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Protein Foods and Nutrition Development Association of India

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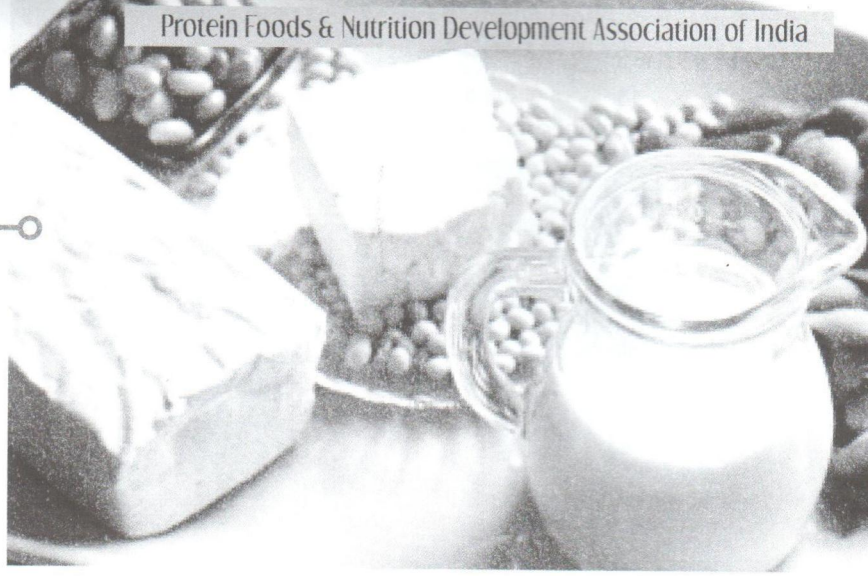
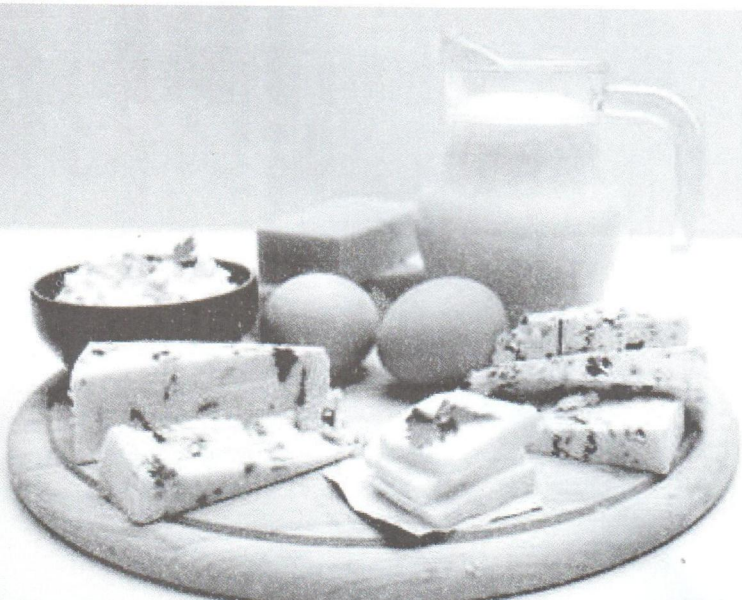
Editorial



Protein is the most important macronutrient that is needed by all animals and more so the humans. It is essential for many reasons. About 75% of our body dry weight is protein so in order to maintain it from wear and tear proteins are needed in our diet. The protein not only is part of our muscles and all part of the body, it is needed by infants and children both for growth and for development of brain. Deficiency at this stage will cause mental retardation. Proteins are also needed as enzymes and hormones besides being instrumental in transporting oxygen and lipids to different tissues. It also helps fight disease as antibodies and also useful in clotting of blood so a cut may not cause death due to bleeding. Thus proteins are useful in many ways.

In India, good proportions of people are vegetarians so they need to be extra careful to not only get enough proteins but to get good quality of proteins which contain all the essential amino acids in adequate amounts. With vegetarian diet it is difficult to get enough protein and also since there are some limiting amino acids it further lowers the quantity of useful amounts. One way of course is to include milk in the daily diet which has complete protein and also improve the quality of vegetarian diets.

From the surveys it is clear that Indian diets are deficient in protein not only in quantity but also in quality. The problem is more severe considering that children need more of high quality protein and so do pregnant and lactating women.



Many Indians are non-vegetarian and get high quality proteins. Meat, fish and poultry as well as eggs contain high quality proteins and when combined with cereals, pulses, fruits and vegetables, gives complete meal with adequate amounts of high quality protein. Even soya products can make it better quality but somehow this has not picked up so far.

Fish is quite popular with coastal population and contain good quality protein but the smell is not acceptable to all. Red meat although is excellent source of iron, has certain problems like higher amount of saturated fat and also has been associated with heart disease and cancer. Chicken has become the non-vegetarian protein source of choice because of high and good quality protein, less fat and can be used in a variety of cuisines as it is goes well with many different ingredients.

With poultry industry growing leaps and bounds in India, chicken and eggs have become quite affordable and many high quality and safe products have become available. Not just chilled and frozen poultry meat but a lot of value-added easy to cook and many heat-&-serve products have made it very easy and acceptable.

Even fast food stores have made it quite popular with burgers, pizza and fried foods are turning more people to enjoy chicken foods. Even Indian preparations like chicken tikka have become a global favourite. Going from roadside chicken store to processed chicken has certainly made it a much safer and higher quality product. This trend will certainly keep growing in future as well. With Greetings & Wishes,

Prof. Jagadish S. Pai.
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FSSA 2006: Transparency & Conflict of Interest

Dr. J. I. Lewis, Chairman, Regulatory Affairs, PFNDAI

Conflict of interest is popularly assumed to arise solely from industry. Conflicts of interest situations arise whenever undue influence on outcomes result from gain (commercial), glory (populism) or bias (caucus). It may well be argued that the overtly heavy drawing of members from government funded institutions is likely to create a caucus of opinions that favours a certain point of view, rather than one emerging from the best scientific evidence or technology available. Another kind of conflict arises - more serious – when outcomes are delivered by compromising principles under the guise of 'solving problems in a practical way'. All these are conflicts and the validity of outcomes are acceptable only when they are made consistent with processes under the Act.

India is passionate about cricket – a game it understands well – and herein lies a lesson to be learned. Cricket's first issue on conflict of interest arose when accusations were levied on home country umpires as being likely to influence outcomes of matches. To overcome this perception cricket boards opted for neutral (country) umpires – so that conflicts of interest would be removed. But neutral umpires continued to make mistakes as slow motion TV replays would show. What they had dealt with was conflict of interest but not 'expertise'. Even now inspite of providing for a third umpire, faulty decisions are being made and there is talk of "Hawkeye", and "Hotspot" and DRS – seen by India to be not 'completely expert'. Quite clearly it's the transparency available through slow motion TV replays that revealed the quality of expertise. Transparency overcomes and exposes conflicts of interest including inadequate expertise. The lesson learned is – conflict of interest is not a reason to replace (exclude) genuine expertise.

The example shows that conflict of interest is likely to arise when transparency is absent. Interest and expertise are compatible - interest itself is a prerequisite for expertise. How on earth would one become an expert if one had no interest in the subject? Are umpires for country test matches selected from university professors of physical education or sport management to officiate in the game? The same analogy is applicable to FSSAI which should ensure expertise is above all paramount while being transparent at the same time through interest declarations. Interest is not synonymous with conflict.

Conflicts are several:

Conflict of interest is popularly assumed to arise only from industry. Conflict of interest situations arise whenever undue influence on outcomes result from gain (commercial), glory (populism) or bias (caucus) occurs It may well be argued that the overtly heavy drawing of members from government funded institutions is likely to create a caucus of opinions that favours a certain point of view, rather than one emerging purely from the available scientific evidence or technology prevailing in the country. Another kind of conflict arises - more serious – when outcomes are delivered by compromising principles under the

guise of 'solving problems in a practical way'. More often the latter arise when persons not familiar or experienced with legislative jurisprudence propose anecdotal remedies based on "personal knowledge', 'field experience' and 'in my opinion'. Readings of drafts being put out reveal these leanings. Often there is neither a regulatory principle nor an international precedence nor reasonable data placed on the table to support the several clauses therein. Regulatory texts are made on the hoof – divined by a few, never vetted for bias, whim or the ad lib manner of construction. All these are conflicts – and the validity of outcomes are acceptable only when they are made consistent with principles and due processes required under the Act.

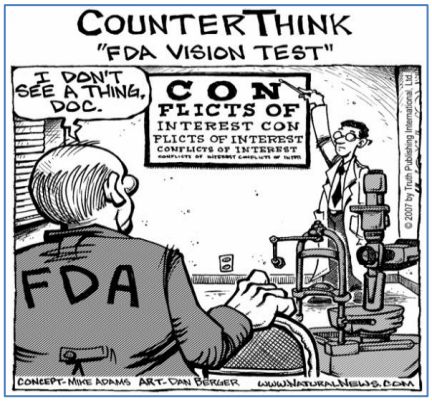
Some conflicts have received more attention than others. Perhaps no other constituted body of the Food Safety and Standards Authority of India (FSSAI) has received greater attention regarding this issue than the Scientific Panels and Committee. Acts are noble - it could never have intended removal of only one kind of conflict while allowing others to flourish. The assumption that removal of industry affiliations automatically removes all conflict and yet provides comprehensive science needs serious thought. While they may not be included within the Scientific Panels or Committee – should not an external working group of industry scientists review the scientific opinions being delivered and report their findings to the Authority – prior to developing the regulatory response?

The highest principles to uphold are expertise and transparency; interest is the sub text. Expertise comes in several forms. Industry 'expertise' provides the Authority a very significant component of knowledge namely 'tacit knowledge' – the actual expertise gathered while doing things – not often codified in texts. This is different from formal or explicit knowledge – the kind we learn at institutions. A blend of both tacit and explicit knowledge is required if the best scientific outcomes for consumer safety and health are to prevail. The anxiety or apprehension that inclusion of industry experts in the Scientific Panels/Committee will influence rulemaking is false. The fact is that the functional role under the Act excludes Scientific

Panels/Committee from rulemaking and legally limits their ambit to science. Unfortunately these are ignored or have been discarded nonchalantly.

For the sake of argument if industry scientific inputs (tacit knowledge) are considered a counterpoint to what institutional science (explicit) provides does not a conflict arise by a biased pre-arrangement to exclude one for the other? By removing one section of expertise the Authority is constrained to an overload of institutional appointments and in the absence of challenge a caucus of opinion can emerge. Good quality scientific opinion emerges when all the scientific evidence (industry and institutional) are comprehensively evaluated, overcoming the irrelevant, inappropriate and insignificant in a principled manner while arriving at the scientific opinion. Is institutional science so ephemeral that it cannot overcome scientific inputs from industry?

Functional Proximity: Even the Authority can be seen to be in conflict if it were not to maintain the functional separation between risk assessors and risk managers. In order to ensure that risk assessors function independently, the Act has mandated a functional separation between risk managers and risk assessors. A conflict of interest arises when the risk assessor (Scientific Panel and Committee) commits functional trespass into the ambit of the risk manager. The Authority is well aware of this separation and needs to do more to prevent it.



Another conflict arises when supposedly 'realistic or practical approach' to a problem is taken resulting in "weak" and 'ambiguous' forms of regulations. Even more serious is when actions are taken from ill advised considerations or an inability to read the regulatory context. Product approval is an example – where actions were mounted from a misreading of Schedule 1 (item VIII). The flurry of advisories confirms a 'weak' understanding of the intent. The regulator believes that it can overcome weak enforcement through labelling 'pledges' (declarations) thinking it will make the problem go away. Often rules are made to solve enforcement issues that have little or nothing to do with consumer health or safety. For the sake of doing something that will work, often agreed or mandated principles are compromised or disregarded.

Secondly acts of omission such as not making transparent (published in public domain) the procedural steps that constituted bodies take in arriving at scientific opinion is another conflict of interest – because it

does not reveal to stakeholders how principles under the Act are being followed to arrive at the decision point.

Once again the product approval system disregards this principle of the Act which requires risk assessment to be done in an independent, objective and transparent manner. The system is non transparent and the consequence of this is the minefield of issues that keep erupting.

The Act promotes transparency:

The Act categorically encourages transparency within FSSAI functioning and limits confidentiality. It is practiced the other way around. This is the second most valuable provision of the Act after the obligations on scientific expertise. The Act is concerned about good governance in the making of food laws – and transparency is an important element of this.

The only reference to confidentiality under the Act is Section 16.6, which states: 'the *Authority shall not disclose or cause to be disclosed to third parties confidential information that it receives for which confidential treatment has been requested and been acceded, except for information which must be made public if circumstances so require, in order to protect public health'.* This clause seeks to protect commercial data that is made available to the Authority during the course of a petition or application and only where a specific request is made by the applicant. The Act does not extend the requirement of confidentiality to any of the deliberations of the constituted bodies. All proceedings and methodology are expected to be notified in the public domain so that the manner in which decisions are taken is known to all. This action dissuades any rules being made without the stated or agreed principles of risk analysis being applied.

It is ironical that greater transparency existed under the erstwhile PFA 1954 even though no such requirement was specified in the Act. For example applications for use of new food additives were received under PFA 1954 (as is under FSSA 2006). Agenda and the minutes of both the Sub Committee on Food Additives and Central Committee on Food Standards (CCFS) were circulated to all members including industry. In fact companies applying for these additives convened at Industry Chambers prior to the meeting to brief its representative regarding the issue and provision of data. The minutes were provided in a timely manner to all including industry where companies could determine the outcomes of the deliberations. Similar applications regarding additive use are being made under FSSA 2006 – yet the agenda and minutes of the meeting are not being published in the public domain. In the absence of any explanation of the discovery that FSSAI has made that an age old practice of proactive transparency

needed change to ‘confidential’ or ‘highly secretive’ demeanour is perplexing. The change however is regressive.

Increasingly governments are being expected to be more accountable, approachable and transparent – the Act has been designed to make this happen. It is not uncommon to hear stakeholders being confused by regulatory advisories or drafts often reflecting opinions rather than principles. This is one of the major conflicts of interest where non mandated behaviour is allowed to flourish. The best regulatory agencies world over – are transparent in their rule making procedures. Unrestrained pursuit of inconsistency, undisclosed procedures and incomprehensible outcomes perpetuates a weak institutional set up. The food industry has a big price to pay if actions are not aligned to the Act.

Progress in Fibre-Enriched Foods

While science is proving the benefits of fibre on health, consumers are getting interested in health foods and beverages helping innovation in foods with fibre value.

When one sees the many fibre-containing products in market, it is clear that meaning of fibre has gone beyond simply the cellulose or roughage as it was referred to until 1950s. The term dietary fibre was adopted in 1970s and relationship between fibre intakes and reduced incidence of various diet-related problems were observed. These early studies on nature, composition and physiology of fibre started interest in the role of fibre in nutrition, health and disease. Over the next decades increasing scientific evidence has shown the association of fibre with health and disease prevention.

A Multi-faceted Ingredient

The term fibre applies to a somewhat heterogeneous mix of indigestible carbohydrates, from many different sources, with varying characteristics, functions and physiological effects. While traditional categories, soluble and insoluble fibre are still commonly used, these terms do not adequately capture the complexity of fibre. Other characteristics like fermentable and non-fermentable, viscous and non-viscous, and intrinsic and functional are also commonly used to describe different types of fibre (Figure 1).

A More Holistic Definition of Fiber

there is no universal definition of fibre yet, but there is good consensus on what constitutes fibre. The most fundamental description is that it is not hydrolysed by digestive enzymes and so for the most part is not absorbed. In early years it was not really analysed like other macronutrients. It was simply the gravimetric residue of grain seed bran or fruit and vegetable cell walls that remained after all other nutrients were hydrolysed and quantified. As our understanding improved, various definitions have been proposed.

The most widely accepted definition of fibre is proposed by FAO Codex in 2009. There are three elements of definition of fibre: a) carbohydrate polymers of 10 or more monomeric units, b) not hydrolysed by small intestine enzymes, c) could be naturally occurring or extrinsic polymers, which have been shown to have a beneficial physiological effect. According to Institute of Medicine, acceptable physiological effects include laxation, blood glucose attenuation, normalisation of blood lipids, and colonic fermentation. The US FDA allows nutrient content claims to be made with fibre, a “good source of fibre” claim can be made if a food or beverage contains 2.5g or more of fibre per serving, while an “excellent source” claim requires 5g per serving. The FDA allows for some fibre health claims with regard to cholesterol reduction and reduced risk of heart disease.

The evolution in regulatory policy has provided a more comprehensive approach to the definition of fibre, one that better probes and reflects the critical aspects of chemical structure, functionality and physiological aspects of fibre.

Fibre’s Role beyond Laxation

The dietary fibre hypothesis first proposed in 1960 by Trowell was the first thorough attempt to understand the complex relationship between fibre, health and disease prevention. This was based on epidemiological assessment of sub-Saharan African populations where there appeared to be exceedingly rate incidences of non-infective colonic diseases: constipation, diverticular disease, ulcerative colitis and colon cancer. Others demonstrated over the next two decades correlation between fibre consumption

among various populations and incidences of diseases like heart disease and diabetes, concluding that fibre seeming to play a protective role against these diet-related diseases.

Since then, a large number of studies showing beneficial impact of fibre on laxation and regularity, blood glucose response and diabetes management, blood lipids, cholesterol, and cardiovascular disease prevention have been published. With the progress in clinical research, and spurred by consumers increasingly looking for nutritional benefits, understanding of relationship between fibre and health has vastly increased. Physiological effects of different types of fibres are being established.

There are several studies showing that fermentation of soluble fibres by beneficial bacteria in the colon influences the digestive system and overall colonic health. We now know that products of fermentation in the colon vary depending on the type of fibre. Fibres are metabolised differently, impacting physiological outcomes like blood glucose response and even cholesterol levels. Thus different fibres have different physiological effects. (Figure 2)

Nutritional and Health Benefits

Interest and awareness in the nutritional and health benefits of foods is quite high among consumers. In 2011, 73% of US consumers reported that food and nutrition play a great role in maintaining health and wellness with 87% indicating that they would be interested in learning more about foods with specific health benefits. More consumers are seeking product information and reading labels, not just for themselves but for their households and children as well.

In one survey, the overwhelming majority of respondents indicated that they read labels with 92% reporting that they read food labels with care. Another survey found that a significant proportion of consumers look for various items on food and beverage packages: 66% looking at nutrition facts panel, 51% at ingredients list, 42% for statements about nutritional benefits and 30% looking for statements about health benefits.

Fibre in particular seems to be resonating well with consumers. They understand that fibre is a critical dietary component, 81% of those who read product labels said they look for fibre content and fibre claims on labels (Figure 3).

In another survey, fibre ranked third just behind caloric content and whole grains among key components that consumers take into consideration in making purchase decisions about buying packaged foods and beverages. Fibre in fact ranked higher than other nutrients associated with health like protein and calcium. Fibre content also influences purchase decisions more than even some high profile ingredients that consumers are often encouraged to reduce consumption of like sodium/salt, trans fats and saturated fats.

More Options for Fiber Delivery

Packaged food industry is steadily evolving and offering health and nutrition conscious consumers foods and beverages fortified with antioxidants, fibre, omega-3, calcium, probiotics and other health components. Despite positive attitudes toward fibre, actual intakes of fibre in the US still fall short of dietary recommendations. In other words, “fibre-gap” still exists. While IOM recommends daily intake of 25g for women and 38g for adult men, the actual intakes are around 14-17g per day among adults. Fibre consumption among children and teenagers 9-18 years also falls short of recommended 26g and 31g per day for girls and boys respectively.

Consumers are actively trying to increase their fibre intake, however. In one survey, 56% consumers reported that they are trying to get more fibre. This second only to whole grain and considerably higher than those reporting that they are trying to get more calcium or omega-3 in the diet.

Over past few years, innovation in fibre ingredients and product development has vastly increased scope for fibre products from traditional low-moisture products like bread and cereals to include previously uncharted categories like dairy products and beverages. Technology innovation has enabled development of smaller molecular weight fibres and the fibres with greater solubility and versatility. This renders them essentially "invisible" in food products, facilitating their use with barely any impact on food quality.

According to surveys, bakery and snacks are most touted for their increased fibre contents. Over the years products highlighting fibre content has gone across a broad range of food and beverage products. This is because consumers feel that they need to consume fibre from a wide range of food products. They are no longer happy with only traditional sources of fibre.

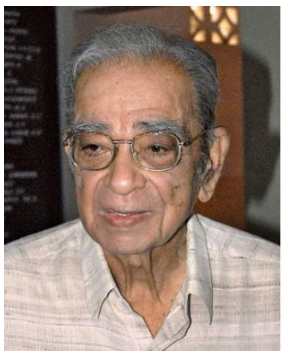
It is now possible to get practically "invisible" fibre in convenient food and beverage delivery forms. This is possible because of the scientific and technical advances that are enabling the development of superior, multi-functional fibres with a range of performance characteristics and benefits.

Strong, Sustained Consumer Interest

there is a high level of awareness of relationship between fibre and health among consumers. Thus they would like to increase dietary intake of fibre. Educational level is a factor in fibre consumption. Proportion of consumers actively consuming fibre for health benefits is on the rise. There is need therefore, for innovation that delivers superior quality, physiologically beneficial fibres in convenient food and beverage forms for today's savvy, evolving consumers.

Condensed from article by Lorraine Niba in Food Technology November 2012

(Editor's Note: Traditionally Indians used to consume more fibre through whole grains, pulses and fruits & vegetables. However, with the increasing use of refined grain products there is a decrease in fibre consumption with reduced intake of fruit and vegetable adding to the problem. There is now increased awareness with whole grain products as well as some innovative products with higher fibre in bakery, snacks, energy bars, breakfast cereals etc. is providing contributions. Indians with susceptibility to diabetes and heart diseases need to consume more fibre.)



H.A.B. Parpia, Food Scientist, Passes Away

H.A.B. Parpia (91), renowned food scientist and former Director of the Central Food Technological Research Institute (CFTRI), passed away at his residence after a brief illness.

Dr. Parpia held various positions in different organisations, including the Food and Agriculture Organization (FAO) of the United Nations at Rome. He served as Assistant Director-General of the CSIR in 1959. Dr. Parpia had published nearly 250 papers and documents on food science and technology and advanced education. He was Principal Adviser, U.N. Conference on Science and Technology for Development, New York, from 1978-82. He was appointed Director of Planning and Evaluation at the United Nations University in 1981, was a visiting lecturer at MIT from 1967 to 1978, and was also Chairman of Protein-Calorie Advisory Group of the UN System.

A strong believer in Mahatma Gandhi's principles, he had spent a year at Sevagram Ashram, Wardha, as a volunteer. After obtaining a degree in Microbiology (Industrial and Medical) and Chemistry from the University of Bombay, Dr. Parpia studied Food Technology at University of California and at Oregon State University.

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Obituary: Shri Nalinbhai Vissanji

Shri Nalin Karsondas Vissanji was born on 14th January 1931 at Cairo, Egypt. He was educated in Mumbai and graduated from Royal Institute of Science, Mumbai. He was in charge of the family chemical business Western Chemicals. He was also looking after another family enterprise, Permali Wallace Private Limited, manufacturers of densified wood and allied products. He was also on the board of many other group companies. Apart from family owned business, he was on the board of directors of many major companies including India Gelatine, Rolcon Engineering, Shree Krishna Keshav Laboratories Limited and others.

He was a great aspirant and visionary with a clear vision of progress. Under his leadership, the Group succeeded in penetrating new avenues of business. He was not only involved in commercial business, but was a well known figure in various charitable and philanthropic institutions and was on board of trustees of many charitable and social organisations.

He was past President of Indian Merchants' Chamber and Managing Committee Member and past President of Council for Fair Business Practices and the Governing Board Member and past Chairman of Protein Foods & Nutrition Development Association of India. He was one of the founder members who started the original Protein Foods Association in 1960s.

After a brief illness Shri Nalinbhai passed away peacefully on June 27, 2013 in Mumbai. PFNDAI got a lot of support from late Nalinbhai who was always a smiling face cheering and encouraging everyone. We pray to God so his soul may rest in peace.

REPORT- Workshop on 'Microbial Safety in Food industry

by Ms. Ummeayman R, Nutritionist, PFNDAI

The workshop on Microbial Safety in Food Industry using Rapid Methods with special emphasis on Pathogen Detection was held on February 15, 2013 in Hotel Courtyard Marriott and was jointly organised by PFNDAI and Bhavan's Research Center (Microbiology).

Illness resulting from foodborne disease has become one of the most widespread public health problems globally. About two thirds of all outbreaks are traced to microbial contaminated food- some of the most hazardous being *Clostridium botulinum*, *E.coli* O157:H7and *Salmonella*. These can contaminate food products anywhere in the food chain and hence imply that microbial vigilance in the chain is of prime importance.

Food Safety & Standards Authority of India is mandated under the Act to ensure safe food to the consumer, while it has some microbial specifications for food products – a greater responsibility is imposed on the FBO under the obligatory Food Safety Management System. The decision to recall food products is critically dependant on the FBO's ability to make a risk based determination that his product is likely to be 'unsafe'. How can he do this if he does not have a risk based safety plan?

A common complaint is that microbiological testing is laborious, time consuming and reveals less about what actions should be taken. However, much progress has happened with an influx of rapid methods – some expensive, some over in a few hours and some conveniently conducted away from a full-fledged laboratory.

The workshop was welcomed by the Chairman of PFNDAI, Mr. R.D. Shenoy. In his opening remarks, he shared the general industry concern for rapid analysis methods. Currently there are many analysis methods available but which are more accurate, authorized by the regulatory authorities and suitable meet their needs is always a question for all. This is one such section which has large scope of innovation and one need to be abreast with the rapid technology changes and the new scientific discoveries.

Food Safety Commissioner of Maharashtra State, Shri Mahesh Zagade inaugurated the workshop. In his inaugural address, he stated the importance of the analysis methods and the risk factors to be considered with regards to the safety of the consumers. FBO's (Food Business Operators) need to be more concerned towards the analysis of products as they form a part of the FSSAI registration. Maharashtra region has seen a growth in the registrations and licensing, however this needs to be more intensified. There are many rapid analysis kits and methods available in foreign countries and we need to adopt these new methods, but we also need to consider the environmental factors prevailing in our country and the microbial concerns that are specific for individual products.

Dr. Lewis J.I., Convener of the Workshop and Chairman-Regulatory Affairs, PFNDAI, introduced to the workshop with a positive note for the industry to look at the scientific progresses and acquire them and grow with them. It is not only favourable for the consumer but to the industry at large. Today there are improvisations in the regulations and we are moving from risk assessment to risk analysis and its managements with science as the basis of these regulations.

Various sessions were chaired by Dr. Adhikari V.M., Dr. Shruti Samant, Dr. Tewari and the briefs of the deliberations by the speakers are presented in this report.

Dr. C.R. Behl, Poultry Business Unit Head, Vista Processed Foods, in his Keynote presentation 'Importance of Microbial Analysis in Food Industry', stated that Food is excellent source of nutrients for the consumers & is prone to microbial growth leading to spoilages and nightmares to consumers. Thus there is need of proactive detection and control of pathogens and spoilage organisms to balance the food nutritionally & make it microbiologically safe. Outbreaks of food borne illness occur daily in all the countries, from the most to the least developed. Most of the cases are not reported, the true dimension of the problem is unknown with the absence of reliable data & hence effective solutions often fail. In India, we face a severe problem that there is no formal surveillance system for food borne disease reporting and statistical analysis. Even the educated people keep food borne illness to them and the only reported cases are of major disease outbreaks such as during some functions like marriage.

In developed countries the public awareness on the food safety risk is high with clear commitments of the government & in developing countries there are competing priorities in health agenda. WHO estimates that 1.5 billion cases of food borne illness cause about 3 million deaths each year costing up to $ 40 billion in health care & job related absenteeism. More than 250 different food borne diseases have been described with different symptoms.

Innovative strategies and methods are needed for laboratory based surveillance system with international networking on food borne disease and contaminations. The evaluation procedures should be based on internationally agreed principles. Methods shall ensure that product is safe before consumption.

Dr.C.M. Joshi, Director-Quality Assurance, Pepsico India, gave an insight into 'Managing Microbial Food safety In Industry'. Microorganisms are everywhere, however few are of major concern and yeast, moulds, non-spore forming bacteria (lactic acid and acetic acid) and spore forming are of concern. Time is one of the crucial factors for controlling bacterial contamination as its growth is exponential growth. Consumer protection and hence business continuity is assured with high level of Food Safety Management Process. Although we find microorganisms everywhere around us, we need to take steps such that we are able to prevent their entry into our products from the very beginning of the processing. Second step, if we are not able to prevent their entry, try to reduce them to safety levels and then see that we are protecting what is good in the food and protecting the consumer from harmful effects. Dr. Joshi also presented on the various types of microorganisms that can cause harm and the preventive measures that can be taken.

Taking the theme of safety, a step ahead, Dr. Nimish Shah, Head-Safety &Environment Assurance Centre, HUL, presented on "Microbial Risk Analysis & Product Safety".The Risk Analysis framework was not developed starting after the SPS agreement. It was under developed since the early 90's, but after the SPS agreement had been agreed on Risk Analysis and most of its component parts experienced a very fast evaluation to final Codex products. The component parts of this are risk management, risk assessment and risk communication.

Microbial Risk Analysis (MRA) provides a harmonised approach to evaluate risk and prioritise issues / solutions.MRA also supports the governmental / societal move away from hazard-based to risk-based decision-making and supports the notion that "zero risk" does not exist. It is equally important for the industry in simulating consumer safety of complex or radical product innovations.
Mr. Nuno Reis, Business Manager - Asia Pacific region – BioMerieux presented on "Challenges in the Food industry" and gave a comprehensive view of the various analysis methods from traditional to modern and the challenges that are faced by industry.

Traditional microbiology results are based on plate count methods. It takes several days until results are available, thus on part of being slow, it delays released finished products & ingredients and delays response to environment monitoring program data. Results vary with microbial population, media & conditions – can yield false negatives or positives with a large measurement of uncertainty. Thus food industry indeed needs Rapid Methods. But one needs to know which rapid methods are useful for the desired product, on which criteria do I release products?, Quality Indicators (TPC, Y&M) or Pathogens (*Listeria*, *Salmonella*…)?

Mr. Nuno also gave an insight into the available methods, Rapid or Classical methods in compliance with ISO, FDA BAM, AOAC and other official compendia. The reference method and alternative validated methods. In Europe, the reference method = ISO whereas alternative methods must be validated according to ISO 16140 and certified. In USA, Reference method = FDA BAM and USDA MLG whereas Alternative methods must be validated by AOAC. In conclusion, Automated alternative methods make it possible to improve food safety testing and enables significant gains in productivity.

Ms. Kavita Kulkarni, Food Safety division, 3M India in her presentation on "Innovative solutions for Food Safety & Hygiene Management" gave a review of the solutions that can be provided by 3M. There is a need of environment monitoring as one study suggests, 'if an organism is found in the environment there is a 70% chance of it getting into the food'. While it is not possible to prevent the introduction of pathogens into food processing facilities, it is crucial to minimize their presence.

Dr. Sandhya Shrivastava, Associate Professor, Bhavan's College, Coordinator, BRC (Microbiology) presented the "Assuring Food Safety through Microbiological Analysis: Rapid or Conventional Methods". To meet the challenges of nutritional complexities and the ensuing shelf as well as omnipresent contaminants, research by microbiologists has been and will continue to be crucial to meeting the global need of ensuring food security and food safety.Currently, as per convention and regulatory requirements all over the globe, most laboratories are following classical methods for evaluating bio-burden, hygiene status and pathogen detection. Although the new methods have been there for a while, they are being adopted rather slowly by the laboratories. After discussions with the laboratories and industries associated with new technology few common reasons have been perceived for why food industry laboratories were reluctant to adopt new technology. These included methods not being approved or having official status and because certain tests, particularly those used for regulatory requirements, often stipulated the use of conventional methods. Furthermore, the high capital investment and cost of consumables associated with some new technologies, together with the need for well-trained technicians, made some new methods too expensive for many industry laboratories. It is thus important to table merits and limitations of contemporary methods in comparison with conventional, to take a balance view regarding method selection to deliver most reliable data regarding the microbiological quality of the foods; ensuring safety of the consumer as well as the product.

'Rapid & Reliable Detection of Food Pathogens Using Proprietary Enrichment & Immunoassay Detection' was presented by Dr. Adrian Almeida, CEO, BioAzure. The need for Rapid Methods for Food Pathogen Detection is for detection of a single, specific, viable cell in food samples in a minimal amount time. These methods are highly sensitive and highly specific. However one basic principle behind enrichment of this specific viable cells is 'if you can't grow it, you won't show it', and there are methods to enrich these cells and analyze them.

Ms. Sweta Patel, CEO Tara International gave a brief of the workings of the Soleris system; it is a rapid optical system for the detection of microbial contamination. The optical assay measures microbial growth by monitoring pH and other biochemical reactions that generate a colour change as microorganisms in the broth grow and metabolize. The results are displayed by colour-coded monitoring with an alert on samples out of specification. Sensitivity of the technology ranges from a single organism per vial to 10^8 CFU/mL (upper limit).

Discussing the new challenges to food safety that are caused by micro-organisms as well as strategies and methodologies to counter these, Dr. Deepa Bhajekar, Managing Director, MicroChem Silliker presented "Food Safety & Challenges in Food Microbiology: Regulatory Perspective". Management of food safety is based on generally accepted principles of Hazard Analysis Critical Control Points and of Good Manufacturing Practices. However, a more pro-active, science-based approach is required, starting with the ability to predict where problems might arise by applying the risk analysis framework. Developments that may influence food safety in the future occur on different scales (from global to molecular) and in different time frames (from decades to less than a minute). This necessitates development of new risk assessment approaches, taking the impact of different drivers of change into account.

Mr. Udit Parekh, CEO, Sabio, have innovative rapid analysis methods like 'Automated detection and quantification system for Pathogens in Process Water". New developments in biology and detection systems have enabled rapid detection of low levels of pathogens, down to single cells. Current systems which perform such detection are few, have a large footprint and are unaffordable in the Indian context. They also do not have the ability to perform sample preparation and detection in a self-contained format, thus making field use infeasible. Sabio has designed a novel pathogen isolation and direct detection system, to replace slow and tedious culture-based techniques. The system is easy to use, versatile and incorporates automated detection and analysis, reducing the number of steps needing trained personnel. The isolation device is also self-contained from sample input to data output, making it possible to use in field or manufacturing settings. With a simple design of the isolation device as well as the fluorescence-based optical reader, the system will have low capital and per-use costs enabling adoption at scale.

The workshop was well appreciated by industry as it was a platform for the various analysis methods to be discussed and get experts opinion on some of the problems faced by the industry.

The workshop was supported by sponsorship from Vista Processed Foods, Marico India, HiMedia Laboratories, 3M, Pepsico, Glaxo SmithKline Consumer Healthcare, Scientific Sales Syndicate and Bhavi Chem.

Research in Health & Nutrition

Parents with Heavy TV Viewing More Likely to Feed Children Junk Food

June 6, 2013 Science Daily

If your preschooler thinks a cheeseburger is healthy, you may want to reconsider how you watch TV. A recent study by researchers at the University of Michigan found commercial TV viewing, as opposed to commercial-free digitally recorded TV or other media without food advertising, in the home was related to greater junk food consumption.

Kristen Harrison and Mericarmen Peralta, both of the University of Michigan, will present their findings at the 63rd Annual International Communication Association conference in London. Harrison and Peralta interviewed over 100 parents about a wide variety of home and family characteristics, including child and parent media exposure, and child dietary intake. They conducted separate interviews with children in preschools to get a sense of what children thought made up a healthy meal. The goal was to see how family characteristics were associated with children's dietary intake and perceptions of healthy meals. Using food security as a marker, Harrison found that the media-junk food link is very strong among food-secure people, and almost zero among food-insecure people. Since food insecurity is associated with limited income, it sets limits on how much people can spend on junk food. Food-secure people, on the other hand, can afford to give in to cravings when watching food advertising. People in this category were more likely to consume junk food, and their children had distorted views on what constitutes a healthy meal.

Past research has linked child TV viewing to obesity in childhood, but not during the preschool years. It has also combined commercial TV with digitally-recorded TV, so there was no way to separate the two. Little research has investigated the development of ideas about healthy-meals in the preschool years. Harrison and Peralta's research aimed to address these less-studied topics to get a better sense of what children are learning about eating before they begin to make their own food choices.

"Even though parents and other caregivers are the primary gatekeepers regarding young children's food intake, children are still learning about food as it relates to health from family, media, and other sources, and may use this knowledge later on to inform their decisions when parents or other adults aren't there to supervise them," Harrison said. "The preschool years are especially important, because the adiposity rebound in kids who grow up to be normal weight tends to be around age 5 or 6, whereas for kids to grow up to be obese, it happens closer to 3. We need to know as much as we can about the factors that encourage obesogenic eating during the preschool years, even if that eating doesn't manifest as obesity until the child is older."

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Vegetable Oil Is Good for You, Experts Say

June 7, 2013 Science Daily

A typical American consumes approximately 3 or more tablespoons of vegetable oil each day. Vegetable oils, like those from soy, corn and canola, are a significant source of calories and are rich in linoleic acid (LA), which is an essential nutrient. Since the 1970s, researchers have known that LA helps reduce blood cholesterol levels, and for decades, scientists have known that consuming LA can help lower the risk of

heart disease. However, some experts have been claiming recently that Americans might be getting too much of a good thing. A new study from the University of Missouri contradicts that claim.
In the study, "Effect of Dietary Linoleic Acid on Markers of Inflammation in Healthy Persons: A Systematic Review of Randomized Controlled Trials," researchers at the University of Missouri and the University of Illinois found that no link exists between vegetable oil consumption and circulating indicators of inflammation that are often associated with diseases such as heart disease, cancer, asthma and arthritis. While earlier animal studies have shown that a diet rich in LA can promote inflammation, MU animal sciences researcher Kevin Fritsche says that humans respond to LA differently.

"In the field of nutrition and health, animals aren't people," said Fritsche, an MU professor of animal science and nutrition in the Division of Animal Sciences. "We're not saying that you should just go out and consume vegetable oil freely. However, our evidence does suggest that you can achieve a heart-healthy diet by using soybean, canola, corn and sunflower oils instead of animal-based fats when cooking."
Linoleic acid is an omega-6 fatty acid that is a major component of most vegetable oils. This fatty acid is an essential nutrient and comprising 50 percent or more of most vegetable oils.

Fritsche, along with Guy Johnson, an adjunct professor of food and human nutrition at the University of Illinois, conducted one of the most thorough studies on LA questioning whether this fatty acid promotes inflammation in humans. When the evidence from numerous clinical trials was gathered and examined, Fritsche said it was clear that LA consumption did not promote inflammation in healthy people.
"Some previous studies have shown that inflammation, which is an immune response in the body, can occur when certain fats are consumed," Fritsche said. "We've come to realize that this inflammation, which can occur anywhere in the body, can cause or promote chronic diseases. We know that animal fats can encourage inflammation, but in this study, we've been able to rule out vegetable oil as a cause."
Fritsche and Johnson reviewed 15 clinical trials that studied nearly 500 adults as they consumed various forms of fats, including vegetable oils. The researchers could find no evidence that a diet high in linoleic acid had any links to inflammation in the body. Due to this discovery, the researchers say that it is important to continue following the current recommendations from the Institute of Medicine and the American Heart Association to use vegetable oil when cooking and consume between two and four tablespoons of vegetable oil daily to reach the necessary amount of linoleic acid needed for a heart-healthy diet.

"Consumers are regularly bombarded with warnings about what foods they should avoid," Fritsche said. "While limiting the overall fat intake is also part of the current nutrition recommendations, we hope people will feel comfortable cooking with vegetable oils."
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Cocoa May Help Fight Obesity-Related Inflammation

June 12, 2013 Science Daily
A few cups of hot cocoa may not only fight off the chill of a winter's day, but they could also help obese people better control inflammation-related diseases, such as diabetes, according to Penn State researchers.
Mice that were fed cocoa with a high-fat diet experienced less obesity-related inflammation than mice fed the same high-fat diet without the supplement, said Joshua Lambert, associate professor of food science. The mice ate the human equivalent of 10 tablespoons of cocoa powder -- about four or five cups of hot cocoa -- during a 10-week period.

"What surprised me was the magnitude of the effect," Lambert said. "There wasn't as big of an effect on the body weight as we expected, but I was surprised at the dramatic reduction of inflammation and fatty liver disease."
The researchers reported that several indicators of inflammation and diabetes in the mice that were fed the cocoa supplement were much lower than the mice that were fed the high-fat diet without the cocoa powder and almost identical to the ones found that were fed a low-fat diet in the control group. For example, they had about 27 percent lower plasma insulin levels than the mice that were not fed cocoa. High levels of insulin can signal that a patient has diabetes.
The cocoa powder supplement also reduced the levels of liver triglycerides in mice by a little more than 32 percent, according to Lambert, who worked with YeyiGu, graduate student in food science, and Shan Yu, a graduate student in physiology. Elevated triglyceride levels are a sign of fatty liver disease and are related to inflammation and diabetes.
The mice also saw a slight but significant drop in the rate of body weight gain, according to the researchers, who reported their findings in the online version of the European Journal of Nutrition.
While researchers have linked obesity-related chronic inflammation to several diseases, including type 2 diabetes and fatty liver disease, the reason for the inflammation response is not completely known.
Lambert said two theories on inflammation and obesity that have emerged may help explain cocoa's role in mitigating inflammation. In one theory, Lambert said excess fat may activate a distress signal that causes immune cells to become activated and cause inflammation. The cocoa may reduce the precursors that act as a distress signal to initiate this inflammatory response.

Lambert said that another theory is that excess fat in the diet interferes with the body's ability to keep a bacterial component called endotoxin from entering the bloodstream through gaps between cells in the digestive system -- gut barrier function -- and alerting an immune response. The cocoa in this case may help improve gut barrier function.
Cocoa, although commonly consumed in chocolate, actually has low-calorie content, low-fat content and high-fiber content.

"Most obesity researchers tend to steer clear of chocolate because it is high in fat, high in sugar and is usually considered an indulgence," Lambert said. "However, cocoa powder is low in fat and low in sugar. We looked at cocoa because it contains a lot of polyphenolic compounds, so it is analogous to things like green tea and wine, which researchers have been studying for some of their health benefits."
Lambert said he expects future research will be conducted to better identify why the cocoa powder is effective in treating inflammation, as well as determine if the treatment is suitable for humans.
The National Institutes of Health supported this work.
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Excessive Salt Consumption Appears to Be Bad for Your Bones
June 17, 2013 Science Daily

A high-salt diet raises a woman's risk of breaking a bone after menopause, no matter what her bone density is, according to a new study that was presented Saturday at The Endocrine Society's 95th Annual Meeting in San Francisco.

The Japanese study found that older women who consumed the highest amount of sodium had more than four times the risk of a nonvertebral fracture, or fracture at any site other than the spine. That finding held

true even after the researchers made adjustments for many other characteristics that could affect fracture risk, said the study's lead author, Kiyoko Nawata, PhD.
"Excessive sodium intake appears to be a risk factor for bone fragility. It is therefore important to consider excessive sodium intake in dietary therapy for osteoporosis," said Nawata, a professor of health and nutrition at the University of Shimane in Matsue, Japan.
A nonvertebral fracture, particularly of the hip, can cause substantial disability and even death, many studies have found.

Past research shows a connection between excess sodium intake and increased bone breakdown and decreased bone mineral density. Nawata and her colleagues conducted the study to learn whether too much sodium also is related to fracture risk. The researchers studied 213 postmenopausal women, with an average age of 63, who had undergone osteoporosis screening.
The screening included bone density scanning, a food questionnaire and bloodwork to test markers of bone metabolism and rule out medical conditions that can raise fracture risk. In addition, a physician determined the presence or absence of an existing nonvertebral fracture. The women also had motor function tests of their balance, to determine their fall risk, and a test of handgrip strength. Low grip strength is a risk factor for osteoporosis-related fracture.

For all women, the average daily sodium intake was 5,211 milligrams (mg), the authors reported. The group with the highest sodium intake consumed an average of 7,561 mg per day, the sodium equivalent of more than seven McDonald's double cheeseburgers, according to Nawata. That group was 4.1 times likelier to have an existing nonvertebral fracture, compared with the groups who had lower sodium intakes. The increased risk was independent of the other risk factors assessed, including the woman's age, bone mineral density, body mass index, calcium and vitamin D intake, and blood level of vitamin D, as well as balance and muscle strength.

The groups with less sodium intake did not have an increased risk of fracture, Nawata said.
Japanese consume more sodium on average than Americans -- 3,972 mg versus about 3,400 mg per day -- said study co-investigator Mika Yamauchi, MD, associate professor of internal medicine at Shimane University Faculty of Medicine in Izumo.

Americans, however, consume far more sodium than the daily recommended intake of 2,300 mg, which equals less than 1 teaspoon of table salt. The 2010 Dietary Guidelines for Americans further recommend that people 51 and older consume no more than 1,500 mg of sodium per day. However, the Institute of Medicine released a report in May stating that "evidence on direct health outcomes does not support recommendations to lower sodium intake … to, or even below, 1,500 mg per day."
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Weight Loss Improves Memory and Alters Brain Activity in Overweight Women

June 17, 2013 Science Daily

Memory improves in older, overweight women after they lose weight by dieting, and their brain activity actually changes in the regions of the brain that are important for memory tasks, a new study finds.
The results were presented today at The Endocrine Society's 95th Annual Meeting in San Francisco.
"Our findings suggest that obesity-associated impairments in memory function are reversible, adding incentive for weight loss," said lead author Andreas Pettersson, MD, a PhD student at Umea University, Umea, Sweden.

Previous research has shown that obese people have impaired episodic memory, the memory of events that happen throughout one's life.
Pettersson and co-workers performed their study to determine whether weight loss would improve memory and whether improved memory correlated with changes in relevant brain activity. A special type of brain imaging called functional magnetic resonance imaging (functional MRI) allowed them to see brain activity while the subjects performed a memory test.

The researchers randomly assigned 20 overweight, postmenopausal women (average age, 61) to one of two healthy weight loss diets for six months. Nine women used the Paleolithic diet, also called the Caveman diet, which was composed of 30 percent protein; 30 percent carbohydrates, or "carbs"; and 40 percent unsaturated fats. The other 11 women followed the Nordic Nutrition Recommendations of a diet containing 15 percent protein, 55 percent carbs and 30 percent fats.

Before and after the diet, the investigators measured the women's body mass index (BMI, a measure of weight and height) and body fat composition. They also tested the subjects' episodic memory by instructing them to memorize unknown pairs of faces and names presented on a screen during functional MRI. The name for this process of creating new memory is "encoding." Later, the women again saw the facial images along with three letters. Their memory retrieval task, during functional MRI, was to indicate the correct letter that corresponded to the first letter of the name linked to the face.
Because the two dietary groups did not differ in body measurements and functional MRI data, their data were combined and analyzed as one group. The group's average BMI decreased from 32.1 before the diet to 29.2 (below the cutoff for obesity) after six months of dieting, and their average weight dropped from 188.9 pounds (85 kilograms) to 171.3 pounds (77.1 kilograms), the authors reported. This study was part of a larger, diet-focused study funded by the Swedish Research Council and the Swedish Heart-Lung Foundation.

Memory performance improved after weight loss, and Pettersson said the brain-activity pattern during memory testing reflected this improvement. After weight loss, brain activity reportedly increased during memory encoding in the brain regions that are important for identification and matching of faces. In addition, brain activity decreased after weight loss in the regions that are associated with retrieval of episodic memories, which Pettersson said indicates more efficient retrieval.
"The altered brain activity after weight loss suggests that the brain becomes more active while storing new memories and therefore needs fewer brain resources to recollect stored information," he said.
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Iodine in Bread Not Enough for Pregnant Women

June 18, 2013 Science Daily

Research from the University of Adelaide shows that iodized salt used in bread is not enough to provide healthy levels of iodine for pregnant women and their unborn children.

The study -- led by researchers from the University's Robinson Institute -- has prompted calls for pregnant women to keep taking iodine supplements.
Iodine deficiency is recognized by the World Health Organization (WHO) as the most common preventable cause of brain damage in the world.

"Iodine is an essential element which is important for human brain development and thyroid function," says one of the lead authors of the study, Associate Professor Vicki Clifton from the University's Robinson Institute and the Lyell McEwin Hospital.
"In 2009, Australian bread producers began a mandatory program of iodine supplementation in bread to help provide a boost to iodine levels in the community. Our study was aimed at determining whether or not that was having a positive impact on iodine levels for pregnant women."
In the study, almost 200 South Australian women were tested throughout their pregnancy and six months after giving birth.

"We found that South Australian women are mildly iodine deficient. Despite the inclusion of iodized salt in bread, women who were not taking an iodine supplement during pregnancy were still suffering from iodine deficiency," Associate Professor Clifton says.
"Those women who were taking a supplement in addition to eating bread with iodized salt were receiving healthy levels of iodine, well within WHO guidelines."

This is the latest study to follow on from the pioneering work of the University's Emeritus Professor Basil Hetzel AC, who began researching iodine deficiency more than 50 years ago at the Queen Elizabeth Hospital, in collaboration with the Papua New Guinea Public Health Department.
His work revealed very low urine iodine levels and high rates of goitre were associated with a form of brain damage called 'cretinism'. Professor Hetzel showed that this brain damage could be prevented by correcting the severe iodine deficiency before pregnancy.
"There's a lot of work going on around the world to ensure that pregnant women are receiving enough iodine for the healthy development of their unborn babies," says Professor Hetzel, who is also a lead author on this current study.

"The message is simple: by taking iodine supplements, pregnant women will be able to prevent brain and organ development problems in their babies, and also maintain a healthy level of iodine for themselves."
Professor Hetzel says Australia continues to be a world leader in this field, "but there is still very little public understanding about the dangers of iodine deficiency."
The results of this study were published in the *Nutrition Journal.*

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Exercise Benefits Patients With Type 2 Diabetes

June 25, 2013 Science Daily

Moderate-intensity exercise reduces fat stored around the heart, in the liver and in the abdomen of people with type 2 diabetes mellitus, even in the absence of any changes in diet, according to a new study published online in the journal *Radiology*.
Type 2 diabetes occurs when the body does not produce enough insulin, a hormone that regulates the movement of sugar into the cells, or when the cells resist the effects of insulin. The disease can lead to a wide range of complications, including damage to the eyes and kidneys and hardening of the arteries.
Exercise is recommended for people with diabetes, but its effects on different fat deposits in the body are unclear, according to the study's senior author, Hildo J. Lamb, M.D., Ph.D., from the Department of Radiology at Leiden University Medical Center in the Netherlands.
"Based on previous studies, we noticed that different fat deposits in the body show a differential response to dietary or medical intervention," he said. "Metabolic and other effects of exercise are hard to investigate, because usually an exercise program is accompanied by changes in lifestyle and diet."
For the new study, Dr. Lamb and colleagues assessed the effects of exercise on organ-specific fat accumulation and cardiac function in type 2 diabetes patients, independent of any other lifestyle or dietary

changes. The 12 patients, average age 46 years, underwent MRI examinations before and after six months of moderate-intensity exercise totaling between 3.5 and six hours per week and featuring two endurance and two resistance training sessions. The exercise cycle culminated with a 12-day trekking expedition.
MRI results showed that, although cardiac function was not affected, the exercise program led to a significant decrease in fat volume in the abdomen, liver and around the heart, all of which have been previously shown to be associated with increased cardiovascular risk.
"In the present study we observed that the second layer of fat around the heart, the peracardial fat, behaved similarly in response to exercise training as intra-abdominal, or visceral fat," Dr. Lamb said. "The fat content in the liver also decreased substantially after exercise."
Dr. Lamb noted that the exercise-induced fat reductions in the liver are of particular importance to people with type 2 diabetes, many of whom are overweight or obese.
"The liver plays a central role in regulating total body fat distribution," he said. "Therefore, reduction of liver fat content and visceral fat volume by physical exercise are very important to reverse the adverse effects of lipid accumulation elsewhere, such as the heart and arterial vessel wall."
The findings point to an important role for imaging in identifying appropriate treatment for patients with type 2 diabetes, which the World Health Organization projects to be the seventh leading cause of death worldwide by 2030.
"In the future, we hope to be able to use advanced imaging techniques to predict in individual patients which therapeutic strategy is most effective: diet, medication, exercise, surgery or certain combinations," Dr. Lamb said.
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Vitamin D Improves Mood and Blood Pressure in Women with Diabetes

June 25, 2013 Science Daily

In women who have type 2 diabetes and show signs of depression, vitamin D supplements significantly lowered blood pressure and improved their moods, according to a pilot study at Loyola University Chicago Niehoff School of Nursing.
Vitamin D even helped the women lose a few pounds.
The study was presented at the American Diabetes Association 73rd Scientific Sessions in Chicago.
"Vitamin D supplementation potentially is an easy and cost-effective therapy, with minimal side effects," said Sue M. Penckofer, PhD, RN, lead author of the study and a professor in the Niehoff School of Nursing. "Larger, randomized controlled trials are needed to determine the impact of vitamin D supplementation on depression and major cardiovascular risk factors among women with Type 2 diabetes."
Penckofer recently received a four-year, $1.49 million grant from the National Institute of Nursing Research at the National Institutes of Health to do such a study. Penckofer and her Loyola co-investigators plan to enroll 180 women who have type 2 diabetes, symptoms of depression and insufficient levels of vitamin D. Women will be randomly assigned to receive either a weekly vitamin D supplementation (50,000 International Units) or a matching weekly placebo for six months. The study is titled "Can the Sunshine Vitamin Improve Mood and Self Management in Women with Diabetes?
About 1 in 10 people in the United States has diabetes, and the incidence is projected to increase to 1 in 4 persons by 2050. Women with type 2 diabetes have worse outcomes than men. The reason may be due to depression, which affects more than 25 percent of women with diabetes. Depression impairs a patient's ability to manage her disease by eating right, exercising, taking medications, etc.
Many Americans do not get enough vitamin D, and people with diabetes are at especially high risk for vitamin D insufficiency or deficiency. Reasons include limited intake of foods high in vitamin D, obesity, lack of sun exposure and genetic variations.

The pilot study included 46 women who were an average age of 55 years, had diabetes an average of 8 years and insufficient blood levels of vitamin D (18 ng/ml). They took a weekly dose (50,000 International Units) of vitamin D. (By comparison, the recommended dietary allowance for women 51 to 70 years is 600 IU per day.)
After six months, their vitamin D blood levels reached sufficient levels (average 38 ng/ml) and their moods improved significantly. For example, in a 20-question depression symptom survey, scores decreased from 26.8 at the beginning of the study (indicating moderate depression) to 12.2 at six months (indicating no depression. (The depression scale ranges from 0 to 60, with higher numbers indicating more symptoms of depression.)
Blood pressure also improved, with the upper number decreasing from 140.4 mm Hg to 132.5 mm Hg. And their weight dropped from an average of 226.1 pounds to 223.6 pounds.
Penckofer is internationally known for her research on vitamin D, diabetes and depression. In October, she will be inducted as a Fellow in the American Academy of Nursing for her scientific contributions in improving the health and quality of life of women with chronic disease. And she recently was appointed as the first nurse researcher to the Chicago Diabetes Center for Translational Research.
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Fatty Acids Found in Fish Linked to Lower Risk of Breast Cancer

June 27, 2013 Science Daily
A high intake of fatty acids found in fish is associated with a 14% reduction in the risk of breast cancer in later life, finds a study published on bmj.com today.
The results show that each 0.1 g per day or 0.1% energy per day increment of intake of n-3 polyunsaturated fatty acid (n-3 PUFA) derived from fish was associated with a 5% reduction in risk. To achieve this risk reduction, intake of oily fish such as salmon, tuna or sardines should be 1-2 portions per person per week.
Breast cancer is one of the most common cancers, accounting for 23% of total cancer cases and 14% of cancer deaths in 2008. Studies suggest that a healthy diet and lifestyle is crucial for the prevention of breast cancer, and dietary fat is one of the most intensively studied dietary factors closely related with risk.
The n-3 PUFAs include ALA, EPA, DPA and DHA. They are involved in chemical messaging in the brain, helping to regulate blood vessel activity and areas of the immune system. The main dietary sources of EPA, DPA and DHA come from oily fish, while ALA is found mainly in nuts, seeds, and leafy green vegetables. Although n-3 PUFAs are the most promising types of fat to reduce cancer risk, results from human studies are inconsistent.
So a team of researchers based in China set out to investigate the association between fish and n-3 PUFA intake and the risk of breast cancer. Levels were measured from both dietary sources and blood tests. They reviewed and analysed the results of 26 studies from the United States, Europe and Asia involving over 800,000 participants and over 20,000 cases of breast cancer.
Marine n-3 PUFA was associated with a 14% reduction of breast cancer between the highest and lowest category of marine n-3 PUFA intake. The risk was lowest in Asian populations, probably because fish intake is much higher in Asia than in western countries, say the authors.
Further analysis indicated a dose response: each 0.1 g per day or 0.1% energy per day increment of intake was associated with a 5% reduction in risk. However, no significant protective association was found for ALA -- the plant based n-3 PUFA.
The authors say their analysis, together with previous publications, "supports a protective role of marine n-3 PUFA on the incidence of breast cancer."

They conclude: "Our present study provides solid and robust evidence that marine n-3 PUFA are inversely associated with risk of breast cancer. The protective effect of fish or individual n-3 PUFA warrants further investigation of prospective studies."
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After Menopause Calcium and Vitamin D Help Hormones Help Bones

Friday 28 June 2013 –Medical News Today
Should women take calcium and vitamin D supplements after menopause for bone health? Recommendations conflict and opinions are strong. But now, an analysis from the major Women's Health Initiative (WHI) trial throws weight on the supplement side - at least for women taking hormones after menopause. The analysis was published online in Menopause, the journal of The North American Menopause Society.

Among the nearly 30,000 postmenopausal women in the hormone trial, some 8,000 took supplemental calcium (1,000 mg/day) and vitamin D (400 mg/day), and some 8,000 took look-alike placebos. These women came from all the hormone groups in the study - those who took estrogen plus a progestogen (required for women with a uterus), those who took estrogen alone, and those who took the hormone look-alike placebos. The researchers looked at how the rates of hip fracture differed among women who took hormones and supplements, those who took hormones alone, and those who took neither.

The supplements and hormones had a synergistic effect. Women using both therapies had much greater protection against hip fractures than with either therapy alone. Taking supplements alone wasn't significantly better than taking no supplements and no hormones. The benefit of hormone therapy was strong in women who had a total calcium intake (supplements plus diet) greater than 1,200 mg/day. Similarly, the benefit was strong in women who had higher intakes of vitamin D, but the individual effect of each one could not be determined because the two supplements were given together.

The effects translated into 11 hip fractures per 10,000 women per year among the women who took both hormones and supplements compared with 18 per 10,000 women per year among those who took hormones only, 25 per 10,000 women per year among those who took supplements alone, and 22 among those who got neither therapy.

These results suggest, said the authors, that women taking postmenopausal hormone therapy should also take supplemental calcium and vitamin D. Although they couldn't specify how much, they noted that the benefits seem to increase with increasing total intake of calcium and vitamin D. The dose will depend on keeping side effects, such as constipation from too much calcium, to a minimum, they said.

That differs from the recommendation of the US Preventive Services Task Force (USPSTF), made earlier this year. USPSTF stated there was no basis for recommending calcium and vitamin D supplements to prevent fractures. But now, with a study this large, there may well be.
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Breastfeeding Helps Children Climb Social Ladder in Adulthood

Wednesday 26 June 2013 –Medical News Today
According to a new study published in the *Archives of Disease in Childhood*, breastfeeding is not only good for the overall health of a baby, but it can also boost their ability to climb the social ladder in adulthood.

Researchers from University College London (UCL) found that breastfeeding can have significant impacts on cognitive development and improvements in social status. In addition, they revealed it can lower the chances of downwards mobility.

They based their findings on changes in social class among 17,419 people born in 1958 and 16,771 born in 1970.

The study involved questioning the children's mothers on whether they had breastfed their child.

They identified the social class of the fathers of the children when they were 10 years old and compared it to their social class when they were adults at the age of 33.

Using a four-point scale, the investigators categorized social class from unskilled to professional.

Dr Amanda Sacker, International Centre for Lifecourse Studies in Society and Health at UCL, said that "this is the first large scale study to find that the benefits of breastfeeding extend beyond infancy and childhood into adulthood."

A number of different influential factors were taken into account, such as cognitive development and stress scores, which were assessed at the age of 10.

Children born in 1970 were far less likely to be breastfed by their mothers compared to those born in 1958. Only 36% of children born in 1970 were breastfed, compared to 68% in 1958.

The researchers found that children born in 1958 were more likely to be downwardly mobile compared to those born in 1970 - who were found to be more upwardly mobile.

Even when considering background factors, **those who were breastfed were significantly more likely to climb the social ladder** compared to those who weren't.

The "breastfeeding effect" was consistent among children born in both years.

Breastfeeding increased the chance of upwards mobility by 24% and reduced the risk of downward mobility by 20%.

Breastfeeding increased upwards social mobility because it improves brain development and intellect as well as reducing the likelihood of being overwhelmed by stress.

An Australian study found that babies who were breastfed for at least six months scored significantly higher in academic tests at the age of ten compared to those who weren't.
The authors stress that breastfeeding offers a wide range of long-term health advantages to children, which continue into adulthood.

It is still uncertain whether it is the nutrients in breast milk or the bonding during breastfeeding which contributes to the benefit of the child.

The authors suggest that a "combination of physical contact and the most appropriate nutrients required for growth and brain development is implicated in the better neurocognitive and adult outcomes of breastfed infants."

Professor Amanda Sacker, of the ESRC International Centre for Lifecourse Studies in Society and Health at UCL, and lead author of the study, concluded:

"This is the first large scale study to find that the benefits of breastfeeding extend beyond infancy and childhood into adulthood. Independent of other biological, social and economic circumstances, those who were breastfed were about 1.25 times more likely to be upwardly mobile."

The benefits of breastfeeding

A recent Save the Children report stated that if all mothers breastfed their newborns as soon as they were born, about 830,000 lives annually would be saved.

Scientists in Switzerland and the UK found that breastfeeding is linked to enhanced lung function at school age, their study was published in the *American Journal of Respiratory and Critical Care Medicine*.

Breastfeeding Medicine recently published a report which revealed that breastfeeding can help prevent children from developing ADHD(attention-deficit/hyperactivity disorder) later in life.

Breastfeeding rates on the rise

The Centers for Disease Control and Prevention (CDC) said that there are more American mothers breastfeeding today than before, and that there is also a record number still breastfeeding at six months.

CDC Director Tom Frieden, M.D., M.P.H., said:
"Breastfeeding is good for the mother and for the infant - and the striking news here is, hundreds of thousands more babies are being breastfed than in past years, and this increase has been seen across most racial and ethnic groups.

Despite these increases, many mothers who want to breastfeed are still not getting the support they need from hospitals, doctors, or employers. We must redouble our efforts to support mothers who want to breastfeed."

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Does Coffee Reduce Appetite?

Tuesday 25 June 2013 –Medical News Today

Millions of us cannot start the day without our coffee. Is that such a bad thing? According to several studies, regular coffee reduces our risk of developing diabetes, mental illness, many cancers, and overall mortality. However, no scientific studies have looked at whether coffee might affect appetite.

Matt Schubert, a Ph.D. candidate, and Associate Professor Ben Desbrow, both from the Centre for Health Practice Innovation, Griffith University, Australia, set out to determine what effect coffee might have on appetite.

That is the question being asked by PhD candidate Matt Schubert and Associate Professor Ben Desbrow from Griffith University's Centre for Health Practice Innovation.

Schubert said:
"Anecdotally, people have reported feeling less hungry after consuming a coffee, and some people prefer to have coffee instead of breakfast.

However, when you observe what people pair with their coffees in a coffee shop setting, you see consumption of high-fat, sweet foods. What we want to explore is whether there is an effect of coffee on food preference and what the implications of this might be for weight control."

The researchers are currently conducting four trials. Some of the participants are given two coffee drinks - one during their breakfast and the other two hours later, while the rest are having coffee-free mornings or just caffeine alone.

The investigators monitor the volunteers from breakfast to lunch time (4 to 5 hours) and regularly assess their perceptions of satiety (fullness), hunger, and desires for certain foods to examine appetite responses.
While emphasizing that the trials are still ongoing, Schubert explains that the team have so far observed less hunger and a greater sensation of fullness among those having two coffees. "A trend we're not observing with decaffeinated coffee or caffeine alone for some individuals. This may be important for weight control, as any decrease in appetite could help reduce food intake."

If an individual consumes less energy while maintaining or raising energy expenditure through physical activity, this could be used as a strategy to help people maintain a desirable body weight, the researchers believe.

Schubert and Desbrow are currently recruiting participants for the ongoing study. They are looking for healthy, non-smoking 18 to 45 year-olds with no chronic diseases or special diets.

Coffee may help you live longer

Researchers from the University of Athens Medical School believe that coffee improves cardiovascular health and increases longevity - boiled Greek coffee to be exact. Their findings, which were published in *Vascular Medicine* (March 2013 issue), were based on observations made among the residents of Ikaria, Greek island.Ikarians say they have the longest lifespans in the world.

Too much coffee can make you hear things that are not there - a team from La Trobe University, Australia, reported in *Personality and Individual Differences* (June 2011 issue) that too much coffee can trigger auditory hallucinations.

Professor Simon Crowe and colleagues randomly selected 92 volunteers to either a high or low stress condition, and a high or low caffeine condition. They then listened to white noise and were asked to report whenever they heard the song "White Christmas". Humans hear white noise as a fuzzy sound; it contains every frequency within the range of human frequency.

A significantly higher percentage of participants with high caffeine levels or high stress reported hearing

the White Christmas song - even though it was never played.

Professor Crowe said: "There is a link between high levels of stress and psychosis, and caffeine was found to correlate with hallucination proneness. The combination of caffeine and stress affect the likelihood of an individual experiencing a psychosis-like symptom."
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A High-Fat Diet Impairs Memory and Learning In Adolescent Mice

Wednesday 19 June 2013 –Medical News Today

A high-fat diet in adolescence appears to have long-lasting effects on learning and memory during adulthood, a new study in mice finds. The results were presented at The Endocrine Society's 95th Annual Meeting in San Francisco.

Adolescent mice fed a normal-calorie but high-fat diet became moderately obese but not diabetic, and they displayed significantly impaired spatial memory, according to the study authors, from CEU-San Pablo University (Universidad CEU-San Pablo) in Madrid. Spatial memory allows recording of information needed to navigate in a familiar environment and is pivotal for learning, said the lead author, Mariano Ruiz-Gayo, PhD, a professor of pharmacology at the university.

Adult mice that received the same diet had intact performance on memory tasks, showing that, unlike the adolescents, they were not sensitive to the effects of the fatty diet, he reported.

"This study shows that normocaloric diets containing high amounts of saturated fat might have deleterious and long-lasting effects on the developing brain, even in the absence of apparent diabetes," Ruiz-Gayo said.

In their study, the investigators gave 15 male adolescent mice an eight-week, high-fat diet in which 45 percent of the calories came from unhealthy, saturated fat. Another 15 male mice received a conventional diet with the same number of calories (the control group). A similar study was carried out in adult mice so the researchers could test the effects of a high-fat diet starting later in life.

To test the rodents' spatial memory, the researchers used the novel location recognition test. In this test, the mice were placed in an open-field box - an open but walled box with a single chamber - containing two objects, plastic toy (Lego) pieces. The mice were already familiar with the box and one of the objects, but the other object was new to them. The mice explored the box for 10 minutes initially. One hour and 24 hours later, the mice returned to the box, where each time the new object was in a different position. The researchers recorded how long it took the rodents to find the new object.

The scientists found that it took mice significantly longer to find the new object if they had received the high-fat diet when their brains were immature. Ruiz-Gayo said this demonstrated impaired spatial memory in the mice whose high-fat diet started in adolescence. The memory damage reportedly did not reverse after these mice received a reduced-calorie diet, suggesting that the changes were long-lasting.

Additionally, laboratory analyses of the brain showed corresponding long-lasting brain changes in the mice with memory deficits, according to the authors. In the brain regions related to memory (the hippocampus), these mice had changes in the structure of their neurons, or nerve cells. The researchers also found, in the brain, a partial loss of leptin, a hormone released by fat tissue that helps support cognitive function.

Ruiz-Gayo speculated that the brain's memory centers are susceptible to a high-fat diet during adolescence because of hormonal changes in the brain, most prominently in leptin.

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5 OR MORE CUPS OF COFFEE A DAY INCREASES WEIGHT GAIN, DIABETES RISK

May 30, 2013 **Food Product Design**

Individuals who drink 5 or more cups of coffee a day may put themselves at risk for weight gain and an increased risk of diabetes, according to a new study published in the ***Journal of Agricultural and Food Chemistry***. The findings suggest a polyphenol in coffee called chlorogenic acid (CGA) known to reduce blood pressure and aid weight loss has the opposite effect in large doses.

Researchers from the Western Australian Institute for Medical Research (WAIMR) and the University of Western Australia's School of Medicine and Pharmacology found excess consumption of CGA found in coffee could have health implications, from preventing fat loss to developing insulin resistance.

Studies have shown that coffee consumption lowers the risk of developing type 2 diabetes. This also included research on decaffeinated coffee, which suggested that the health benefits are from a compound in coffee apart from caffeine.

“With this in mind, we studied the effects of polyphenols, or more specifically CGAs, which are very rich in coffee but also found in tea and some fruits including plums. The CGAs were previously known for their health benefits, increasing insulin sensitivity and reducing blood pressure and body fat accumulation," the researchers said. “However, this study proved the opposite in dosages equivalent to five or six cups of coffee per day."

The researchers found that the equivalent dose of CGA fed to laboratory mice affected the utilization of fat in the liver and caused abnormal retention of fat within cells. The obese mice also had a tendency for a higher degree of glucose intolerance and increased insulin resistance. They also found CGA doesn't prevent weight gain in obese laboratory mice fed a high-fat diet when used at higher doses.

“It seems that the health effects are dose-dependent. A moderate intake of coffee, up to three to four cups a day still seems to decrease the risk of developing diseases such as cardiovascular disease and type 2 diabetes," the researchers added. "Everybody knows about the effects of caffeine, but when we're considering our lifestyle choices it's important to remember that compounds such as CGA can have an effect on our health if they're not consumed in moderation."

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EATING PROBIOTICS HELPS IMPROVE BRAIN FUNCTION

May 29, 2013 **Food Product Design**

LOS ANGELES—Women who regularly eat yogurt containing probiotics show altered brain function, both while in a resting state and in response to an emotion-recognition task, according to a new study published in the journal ***Gastroenterology***. The discovery that changing the bacterial environment, or microbiota, in the gut **can affect the brain** carries significant implications for future research that could point the way toward dietary or drug interventions to improve brain function.

Researchers have known the brain sends signals to the gut, which is why stress and other emotions can contribute to gastrointestinal symptoms. This study, conducted by scientists with UCLA's Gail and Gerald Oppenheimer Family Centre for Neurobiology of Stress and the Ahmanson-Lovelace Brain Mapping Centre at UCLA, shows what has been suspected but until now had been proved only in animal studies: that signals travel the opposite way as well.

"Our findings indicate that some of the contents of yogurt may actually change the way our brain responds to the environment. When we consider the implications of this work, the old sayings 'you are what you eat' and 'gut feelings' take on new meaning," said Dr. Kirsten Tillisch, associate professor of medicine at UCLA's David Geffen School of Medicine and lead author. "Time and time again, we hear from patients that they never felt depressed or anxious until they started experiencing problems with their gut. Our study shows that the gut-brain connection is a two-way street."

The small study involved 36 women between the ages of 18 and 55 years. Researchers at UCLA's David Geffen School of Medicine divided the women into three groups: one group ate a specific yogurt containing a mix of several probiotics twice a day for four weeks; another group consumed a dairy product that looked and tasted like the yogurt but contained no probiotics; and a third group ate no product at all.

Functional magnetic resonance imaging (fMRI) scans conducted both before and after the four-week study period looked at the women's brains in a state of rest and in response to an emotion-recognition task in which they viewed a series of pictures of people with angry or frightened faces and matched them to other faces showing the same emotions. This task, designed to measure the engagement of affective and cognitive brain regions in response to a visual stimulus, was chosen because previous research in animals had linked changes in gut flora to changes in affective behaviours.

The researchers found that, compared with the women who didn't consume the probiotic yogurt, those who did showed a decrease in activity in both the insula—which processes and integrates internal body sensations, like those form the gut—and the somatosensory cortex during the emotional reactivity task.

In response to the task, the women had a decrease in the engagement of a widespread network in the brain that includes emotion-, cognition- and sensory-related areas. The women in the other two groups showed a stable or increased activity in this network.

During the resting brain scan, the women consuming probiotics showed greater connectivity between a key brainstem region known as the periaqueductal grey and cognition-associated areas of the prefrontal cortex. The women who ate no product at all, on the other hand, showed greater connectivity of the periaqueductal grey to emotion- and sensation-related regions, while the group consuming the non-probiotic dairy product showed results in between.

The researchers were surprised to find that the brain effects could be seen in many areas, including those involved in sensory processing and not merely those associated with emotion.

The knowledge that signals are sent from the intestine to the brain and that they can be modulated by a dietary change is likely to lead to an expansion of research aimed at finding new strategies to prevent or treat digestive, mental and neurological disorders, said Dr.Emeran Mayer, a professor of medicine, physiology and psychiatry at the David Geffen School of Medicine at UCLA and the study's senior author.

"There are studies showing that what we eat can alter the composition and products of the gut flora—in particular, that people with high-vegetable, fibre-based diets have a different composition of their microbiota, or gut environment, than people who eat the more typical Western diet that is high in fat and carbohydrates," Mayer said. "Now we know that this has an effect not only on the metabolism but also affects brain function."

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MALNOURISHMENT DECREASES LITERACY RATES IN CHILDREN

May 29, 2013 **Food Product Design**

Chronically malnourished children are nearly 20% less literate than those who have nutritious diets, according to **a new report** released by Save the Children. The findings estimate the global economic impact of malnutrition could amount to $125 billion.

Based on studies from Ethiopia, India, Peru and Vietnam, which focused on thousands of children within these regions, researchers found that at 8-years-old, children stunted by chronic malnutrition are 19% more likely to make a mistake when reading a simple sentence than those receiving proper nourishment.

In addition, stunted children are 12.5% more likely to make a mistake when writing a simple sentence, and they perform at a 7% lower rate when answering simple math questions.

These results show that not having a nutritious diet can severely impair a child's ability to read and write a simple sentence and answer basic math questions correctly, regardless of the amount and quality of schooling they received.

"One-quarter of the world's children are suffering the effects of chronic malnutrition," said Carolyn Miles, Save the Children CEO and president. "Poor nutrition in the early years is driving a literacy and numeracy crisis in developing countries and is also a huge barrier to further progress in tackling child deaths."

Save the Children's report also indicates malnourished children could earn as much as 20% less in adulthood.

Despite being one of the most cost-effective forms of development assistance, spending on nutrition programs currently amounts to just 0.3% of global development spending. Any investment now, the report said, would be a down payment on future prosperity.

The U.S. government is expected to attend the Nutrition for Growth summit in London with funding for nutrition and a plan to tackle the problem, including efforts to reform U.S. food aid policy that would feed 2 million to 4 million more children at no extra cost.

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Peppers may protect against Parkinson's disease

A study published in the *Annals of Neurology* shows that eating foods from the *Solanaceae* family, which contain naturally-occurring nicotine, may be able reduce the risk of Parkinson's disease. Foods in the *Solanaceae* family include peppers, tomatoes, and potatoes.

The researchers recruited 490 newly-diagnosed Parkinson's patients, and 644 unrelated individuals with no neurological disorders for the control group. The researchers examined whether Parkinson's disease was associated with self-reported typical frequency of consumption of peppers, tomatoes, tomato juice,

and potatoes during adulthood, while adjusting for consumption of other vegetables, age, sex, race/ethnicity, tobacco use, and caffeine.

The researchers found that consuming foods in the *Solanaceae* family did lower the risk for Parkinson's disease, with peppers displaying the strongest association. However, the consumption of all other vegetables did not have any association with Parkinson's disease. In fact, *Solanaceae* vegetable eaters lowered their risk by 19% on average. And eating two to four peppers a week lowered the risk by about 30%. In addition, the potentially protective effect of edible *Solanaceae* largely occurred in men and women who had never used tobacco or who had smoked cigarettes for less than 10 years.

The researchers concluded that "confirmation and extension of these findings are needed to strengthen causal inferences that could suggest possible dietary or pharmaceutical interventions for Parkinson's disease prevention." IFT Weekly June 5, 2013

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Low-Cal Sweeteners Help Prevent Diabetes

June 11, 2013 Food Product Design

Low-calorie sweeteners may facilitate weight loss, while also playing an important role in type 2 diabetes prevention and management, according to a new study published in *US Endocrinology*.

Low-calorie sweeteners provide an alternative to sugar and help limit caloric intake. Researchers found no conclusive evidence that fructose is harmful—it may even have advantages for glycemic control. Because added sugars increase carbohydrate intake, this study examined the benefits of using low-calorie sweeteners to prevent weight gain.

Based on a review of multiple studies, scientists conclude the sweeteners can help improve oral hygiene and dental care, and they provide a viable way for individuals to manage reactive hyperglycemia by preventing excessive sugar intake that can lead to increased sugar secretion.

In addition, the reviewers document the safety of low-calorie sweeteners for the prevention and treatment of diabetes and weight loss because they have no effect on insulin or hormone secretion, and they have not been shown to increase appetite.

Use of low or no-calorie sweeteners has increased among consumers in 2013, with 28% of adults consuming foods or beverages containing the sweeteners.

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Raisins may lower cumulative food intake in children

A study published in a supplement of the *Journal of Food Science* shows that consuming raisins may contribute to lower daily energy intake in children. Snacks are an important part of children's dietary intake, but the role of dried fruit on energy intake in children is unknown.

Therefore, the researchers wanted to study the effect of consumption of an after-school snack of raisins, grapes, potato chips, and chocolate chip cookies on appetite and energy intake. The study involved 20 normal weight children, ages 8–11. On four separate weekdays, one week apart, the children were given a standardized breakfast, morning snack (apple), and a standardized lunch. After school, the children randomly received one of four snacks and were instructed to eat until "comfortably full." Appetite was measured before and 15, 30, and 45 min after snack consumption.

The researchers found that children consumed the least calories from raisins and grapes and the most from cookies. However, weight of raisins consumed was similar to potato chips (about 75 g) and lower compared to grapes and cookies. Raisins and grapes led to lower cumulative food intake (breakfast + morning snack + lunch + after-school snack), while the cookies increased cumulative food intake compared to the other snacks. Grapes lowered appetite compared to all other snacks.

The researchers concluded that the "consumption of raisins has potential as an after-school snack to achieve low snack intake prior to dinner."

IFT Weekly June 26, 2013

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Food Science & Industry News

OFFERING KIDS FLAVORED DIPS INCREASES VEGGIE CONSUMPTION

June 4, 2013 **Food Product Design**

Offering children flavoured dips with their veggies may help increase vegetable consumption and acceptance among kids, according to a new study published in the ***Journal of the Academy of Nutrition and Dietetics.***

Researchers studied preschool children ages 3 to 5 years by first assessing their familiarity and liking of six raw vegetables and five different dips (reduced-fat plain, herb, garlic, pizza and ranch). The children tasted one vegetable they liked, one they disliked and one they refused, along with a reduced-fat plain dip and a reduced-fat herb-flavoured dip.

The children rated their liking of celery and yellow squash with and without the herb dip, and researchers measured their intake of the vegetables. Kids preferred the herb-flavoured dip over the plain dip, and findings indicate children were three times more likely to reject the vegetable when served by itself rather than with an herb dip, suggesting that offering vegetables with a flavoured dip can promote liking and consumption of some veggies among children.

The kids' food and beverage market in the United States represents over $10 billion worth of opportunity. But, whether it's designing a healthier beverage, choosing the right colour or flavour, or pleasing picky kids and pickier parents, designing products for the younger set is not exactly child's play.

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Healthy Options on Kids' Menus Cost Less than Expected

June 11, 2013 Food Product Design

Healthy entrees on children's menus cost much less than people think, despite the assumption that healthy foods tend to be more expensive, according to new findings published in the journal *Preventing Chronic Disease*.

With the economy still in recovery mode, consumers want value-priced healthy menu items. Researchers from the University of Tennessee found healthy items on kids' menus cost an average of $5.38, which was not significantly more than less healthy meals ($5.27).

The study involved children's menus from 75 full-service restaurant chains in the Little Rock area. All 75 restaurants had less healthful entrees on their kid's menus, 23% had *only* less healthful entrees, and 77% had at least one or more healthful entrees. One average, there were significantly fewer healthful entrees compared to less healthful entrees.

"More healthful" meals included foods that were grilled, baked or broiled (except grilled cheese), and the "less healthful" meals were fried, contained red meat (unless low-fat or low-calorie), or contained a large amount of cheese, butter or cream sauce. Sandwiches were considered healthful if made with whole wheat and low-fat or low-calorie condiments.

The study did not examine the prices of beverages, side dishes or desserts.

Restaurants have increased their focus on healthful menu options in recent years, and in 2011, the National Restaurant Association (NRA) launched an initiative to highlight actions taken by restaurants to promote healthier diets.

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Market for Protein Products Surges

June 7, 2013 Food Product Design

The world market for protein bars, drinks and other supplements continues to boom, with the 2017 market earnings expected to hit £8 billion (US $12.4 billion) per year by 2017, reported *BBC News*.

While protein product marketers previously focused on bodybuilders and athletes, a wider range of buyers has taken an interest to the products for a "healthy" lifestyle. Past research from Global Industry Analysts, Inc., indicates the U.S. whey protein market could reach 472.3 million pounds by 2015, largely due to a surging demand from the nutrition industry.

While protein has become popular in the health food industry, the Centres for Disease Control and Prevention (CDC) only recommends 56 grams of protein per day for the average man, and 45 grams for a woman. Helen Crawley of the CDC said adults in the United States already get more than enough.

Research by the *Sun Sentinel* indicates people get all the protein they need without even trying, and consumers should be careful not to add excess calories to one's diet when consuming extra protein products.

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Polydextrose fibre may increase satiety

A study published in the *British Journal of Nutrition* shows that polydextrose may increase satiety and reduce subsequent energy intake. The 21 participants in the randomized, cross-over study consumed chocolate milk drinks with an equal energy load and varying doses of polydextrose, from 0 g up to 25 g, 90 min prior to being served an unlimited pasta-based test meal.

The researchers determined the exact amount of energy consumed by each participant before they declared themselves comfortably full. This revealed that total meal energy intake was significantly lower when participants had received 6.3 g, 12.5 g, or 25 g in the pre-meal snack, compared to the no-polydextrose control.

Consumption of 25 g polydextrose led to the lowest meal energy intake, indicating that the impact on satiety is dose-dependent. In addition, it was found that both the 12.5 g and 25 g polydextrose doses were linked to a lower total energy intake over the entire day.

IFT Weekly June 13, 2013

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Report: Beverage Fortification—Enhancing Nutritional Quality & Consumer Appeal

June 18, 2013 Food Product Design

Years ago, fortification was implemented in staple items, such as flour and milk, as an effective strategy to help stave off widespread disease resulting from malnourishment. One of the earliest records of fortification beneficial to the U.S. population was the addition of vitamin D to milk, which aided the body in absorbing milk's natural calcium content. The combination acted to calcify bone structure, resulting in reduced instances of rickets, a disease in which bones are softened due to lack of calcium absorption.

With increasingly savvy consumers looking to glean nutritional benefits in everything from tea and juice to bottled water, beverage fortification has taken on a whole new life. However, fortifying beverages with new and different ingredients presents many challenges from stability and taste perspectives. This issue was less prevalent in the early days of the new-age beverage boom, as typically only very small amounts of herbs and vitamins were added in order to be able to list them in the ingredient line.

Armed with information, today's consumers are looking for more research-based, effective doses of ingredients. But many highly purified or standardized botanicals can add bitterness to a beverage, and some minerals, such as calcium, can add chalkiness. This can present a challenge for any beverage scientist trying to add highly concentrated ingredients and still make a beverage taste great.

As such, some beverage technologists use a four-tiered approach to modify taste to create an overall pleasant drinking experience. This strategy involves reviewing and choosing the right combination of sweeteners, acids, modifiers of flavour and other ingredients (SAMO) in the quest for fortified beverages that meet a marketer’s demand for function. In order to effectively implement the SAMO method of ingredient selection, beverage developers must also understand the intended marketing and brand positioning of the product.

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New Freeze-Dried Mango Strips Snack

June 20, 2013 Food Product Design

Freeze-Dried Mango Strips, a healthy ingredient to make snack foods both good tasting and nutritious, entered market.

Naturally high in vitamin A, vitamin C, iron and calcium, mangos are also low in fat and cholesterol-free. Mangos are a healthy alternative to artificial, sugary snacks or salty, fried foods. One handful of Freeze-dried Mango Strips provides a full serving of fruit.

The freeze-drying process allows the fruit to retain much of its flavour and nutrition, and enables a longer shelf-life. The mango strips can serve as a stand-alone snack, but can also be added to trail mixes or granola. In addition to snack applications, the versatile product can be served with salads, yogurt, cold cereal and instant oatmeal, or they can be blended into fruit smoothies or vanilla milkshakes.

The product is offered in conventional and organic forms and is certified kosher as well. VDF also offers Freeze-dried Blueberries and Freeze-dried Cranberries.

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Safety & Regulatory News

SPORTS CELEB ENDORSEMENTS, NUTRIENT CLAIMS DRAW KIDS TO UNHEALTHY FOODS

May 31, 2013 **Food Product Design**

Boys are more likely to choose unhealthy foods with on-pack endorsements by sports celebrities, and children of both genders are more likely to choose energy-dense and nutrient-poor (EDNP) products if the packages have nutrient content claims, according to a study published in the journal ***Pediatric Obesity***.

Researchers at the **Cancer Council Victoria's Centre for Behavioural Research in Cancer** surveyed 1,302 children in fifth and sixth grade, averaging 11 years of age. Children were asked to look at mocked-up food packets for products in five categories including, sweetened breakfast cereal, cheese dip snacks, ice cream bars, frozen chicken nuggets and flavoured milk drinks. For each product category a comparison pack was offered, matching on packaging style to control for visual appeal of factors other than the promotion condition, but having a healthier nutritional profile. Researchers found on-pack nutrient content claims made pre-adolescents more likely to choose EDNP products and increased perceptions of their nutrient content. Children of both sexes were more likely to want foods with packaging showing claims about the food's nutrient content, such as "reduced fat" or "source of calcium" claims. Further, results show sports celebrity endorsements made boys more likely to choose EDNP products.

The authors conclude these findings suggest policy interventions to reduce the impact of unhealthy food marketing to children should be made to limit the use of these promotions. "Stricter measures need to be introduced to limit food manufacturers' use of nutrient content claims and sports celebrity endorsements to promote unhealthy foods, to ensure consumers aren't confused about the healthiness of such products," said Helen Dixon, Ph.D., lead author of the study and senior research fellow at the Centre for Behavioural Research in Cancer, told ***The Conversation***.

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CAFFEINE BUZZ CROSSES INTO MENTAL DISORDER SAYS APA

May 31, 2013 **Food Product Design**

Excessive levels of caffeine intake could lead to the diagnosis of a new mental disorder called "caffeine intoxication" or "caffeine withdrawal" according to a new edition of the American Psychiatric Association's (APA) *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5). The manual added several new disorders to its retinue of possible maladies, including two food-related diagnoses including caffeine intoxication and binge eating disorder. Both were included in the appendix of the previous version of the manual, DSM-4, as conditions requiring further study.

Caffeine is a drug, a mild stimulant, which is used by almost everybody on a daily basis," said Dr. Charles O'Brien, who chairs the Substance-Related Disorder Work Group for the DSM-5, as quoted in the New York Post. "But it does have a letdown afterwards. If you drink a lot of coffee, at least two or three [eight ounce] cups at a time, there will be a rebound or withdrawal effect."

Another new listing in the manual is Binge Eating Disorder, with this comment from psychiatrists, "This change is intended to increase awareness of the substantial differences between binge eating disorder and the common phenomenon of overeating," according to an APA fact sheet.

Telltale signs of caffeine intoxication might be personified by restlessness, nervousness, excitement, red face, gastrointestinal upset, muscle twitching, rambling speech, sleeplessness, rapid and irregular heartbeat and other symptoms.

Specifically, a coffee drinker who experiences five or more of these symptoms during or shortly after consuming caffeine could be diagnosed with this disorder. It also must cause distress or impair the consumer's ability to function.

The DSM groups this disorder with others associated with substances ranging from alcohol and nicotine to cannabis and hallucinogens. These can alter behaviour, mental processes and cause physical symptoms.

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Health Canada approves partially hydrolyzed guar gum as a dietary fibre source

Health Canada has approved partially hydrolyzed guar gum for use as a dietary fibre source. It is a soluble, transparent, and tasteless dietary fibre.
"While there have been a select number of soluble fibres recently approved by Health Canada, galactomannan-based fibre (as opposed to a sugar/starch based fibre) allows product formulators to bring the benefits of this truly regulating fibre to consumers who are looking for a unique, more comfortable fibre source," said LekhJuneja.
It is low in viscosity, improves stability of beverages at various pH levels, and is resistant to heat, acid, and digestive enzymes. In addition to its blood glucose benefits, it improves absorption of minerals (such as calcium, iron, and zinc) and aids protein utilization. It has prebiotic characteristics that stimulate health-promoting indigenous bacteria such as Lactobacilli and Bifidobacteria.
IFT Weekly June 5, 2013

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U.K. gives green light to nutrition labeling system

The U.K. Dept. of Health has finalized the front-of-pack nutrition label, which aims to make it easier for

people to make healthier choices about the food they eat. The consistent system will combine red, amber, green color-coding and nutritional information to show how much fat, saturated fat, salt and sugar, and calories are in food products.

MARS UK, Nestlé UK, PepsiCo UK, and Premier Foods have announced that they will join all the major retailers, including Sainsbury's, Tesco, ASDA, Morrisons, the Co-operative, and Waitrose, in using the consistent label on their products. Manufacturer McCain Foods, which already uses front of pack, will be using the consistent label too. This comes after detailed discussions with the U.K. government working with the food industry, health NGOs, and other partners to agree the proposed system and what the label would look like.

"The U.K. already has the largest number of products using a front-of-pack label in Europe but we know that people get confused by the variety of labels that are used. Research shows that, of all the current schemes, people like this label the most and they can use the information to make healthier choices," said Public Health Minister Anna Soubry.

As part of the government's work to reduce obesity levels, the Dept. of Health is working with industry, through the Responsibility Deal, to get business taking action to reduce the amount of calories, salt, and *trans* fat in foods. The consistent front-of-pack label will be a new Responsibility Deal pledge that food and drink companies can sign up to and deliver. Businesses that have signed up to using the new label today already account for more than 60% of the food that is sold in the U.K. Guidance for business has been published on developing front-of-pack nutrition labels.

The new consistent label will include the information presented consistently per portion of food:

- The amount of energy—presented in kilocalories and kilojoules—fat, saturated fat, salt, and sugar. This will be presented as Reference Intakes (RI)—formerly known as Guideline Daily Amounts (GDA)—and will show how much of the maximum daily intake a portion accounts for.
- A consistently determined red, amber, or green color-coding system (note the basis of this is per 100 g not per portion except where the amount in a portion exceeds 30% of the RI)

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