's burgeoning coastal cities, has been located off Australia, China, North America and South Africa.

"The volume of this water resource is a hundred times greater than the amount we've extracted from the Earth's sub-surface in the past century since 1900," says lead author Dr Vincent Post of the National Centre for Groundwater Research and Training (NCGRT) and the School of the Environment at Flinders University. "Knowing about these reserves is great news because this volume of water could sustain some regions for decades."

Dr Post says that groundwater scientists knew of freshwater under the seafloor, but thought it only occurred under rare and special conditions. "Our research shows that fresh and brackish aquifers below the seabed are actually quite a common phenomenon," he says.

These reserves were formed over the past hundreds of thousands of years when on average the sea level was much lower than it is today, and when the coastline was further out, Dr Post explains. "So when it rained, the water would infiltrate into the ground and fill up the water table in areas that are nowadays under the sea.

"It happened all around the world, and when the sea level rose when ice caps started melting some 20,000 years ago, these areas were covered by the ocean. Many aquifers were - and are still - protected from seawater by layers of clay and sediment that sit on top of them."

The aquifers are similar to the ones below land, which much of the world relies on for drinking water, and their salinity is low enough for them to be turned into potable water, Dr Post says. "There are two ways to access this water - build a platform out at sea and drill into the seabed, or drill from the mainland or islands close to the aquifers."

While offshore drilling can be very costly, Dr Post says this source of freshwater should be assessed and considered in terms of cost, sustainability and environmental impact against other water sources such as desalination, or even building large new dams on land.

"Freshwater under the seabed is much less salty than seawater," Dr Post says. "This means it can be converted to drinking water with less energy than seawater desalination, and it would also leave us with a lot less hyper-saline water.

"Freshwater on our planet is increasingly under stress and strain so the discovery of significant new stores off the coast is very exciting. It means that more options can be considered to help reduce the impact of droughts and continental water shortages."

But while nations may now have new reserves of freshwater offshore, Dr Post says they will need to take care in how they manage the seabed: "For example, where low-salinity groundwater below the sea is likely to exist, we should take care to not contaminate it.

"Sometimes boreholes are drilled into the aquifers for oil and gas exploration or production, or aquifers are targeted for carbon dioxide disposal. These activities can threaten the quality of the water." Dr Post also warns that these water reserves are non-renewable: "We should use them carefully - once gone, they won't be replenished until the sea level drops again, which is not likely to happen for a very long time."

The National Centre for Groundwater Research and Training is an Australian Government initiative, supported by the Australian Research Council and the National Water Commission.

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Four Trends Propelling the Dairy Market

08-Nov-2013 Nutra Ingredients

An ageing population, new EFSA health claims, protein perceptions and a focus on sugar as opposed to fat are some key considerations that are or should be driving the dairy industry, according to an analyst.

Food Navigator spoke dairy trends with Chris Brockman, senior global food and drink analyst at Mintel, ahead of the firm's presentation at the upcoming industry event Food Ingredients Europe (FiE).

An ageing population

By 2015 Europe will have twice as many 55-74 year olds as 15-24 year olds. *"This is changing the way brands look at their consumer base,"* Brockman said. With this new consumer base skew comes health and format considerations particular to this demographic. Brockman suggests that manufacturers could do more to meet the needs of older consumers, while not overtly targeting them. Older people are more likely to live in smaller households, or even alone, and typically have smaller appetites. Therefore smaller portions of products could appeal to this age group as has already been seen with some new product launches. Brockman said that packaging was a big consideration when appealing to this population, saying that easy-to-open packaging like easy-peel lids for dairy products is currently a missed opportunity.

EFSA health claims

This year's EFSA ruling for generic descriptors was a game changer for yoghurt companies who found themselves no longer able to connect pre and probiotics with digestive benefits. Brockman said that this has led to a decrease in new yoghurt products boasting digestive health claims – falling from 10% of new launches in 2009 to just 2% in 2013 – yet this has not significantly affected the number of products which contain pre and probiotics.

As a result dairy manufacturers have become more creative in the health claims they employ, Brockman said. In place of the generic descriptors, manufacturers have pushed fibre content in order to make digestive claims and have diversified also into calcium and approved vitamin

claims related to immunity. Brockman said that these are also *"potentially more consumer friendly"* claims to make.

Pro protein

Protein has been a big trend rumbling within the dairy industry and more generally for a while now, with many Europeans rightly or wrongly believing that they need more protein in their diet, explained Brockman.

Mintel data found that six in ten UK consumers believe protein keeps them feeling fuller for longer, and Brockman said that manufacturers are increasingly monopolising on this perception. Manufacturers cannot make this satiety claim in Europe but often infer this with descriptions of thickness and creaminess and with larger pot servings. This has been seen in particular with Greek and Greek-style yoghurt. The US market is leading the way in this, he said, with 58% of US consumers eating yoghurt for taste and 44% for protein content.

According to Mintel, in Europe 1.33% of new dairy product launches contained high protein claims in 2013, compared to 7.4% in the US. Brockman said that in Germany up to a quarter of consumers buying yoghurts see them as meal replacers, as opposed to just snacks or desserts. This is an idea, coupled with the inference of satiety, which seems to be spreading via bigger pot sizes and the inclusion of things like nuts, seeds and fruit, he explained.

Sugar as an "evil ingredient", not fat

The yoghurt market's focus on reduced fat represents a missed opportunity in sugar reduction, Brockman said. He said this could change as stevia *"creeps up a bit"* in the dairy category and suggested that there could be a repositioning from a focus on low and no fat yoghurt towards reduced sugar. He said that sugar may be increasingly seen as more of an *"evil ingredient"* than fat considering concerns over diabetes.

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Another BRIC in the weight management wall as sector hits $150bn globally in 2013

Food Navigator, 25-Nov-2013

Weight management products are booming globally, especially in increasingly image driven emerging economies like India and Brazil. It has pushed beyond $150bn (€110m) in global sales this year (not including food supplements).

"It was actually the second largest health trend globally, just behind general wellbeing," said Ewa Hudson, Euromonitor International global head of health and wellness research, at Food

Ingredients Europe in Frankfurt, Germany, recently. “We expect it grow by 34% by 2019 so it is a pretty strong growth,” Hudson said.

The growth was being driven by emerging markets like Mexico, Brazil, Argentina and India. “For example Brazil added just over $700m (€518m) in new sales just in one year but…in 2013 India will be in the lead with new sales of over $800m (€592m).”

Hudson noted formats differed very much in emerging markets where, say, in India dairy dominated compared to a broader range of options in mature markets like North America and western Europe. Despite the Nestlé exit, weight management remains important to the biggest food companies, it being the most important health category to Coca-Cola and others.

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Better supply chain management will bring sustainability and quality, says botanical expert

Nathan Gray in Nutra-Ingredients 07-Nov-2013

Botanical players who are serious about providing good quality products must take more care of their supply chain in order to increase sustainability and build quality, says Professor Monique Simmonds, OBE.

As the demand for botanical ingredients rapidly grows so do the risks of adulteration and overharvesting, warned Simmonds - an expert from the Royal Botanical Gardens at Kew, UK.

"I think it is a big issue, especially as supplements and things like that are increasing in popularity," said the expert, who is director of the Kew innovation unit, deputy keeper and head of the sustainable uses of plants group at the Royal Botanical Gardens. *"There is a real desire to provide quality materials, but the question is whether people will pay for that quality." "If you take the narrow range of things that we do use - for medicinal uses, or in food supplements - I think the challenges are increasing, and that they will increase further."*

Speaking with NutraIngredients as part of our special edition on botanicals Simmonds said that many companies that are supportive of quality are investing in better supply chain management - causing a shift from relying on third parties that are not connected with the parent company to a state where the main company are much more invested in the supply chain.

"I think you see more companies really having a greater concern that they do know exactly what is happening on their supply chain, and therefore linking closer with the source."

"And that's not just about ethical issues like labour or land use and fair costs, it's that they want to absolutely make sure that the product they are getting is what it says on the bottle - and not something that has been mixed."

From wild to cultivated

Simmonds added that that one of the main issue facing suppliers of 'smaller' botanical ingredients is getting the right supply chain as popularity grows - and moving from a wild harvested plan to one grown in plantations.

"If they suddenly become popular and there isn't a good agricultural practice in place to get them from wild harvest to cultivation then that can cause real problems because you end up with overharvesting," she explained - noting that not all botanicals will be able to take the step between wild harvested and cultivation, due to a number of factors involving environmental and planting conditions.

"A lot of research needs to be done in developing cultivation methods," Simmonds told us. *"But also there is an amount of care that needs to be taken in making sure that the material selected for cultivation actually contains the profile of chemicals that are associated with its potential use."*

"You might have the right species but you could end up with the wrong chemotype or variety, which leaves you with inferior material being grown that then ends up getting in to the trade and in the end has a negative effect."

"I would not be surprised, if we looked at how plants got from the field to the final product ten years ago compared to maybe in five or six year's time - I think it's going to be very different,"

"DNA barcoding is definitely, I think, a way for the future. We need to have something that does support and improve transparency."

"If you look at the diversity of plants, and then look at how few actually make it to market. Does that reflect that very few plants work?" she questioned. *"I wouldn't have thought so. I would think that it's more about that we have not studies them enough or that we have not been able to make this transition from something that is wild harvested to something that is cultivated."*

"We end up selecting the easily cultivated material."

Adulteration issues

Simmonds warned that increasing pressure on land use, due to population rises, housing, and climate change, have led to a huge increase in adulteration of botanical ingredients in recent times. As a result, she said there is a clear need for further research in order to better understand and spot adulteration in addition to industry embracing different ways of identifying plants - from using traditional morphology to DNA barcoding.

"You will find that those companies that really do want to have quality will most likely support that, or whatever other alternative is used," she said. She added that because mixing and

adulteration can occur at various stages of the chain, there is likely to be a greater focus on managing every stage of that chain.

"I would not be surprised, if we looked at how plants got from the field to the final product ten years ago compared to maybe in five or six year's time - I think it's going to be very different," she said. *"The number of people involved, I would not at all be surprised to see decrease."*

Simmonds told us that one of the 'really fascinating' things about Kew is that she has access to such a wide array of collections which allows her and her colleagues to look back at the adulterants that were occurring 100 years ago. *"They were occurring, though not to the same level as now,"* she said. *"The sophistication, and lengths that some will go to in order to get something through now is far more."*

One of the examples that the Kew team had recently was the adulteration of ginseng with codonopsis, which is another form of ginseng but doesn't have the same properties, said Simmonds. In this case codonopsis plants that did not contain the same chemical compounds were sprayed with a solution of ginseng - meaning that when people did a test for these valuable compounds that are used as a quality control, they were found in the sample.

"They would have been in lower concentrations, but they were there, which would maybe lead somebody to think that the sample might not be of the best quality but was the real thing," she said. *"Of course it wasn't it was totally different."*

Quality comes at a price

"I think the need for authentication is definitely increasing," said Simmonds. *"DNA barcoding is definitely, I think, a way for the future. We need to have something that does support and improve transparency."* However, the Kew director of innovation said that if the industry does want to have such quality controls, then they will come at a price.

"It would put a cost on, so if it's for the mass market, are they going to be able to bare that cost? ... It's a difficult challenge." However, she did note that the cost of doing some types of authentication will decrease as the experts and industry gain a better knowledge of exactly what the issues are in order to come up with 'robust methods' for testing. *"We spent months and months initially when we had problems with star anise,"* she said. *"We had an issue where Chinese star anise which is used in cooking was being replaced with adulterants like the Japanese star anise - which is toxic."*

"Initially when we did that work, it took us quite a few months to get a robust method together for a test. But now we have that it's a little bit more routine." However, the botanical expert noted that adulterants could vary widely depending on where the source material comes from and how it enters the supply chain.

"You might have the same product - like cinnamon - but the things it will be adulterated with will vary depending on whether that comes from for example Sri Lanka or India." "Local substitutes will vary, so therefore having a knowledge about, what we term 'the lookalikes' and common substitutes is very important," she said.

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Frying temperatures key for flaxseed wheat chips: study

30-Oct-2013 Food Navigator

Wheat chips can be fortified with flaxseed but frying temperatures must be high to counteract textural and taste impacts, research shows.

The study published in the *Journal of Food Chemistry* investigated fortifying wheat chips at a formulation stage with flaxseed flour which is high in dietary fibre and omega-3s. It then looked at how this impacted the chemical and physical properties of the chips as well as texture, taste and colour. The researchers from Erciyes University in Turkey successfully fortified the wheat chips but acknowledged that inclusion of flaxseed does impact the physiochemical, textural, fatty acid composition and sensorial properties. They said it is therefore important for manufacturers to work on optimal formulation and processing parameters, particularly the frying temperature.

High frying temperatures for acceptability

"Overall acceptability scores of samples significantly increased with the increasing of frying temperature," the researchers wrote. Taste scores were higher when the chips were fried in hotter oil and crispiness improved. The increase in frying temperatures also counteracted the hardness given by the flaxseed flour in the chips, the researchers found. Wheat chips could be fortified using levels of flaxseed flour as high as 20%, they said, but the optimal amount was 10%. Ideal processing for a formulation containing 10% flaxseed flour involves a frying temperature of 180°C cooked for 52 seconds, the researchers said.

Flaxseed omega-3 benefits

The researchers said that findings proved particularly interesting for the Turkish market, given how much wheat the population consumes as it would enable manufacturers to bring an appealing functional snack to the market. Flaxseed is high in omega-3s, containing about 40-45% of fatty acid oils, and also a good source of fibre, vitamins and minerals, they said.

"Because of the high unsaturated fatty acid content of flaxseed, fortification of foods with flaxseed can be a good way to increase the omega type fatty acid content of the processed foods," the researchers added.

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Consumers to Undergo Brain Scanning to Test Food Promotions

18-Nov-2013 Food Manufacture

Food and drink shoppers are to undergo brain scanning, under lab conditions, to test their reactions to promotions and special offers as part of a new project by the University of Bangor and shopper research firm SBXL.

SBXL claimed the project could save supermarkets millions of pounds lost through offering the wrong kind of promotions to consumers. SBXL's md Phillip Adcock said: *"Around a quarter of all products on supermarket shelves are on some kind of offer or promotion, so we are talking about many millions of pounds at stake in lost margins if the supermarkets get it wrong. We estimate that supermarkets and brands consistently give away 23% more margin than they need to."*

£3M medical scanner

As part of the project, consumers will be asked to simulate a £80 grocery shop in a supermarket, while going through a £3M 20t medical functional magnetic resonance imaging scanner. A variety of supermarket products will be displayed on a screen in front of shoppers, who will then be asked to make normal shopping choices from a shopping list, while faced with a wide range of promotions and special offers. This should identify which part of the brain is involved in making choices by measuring blood flow and brain activity. The aim of the project is to find out how shoppers respond to special offers, what their attention span is and how capable they are of ignoring brands surrounding those on offer. The project is being sponsored by three multi-national grocery and healthcare companies, together responsible for more than 20 household brands, ranging from canned vegetables to beauty products.

Early research

Early research suggested that at around 23 minutes into their shop, customers began to make choices with the emotional part of their brain. This part of the brain can only guess at value for money, rather than the cognitive part of the brain which is capable of logical decision-making, the University of Bangor said.

The research also showed that after 40 minutes, the average time taken to complete a weekly shop, the brain gets tired and effectively shuts down – ceasing to form rational thoughts.

Previous research also found that 20% of shoppers were likely to put special offers in their basket even if they were more expensive than the normal product. Nearly half of shoppers were also said to ignore buy-one get-one-free items and only chose one.

Senior lecturer in psychology at the University of Bangor, Dr Paul Mullins, added: *"This* [project] *gives us the chance to bring our research on decision making into a real world context, and we hope will tell us a lot about how we respond to different types of competing information in the world around us. In particular we are interested in how factors we may be unconsciously aware off can override what might be considered the optimal choice based on conscious judgements."*

Meanwhile, last week grocery think-think IGD's chief economist James Walton told FoodManufacture.co.uk that consumers would hold on to the defensive shopping habits they have adopted over the last few years even if the UK experienced an economic recovery. Earlier this month, Tesco announced it planned to install face-scanning advertising screens in all its 450 petrol stations. Camera will scan the faces of people queuing and alter the adverts being played out on the screen depending on the gender and age of shoppers.

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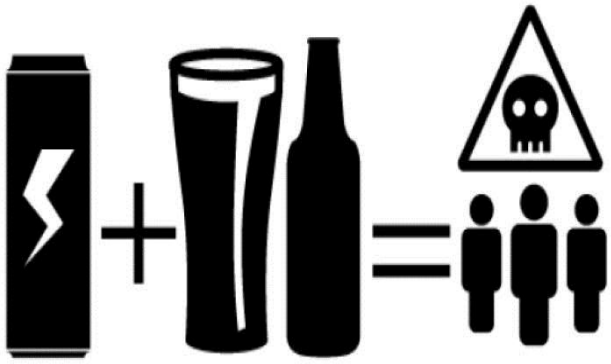
Food Safety & Regulatory News

Energy drinks plus alcohol pose a public health threat

Science Daily December 2, 2013



Mixing energy drinks with alcohol is riskier than just drinking alcohol alone, according to a new study that examines the impact of a growing trend among young adults.
Mixing energy drinks with alcohol is riskier than just drinking alcohol alone, according to a new study that examines the impact of a growing trend among young adults.

Published in the current issue of the *Journal of Adolescent Health*, the study was conducted by Megan Patrick of the University of Michigan Institute for Social Research and Jennifer Maggs of Penn State University. "We found that college students tended to drink more heavily and become more intoxicated on days they used both energy drinks and alcohol, compared to days they only used alcohol," said Patrick, lead author of the study.

While the U.S. no longer permits manufacturers to premix high-caffeine products with alcohol, mixed drinks such as vodka & energy drink and Jäger bombs, made by dropping a shot of Jägermeister liquor into a glass of energy drink, are becoming increasingly popular.

According to the researchers, the public health implications include not only physical risks to individuals from blacking out and alcohol poisoning, for example, but also exposing the community to dangerous situations in which young adults may be "wide awake drunk" after a night of partying.

Patrick and Maggs analyzed data on 652 college students over a period of four semesters. During four two-week periods, the students answered questions every day about their consumption of energy drinks and alcohol, and about any negative consequences they experienced as a result -- from having a hangover to getting into trouble.

"Our findings suggest that the use of energy drinks and alcohol together may lead to heavier drinking and more serious alcohol-related problems," Patrick said. "As energy drinks become more and more popular, we should think about prevention strategies for reducing the negative consequences of using energy drinks and of combining energy drinks with alcohol."