Editorial

Food regulators have been talking about the Proprietary Foods whether their safety or their standards or any other aspects. By definition from Food Safety & Standards Act 2006, proprietary foods are those which do not have standards. There are literally thousands of such foods and many regulators feel that all these should have standards so by the time they get their work done, there will be thousands of standards. The FSSA Rule book will look like Encyclopaedia Britannica with several volumes. Whether it is useful to anyone or not is not their concern but they would like manufacturers to follow standards prescribed by them.

Regulators cannot think of any food manufactured by industry without any standards. They feel that they will add any additive they like at any level they like. They probably do not realise that additives are commonly more expensive than most ingredients that go into making foods. And why would manufacturers add additives at higher levels than necessary? If they add them the food would taste awful or would look unacceptable. Except in certain instances, the limits of these additives would be decided by the acceptability of that food product. Colours would be added just to make the product look attractive and too much will look unacceptable. Similarly acids, emulsifiers, stabilisers, preservatives, artificial sweeteners etc. will become unacceptable to consumer if added too much and much before they reach their safety limits.

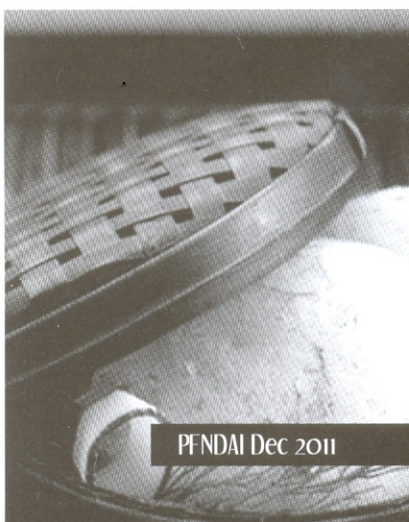
In some cases where these are harmful or be used as adulterants, such regulations can be made in general terms.

Still regulators may want to define some foods like standards already existing for jams, jellies, bread or skimmed milk. Let us look at Indian milk sweets e.g. pedha or burfi. Normally they contain khoa and sugar with other natural colorants and flavour substances as well as nuts etc. Khoa is more expensive than sugar so more expensive pedha or burfi would contain more of khoa and less of sugar. As sugar is increased the product becomes less expensive and sweeter. There are some consumers that prefer sweeter pedha than others. Now is it necessary to have a standard for pedha with certain minimum amount of khoa or maximum amount of sugar specified. This would deprive certain clientele that would like to buy pedha but cannot afford to pay too much. The standard might restrict making of pedha beyond certain price range that would price this segment out of market as they may not be able to afford the product as per standard.

There certainly can be some safety standards like microbiological standards which can be applied for the whole range of milk products without giving standards to individual products. Lack of standards also allows innovation as to the kinds of ingredients that could be added.

If there is a need of standards then we must have them. Some unscrupulous manufacturers may adulterate a product in which case to prevent adulteration a quality standard may be prescribed as khoa has been defined. But product standards should not be made just for the sake of making them. They would be doing a disservice to consumers.

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



Whey Protein: Prof. Jagadish Pai

A report on global opportunities for whey states that whey ingredients like whey powder, whey protein and fractions thereof represented a global market value of about 5 billion US dollars in 2010. It has been forecasted to reach about 6.4 billion dollars in 2014 becoming among the fastest growing specialty ingredients. Although major products for whey products are Europe and the US, Asia is rapidly becoming a rapidly growing market. Europe and the US are also the largest producing regions with the US has shown stronger growth rate and also tops in exports. Indian market has been growing in the last decade or so with the lead from many health and dietary supplement products promoted by sports and fitness centres. Many health food drinks have started including whey proteins for their various benefits ranging from muscle building and convalescence to various disease risk reduction. Indian market will be seeing a sharp growth in near future for many foods and dietary supplements containing whey proteins.

What is whey?

When milk coagulates, solids separate from liquid called whey. Solids contain caseins which precipitate when pH is lowered to 4.6 or when rennet enzyme is used. When cheese is made a large amount of whey is produced. This was considered a waste product as it contained small concentration of protein and lactose and recovery was quite expensive. However, modern methods of concentration and separation technologies have allowed preparation of whey proteins along with other components of whey. Also many health benefits of whey protein have been shown by research studies that have resulted in many health foods and dietary supplements being developed in the last couple of decades and whey proteins have become an important specialty food ingredient.

Composition

Major portion of milk proteins is casein. About 80% of the total proteins are caseins in cow milk whereas about 20% is whey protein. Among the whey proteins are β-lactoglobulin, α-lactalbumin, bovine serum albumin (BSA) and immunoglobulins (Ig). The last fraction confers immunity which mothers pass on to their babies through milk. Colostrum or first milk is higher in protein and is thicker. It has very high content of immunoglobulins to protect the babies against a variety of diseases.

Preparation

Whey is commonly prepared in cheese making wherein milk is fermented by lactic bacteria and rennet enzyme is added. When milk is not fermented and coagulated either by acid and/or enzyme then the lactose content of the whey is higher as fermentation converts some lactose to lactic acid. Whey is then dried to powder to prepare whey powder which roughly contains 11 to 15% protein and about 60-75% lactose. Lactose can be removed from whey either by hydrolysis or by crystallisation and filtration. Minerals can be removed to prepare whey protein with lower mineral content. Removal of lactose and minerals increase the protein content to about 25 to 35%.

Further removal of these substances using membrane separation processes and protein contents may go up to 70 to 80% in whey protein concentrates. Higher concentrations of protein are obtained in whey protein isolates which are prepared using membrane separation along with techniques such as ion-exchange chromatography that gives protein concentration of over 90%.

A typical whey protein isolate (WPI) will have about 92% protein, 4.5% moisture, 2% ash, 1% fat and 0.5% lactose, however, modifying process makes WPI products with varying composition and functional properties. Ion-exchange WPI contains high levels of beta-lactoglobulins and no glycomacropeptide whereas microfiltration contains much higher levels of glycomacropeptide.

Enzymatic hydrolysis alters WPI functionality with varying functional and nutritional attributes. Degree of hydrolysis, specificity or enzymes used, temperature and pH of process all affect functionality. Mineral content can also be manipulated through membrane and electrodialysis processes and can also impact functional properties.

Applications

Whey protein is a complete protein containing all 20 amino acids and all essential amino acids in proportions needed by humans. Its PDCAAS score is 1.14 and the biological value is 104. It has a distinct advantage in amino acid profile because it has higher amounts of essential especially branched amino acids and sulphur amino acids which are make them useful in

exercises and sports with products such as high-protein energy bars and beverages. Its solubility allows applications in protein waters, isotonics and protein shots.

Since whey proteins are water soluble beverages were the natural products for their applications. High protein health beverages could be prepared using whey proteins. Since these proteins are stable to acidic pH unlike casein, fruit flavoured beverages with low pH could be successfully fortified with whey proteins.

Since whey protein isolate has excellent properties including emulsifying, fat binding, water binding and thickening it can be used in a variety of food products. It can also be added to products for its gelling and whipping properties. It can replace eggs when they are avoided for allergy or other issues. It provides aeration in baked goods such as muffins or cakes and also mousse and toppings. Some of the other applications have been nutrition bar as well as high protein chips.

Hydrolysed whey protein is used when allergy is a problem. Hydrolysis also imparts it less water binding so in high-protein bars it is less likely to take up water from other ingredients preventing hardening of bars. Hydrolysis also gives clarity to solution so clear beverages with lower viscosity can be obtained.

Nutritional & Health Benefits of Whey Protein

Whey protein is unique in several ways. It has the highest biological value and is easily digestible. It does not get coagulated in stomach so it can move in small intestine quite rapidly and get assimilated quickly. So it is very important in protein synthesis with applications in infant, geriatric and sports nutrition as well as for providing physiological and immunological responses. It has also been shown to have applications in weight control and in cardiovascular health.

Child Nutrition

Mother's milk is ideal for infants. When it is inadequate or not available infant formulae are recommended. Whey protein is being increasingly used in infant formula. Infants with colic and allergy to cow's milk respond well to whey protein. Human milk is the best food for infants with large number of antibodies, functional enzymes, growth factors, gastrointestinal protective factors, functional immune cells and non-protein nitrogen sources important to infants. Cow's milk does not match human milk one major difference being whey protein content. While human milk predominantly contains whey proteins, major protein in cow's milk is casein.

Most formulae for premature infants are whey-predominant. Codex guidelines recommend that infants and children should get 15g high quality protein per 100g products meant for this group, use of whey protein helps provide such protein rich in essential amino acids. According to University of Illinois McKinley Health Centre, whey protein has the highest biological value of any protein source so it gets absorbed and used up more efficiently in body compared to any other protein. This is especially beneficial for children because their muscles are growing rapidly and protein is the key component of diet for muscle building.

Whey protein also can help strengthen child's immune system. It could be safely given to children including infants as long as they do not have any milk allergies and it is consumed in moderation. Hydrolysed whey protein is less likely to cause an allergic reaction than non-hydrolysed whey protein, making it desirable for use in infant formula and functional food and beverages.

Senior Nutrition

As people get old, their metabolic activity with body composition changes along with various physiological functions. Body fat increases due to decreased physical activity, reduced metabolic rate and excess consumption of calories and there is also loss of muscle (sarcopenia) due to reduced protein intake and protein synthesis among other causes. Postprandial stimulation of protein synthesis can be stimulated by whey protein better than any other protein.

Sufficient intake of high quality protein is very important especially in overweight elderly as weight loss is achieved without decreasing muscle mass. Whey protein is rich in essential and branched chain amino acids which contribute to better postprandial protein synthesis and maintenance of muscle. Whey protein contains β-lactoglobulin, α-lactalbumin, immunoglobulins, lactoferrin, lactoperoxidase, glycomacropeptide etc. which possess antioxidant, anticancer, antihypertensive, antihyperlipidemic, antimicrobial and antiviral properties. Hence whey protein containing these biologically active proteins and peptides may promote general health in seniors in many ways.

One study in elderly has indicated that whey protein can boost building of muscle in elderly and the effects beyond that of just amino acid content. It may enhance muscle anabolism in older individual to compensate for the reduced protein

synthesis with age. When whey protein was compared with equivalent constituent amino acids it was less effective so improvement in muscle accretion is beyond those associated with the essential amino acids. Both whey protein and essential amino acids improve stimulation of muscle protein synthesis in elderly that might slow down or reduce sarcopenia.

In rats it has been shown that high whey protein diet reduces body weight gain and alters insulin sensitivity. These are some problems of ageing which come about because of the changes in physiology and in dietary and lifestyle changes making it aged prone to gain weight especially higher body fat and diabetic.

Sports Nutrition

Whey protein concentrate and isolate excellent source of high quality protein with minimal fat and carbohydrate. They also promote immunity, efficient muscle recovery and extend health benefits of physical activity. Protein synthesis and minimising protein breakdown are necessary for efficient recovery after vigorous exercise. Amino acid profile of whey protein is very similar to skeletal muscle with high proportion of essential amino acids especially branched chain amino acids necessary for stimulating rapid protein synthesis in adult muscle. Whey proteins are known to improve muscle strength so the athletes perform better.

It has been shown in rats that whey protein rich in alpha-lactalbumin rapidly delivers amino acids for use during exercise which improves the efficiency of exercise and incurs lesser muscle wear. This also allows better recovery after exercise. In a study with healthy athletic male adults effects of branched chain amino acids (BCAA) was investigated along with whey protein. Although whey protein alone achieves significant decrease in percent body fat within 10 weeks while resistance training, combined with BCAA and glutamine, there was significant gain in lean muscle and improved exercise performance.

Because of muscle building and lean body mass ability of whey proteins, it is very popular among the body builders. The BCAA are very important in this process and whey proteins supply good amounts of this so this has been the highest growth area for whey proteins especially isolates. Whey protein not only promotes the protein synthesis and anabolism more so than carbohydrate based drinks, it also improves the recovery and there is less damage to muscles when they are stretched to their limits of performance.

Studies have shown that pre-workout supplementation with whey protein reduce the muscle damage during workout and accelerates post-workout muscle building and recovery. Whey protein consumed during extended period sports or workouts, helps reduce muscle damage, increases endurance and promotes faster recovery. Whey protein also works well after the exercise during recovery and helps muscle building.

Weight Management

Whey protein influences satiety by suppressing ghrelin and stimulating appetite suppressing hormones. Australian researchers conducted study with obese men of 20 to 65 years and found that whey protein beverage produced 2 to 4 hours suppression of ghrelin, which when elevated signals brain to increase hunger. Satiety hormones GLP-1 and cholecystokinin were elevated after the whey protein beverage. Thus whey protein has hormonal impact on satiety.

Another study showed that whey protein lowers intake of food compared to casein and also that the satiety hormones are increased by over 60% by whey protein having direct impact on appetite. Other studies have shown similar trends on hormones and food intake affected by whey protein. There are other studies that show that whey protein intake reduces body weight and that it increases the insulin sensitivity in rats.

When people are dieting to reduce weight, they tend to reduce the intake of food. While doing this it also reduces intake of essential nutrients like proteins. Hence while dieting to reduce weight, one must have high quality protein and the food should be protein dense. This is possible with whey protein isolate which is not only of the highest quality but also it could be added to various foods and beverages to increase the protein content. Many diet beverages and nutrient bars now have been incorporating good amounts of whey protein isolate which increases protein without increasing the bulk. If viscosity increases too much because of large amounts of protein then whey protein hydrolysate can be used which is more soluble and does not increase viscosity as much as intact protein.

Conclusions

Whey proteins is a complete protein with high biological value (104) and protein digestibility corrected amino acid score (PDCAAS) of 1.14. It has higher amounts of essential amino acids and the BCAA as well as sulphur-amino acids. This makes whey protein extremely useful in child and geriatric nutrition for protein synthesis in body. It suppresses appetite

stimulating hormones and helps bring about satiety which reduces food intake for weight reduction. It helps muscle building and reduces damage and recovery of muscles as well as promotes endurance in sports. Whey protein isolate enables formulating high protein content nutritious products like energy bars and beverages. It can also be added to many different formulated products to improve the nutritive value. As it has good emulsifying, fat-binding, water-binding and thickening properties it could be used in many different products without affecting taste and flavour. It also has gelling and whipping properties. It can replace eggs in many products like muffins, cakes, mousse and toppings. Thus it is a specialty ingredient that could be used in many different food products for its functional as well as nutrient properties.

ORGANIC FOOD & CERTIFICATION

(Mr. Prabodh Halde & Ms. Chetana Bhandari, Regulatory Marico Ltd)

INTRODUCTION

Last few years have seen significant growth in organic food that is food growth using those agricultural principles and techniques that predated introduction of agrochemicals and intensive farming methods. Organic food is a small but growing sector of food industry with an identity defined and protected by law. Organic food is likely to contain lower residues of agricultural chemicals than its non-organic counterpart.

Organic foods are those produced using methods that do not involve modern synthetic inputs like synthetic pesticides and chemical fertilisers, do not contain genetic modification and are not produced using irradiation, industrial solvents or chemical food additives. The available scientific evidence has not shown major differences between organic and more conventionally produced food in terms of safety, nutritive value or taste. Organic farming movement started in 40s in response to industrialisation of agriculture and Green Revolution. Currently European Union, the US, Canada, Japan and many other countries require producers to obtain special certification in order to market food as organic within their borders. The term organic farming was coined in 1940 in UK to describe a holistic, ecologically-balanced approach to farming in contrast to chemical farming.

US organic foods and beverages sales have grown from about $1 billion in 1990 to over $26 billion in 2010 experiencing a double digit growth in the last year according to Organic Trade Association survey in 2011. Organic Monitor reports a global growth of organic food and drink sales towards $40 billion. Fresh produce is the leading category in organic products comprising about one third the global revenues. Fruit and vegetables like apples, oranges, carrots and potatoes are typical organic products consumers are buying. Dairy products and beverages are the next most important category.

IFOAM defines the overarching goal of organic farming as:

Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved.."

Indian Scenario:

Internationally and nationally, standards regulate production methods and in some cases final output for organic agriculture. Standards may be voluntary or legislated. But certification of products/process may be described as what confidence in organic agriculture rests on. An organized system of inspection and certification supported by regulations enables to build a confident consumer community. Thus, Government of India has implemented the National Programme for Organic Production (NPOP). The National Programme for Organic Production proposes to provide an institutional mechanism for the implementation of National Standards for Organic Production, through a National Accreditation Policy and Programme. The National Programme for Organic Production includes the policies for development and certification of organic products and provides national standards for organic products and processes. The standard for National Programme for Organic Production provides information on standards for organic production, systems criteria & procedures for accreditation of certifying bodies, the national organic logo and the regulations governing its use.

India has been exporting certified organic foods for some years now and the demand is gradually on the rise with respect to domestic markets too. Keeping in viewing the growing demand and to check fraudulence in organic production, the Ministry of Agriculture, GOI launched the notification “Organic Agricultural Produce Grading and Marking Rules, 2009” in 2009. Thus organic agricultural produce may now be graded and certified under AGMARK. AGMARK is the accreditation body and the Agricultural Marketing Adviser issues the certificate of authorisation to certification agencies authorising them to certify organic farms, products and process, to grade and mark organic agricultural produce. Any accredited inspection and certification agency under the NPOP is eligible for the grant of certificate of authorization under these rules by applying with complete documentation as prescribed in the guidelines. These authorized inspection and certification agencies in turn certify the agricultural produce of operators/grower groups as organic.

REQUIREMENTS-

The quality of the produce must be as provided in the NPOP. It must also comply with residue levels of contaminants as provided in the FSSAR rules. The requirements for method of packing and labeling of agricultural produce has been prescribed. Some of the packing requirements include use of food grade packing material, employing approved additives for manufacturing packaging films etc. the label of the produce must be provided with the person/company legally responsible

for the production with the grade designation mark securely affixed to each package as approved. The ink used for marking must not contaminate the produce.

GRADE DESIGNATION-

The grade designation for such certified agricultural produce will be "Agmark India Organic". The grade designation mark consists of Agmark India Organic Insignia which is a design incorporating the name of the commodity, certificate of authorization number and the grade designation. The mark may be affixed to products or used on packaging or promotional material or in context of advertising activities.

AGMARK C.A. NO. :

Name of the Commodity……

Grade: - Agmark India Organic

This decision of Ministry of Agriculture enables farmers, farmer groups and processing units use Agmark Organic Certification for their products. This ensures organic produce that are sold in the domestic market to comply with India's organic agriculture regulation - NPOP as well as grading and marking rules under Grading and Marking Act 1937.

CERTIFICATION PROCEDURE & FEE-

The procedure of certification is generally provided by the authorised inspection and certification agency. Typically, the process of certification involves review of operator's application by agency, pre-inspection procedures, farm inspection by agency, sampling procedures & lab analysis, post inspection and evaluation. Post this, the decision of certification is taken and communicated to the operator.

The fee structure for the certification process will be devised from the components namely the application fee, travel and inspection cost, assessment and report preparation (man-day cost) and issue of certificates.

The charges are fixed in the following categories annually, namely:-

i) grower groups (small and marginal farmers);

ii) co-operatives and cottage industries;

iii) large farmers, estates and exporters;

iv) medium and large sized processors.

DOCUMENTATION-

The guidelines issued by AGMARK for the organic certification enlists in detail the documents required to be submitted by operators/grower groups to the AICA as listed below-

1. Duly filled in Form-3 and Form-5.

2. Self attested copies of the proprietorship declaration/partnership deed/Memorandum and Articles of Association/Bye-laws of society, etc.

3. Blue print or neatly drawn sketch of the premises (where the commodity shall be graded and packed) showing all dimensions duly signed by the authorised person of the firm.

4. Following declarations on non-judicial stamp paper of minimum Rs. 5/- in the prescribed proforma – III.

a. Ownership of premises.
b. Ownership of proposed Trade Brand Label (TBL).
c. Use of proposed TBL only on the packages graded under Agmark.
d. Use of eco friendly packaging material of food grade quality as permitted in Prevention of Food Adulteration Rules, 1955 and use of only approved additives (given in Appendix 6 of the National Programme for Organic Production) in manufacturing of packaging films.

5. Copy of the consent letter from the legal owner of the premises, in case, the premises is not owned by the applicant and taken on rent/lease.

6. Specimen copy of the proposed Trade Brand Label of each commodity.

7. Medical fitness certificates issues by the Registered Medical Practitioner certifying that the workers engaged in the handling of the product in the various operation, are free from communicable and contagious diseases.

8. Consent letter from the permitted printing press to print Agmark India Organic Insignia.

Market potential- (INDIA)

With the change in dietary need and enhanced income coupled with awareness for health there is a growing appreciation for organic products. Many of the hotels consume green food grown under the contracts. Organically labeled fruits and vegetables are also appearing on some of markets. Since India has much larger area, which have used minimal pesticides and chemical where potential for conversion exist, organic movement has taken a root in many of the states and there is growing demand especially in cities and market is expected to grow more than 20 per cent annually. It is envisaged that 20 per cent of production shall be organic in 5 years.

Organic farming provides long-term benefits to people and the environment. Awareness and education in Western countries has brought about an unprecedented demand for organic foods. There is a need in India for public information and education to encourage more appreciation for organic foods and certification will support and enhance the consumer confidence.

Food Safety and Standard Authority India has introduced the new category of food as ‘Organic Food’ as per section 22 and thus in coming days the organic food will have huge potential.

(The author can be contacted on prabodh@maricoindia.net or 9820278746)

RESEARCH IN NUTRITION & HEALTH

UNHEALTHY EATING HABITS FORM EARLY

Children as young as 12 months are developing unhealthy eating habits that many lead to long-term struggles with weight and obesity issues, according to results of a new Nestle Nutrition study presented at The Obesity Society's annual scientific meeting in Orlando, Fla.

The Nestlé Feeding Infants and Toddlers Study began in 2002 and examined the evolution of children's diets from birth through to preschool, including sources of calories, key nutrients and snacking patterns. The survey was expanded in 2008 to find out whether the eating habits of young children in America had changed since 2002. More than 3,200 children are included in the survey, making it the largest, most-comprehensive study of the diets and eating habits of infants, toddlers and preschoolers in the United States.

Researchers found toddlers from the age of 12 months and older consumed one-third of their daily calories from snacking between meals. In the United States, 10% of young children between 2 and 5 years old are categorized as obese. "We're seeing poor eating habits starting early in life, and they mirror those of older children and adults," said Dr Kathleen Reidy, Global Head of Nutrition Science, Baby Food, at Nestlé Nutrition. "It's important to establish the foundation for healthy diets early in life when eating habits and preferences are being formed."

The study concluded parents and guardians need better nutrition guidance to help young children develop healthy eating habits from the age of 12 months. Simple dietary changes can make significant improvements in the quality of children's diets. The researchers suggested parents should consider snacks as "mini-meals" and offer healthy options such as fruits, vegetables, low-fat yogurt and whole grain foods. **(Food Product Design** October 6, 2011)

❁❁❁

Green tea may help prevent weight gain

Green tea may slow down weight gain and serve as useful tool in the fight against obesity, according to new research by food scientists at Penn State University. The researchers found that obese mice fed a compound found in green tea along with a high-fat diet gained weight significantly more slowly than a control group of mice that did not receive the green tea supplement.

The released their findings in the current online version of Obesity, fed two groups of mice a high-fat diet. Mice that were fed Epigallocatechin-3-gallate (EGCG) a compound found in most green teas, along with a high-fat diet, gained weight 45% more slowly than the control group of mice eating the same diet without EGCG.

In addition to lower weight gain, the mice fed the green tea supplement showed a nearly 30% increase in fecal lipids, suggesting that EGCG was limiting fat absorption. The green tea did not appear to suppress appetite – both groups of mice were fed the same amount of high-fat food and could eat at any time. The researchers say a person would need to drink 10 cups of green tea each day to match the amount of EGCG used in the study. However, recent studies indicate that just drinking a few cups of green tea may help control weight. (Ingredients Network 5 October 2011)

❁❁❁

INCREASING HDL LEVELS BOOSTS HEART HEALTH IN DIABETICS

PORTLAND, Ore.—Increasing levels of the good cholesterol high-density lipoproteins (HDL) helps reduce the risk of heart attack and stroke among patients with diabetes, according to a new study published in the ***American Journal of Cardiology***. Researchers at Kaiser Permanente conducted an observational study that included 30,067 patients who entered Kaiser Permanente diabetes registries in Oregon, Washington and Georgia between 2001 and 2006. Patients had at least two HDL cholesterol measurements between 6 and 24 months apart. Sixty-one percent of the patients had no significant change in HDL levels; in 22% of patients had increased HDL levels by at least 6.5 mg/dl (milligrams per deciliter of blood); 17% of patients had decreased HDL levels by at least that same amount. After obtaining the cholesterol measurement, researchers followed the patients for up to 8 years to see if they were hospitalized for a heart attack or stroke. Patients whose HDL levels increased had 8% fewer heart attacks and strokes than patients whose HDL levels remained the same, while patients whose HDL levels decreased had 11% more heart attacks and strokes.

"Our study adds to the growing body of evidence that raising HDL levels may be an important strategy for reducing heart attack risk," said study lead author Gregory Nichols, PhD, senior investigator with the Kaiser Permanente Center for Health Research. **(Food Product Design** October 10, 2011)

❁❁❁

BETA-GLUCAN SOLUBLE FIBER IMPROVES INSULIN SENSITIVITY

According to a prospective, randomized, placebo-controlled, double blind, parallel group trial published in the journal ***Nutrition & Metabolism***, 6 g/d of barley beta-glucan (BBG; as Barliv™ from Cargill) consumed in a beverage over 12

weeks may improve insulin sensitivity among hyperglycemic individuals with no prior diagnosis of diabetes mellitus, and who experience no change in body weight. “Since this study demonstrated that barley betafiber improved glycemic parameters despite no change in body weight, this suggests that it may have glycemic benefits in humans beyond effects of weight loss," said lead researcher, Harold Bays, M.D.

The study evaluated 50 generally healthy subjects without prior diagnosis of diabetes mellitus (44 completers), who were administered beverages containing placebo (control), lower dose (3 g/d) or higher dose (6 g/d) reduced viscosity BBG extract. Subjects (68% women) mean age 56 years, body mass index (BMI) 32 kg/m2 and baseline fasting plasma glucose 102 mg/dl were instructed to follow a weight-maintaining Therapeutic Lifestyle Changes (TLC) diet and consumed three 11-ounce study beverages daily with meals for 12 weeks. The four primary study endpoint measures were plasma glucose and insulin [each fasting and post-Oral Glucose Tolerance Testing (OGTT)].

Compared to placebo, administration of 3 g/d of BBG over 12 weeks significantly reduced glucose iAUC (incremental Area Under the Curve) measures during OGTT; and 6 g/d of BBG over 12 weeks significantly reduced fasting insulin, as well as the related homeostasis model assessment of insulin resistance (HOMA-IR). Beverages were generally well tolerated with no serious adverse experiences, and no significant differences between groups for adverse experiences. Individuals in the clinical trial who consumed 6g/day of Barliv™ barley betafiber also had a 3.9% reduction of body fat in the hips, buttocks and thighs, despite maintaining their weight during the study as instructed. Barliv already is backed by a FDA Health Claim that says consuming 3g of beta-glucan soluble fiber per day from barley betafiber may reduce the risk of heart disease. **(Food Product Design** October 7, 2011)

❁❁❁

SOY PROTEIN IMPROVES LIPID PROFILES

Supplementation with soy protein, compared to dairy milk protein, improves the lipid profile in healthy individuals and helps reduce their risk of coronary heart disease (CHD), according to a new study published in the ***European Journal of Clinical Nutrition***. Researchers at the University of Mississippi Medical Center’s Department of Medicine investigated the effect of soy and milk protein supplementation on lipids compared with carbohydrate among healthy adults.

Trial participants were assigned to 40g/day supplementation of soy protein (provided by Solae), milk protein or complex carbohydrate from wheat each for eight weeks in random order with a three-week washout period between interventions. Overnight fasting blood samples were collected at the termination of each intervention phase. Total cholesterol reduction as well as the total/HDL cholesterol ratio reduction was statistically significant with soy protein supplementation compared with carbohydrate. Compared with milk protein, soy protein supplementation significantly increased HDL and significantly reduced total/HDL cholesterol ratio as well as lowered LDL cholesterol. **(Food Product Design** October 24, 2011)

❁❁❁

BLACK TEA, FRUIT LOWER LUNG CANCER RISK

Individuals who consume high amounts of black tea and fruit, as well as those with higher BMIs, have a lower risk of developing lung cancer, while those who consume more than three alcoholic drinks per day have an increased risk of developing the disease, according to three separate studies presented at CHEST 2011, the 77th annual meeting of the American College of Chest Physicians (ACCP).

Kaiser Permanente researchers studied 126,293 people who provided baseline data from 1978 to1985 and followed them until 2008 to determine their risk for developing lung cancer in relation to cigarette smoking, alcohol consumption, gender, ethnicity, BMI, and level of education. Of the 1,852 people who developed lung cancer during this time, results showed that cigarette smoking remained a strong predictor of all types of lung cancer; however, heavy alcohol consumption (more than three alcoholic drinks per day) also increased lung cancer risk, with a slightly higher risk related to heavy beer consumption as opposed to wine and liquor.

In a second study, the same researchers found an inverse relationship between BMI and lung cancer risk, where higher BMI levels were associated with a lower risk for lung cancer. A similar relationship was seen in those who graduated from college. In a separate study also presented at CHEST 2011, researchers from the Czech Republic investigated the relationship between smoking exposure, diet, and exercise, and the risk of lung cancer. They found that consumption of black tea had a protective effect on non-smoking women, while fruit had a protective effect for both men and women. **(Food Product Design** October 24, 2011)

❁❁❁

DHA BOOSTS MENTAL PERFORMANCE

Consuming a diet rich in omega-3 fatty acid docosahexaenoic acid (DHA) has been shown to improve blood flow to the brain during mental activity and helped to reduce mental fatigue in young adults, according to results of two new studies published in the *British Journal of Nutrition*. Researchers at Northumbria University conducted two studies to examine the effects of two different types of fish oil supplement containing omega-3 on brain function. In the first study they found taking either of two different types of fish oil supplement containing omega-3 for three months had no consistent impact on mental function in 18- to 35-year-olds; however, they did find evidence of reduced mental fatigue and faster reaction times.

Results of the second found taking DHA-rich fish oil over the same time period did increase blood flow to active areas of the brain during performance of similar mental tasks. The findings could have implications for mental function later on in life, as evidence suggests regularly eating oily fish or taking omega-3 supplements may prevent cognitive decline and dementia, and increased blood flow to the brain may be a mechanism by which this occurs. Researchers are planning a third study to assess the impact of a fish oil supplement on their memory, mental performance and blood flow to the brain in people between the ages of 50 and 70. “If we can pinpoint both the behavioural and brain blood flow effects of this fatty acid in older healthy people, then the benefits for those with mental degenerative conditions associated with normal ageing could be that much greater," the researchers said. **(Food Product Design** October 24, 2011)

❁❁❁

WEIGHT LOSS BOOSTS COGNITION IN OBESE INDIVIDUALS

Obese individuals who lose weight experience significant improvement in cognitive performance in memory and attention/executive functioning, according to new research published in the November issue of ***Obesity Reviews***. Researchers at the University of Naples conducted a meta-analysis to estimate the effectiveness of intentional weight loss on cognitive function in overweight and obese adults. A total of 12 studies met the inclusion criteria, including seven randomized trials and five that included a control group. Data were extracted on study design, age, nutritional status, weight-loss strategy, weight lost and cognitive testing.

Weight loss was associated with a low-order significant effect on improvement in cognitive performance in memory and attention/executive functioning (effect size, 0.13 and 0.14, respectively). Studies exhibited heterogeneity in design, sample selection, weight-loss interventions, and evaluation of cognitive function. The researchers concluded weight loss appears to be associated with low-order improvements in executive/attention functioning and memory in obese but not in overweight individuals. **(Food Product Design** November 1, 2011)

❁❁❁

100% OJ BOOSTS KIDS' NUTRIENT INTAKE

Children who drink 100% orange juice on a regular basis have higher nutrient adequacy and diet quality than kids who don't power up on OJ every morning, according to a new study published in the journal ***Nutrition Research***. The research also found drinking 100% orange juice was not associated with overweight or obesity in children ages 2 to 18. Kids who consumed 100% orange juice also had significantly lower mean LDL cholesterol levels than those who did not consume 100% orange juice.

Researchers at Louisiana State University analyzed data from the 2003-2006 National Health and Nutrition Examination Survey (NHANES) and found that children who regularly consume 100 percent orange juice tended to have significantly higher intakes of vitamin C, potassium, vitamin B6, folate, dietary fiber and magnesium than non-consumers. None of the children who consumed 100% orange juice were below the Estimated Average Requirement (EAR) for vitamin C, while nearly 30% of non-consumers were below the EAR. Furthermore, diet quality (as measured by the Healthy Eating Index (HEI-2005) was significantly higher in those children consuming 100% orange juice than in non-consumers, as was intake of total fruit, fruit juice and whole fruit.

"A growing body of research has painted a clear picture that enhanced nutrient intake and better diet quality are associated with drinking 100 percent orange juice in children," said study co-author Carol E. O'Neil, PhD, MPH, LDN, RD, School of Human Ecology, Louisiana State University Agricultural Center. "Our research adds further support to the association between drinking 100 percent orange juice and higher intakes of five important nutrients—vitamin C, folate, magnesium, dietary fiber and potassium—which are generally underconsumed by the U.S. population." **(Food Product Design** October 31, 2011)

❁❁❁

PROBIOTICS AFFECT METABOLISM

Scientists at Washington University School of Medicine have demonstrated a way to test the effects of probiotic bacteria on digestive health by zeroing in on the community of microbes that naturally live in the intestine and help to digest foods the body can’t on its own. The study, published in the Oct. 26 issue of ***Science Translational Medicine***, establishes a way to understand more fully the complex relationship that exists between diet and the way the gut microbiome operates to digest particular foods.

“Now, we can directly test the influence of existing or candidate probiotics on the ability of our gut microbial community to digest various components of our diets," says senior author Jeffrey I. Gordon, M.D., the Dr. Robert J. Glaser Distinguished University Professor and director of the Center for Genome Sciences & Systems Biology. “Our group’s goal is to help develop new ways to improve the nutritional value of the foods we consume, in part by optimizing the features contained in the gut microbial communities of people at various stages of life and from different cultural traditions."

The researchers investigated the way a yogurt (supplied by Danone) influenced intestinal microbes in people and in mice that were raised under sterile conditions and seeded with a model community of human gut microbes. They first tested the

effects of the yogurt on the gut microbial communities of seven pairs of healthy adult identical twins—all females—who ate two servings daily for seven weeks. The yogurt, with its five live bacterial strains, did not disturb the mix of microbes in the women's digestive tracts. A repeated analysis of stool samples taken in the weeks before, during and after the yogurt was consumed showed that the various microbial species and their genes present in the women's intestines remained remarkably stable. Within two weeks after the women stopped eating the yogurt, no live bacteria from the yogurt could be detected in their intestines.

The researchers then compared their results in humans with those in mice that had been transplanted with a model community of 15 prominent human intestinal microbes, in which each of the microbes' genomes had been sequenced. When the mice were fed the same yogurt strains, the mix of human microbes and the content of their 58,000 human microbial genes did not change appreciably.

By analyzing the expression of genes in the human intestinal microbes of these mice, along with metabolites in their urine, the researchers found the yogurt strains elicited key changes in a number of metabolic pathways, particularly those related to the processing of carbohydrates in the diet. Many of the changes in metabolism first detected in the mice also were found to occur in the twins. "Carbohydrates are an important part of our diet, and the way they are broken down by gut microbes is an important part of digestive health," Gordon said. "A number of carbohydrates are quite complex and can only be digested by enzymes made by gut microbes. We found that when the mice were given the bacterial strains found in the yogurt, at doses comparable to those consumed by humans, they could more efficiently break down certain classes of carbohydrates." **(Food Product Design** October 31, 2011)

❁❁❁

Controlling what — and how much — we eat

Our cravings for fat, salt, and sugar started back when humans lived in caves and hunted and gathered for their food. Fat, salt, and sugar were in short supply. So to ensure that we ate adequate supplies of each, we evolved a craving for them. But now we live in an environment that is brimming with food and drinks that satisfy these cravings — and, in the process, make us overweight, cause illness, and shorten our lives. An adult can get by on as little as 500 milligrams (mg) of sodium a day; the average American intake is about seven times that amount, or 3,400 mg. Humans can certainly live without sugar (and, in fact, without any kind of carbohydrate as long as some fat and protein are available), but Americans now consume, on average, about 20 teaspoons of added sugar daily — and that's above and beyond the sugars found naturally in fruit, vegetables, and dairy products.

Many people say that adopting diets low in salt, fat, sugar, or animal products alters their food preferences, and there's some scientific evidence to support this experience. Researchers have also investigated methods of modifying one's food preferences so more healthful foods will be more appealing. In general — and not unexpectedly — flavor and food preferences are more malleable when we're young (indeed, in utero), but as adults, we can still work on them.

Several studies have shown that people who manage to follow a low-sodium diet for several months wind up preferring lower concentrations of salt in their food. Appetites for sugar and fat can also be changed, although there's less experimental evidence for it. British researchers reported results in 2011 from a small study that showed that tastes changed to liking sweeter things after a month of drinking a sweetened energy drink.

How to avoid overeating

One expert on nutrition and behavior change has developed a number of behavioral techniques for reducing ingestion of unhealthy calories. Brian Wansink, a Cornell professor and author of *Mindless Eating*, has identified five situations where people are particularly at risk for ingesting large quantities. He has called them "meal stuffing," "snack grazing," "restaurant indulging," "party bingeing," and "desktop or dashboard dining."

To reduce meal stuffing, Wansink suggests using a smaller plate, and serving the meal from the stove, not from the dining table. "Our research shows you eat 22% less on a 10-inch than on a 12-inch plate." To reduce snack grazing, keep the snacks at least six feet away from your desk or from wherever you are sitting. The distance forces you to think before you grab another bite, and Wansink's research shows that it can translate into a 125-calorie reduction in your daily energy intake (every little bit helps). The same distancing advice applies to party bingeing. You should also put no more than two items on your plate on any trip to the snack table and start with the bulky, low-calorie stuff — the raw vegetables.

Wansink also advises people not to try more than a couple of his techniques at one time. "We find that if people can maintain changes for a couple of months, they will then make a second, or third, or fourth change," he says.

Developing a taste for vegetables

Altering our palates so we don't like unhealthful salt and sugar is one way to go. But an alternative strategy is to increase our taste for foods that are certifiably healthful, like vegetables. Vegetables contain bitter compounds — and some people have a genetic propensity to experience more bitterness from vegetables (as well as other foods) than other people do. Heightened bitterness can also obscure sweetness. Vegetables tend to be more palatable to more people when the bitter and sweet tastes are nicely balanced and form that complicated bittersweet experience. If you keep an open mind and try a variety of vegetables, you might find varieties that contain bitter compounds to which you are less sensitive. You may respond more to the bitter compounds in, say, broccoli than those in kale.

Developing a taste for whole grains

According to dietary guidelines, at least half of the grain-based food we eat should be made from whole grains (and that is setting the bar too low). Most Americans don't even come close to meeting that recommendation, partly because whole grains tend to have a slightly more bitter taste and rougher texture than foods made with refined grains (think white bread). One strategy for making whole grains more appealing is simply to mix in some refined grains. You can do this at home by substituting half the flour in cookie, muffin, or bread recipes with whole-wheat flour. Mixing wheat germ into meatballs, meatloaf, or burgers or adding barley, a whole grain that's mild in flavor, as a thickener in soups and stews are other easy ways to sneak more whole grains into your diet.

Give in to your desire — a little

Weight-loss and other kinds of diets have a long history of poor long-term success. One possible explanation — among many — is that completely excluding certain foods, and their flavors, stokes our appetites for them. Once again, moderation is a good idea. Excessive dietary restriction can lead to bingeing. In one experiment, female dieters and nondieters were served either nothing, one milk shake, or two. Then they were asked to taste and rate some ice cream. Dieters who felt they had broken their diets responded by overeating the ice cream, regardless of whether they'd had one or two milk shakes. The nondieters did no such thing.
Health Beat: Harvard Medical School November 8, 2011
❁❁❁

High fiber diet may cut teens' risk of metabolic syndrome

A study published in the *Journal of the American Dietetic Association* shows that teens that eat a lot of fiber-rich foods are less likely to have risk factors for diabetes and heart disease. The researchers conducted a cross-sectional analysis of 2,128 teenagers, ages 12–19, who participated in the National Health and Nutrition Examination Survey 1999–2002. The prevalence of metabolic syndrome (abnormal values of three or more of the following: waist circumference, blood pressure, fasting serum high-density lipoprotein cholesterol, triglycerides, and glucose) was compared across quintiles of the dietary indexes (fiber index, saturated fat index, and cholesterol index) derived from 24-hr recalls.

Overall, about 6% of the teens had metabolic syndrome. Of those who ate the least fiber (less than 3 g per 1,000 calories), 9% had the risk factors, compared to only 3% of those who ate the most (11 g or more per 1,000 calories). There was no link between metabolic syndrome and the amount of saturated fat or cholesterol consumed. The researchers concluded: "These findings suggest that to reduce the risks for metabolic syndrome in adolescents, it is more important to emphasize a paradigm that promotes the inclusion of fiber-rich, nutrient-dense, plant-based foods versus what foods to restrict or exclude as is commonly done when the focus is on total fat, cholesterol, or saturated fat intake."
IFT Newsletter November 9, 2011
❁❁❁

Protein, dairy may improve bone health during diet, exercise

A study published in the *Journal of Clinical Endocrinology & Metabolism* shows that consumption of dairy foods and higher protein may improve bone health in overweight and obese women during diet- and exercise-induced weight loss.
Previous studies have shown that higher body weight is associated with greater bone mass and that weight loss through dieting can adversely affect bone health. While the individual effects of dairy, calcium, protein, and exercise on bone during weight loss have been studied in premenopausal women, no trial until now has combined all these strategies together into one study to support bone health.

"Our findings show that a diet with a high proportion of dairy foods and higher than recommended protein intake was associated with improved markers for bone health," said Stuart Phillips of McMaster University in Hamilton, Ontario, and senior author of the study. "Thus, to avoid deleterious consequences to their bone health, women who are attempting weight loss through dieting should practice consumption of more protein from dairy sources."

The researchers conducted a controlled randomized weight loss intervention trial involving 90 premenopausal overweight or obese women which was designed to achieve weight loss and be supportive of bone health. Phillips and his colleagues employed modest dietary calorie restriction and daily exercise including aerobic and resistance training with varied intakes of protein and dairy foods. Researchers used dual-energy X-ray absorptiometry (DXA) scans to assess bone mineral density and content, and analyzed participants' urine and blood samples to evaluate serum levels of several bone health biomarkers. The researchers found that consumption of diets higher in protein with an emphasis on dairy foods during a diet and exercise period positively affected markers of bone turnover, calcium, vitamin D status, and bone metabolism in overweight and obese premenopausal women.

"Our data provide a good rationale to recommend consumption of dairy foods to aid in high quality weight loss, which we define as loss of fat as opposed to muscle, and the promotion of bone health in young women who are at the age when achieving and maintaining peak bone mass is of great importance," said Phillips.
IFT Newsletter November 9, 2011
❁❁❁

Cereal and wholegrain fibre reduces cancer risk

New findings published in the British Medical Journal support the theory that a diet high in fibre from cereals and whole grains – such as whole grain breads, brown rice, cereals, oatmeal and porridge help reduce the risk of bowel cancer. A diet high in fibre from vegetables and fruits, they also concluded, does not offer the same benefit. According to a report published in the British Medical Journal, every additional 10 grams of fibre consumed per day reduces the risk by 10%, while consuming 90 grams/day of whole grains was linked with a 20% reduction in risk. The researchers – from Imperial College, London and the University of Leeds - analysed the data from 25 previous studies that had involved some two million participants in order to reach their conclusions.

The research also concluded that increased intake of fibre and whole grains is also likely to reduce the risk of cardiovascular disease, type-II diabetes, overweight and obesity, and possibly overall mortality. The likelihood of contracting colorectal cancer is put at 1 in 14-18 for men, and one in 19-20 for women. Over 600,000 people worldwide die of the disease each year. Its incidence is significantly higher in Australia, Europe and North America than in South America, Africa or Asia. **(Ingredients Network 12 November 2011)**

❁❁❁

Cheese may be better than butter for heart health

A study published in the *American Journal of Clinical Nutrition* shows that cheese may be better than butter for cholesterol. Doctors and nutritionists have long recommended avoiding all animal fats to trim cholesterol, but Danish researchers say cheese may not be so bad, and probably shouldn't be placed in the same category as butter. The study included 49 men and women who replaced part of their habitual dietary fat intake with 13% of energy from cheese or butter. During six-week intervals, each participant was put on a controlled diet and added a set amount of cheese or butter, separated by a 14-day cleansing period during which they returned to their normal diet. Then they switched, and for six weeks those who had eaten the cheese before, ate butter, while the butter eaters in the first phase ate cheese.

The researchers found that those who ate daily servings of cheese for six-week intervals had lower LDL cholesterol ("bad" cholesterol) than when they ate a comparable amount of butter. The cheese eaters also did not have higher LDL during the experiment than when they ate a normal diet. While eating cheese, subjects' HDL or "good" cholesterol dropped slightly compared with when they ate butter, but not compared with their normal eating period. While eating butter, the subjects had LDL levels about 7% higher on average. The researchers concluded that "cheese lowers LDL cholesterol when compared with butter intake of equal fat content and does not increase LDL cholesterol compared with a habitual diet." The researchers speculated that the results could be due to the high calcium content of cheese, which results in a higher excretion of fecal fat.
IFT Newsletter November 16, 2011
❁❁❁

Too much or too little salt may increase risk for heart disease

A study published in the *Journal of the American Medical Association* shows that for people with heart disease, eating too much or too little salt is linked to a higher risk of heart-related hospitalizations and deaths. The researchers used data from two drug trials involving 28,880 people who already had cardiovascular disease or diabetes. At the start of those trials, participants had their full-day sodium intake estimated through a morning urine test. They were then followed for an average of four to five years for any cardiovascular-related hospitalizations and deaths, including strokes and heart attacks. During that time, there were about 4,700 such events, including just over 2,000 deaths due to cardiovascular disease.

Compared to people who ate between 4,000–6,000 mg of sodium in a day, those who got more than 8,000 mg were 50–70% more likely to suffer a heart attack or stroke or to be hospitalized or die from heart disease. That was after taking into account what medications the participants were taking, as well as other aspects of health and lifestyle known to affect heart problems, such as weight, smoking, fruit and vegetable consumption, and cholesterol levels. Lower sodium intake—between 2,000–3,000 mg per day—was also linked to a 20% higher risk of cardiovascular-related death as well as hospitalization for congestive heart failure. The researchers found that the lowest risk of stroke, heart attack, and other hospitalizations and deaths came with an estimated daily sodium intake of 4,000–6,000 mg.
IFT Newsletter November 23, 2011
❁❁❁

Low-fat dairy may reduce diabetes risk

A study published in the *Journal of Nutrition* shows that consuming low-fat dairy products and yogurt may be associated with a decreased risk of type-2 diabetes among post-menopausal women. The study titled "A diet high in low-fat dairy products lowers diabetes risk in post-menopausal women" was funded by the National Heart, Lung, and Blood Institute, the National Institute of Health, and the U.S. Department of Health and Human Services.

Researchers utilized data collected from 82,046 participants in the Women's Health Initiative observational study, an ongoing prospective study of post-menopausal women. After reviewing the participants' food frequency questionnaire and adjusting for confounding variables, the researchers identified the following key findings:

- Low-fat dairy consumption was inversely associated with development of type-2 diabetes.
- Consumption of full-fat dairy products was not associated with incidence of type-2 diabetes.

- Yogurt consumption, regardless of fat level, was consistently associated with a decreased risk of type-2 diabetes.
- When compared with consuming three servings a day as recommended by the *2010 Dietary Guidelines for Americans*, intakes less than that amount were associated with increased diabetes risk.

IFT Newsletter November 23, 2011

❁❁❁

The secret to joint pain relief — exercise

Joint pain: it throbs, aches, and hurts. Quite likely, it makes you think twice about everyday tasks and pleasures like going for a brisk walk, lifting your grandchild or some grocery bags, chasing a tennis ball across the court, or driving a golf ball down the fairway. Sharp reminders of your limitations arrive thick and fast, practically every time you move.

What causes joint pain?

Very often, the culprits behind joint pain are

- osteoarthritis
- old injuries
- repetitive or overly forceful movements during sports or work
- posture problems
- aging
- inactivity.

How exercise can help

Ignoring the pain won't make it go away. Nor will avoiding all motions that spark discomfort. In fact, limiting your movements can weaken muscles, compounding joint trouble, and affect your posture, setting off a cascade of further problems. And while pain relievers and cold or hot packs may offer quick relief, fixes like these are merely temporary. By contrast, the right set of exercises can be a long-lasting way to tame ankle, knee, hip, or shoulder pain. Practiced regularly, joint pain relief workouts might permit you to postpone — or even avoid — surgery on a problem joint that has been worsening for years by strengthening key supportive muscles and restoring flexibility. Over time, you may find limitations you've learned to work around will begin to ease. Tasks and opportunities for fun that have been weeded out of your repertoire by necessity may come back into reach, too.

Beyond the benefits to your joints, becoming more active can help you stay independent long into your later years. Regular activity is good for your heart and sharpens the mind. It nudges blood pressure down and morale up, eases stress, and shaves off unwanted pounds. Perhaps most importantly, it lessens your risk of dying prematurely. All of this can be achieved at a comfortable pace and very low cost in money or time.

Why weight matters

Being overweight raises your risk for developing osteoarthritis in a weight-bearing joint like the knee — and even in the hand, according to some research, since inflammatory factors related to weight might exacerbate this condition. Simply walking across level ground puts up to one-and-a-half times your body weight on your knees. That means a 200-pound man will deliver 300 pounds of pressure to his knee with each step. Off level ground, the news is worse: each knee bears two to three times your body weight when you go up and down stairs, and four to five times your body weight when you squat to tie a shoelace or pick up an item you dropped.

Fortunately, strengthening your quadriceps (the muscles on the fronts of the thighs) changes the equation, and so does losing weight. Each pound you lose reduces knee pressure in every step you take. One study found that the risk of developing osteoarthritis dropped 50% with each 11-pound weight loss among younger obese women. If older men lost enough weight to shift from an obese classification to just overweight — that is, from a body mass index (BMI) of 30 or higher down to one that fell between 25 and 29.9 — the researchers estimated knee osteoarthritis would decrease by a fifth. For older women, that shift would cut knee osteoarthritis by a third.

Health Beat: Harvard Medical School November 29, 2011

❁❁❁

Vitamin B12: Cognitive Function

In this study, the goal was to investigate the interrelations of serum vitamin B12 markers with brain volumes, cerebral infarcts and performance on different cognitive tests. As part of the Chicago Health and Aging Project, researchers measured homocysteine (and other markers of B12 deficiency), as well as vitamin B12 status in 121 community-dwelling participants. Approximately 4.6 years later, subjects had an MRI to measure brain volume.

Concentrations of all vitamin B12-related markers, but not serum vitamin B12 itself, were associated with global cognitive function and with total brain volume. Methylmalonate levels were associated with poorer episodic memory and perceptual speed, and cystathionine and 2-methylcitrate with poorer episodic and semantic memory. Homocysteine concentrations were associated with decreased total brain volume. The homocysteine-global cognition effect was modified and no longer

statistically significant with adjustment for white matter volume or cerebral infarcts. The methylmalonate-global cognition effect was modified and no longer significant with adjustment for total brain volume. Methylmalonate, a specific marker of B12 deficiency, may affect cognition by reducing total brain volume whereas the effect of homocysteine (nonspecific to vitamin B12 deficiency) on cognitive performance may be mediated through increased white matter hyperintensity and cerebral infarcts. Researchers believe vitamin B12 status may affect the brain through multiple mechanisms. (Nutraceuticals World November 1, 2011)

❁❁❁

Probiotics/Prebiotics/Fiber: Constipation

The goal of this study was to summarize the evidence and assess the reported quality of studies concerning non-pharmacologic treatments for childhood constipation, including fiber, fluid, physical movement, prebiotics, probiotics, behavioral therapy, multidisciplinary treatment and forms of alternative medicine. Researchers systematically searched three major electronic databases and reference lists of existing reviews. They included systematic reviews and randomized controlled trials (RCTs) that reported on non-pharmacologic treatments. Two reviewers rated the methodological quality independently.

Nine studies were included, totaling 640 children. Considerable heterogeneity across studies precluded meta-analysis. Researchers found no RCTs for physical movement, multidisciplinary treatment or alternative medicine. However, they found some evidence to show that fiber might be more effective than placebo in improving both the frequency and consistency of stools and in reducing abdominal pain. Compared with normal fluid intake, researchers found no evidence that water intake increases or that hyperosmolar fluid treatment is more effective in increasing stool frequency or decreasing difficulty in passing stools. Lastly, they found no evidence to recommend the use of prebiotics or probiotics. (Nutraceuticals World November 1, 2011)

❁❁❁

Restricted Calorie Diet Improves Heart Function in Obese Patients With Diabetes

A low-calorie diet eliminates insulin dependence and leads to improved heart function in obese patients with type 2 diabetes, according to a study presented November 28 at the annual meeting of the Radiological Society of North America (RSNA). "Lifestyle interventions may have more powerful beneficial cardiac effects than medication in these patients," said the study's lead author, Sebastiaan Hammer, M.D., Ph.D., from the Department of Radiology at Leiden University Medical Center in the Netherlands. "It is striking to see how a relatively simple intervention of a very low calorie diet effectively cures type 2 diabetes mellitus. Moreover, these effects are long term, illustrating the potential of this method."

Diabetes is a chronic illness in which there are high levels of glucose in the blood. According to the Centers for Disease Control and Prevention (CDC), diabetes affects 25.8 million people in the U.S., with 18.8 million diagnosed cases and an estimated seven million undiagnosed cases. Type 2 is the most common form of diabetes, representing 90 to 95 percent of diagnosed cases among adults.

Pericardial fat is a visceral fat compartment around the heart that can be detrimental to cardiac function, especially in people with metabolic disease. Dr. Hammer and colleagues set out to determine the long-term effects of initial weight loss induced by caloric restriction on pericardial fat and cardiac function in obese patients with type 2 diabetes.
Using cardiac MRI, the researchers analyzed cardiac function and pericardial fat in 15 patients -- including seven men and eight women -- with type 2 diabetes before and after four months of a diet consisting of 500 calories daily. Changes in body mass index (BMI) were also measured.

The results showed that caloric restriction resulted in a decrease in BMI from 35.3 to 27.5 over four months. Pericardial fat decreased from 39 milliliters (ml) to 31 ml, and E/A ratio, a measure of diastolic heart function, improved from 0.96 to 1.2. After an additional 14 months of follow-up on a regular diet, BMI increased to 31.7, but pericardial fat only increased slightly to 32 ml. E/A ratio after follow-up was 1.06.

"Our results show that 16 weeks of caloric restriction improved heart function in these patients," Dr. Hammer said. "More importantly, despite regain of weight, these beneficial cardiovascular effects were persistent over the long term."
Dr. Hammer pointed out that these findings stress the importance of including imaging strategies in these types of therapy regimens. "MRI clearly showed all the changes in fat compartments, structural changes in the heart and improvements in diastolic function, making it a very effective method of quantifying the effects of metabolic interventions," he said.

While these results are promising, not all patients are eligible for this type of therapy. Patients should consult with their doctors before embarking on any type of reduced calorie diet. "It is of utmost importance to follow such a complicated intervention under strict medical supervision," Dr. Hammer said, "especially as patients may be able to stop all anti-diabetic therapy from Day 1." (Science Daily Nov. 28, 2011)

❁❁❁

How the Brain Senses Nutrient Balance

There is no doubt that eating a balanced diet is essential for maintaining a healthy body weight as well as appropriate arousal and energy balance, but the details about how the nutrients we consume are detected and processed in the brain remain elusive. Now, a research study discovers intriguing new information about how dietary nutrients influence brain cells that are key regulators of energy balance in the body. The study, published by Cell Press in the November 17 issue of the journal *Neuron*, suggests a cellular mechanism that may allow brain cells to translate different diets into different patterns of activity.

"The nutritional composition of meals, such as the protein:carbohydrate (sugar) ratio has long been recognized to affect levels of arousal and attention," explains senior study author, Dr. Denis Burdakov, from the University of Cambridge. "However, while certain specialized neurons are known to sense individual nutrients, such as the sugar glucose, it remains unclear how typical dietary combinations of nutrients affect energy balance-regulating brain circuits."

Dr. Burdakov and colleagues studied how physiological mixtures of nutrients influenced "orexin/hypocretin" neurons, which are known to be critical regulators of wakefulness and energy balance in the body. Previous research had demonstrated that orexin/hypocretin neurons are inhibited by glucose. Surprisingly, the current study revealed that physiologically relevant mixtures of amino acids, the nutrients derived from proteins (such as egg white), stimulated and activated the orexin/hypocretin neurons. The researchers went on to show that when orexin/hypocretin neurons were simultaneously exposed to amino acids and sugars, the amino acids served to suppress the inhibitory influence of glucose.

Taken together, these results support a new and more complex nutrient-specific model for dietary regulation of orexin/hypocretin neurons. "We found that activity in the orexin/hypocretin system is regulated by macronutrient balance rather than simply by the caloric content of the diet, suggesting that the brain contains not only energy-sensing cells, but also cells that can measure dietary balance," concludes Dr Burdakov. "Our data support the idea that the orexin/hypocretin neurons are under a 'push-pull' control by sugars and proteins. Interestingly, although behavioral effects are beyond the scope of our study, this cellular model is consistent with reports that when compared with sugar-rich meals, protein-rich meals are more effective at promoting wakefulness and arousal." (Science Daily Nov. 17, 2011)

❁❁❁

Today's Teens Will Die Younger of Heart Disease, Study Finds

A new study that takes a complete snapshot of adolescent cardiovascular health in the United States reveals a dismal picture of teens who are likely to die of heart disease at a younger age than adults do today, reports Northwestern Medicine research. "We are all born with ideal cardiovascular health, but right now we are looking at the loss of that health in youth," said Donald Lloyd-Jones, M.D., chair and associate professor of preventive medicine at Northwestern University Feinberg School of Medicine and a physician at Northwestern Memorial Hospital. "Their future is bleak." Lloyd-Jones is the senior investigator of the study presented Nov. 16 at the American Heart Association Scientific Sessions in Orlando.

The effect of this worsening teen health is already being seen in young adults. For the first time, there is an increase in cardiovascular mortality rates in younger adults ages 35 to 44, particularly in women, Lloyd-Jones said. The alarming health profiles of 5,547 children and adolescents, ages 12 to 19, reveal many have high blood sugar levels, are obese or overweight, have a lousy diet, don't get enough physical activity and even smoke, the new study reports. These youth are a representative sample of 33.1 million U.S. children and adolescents from the 2003 to 2008 National Health and Nutrition Examination Surveys.

"Cardiovascular disease is a lifelong process," Lloyd-Jones said. "The plaques that kill us in our 40s and 50s start to form in adolescence and young adulthood. These risk factors really matter. After four decades of declining deaths from heart disease, we are starting to lose the battle again,"

The American Heart Association (AHA) defines ideal cardiovascular health as having optimum levels of seven well-established cardiovascular risk factors, noted lead study author Christina Shay, who did the research while she was a postdoctoral fellow in preventive medicine at Northwestern's Feinberg School. Shay now is an assistant professor of epidemiology at the University of Oklahoma Health Sciences Center. "What was most alarming about the findings of this study is that zero children or adolescents surveyed met the criteria for ideal cardiovascular health," Shay said. "These data indicate ideal cardiovascular health is being lost as early as, if not earlier than the teenage years."

The study used measurements from the AHA's 2020 Strategic Impact Goals for monitoring cardiovascular health in adolescents and children. Among the findings:

Terrible Diets: All the 12-to-19-year-olds had terrible diets, which, surprisingly, were even worse than those of adults, Lloyd-Jones said. None of their diets met all five criteria for being healthy. Their diets were high in sodium and sugar-sweetened beverages and didn't include enough fruits, vegetables, fiber or lean protein. "They are eating too much pizza and not enough whole foods prepared inside the home, which is why their sodium is so high and fruit and vegetable content is so low," Lloyd-Jones said.

High Blood Sugar: More than 30 percent of boys and more than 40 percent of girls have elevated blood sugar, putting them at high risk for developing type 2 diabetes.

Overweight or Obese: Thirty-five percent of boys and girls are overweight or obese. "These are startling rates of overweight and obesity, and we know it worsens with age," Lloyd-Jones said. "They are off to a bad start."

Low Physical Activity: Approximately 38 percent of girls had an ideal physical activity level compared to 52 percent of boys.

High Cholesterol: Girls' cholesterol levels were worse than boys'. Only 65 percent of girls met the ideal level compared to 73 percent of boys.

Smoking: Almost 25 percent of teens had smoked within the past month of being surveyed.

Blood Pressure: Most boys and girls (92.9 percent and 93.4 percent, respectively) had an ideal level of blood pressure. The problem won't be easy to fix. "We are much more sedentary and get less physical activity in our daily lives," Lloyd-Jones said. "We eat more processed food, and we get less sleep. It's a cultural phenomenon, and the many pressures on our health are moving in a bad direction. This is a big societal problem we must address." (Science Daily Nov. 16, 2011)
❁❁❁

Mid-Afternoon Slump? Why a Sugar Rush May Not Be the Answer

Protein -- not sugar -- stimulates cells keeping us thin and awake, a new study suggests.
A new study has found that protein and not sugar activates the cells responsible for keeping us awake and burning calories. The research, published in the Nov. 17 issue of the scientific journal *Neuron*, has implications for understanding obesity and sleep disorders. Wakefulness and energy expenditure rely on "orexin cells," which secrete a stimulant called orexin/hypocretin in the brain. Reduced activity in these unique cells results in narcolepsy and has been linked to weight gain.

Scientists at the University of Cambridge compared actions of different nutrients on orexin cells. They found that amino acids -- nutrients found in proteins such as egg whites -- stimulate orexin neurons much more than other nutrients. "Sleep patterns, health, and body weight are intertwined. Shift work, as well as poor diet, can lead to obesity," said lead researcher Dr Denis Burdakov of the Department of Pharmacology and Institute of Metabolic Science. "Electrical impulses emitted by orexin cells stimulate wakefulness and tell the body to burn calories. We wondered whether dietary nutrients alter those impulses."

To explore this, the scientists highlighted the orexin cells (which are scarce and difficult to find) with genetically targeted fluorescence in mouse brains. They then introduced different nutrients, such as amino acid mixtures similar to egg whites, while tracking orexin cell impulses. They discovered that amino acids stimulate orexin cells. Previous work by the group found that glucose blocks orexin cells (which was cited as a reason for after-meal sleepiness), and so the researchers also looked at interactions between sugar and protein. They found that amino acids stop glucose from blocking orexin cells (in other words, protein negated the effects of sugar on the cells).

These findings may shed light on previously unexplained observations showing that protein meals can make people feel less calm and more alert than carbohydrate meals. "What is exciting is to have a rational way to 'tune' select brain cells to be more or less active by deciding what food to eat," Dr Burdakov said. "Not all brain cells are simply turned on by all nutrients, dietary composition is critical.To combat obesity and insomnia in today's society, we need more information on how diet affects sleep and appetite cells. For now, research suggests that if you have a choice between jam on toast, or egg whites on toast, go for the latter! Even though the two may contain the same number of calories, having a bit of protein will tell the body to burn more calories out of those consumed." (Science Daily Nov. 16, 2011)
❁❁❁

Watching Less TV, Being More Active and Sleeping More Is Linked to a Healthy Body Weight in Young Children

Getting enough sleep can help children maintain a healthy weight, reveals the EU funded project IDEFICS (Identification and prevention of lifestyle- and Diet-induced health EFfects In Children and infantS). Similarly, the more time children spend in front of the TV or their computers (screen time), the higher their body weight. These results were presented at the 11th European Nutrition Conference in Madrid on Oct. 27, 2011, ahead of the IDEFICS final meeting mid-November in Bremen.

Getting enough sleep is essential

The length of time children sleep varies significantly between European countries (ranging from 9-10 hours in Estonia to more than 11 hours in Belgium). Children from Southern and Eastern Europe tend to get less sleep than children in the North. Children sleeping less than 9 hours a night were twice as likely to be overweight compared to children sleeping 11 hours, and children sleeping 9-10 hours had a 1.3-fold higher chance. The project did not find that time spent sleeping was influenced by season, daylight duration, parental education level, other lifestyle factors, or whether the child was already overweight. Sleep duration may be underpinned by cultural or environmental factors such as unstructured and flexible bedtime routines, not assessed in this study.

TV-viewing centrally linked to body weight

Researchers of IDEFICS identified clusters of 'obesogenic' behaviours (promoting obesity) and found that those behaviours which included TV viewing most related to weight. Notably, children's waist circumference also increased with the time spent in sedentary behaviour in general (i.e. engaging in activity of low energy expenditure, such as sitting). It is still not clear whether the association of screen time with obesity is due to less physical activity or more so, to food intake. The internet as a channel for communicating about food and drinks deserves further attention in this regard.

Link between screen time and diet Across all countries, almost half of the children sometimes or often watch TV during meals. Children viewing more TV consumed higher-fat and particularly higher-sugar diets. This finding was independent of the child's individual taste preferences for fatty or sugary foods, which were objectively measured in a controlled taste experiment. Professor Wolfgang Ahrens, who coordinates IDEFICS, advises: "Eating in front of the screen should be minimised, and emphasis should be placed on nutritious snacks such as fruit and vegetables. First choice for quenching thirst should be water and other non-caloric drinks. Consumption can be encouraged by enhancing availability at kindergarten, school and home. Parents and caretakers need to be aware they are important role models."

Promoting a healthy environment

Children who are active in their leisure time, have lower screen time and are more likely to eat healthily. Since the built environment impacts activity and diet, policy makers and urban planners should ensure children find enough safe and enticing spaces to move and play, e.g. playgrounds, green spaces and play streets. Where these structures don't exist, parents can check with their community for organising play streets every now and then in the neighbourhood.
Says Professor Ahrens, "it's not right to blame just the parents if their children are overweight. It's time to fully acknowledge the environmental impact on health behaviour. The more effectively policy makers, teachers, caretakers and parents work together in creating a healthy environment, the easier it will be for children to learn healthy living." IDEFICS has made start -- let's take it from here.

The IDEFICS Study

Currently in its fifth and final year, the IDEFICS Study has accomplished a huge cross-sectional baseline survey in over 16,000 children aged 2-9 years from eight European countries. This was followed by a targeted intervention and a follow-up survey to assess the impact of dietary and lifestyle changes on body weight and other health parameters. Specifically for this project, IDEFICS researchers have developed standardised data collecting methods for identifying dietary, lifestyle, psychosocial, physical, biochemical and genetic factors for overweight, obesity, metabolic syndrome and impaired bone health in children. Such validated standards are of great value for future research and monitoring as they would allow data comparability across different contexts. Evaluation of the follow-up survey will show whether the IDEFICS intervention was effective, in which countries it was effective and what the main factors were that contributed to a possible intervention effect. Concludes Professor Ahrens, "hopefully from that basis we will be able to develop guidelines and recommendations in the future, but this is ongoing research." (Science Daily Nov. 15, 2011)
❁❁❁

Enzyme Boosts Metabolism, Prevents Weight Gain in Mice

Male and female mice engineered to express the inflammatory enzyme IKKbeta in their fat tissue ate more but gained less weight. They burned sugar and fat more effectively than mice who were left unaltered. The research may shed light on how obesity and inflammation affect insulin resistance and sensitivity. In a new study, scientists report that they substantially curbed weight gain, improved metabolism, and improved the efficacy of insulin in mice by engineering them to express a specific human enzyme in their fat tissue. Although the obesity prevention came at the significant cost of widespread inflammation, the research offers new clues about the connections among obesity, insulin resistance and type 2 diabetes, and inflammation.

"Turning on this molecule has a very dramatic impact on lipid metabolism," said Haiyan Xu, assistant professor of medicine (research) in the Warren Alpert Medical School of Brown University and a researcher at Rhode Island Hospital's Hallett Center for Diabetes and Endocrinology. Xu is the corresponding author of a paper describing the research in the January 2012 issue of *Endocrinology* and released early online.

Obesity and inflammation are both promoters of insulin resistance, but obesity seems to be the worse one. "Lower body weight is always a beneficial thing for influencing insulin sensitivity."The relationship between fat, inflammation, and insulin performance is complex. The conventional wisdom is that obesity leads to inflammation which contributes to insulin resistance. In this study, the researchers changed the sequence of events for transgenically engineered mice by inducing inflammation via the enzyme IKKbeta in their fatty tissue before they were obese. The result for metabolism was much more positive than for control mice who were left unaltered but were fed the same diets.

For both male and female mice, the ones who were altered still put on weight but significantly more slowly. All the mice started at the same weight. After about 22 weeks on a high-fat diet, however, altered male mice weighed less than 38 grams while unaltered male mice weighed more than 45 grams. On a less extravagant diet named "chow" the difference was considerably lessened but was still statistically significant. Both trends held for females as well.

The altered mice experienced slower weight gain despite eating much more food. Their increased metabolism allowed them to dispatch the extra calories much more efficiently. After being injected with glucose, for example, altered mice maintained lower blood sugar levels than unaltered mice. The same was true after insulin injections, suggesting that insulin was more

effective. In addition, the transgenic mice expended much more energy than their normal counterparts, suggesting that the sugar was indeed metabolized.
The mechanisms by which IKKbeta in fatty tissue increases metabolic performance are not completely clear, but the researchers measured increased expression of genes associated both with fatty acid oxidation and with making mitochondria, a cell part responsible for producing energy. One possible lesson from the research seems to be that while obesity and inflammation are both promoters of insulin resistance, Xu said, obesity seems to be the worse one. "Lower body weight is always a beneficial thing for influencing insulin sensitivity," she said. "Reduced adiposity wins over increased inflammation." Another point is that IKKbeta's ability to aid metabolism may be specific to its activation in fat tissue. In previous studies, scientists had activated it in the liver with no weight-reduction benefits and in the brain's hypothalamus, leading to increased weight gain. (Science Daily Nov. 14, 2011)
❁❁❁

Low Vitamin C Levels May Raise Heart Failure Patients' Risk

Low levels of vitamin C were associated with higher levels of high sensitivity C-Reactive protein (hsCRP) and shorter intervals without major cardiac issues or death for heart failure patients, in research presented at the American Heart Association's Scientific Sessions 2011.

Compared to those with high vitamin C intake from food, heart failure patients in the study who had low vitamin C intake were 2.4 times more likely to have higher levels of hsCRP, a marker for inflammation and a risk factor for heart disease. The study is the first to demonstrate that low vitamin C intake is associated with worse outcomes for heart failure patients. Study participants with low vitamin C intake and hsCRP over 3 milligrams per liter (mg/L) were also nearly twice as likely to die from cardiovascular disease within one year of follow-up.

"We found that adequate intake of vitamin C was associated with longer survival in patients with heart failure," said Eun Kyeung Song, Ph.D., R.N., lead author of the study and assistant professor at the Department of Nursing, College of Medicine, in the University of Ulsan in Korea. The average age among the 212 patients in the study was 61, and about one-third were women. Approximately 45 percent of the participants had moderate to severe heart failure.

Participants completed a four-day food diary verified by a registered dietitian and a software program calculated their vitamin C intake. Bloods tests measured hsCRP. Researchers divided participants into one group with levels over 3 mg/L of hsCRP and another with lower levels. Patients were followed for one year to determine the length of time to their first visit to the emergency department due to cardiac problems or death.

Researchers found that 82 patients (39 percent) had inadequate vitamin C intake, according to criteria set by the Institute of Medicine. These criteria allowed the researchers to estimate the likelihood that the patient's diet was habitually deficient in vitamin C based on a four day food diary. After a year follow-up, 61 patients (29 percent) had cardiac events, which included an emergency department visit or hospitalization due to cardiac problems, or cardiac death. The researchers found that 98 patients (46 percent) had hsCRP over 3 mg/L, according to Song.

Inflammatory pathways in heart failure patients may be why vitamin C deficiency contributed to poor health outcomes, the data suggests. "Increased levels of high-sensitivity C-reactive protein means a worsening of heart failure," Song said. "An adequate level of vitamin C is associated with lower levels of high-sensitivity C-reactive protein. This results in a longer cardiac event-free survival in patients."

The use of diuretics may also play a role because vitamin C is water soluble and diuretics increase the amount of water excreted from the kidneys, said Terry Lennie, Ph.D., R.N., study author and associate dean of Ph.D. studies in the College of Nursing at the University of Kentucky in Lexington, Kentucky. "Diet is the best source of vitamin C," Lennie said. "Eating the recommended five servings of fruits and vegetables a day provides an adequate amount." More randomized controlled trials and longitudinal prospective studies are needed to determine the impact of other micronutrients on survival or rehospitalization, Song said. (Science Daily Nov. 13, 2011)
❁❁❁

Eating Fish Can Reduce The Risk Of Diabetes

A study analyses the dietary patterns of the adult Spanish population with high cardiovascular risk. The results reveal a high consumption of both red meat and fish. However, whilst eating lots of cured meats is associated with greater weight gain and a higher obesity rate, the consumption of fish is linked to lower glucose concentrations and a smaller risk of developing diabetes. Mercedes Sotos Prieto, lead author of the study which forms part of the Predimed study (Prevention with a Mediterranean Diet) and researcher at the University of Valencia explains how "in Mediterranean countries, consumption of foods that typically form part of the diet here has decreased in recent decades. The consumption of saturated fats mainly from red meats and industrial baking has increased and this is really worrying."

Conducted in the Valencian Community on 945 people (340 men and 605 women) between 55 and 80 years of age and with a high cardiovascular risk, the aim of the study was to understand dietary patterns in terms of meat and fish consumption. It also sought to understand the correlation between the Mediterranean diet and its association with cardiovascular risk factors. The results were published in the Nutrición Hospitalaria journal and show that the studied Mediterranean population eat a

large amount of red meat and fish. However, the consumption of fish is associated with a decreased prevalence of diabetes and lower glucose concentrations whereas the consumption of red meat, especially cured meats is related to increased weight gain and obesity.

The researcher points out that "the red meat consumption of the sample population reaches an average of once a day, which is high in comparison to dietary recommendations. This could be influenced by many weight-loss diets which recommend eating grilled veal." Eating red meat in excess is linked to higher cardiovascular risk, higher blood pressure, diabetes and a moderate decrease in life expectancy mainly due to cancer or heart disease. In contrast, fish appears in the Mediterranean diet and has health benefits for the heart.

Despite being a cross-sectional study that does not determine a causal effect, its authors confirm that there are many similar studies where the consumption of fish, both white and, even more so oily fish, is associated with a lower risk of developing diabetes type 2. "Various hypotheses have been put forward that attempt to explain why the consumption of fish can be related to diabetes," they explain. "The increase of omega-3 in the cells of the skeletal muscles improves insulin sensitivity."

"It is important to understand the dietary patterns of the Spanish population in order to learn whether dietary habits are changing. We should therefore strengthen dietary education," outlines Mercedes Sotos Prieto, who goes on to say that "we ought to establish dietary intervention programmes so that we do not stray from the Mediterranean diet. In other words, such a diet involves decreasing the amount of red meat that we eat and maintaining equal levels of fish consumption."

Gender Differences

The high intake of saturated fats from red and cured meat consumption (7.4 +/- 4.7 times a week) was more frequent in men. Women proved to eat more white meat, especially chicken and turkey. As for fish consumption (4.5 +/- 2.6 times a week), no significant differences were found between men and women. In general, women scored higher for "healthy dietary patterns" or "healthy diets" compared to men. (Medical News Today: 12 Nov 2011)

❁❁❁

More Fiber, but Not Necessarily Less Fat, Good for Teen Diets

A diet high in fiber -- but not necessarily one low in saturated fat or cholesterol -- is tied to a lower risk of heart disease and type-2 diabetes in teenagers, according to new findings from Michigan State University. A study led by Joseph Carlson of MSU's Division of Sports and Cardiovascular Nutrition suggests to reduce metabolic syndrome -- a collection of risk factors including high blood pressure and a large waistline -- it is more important to emphasize diets including fiber-rich, nutrient-dense, plant-based foods than focus on restricting foods high in cholesterol or saturated fat. The research is published in *Journal of the American Dietetic Association.*

"What we found is that as fiber intake increases, the risk for metabolic syndrome decreases," said Carlson, a registered dietitian and associate professor at MSU. "High-fiber, nutrient-dense foods are packed with heart healthy vitamins, minerals and chemicals that can positively affect many cardiovascular risk factors. It may be better to focus on including these foods than to focus, as is commonly done, on excluding foods high in saturated fat." That does not mean, however, that teens should have carte blanche in eating foods high in saturated fat and cholesterol, Carlson said. "It is well established that saturated fat can raise bad cholesterol," he said. "What this data suggest is the importance of including foods high in dietary fiber."

With the high availability of processed foods today, Carlson said, it is possible for teens to eat a diet that is low in saturated fat and cholesterol but that also is low in fiber and nutrient-rich, plant-based foods. Recent national data indicates up to 30 percent of teens' dietary intake comes from beverages and sugar-rich snacks. Due to low intakes of fruits, vegetables, whole grains and beans, the total dietary fiber intake in teens is about 13 grams per day, well below the recommendation of 26 grams and 38 grams for female and male adolescents, respectively.

In addition, obesity and other key risk factors associated with metabolic syndrome are on the rise in youth; more than 70 percent of teens in the study had at least one of the five risk factors used to assess metabolic syndrome: high blood pressure, high levels of sugar and fat in the blood, low levels of good cholesterol and a large waistline (a person having three or more of the factors are classified as having the syndrome). "One of the takeaways is that our study reinforced the current dietary recommendations for dietary fiber intake by including a variety of plant-based foods," Carlson said. "A strategy of emphasizing fiber-rich foods may improve adherence to dietary recommendations."

The next step, he said, is to figure out the best methods to boost dietary fiber intakes to levels that will improve or sustain a desirable cardiovascular risk factor status. For example, if a person daily has three servings of fruit and vegetables (12 grams of fiber), one serving of beans (seven grams), and three servings of whole grain, they will be at about 30 grams of dietary fiber.
"The trick is getting people in the groove finding the foods that they both enjoy and are convenient," Carlson said.
As part of the cross-sectional study, Carlson and his team focused on data collected as part of the National Health and Nutrition Examination Survey done from 1999-2002. They analyzed the diets of more than 2,100 boys and girls ages 12 to 19, looking at whether the teens had three or more conditions that make up metabolic syndrome.

The study found there was a three-fold increase in the number of children that had metabolic syndrome when the group of children receiving the least fiber was compared with the group receiving the most. There was not a significant relationship with either saturated fat or cholesterol intake. (Science Daily Nov. 10, 2011)
❁❁❁

Dairy Foods May Improve Bone Health During Diet and Exercise in Overweight Premenopausal Women

A recent study accepted for publication in The Endocrine Society's *Journal of Clinical Endocrinology & Metabolism (JCEM)* found that consumption of dairy foods and higher protein resulted in improvements in markers of bone formation and reductions in markers of bone degradation in overweight and obese young women over 16 weeks of diet- and exercise-induced weight loss.

Previous studies have shown that higher body weight is associated with greater bone mass and that weight loss through dieting can adversely affect bone health. While the individual effects of dairy, calcium, protein and exercise on bone during weight loss have been studied in premenopausal women, no trial until now has combined all these strategies together into one study to support bone health.

"Our findings show that a diet with a high proportion of dairy foods and higher than recommended protein intake was associated with improved markers for bone health," said Stuart Phillips, PhD, of McMaster University in Hamilton, Ontario and senior author of the study. "Thus, to avoid deleterious consequences to their bone health, women who are attempting weight loss through dieting should practice consumption of more protein from dairy sources."

In this study, researchers conducted a controlled randomized weight loss intervention trial involving 90 premenopausal overweight or obese women which was designed to achieve weight loss and be supportive of bone health. Phillips and his colleagues employed modest dietary calorie restriction and daily exercise including aerobic and resistance training with varied intakes of protein and dairy foods. Researchers used dual-energy X-ray absorptiometry (DXA) scans to assess bone mineral density and content, and analyzed participants' urine and blood samples to evaluate serum levels of several bone health biomarkers.

Results from the study showed that the consumption of diets higher in protein with an emphasis on dairy foods during a diet and exercise period, positively affected markers of bone turnover, calcium, vitamin D status and bone metabolism in overweight and obese premenopausal women. "Our data provide a good rationale to recommend consumption of dairy foods to aid in high quality weight loss, which we define as loss of fat as opposed to muscle, and the promotion of bone health in young women who are at the age when achieving and maintaining peak bone mass is of great importance," said Phillips. (Science Daily Nov. 9, 2011)
❁❁❁

Lack of Folic Acid Linked to Behavioral Problems in Children

Folic acid supplements taken during pregnancy may benefit toddler behaviour, says research which shows that they can help prevent behavioural problems. The results were presented by Dr Henning Tiemeier at 11th European Nutrition Conference in Madrid (26th-29th October 2011). "We know that folic acid is important in the prevention of spinal cord defects" noted Dr Tiemeier "but we wanted to investigate what happens later in childhood, to emotional and behavioural development" Many countries in Europe recommend taking folic acid supplements before pregnancy and during the first three months. Dr Tiemeier demonstrated that a lack of use of folic acid supplements in early pregnancy, despite existing recommendations, is linked to a higher risk of the development of emotional problems, withdrawn behaviour, by 18 months.

Dr Tiemeier and his colleagues at Erasmus are one of 20 partners in Europe and the US taking part in the €8m European Commission funded Nutrimenthe project, which is looking at how the diet of pregnant women, babies and children affects their mental performance. Folic acid is just one nutrient of interest to the project. Others include Omega-3 fatty acids, B vitamins, and minerals such as iron, and how these affect mental performance of children in the long term.

The 11th European Nutrition Conference took place in Madrid between 26th and 29th October 2011 and attracted over 2000 nutrition experts from countries worldwide under the banner "Diversity versus Globalisation: A Nutritional Challenge for a Changing Europe" Nutrimenthe hosted a symposium on 28th October titled "Nutrition and Cognitive Function"(Medical News Today: 05 Nov 2011)

❁❁❁

Important Research Link Between Active Ingredient In Saffron And MS

Medical researchers at the University of Alberta have discovered that an active ingredient in the Persian spice saffron may be a potential treatment for diseases involving neuroinflammation, such as multiple sclerosis. Chris Power and a team of researchers in the Faculty of Medicine & Dentistry recently published their findings in the peer-reviewed publication, *The Journal of Immunology.*

"We found there is a compound in saffron, known as crocin, that exerts a protective effect in brain cell cultures and other models of MS. It prevented damage to cells that make myelin in the brain," Power said. "Myelin is insulation around nerves. MS is characterized by inflamed brain cells that have lost this protective insulation, which ultimately leads to

neurodegeneration." Power noted they are not close to a clinical trial stage yet, but the finding is still exciting.

It has been known in the research community for years that crocin protected neurons in certain situations, but Power and his team wanted to delve further into this area. His team discovered that inflammation and a specific type of cell stress are closely linked and lead to neurodegeneration and inflammation which cause cells to lose their protective coating - a process known as demyelination. In experiments conducted by Power and his colleagues, the use of crocin suppressed both inflammation and this specific type of cell stress, resulting in decreased neurological impairment in lab models and cell cultures with MS.

"There are still many questions to be answered about how crocin exerts these neuroprotective effects, but this research highlights a potential treatment role for crocin in diseases involving chronic neuroinflammation - something that had not been recognized until now," says Power. He explained the research demonstrates a new mechanism in MS, provides new potential drug targets in the future, and helps explain why physicians see inflammation in MS.

The team's research also revealed that this specific type of cell stress, called the unfolded protein response, may be caused by an ancient virus that was introduced into the DNA of early humans. This particular cell stress is found at high levels in MS brain lesions. "We all have this ancient virus in our DNA, but for some reason it is excessively turned on in MS," says Power. "We are doing more research investigating this link." Power has been investigating this specific area for six to seven years. (Medical News Today: 07 Nov 2011)

❁❁❁

Pomegranate Juice Helps Manage Blood Pressure

Lilach Shema, PhD (Western Galilee Medical Center in Israel) and colleagues investigated the long-term effects of drinking pomegranate juice on heart disease risk factors - such as high cholesterol and blood pressure - in kidney disease patients. Pomegranate juice is rich in antioxidants and has been touted as having a variety of health benefits.

The researchers randomized 101 dialysis patients to receive about three-and-a-half ounces of pomegranate juice or placebo, three times a week. After one year, the number of blood pressure drugs patients took decreased in 22% of patients drinking pomegranate juice compared to 7.7% in the placebo group, while an increase was documented in 12.2% of patients drinking pomegranate juice compared to 34.6% in the placebo group. Patients who drank pomegranate juice also had healthier blood pressure and cholesterol levels and less plaque build-up in their arteries. These results suggest that drinking pomegranate juice might decrease the high rates of illness and death among kidney disease patients. (Medical News Today 14 Nov 2011)

❁❁❁

Food Science & Industry News

Coconut Water Beverage Advantages

Coconut water, recognized by the World Health Organization (WHO) as a natural isotonic juice and natural source of essential electrolytes, is also considered a 100% juice by FDA and under the Codex General Standard for Fruit Juices and Nectars. In addition to its health benefits and 100% juice labelling, what makes using coconut water concentrate (CWC) so attractive for formulation work is that the standard reconstituted Brix for CWC is 5°, which means fewer calories.

Working with coconut water affords formulators the opportunity to create lower-calorie, 100% juice blends. “Just blending coconut water 50/50 with juice products like apple and orange could lead to significant drops in the caloric load of 30% or more, and still allows manufacturers to label the product as 100% juice," explains Don Giampetro, vice president sales, R&D, iTiTropicals, Inc.

Usage levels of coconut water in the finished product range from 10% to upwards of 70% of the total, depending on the desired reduction in caloric load. While coconut water is thin in viscosity and contributes little colour and flavour, its high levels of electrolytes can contribute slight salty notes. However, Giampetro says, even using coconut water at levels above 50% in conjunction with other juices doesn’t affect the flavour profile; in fact, he says, “salty notes actually enhance sweetness, and that could be another reason why coconut water is such an easy blend with other juices."

Suitable applications include lower-calorie juice products with high juice content, as well as lower-viscosity juice products. As coconut water is free of particulates, it lends itself to inclusion in juice or drink products for dispensing units and/or needle fillers. Newer possibilities include carbonated beverages made with coconut water instead of water, or iced tea and/or coffee drinks, which could yield finished products that could be upwards of 90% juice.

Formulators working in high-acid facilities should remain mindful that coconut water’s pH value is above 5. Giampetro says the coconut water can be acidified to help alleviate that situation. Further, coconut water is considered an allergen and should be labelled as such when used in any beverage or food formulation. (October 11, 2011 **Food Product Design)**

❁❁❁

Soy sauce may be used as salt substitute in food

A study published in the *Journal of Sensory Studies* shows that soy sauce can be used to reduce salt in foods. The researchers aimed to explore the use of soy sauce to reduce salt intake in daily food preparation by replacing all or some added salt with naturally brewed soy sauce without change in consumer acceptance. Three types of foods were investigated: salad dressing, tomato soup, and stir-fried pork. A two-alternative forced choice test between a salt standard and a variety of soy sauce samples was used to establish the exchange rate, giving the amount of soy sauce needed to replace added salt with the same taste intensity.

In a separate session, consumers were asked to evaluate the pleasantness and several sensory attributes of another five varieties of the food samples based on the proportion of salt and soy sauce added. The results showed that it is possible to reduce added salt by 33–50% in the foods studied when soy sauce is used to replace added salt during food preparation. Percentage of salt reduction achievable may be higher in a population with prior exposure to soy sauce in their diet. The method can be used by food industries to produce reduced salt products or by consumers at home.

(IFT Newsletter November 23, 2011)

❁❁❁

Pharmaceutical Leadership Awards 2011 for ShriYeshwantRege

Mr.YeshwantRege was awarded the coveted & prestigious Pharma Achiever of the Year in SME 2011 award at the 4th Annual Pharmaceutical Leadership Awards 2011 organised by India's leading bi-monthly Pharma Magazine and the Indo-American Chamber of Commerce (IACC) on 10th December 2011 at Hotel Lalit in Mumbai. This award has been given in recognition of remarkable display of Achievement and Contribution to the growth and the development of the Indian Healthcare Industry.

Congratulating Mr.Rege, His Excellency the Governor of Maharashtra Shri K. Shankarnarayanan said that India will emerge as a leading global player in pharmaceutical industry in the near future, securing a place among the top five major global markets and that he was sure that Mr.Rege will contribute his might towards building a strong healthcare sector with affordable rates to the needy. Mr.Rege is a partner in Dr.Rege's Laboratories, who are our esteemed members of long standing. We congratulate Mr.YeshwantRege on his achievement and wish many more greater achievements in future.

Regulatory & Safety News

Canada sets limits on caffeine in energy drinks

According to *The Globe and Mail*, the Canadian government is placing new restrictions on caffeinated energy drinks. In response to growing pressure from the medical community, Health Minister Leona Aglukkaq announced the decision Oct. 6 to place limits on caffeine in energy drinks and include additional warnings and restrictions on the products.

Energy drinks will now be regulated as food instead of as a natural health product, allowing officials to adopt a wider range of regulations to help ensure they're not misused, the minister said.

The new restrictions ignore many of the recommendations made by the Expert Panel on Caffeinated Drinks, such as limiting the amount of caffeine to 80 mg, prohibiting people under 18 from buying them, renaming them "stimulant drug-containing drinks,"and requiring them to be sold only under supervision of a pharmacist. Energy drinks will continue to be available at gas stations, grocery stores, bars, and other establishments and there are no age restrictions on who can buy them.

Health Canada has decided that energy drinks can contain no more than 400 mg of caffeine per L, or a maximum of 180 mg in a single-serve container. That's equivalent to the amount of caffeine in about five 355-mL cans of Pepsi. The 180-mg figure is more than double the recommended daily maximum for caffeine consumption in children ages 10–12, which is 85 mg.

IFT Newsletter October 12, 2011

❁❁❁

GMA Responds To New Fop Labelling System Proposal

The Grocery Manufacturers Association (GMA) is criticizing the Institute of Medicine's (IOM) call for a **single, standardized front-of-packaging (FOP) symbol system** to appear on all food and beverage products in place of other systems already in use as an "untested, interpretive approach."

GMA contends its "Facts Up Front" nutrition labeling system, which was launched in January in conjunction with the Food Marketing Institute (FMI), is a real-world program that delivers real value to real consumers in real time. The program was developed through extensive consumer testing that showed consumers want fact-based information on calories, saturated fat, sugar and sodium, and where appropriate, nutrients to encourage.

According to the GMA, the Institute of Medicine's Committee on Examination of Front-of-Package Nutrition Rating Systems and Symbols report adds a perspective to the national dialogue about front-of-pack nutrition labeling. In the meantime, food and beverage companies have developed a real-world program that delivers real value to real consumers in real time.

"Consumers have told us that they want simple and easy to use information and that they should be trusted to make decisions for themselves and their families. The most effective programs are those that consumers embrace, and consumers have said repeatedly that they want to make their own judgments, rather than have government tell them what they should and should not eat. That is the guiding principle of Facts Up Front, and why we have concerns about the untested, interpretive approach suggested by the IOM committee."

The IOM report recommended FDA develop, test, and implement a single, standard symbol system to appear on all food and beverage products, in place of other systems already in use. The symbol system should show calories in household servings on all products. Foods and beverages should be evaluated using a point system for saturated and trans fats and sodium, and added sugars. The more points a food or beverage has, the healthier it is. (October 24, 2011 **Food Product Design)**

❁❁❁

IOM releases Phase II report on front-of-pack nutrition labelling

The Institute of Medicine (IOM) has released its Phase II report on front-of-package nutrition labeling, recommending that federal agencies develop a new nutrition rating system with symbols to display on the front of food and beverage packaging that graphically convey calorie counts by serving size and a "point" value showing whether the saturated and *trans* fats, sodium, and added sugars in the products are below threshold levels. This new front-of-package system should apply to all foods and beverages and replace any other symbols currently being used on the front of packaging, added the committee.

The U.S. Congress directed the Centers for Disease Control and Prevention (CDC) to undertake a study on front-of-package nutrition labeling with the Institute of Medicine (IOM) in light of the persistent disconnect between dietary recommendations and Americans' actual diets. The IOM completed Phase I of the task in Oct. 2010. In the second phase the

committee was charged with outlining the benefits of a single, simple food guidance system on the front of packages that best promotes health and will be useful to consumers.

The report envisions a rating system in which foods and beverages earn points if their amounts of nutrients of concern—saturated and *trans* fats, sodium, and added sugars—are at or below levels considered acceptable based on qualifying criteria. The more points a food or beverage has, the healthier it is. A product could earn up to three points, one each for having sodium and added sugars that do not exceed threshold amounts and one for having saturated and *trans* fats below designated levels. For example, 100% whole wheat bread could qualify for all three points while graham crackers could earn two points for having levels of sodium and saturated and *trans* fats below the thresholds. Points would be graphically displayed on packaging as check marks, stars, or some other icon to be determined by the FDA.
Foods and beverages should pass a separate set of criteria to determine if they are eligible to earn points at all, the report adds. If a product exceeds the eligibility criteria for any one of the nutrients of concern, it would not be able to display any points. For example, a sugar-sweetened soda could not earn points for having low sodium and no saturated or *trans* fats because its added sugar content is too high.

Whether a food or beverage qualifies for points or not, it should prominently display the amount of calories per serving with servings described in familiar measurements, such as per slice or per cup. The front-of-package icons should also direct shoppers to the Nutrition Facts Panel on the reverse to get additional information about the healthfulness of products.

Although the committee's Phase I report concluded that calories, saturated fat, *trans* fat, and sodium should be the focus of a new front-of-package system because they are most strongly associated with chronic disease, the Phase II report says that added sugars should also be included.

In January 2011, the Grocery Manufacturers Association (GMA) and the Food Marketing Institute (FMI) launched their own front-of-pack nutrition label called Facts Up Front, offering consumers information on calories, saturated fat, sugar and sodium, and where appropriate, nutrients to encourage. In response to the Phase II report, GMA has said the "report adds a perspective to the national dialogue about front-of-pack nutrition labeling. In the meantime, food and beverage companies have developed a real-world program that delivers real value to real consumers in real time."

The American Dietetic Association applauded the IOM's report, stating: "As more and more nutrition information is thrust upon consumers from credible and non-credible sources alike, this report is a great step in the right direction to helping Americans decipher the healthfulness of the foods they buy," said Registered Dietitian and American Dietetic Association President Sylvia Escott-Stump. "Education of the public is our greatest tool in helping Americans lead healthier lives, and this proposed system is another means towards that end."

IFT Newsletter October 26, 2011

❁❁❁

EU approves stevia sweetener use

The European Commission has formally approved stevia sweeteners for use within the European Union for the first time. After months of examining the safety of natural sweeteners derived from the stevia plant, on Nov. 11 stevia was approved for use in the EU's 27 member states.

The EU established an Acceptable Daily Intake (ADI) for steviol glycosides, expressed as steviol equivalents, of 4 mg/kg bodyweight/day. It was approved for use in 31 different food categories. The Commission Regulation did note that given that the main contributors to the total anticipated exposure to steviol glycosides will be soft drinks, it is likely that the ADI will be exceeded. The EU understands the need for energy-reduced products in the marketplace, but suggests a reduction in the use level for soft drinks given the population's consumption of sodas.

IFT Newsletter November 16, 2011

❁❁❁

WTO rules against U.S. country-of-origin labels

According to the *Associated Press*, the World Trade Organization (WTO) has ruled that U.S. "country-of-origin" labels on cattle and hog exports from Canada and Mexico violate international rules, a move that could lower prices on those exports.

In late 2009, the WTO opened an investigation into U.S. labeling rules at the request of Canada and Mexico. The country-of-origin labeling regulation took effect in 2008. Canada and Mexico each claimed their livestock industries were hurt by a sharp drop in U.S. cattle and hog imports because the labeling raised the costs and discouraged imports of their produce.

Under country-of-origin labeling, foreign cattle and pigs had to be segregated in U.S. feedlots and packing plants, prompting some firms to deal only with American livestock. Foreign animals also were required to have more documentation about where they came from and, in the case of cattle, had to have tags that indicated they were free of mad-cow disease.

The U.S. trade representative's office said it was considering all options, including appealing the decision.

IFT Newsletter November 23, 2011❁❁❁