

PFNDAI Bulletin September 2009

Editorial

Our government excels in one thing, and that is making rules especially if it is to do with banning something. They work so fast and then worry about the consequences later. A recent example is Plastics (Manufacture, Usage and Waste Management) Rules, 2009 notified by SO 2400 dated 17th September 2009.

The problem probably originated because of large-scale use of plastic carry bags used by retailers to give to their customers for their convenient carrying of goods they purchased from shops. These were then dumped in various places. To this is also added the problem of various plastic materials used for a variety of applications including packaging of all kinds of things including food products. Sewers and drainage pipes get clogged with these bags and other materials causing not only unsightly hygiene problem but also at times causing flooding during monsoon in many cities.

This problem needs to be solved both by law and well as a proper system of recycling. With no system or guidance in place, rag-pickers would remove some plastic material having value for recycle and there would be some plants which would use any raw material, add any additive and then produce recycled plastic material that would be used by anybody to pack anything. This situation would also create some problems if some recycled plastic containing unsafe substances gets used for packaging food products.

There are many examples of recycling in other countries. The materials are collected in different bins according to plastic grade (that are labelled on containers) as well as what additives they may contain or what use it has been put to. Some companies are offering reward for bringing their containers back while others give refills in the used cleaned containers.

We need to experiment with some of these strategies besides making rules. There are no agencies guiding public about how to segregate plastic waste. Plastic has been in use in India for many decades for packaging all kinds of products including food products and one cannot suddenly stop using them. Even after making the above mentioned rule, it is going to be extremely difficult if not impossible to enforce it effectively to contain the problem the plastic causes to environment.

One of the most important things we must consider is that we got Food Safety & Standards Act 2006 so we can put in one bag all the other acts, ordinances and rules concerning food. Now again if each ministry starts making a separate rule for food manufacture, it is going to be impossible to keep a track of all the food legislation and follow them scrupulously. FSSAI is the right body to make rules concerning food including which packaging material can be used and which cannot be used. So the government should consider these important issues before finalising the rules concerning plastic.

We welcome Tine B.A. and Ensigns Healthcare as our members and wish them a very long and fruitful association with us. With season's greetings,

Prof. Jagadish S. Pai
Executive Director



Raising Standards: Food for Thought

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

On a last count the PFA had about 342 standards tucked under the chapter Appendix B – an appendage that increases every year. It is not the number of standards that matter but its genesis. Appendix B has become the doctrine of legislation under the erstwhile system – that was dedicated to ‘adulteration’. This set the precedence and dominance of the legislative system in India for the past 60 years, expressing it in several ways.

For example if you applied for a food additive to be used in chutney – the regulator would first address the specifications for chutney and then the technological justifications for the additive. The primary concern was how to provide an iron clad recipe to prevent any addition, subtraction, substitution in the product so designated. That chutney is a generic descriptor of perhaps over a 100 varieties combining fruits, vegetables, and spices and with sensory expressions of sweet, sour, pungent or aromas so exotic did not enter the deliberations. It was easier to download a Codex specification for chutney without reflecting that the product is an expression of our cultural diversity and the task was one of providing safety with variety.

The standards for chutney [Table 1] as specified will allow only formulations of sweet chutneys with variations in sugar content - an ingredient that provides neither essentiality nor characteristic, nor consumer health or even expectation. Its stipulation is merely for the purpose of an enforcement measure. Such is the doctrine of an enforcement mindset that the need to legislate dominates everything else.

Industry has a genuine grievance when it seeks regulations that encourage product diversity and innovation – the growth engine of the food industry while simultaneously providing the highest levels of consumer health.

TABLE 1: Chutney Specifications

| Appendix B | Product Name | Essential Specifications | | | |
|------------|----------------------------|--------------------------|------------------|--------|--------------------------------|
| | | Fruit Content % Min [Wt] | TSS % Min [Brix] | pH max | Ash insoluble in dil HCl max % |
| 16.26 | Mango Chutney | 40 | 50 | 4.6 | 0.5 |
| 16.41 | Fruits | 40 | 50 | 4.6 | 0.5 |
| 16.41 | Hot & Sour [Spicy Chutney] | 40 | 25 | 4.6 | 0.5 |
| 16.41 | Vegetable Chutney | 40 | 25 | 4.6 | 0.5 |

This article is an exploration of the principles of rulemaking that should be laid down in procedures when a standard is sought to be made. Chambers of Industry and its members as implementing stakeholders of food regulations have a significant role to play in forging the character of rulemaking if rules are to be transparent, evidenced based and predictable.

General and Specific Standards:

The first step is the recognition that standards are to be distinguished and separated in accordance with the extent of their application. That is whether they apply to all products in general or a single product or type of product or to all those aspects under which a product is amenable of standardization. A General Standard is one which applies to all products or to a very large group of products i.e. prepackaged foods and relates to matters common to all of them; for example the principles governing use of food additives, labeling, and food hygiene among others. This distinguishes the General Standard from the Specific Standard.

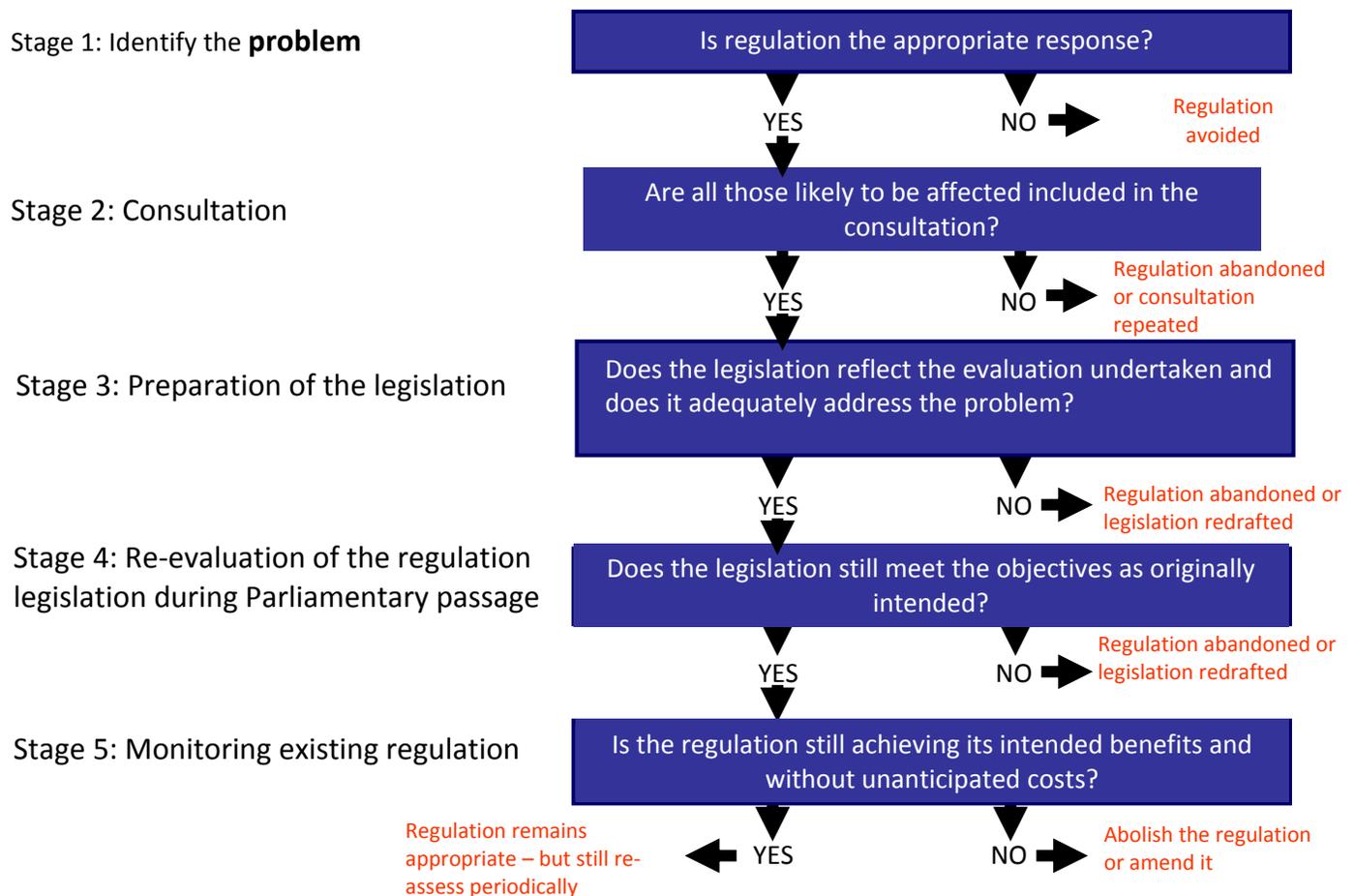
By contrast a specific standard is one which applies either to a single product or type of product [e.g. dietary supplements] or deals with specific characteristics of a product [e.g. identity standards].

When is a Specific Standard Developed

Before developing a standard – the need for one is to be determined and impact assessed [Figure 1]. This stage involves evidential support, market disturbances, consumer safety and risk assessment, risk management to evaluate all regulatory and non regulatory [including none or self regulatory] options. Regulatory Impact Assessment is a tool to improving decision making thereby providing a sound framework for assessment of potential or actual impacts of the regulatory measures being sought. It also brings about regulatory accountability that is woefully lacking in the old system under PFA 1954.

Cranfield University – School of Management

Fig 1: Regulatory Impact Analysis Process



By definition a Standard should be set only when a set of stringent conditions are evident in the product, verifiable by measurement, easily compliant, corrects market distortions, or consumer compromises and not remediable by other means. Several criteria emerge from these conditions requiring that evidential support precede the setting of standards. The question the Food Authority must ask when an application for a standard is made – what issue the standard seeks to address? And then look at the substantive case being made thereof.

The second question to ask - when is a product a candidate for a standard. When a product has readily identifiable characteristics and is open to exact description, and does not stifle variations [as in chutney] then it is possible to lay down in clear terms the requirements which that product must satisfy.

Thirdly these requirements should themselves be verifiable in an objective and by reference to measurable elements that reflect identification or quality then it is possible to 'standardize' the product. 'Standardization' being defined as the laying down, by a legal instrument of precise requirements against which product conformity can be checked. The sum of these requirements constitutes the 'standard'.

Standardized and Non Standardized Products:

Many regulators as a consequence of the indoctrination of adulteration frown on general standards because they feel that if provisions such as labeling or hygiene are so general [horizontal] so as to apply to all foods then how can they be called a standard which by precept is expected to be more defining in nature. This belief is blatantly experienced in the case of non standardized foods, also known as proprietary foods. The adulteration doctrine under the PFA regime is expressed in regulatory postures that all non standardized foods must state the name and category of the food – a contradiction in terms to the premise that in standardized foods the appellations are often reserved and a reference to the name on the label is an offense. If a fruit spread is made that is not of the brix specified for jam – should the label of the spread also contain the appellation jam? The anxiety for such a labeling rule is based on the invalid presumption that 'standardized' products are necessary to ensure quality or that enforcement agencies do not know how to analyze or interpret the product. The latter is a matter of education not legislation. Products in the non standardized sector are equal in quality to standardized products and legislative postures should be based on facts rather than feeling.

Types of Standards:

Broadly one can look at specific standards to mean; standards of identity, quality and fill-of- container.

Standards of Identity typically are of minimum requirements with prescribed names [i.e. they cannot be used without compliance to the standard] and are the legal standard of the named product. These standards govern appellation and specification and are the most restrictive of all standards setting procedure. Many traditional foods come under such standards such as margarine, butter, jam etc.

A conflict arises when many of these foods, especially dairy products contain nutrients in amounts that consumers seek to reduce in their diets. Many of these standards were issued decades ago when nutrition concerns and dietary goals were different than what they are today. Further technology has advanced to render product texture, sensory and nutritional attributes similar to the original standard except for defining or compositional ingredient. What should take precedence consumer health or the need to adhere to a standard of identity for market conformity? Should not the general standard regarding nutritional labeling provisions such as content claims apply to standardized as well as nonstandardized foods?

The second type of standards are Commodity Standards which is wide in its interpretation but largely associated with traded commodities as oils, grains, wheat flour, and other such products. Most often they reflect quality standards with range values of identity indices [e.g. Iodine value, etc] or a minimum nutrient [e.g. protein in flour]. These are generally processed only for quality, shelf life or safety which should be the focus of legislative attention.

Fill – of- Container Standards are defined how full the container must be and how to measure it. There are several ways of expressing fill – of – containers, such as requiring a minimum of 90% fill or a minimum drained weight, or a percentage of drained weight. In the case of fruits and vegetables under PFA 1954 many of

the standards are redundant where only the drained weight is required [Table 2] as an essential specification, all other descriptions being general compliance to good manufacturing practice. When Labeling rules cover this specification the only need is a code of practice to cover GMP.

TABLE 2: Revision of Standards Setting Procedures

| Appendix B. | Product Name | Comment |
|-------------|---------------------------|--|
| A.07.10 | Acesulfame Potassium | List under separate chapter - Food Additive specifications |
| A. 18.01.02 | Protein Rich Atta | Nutritional Labeling rule. Not a standard. |
| A. 11.01.02 | Pasteurization of Milk | Code of Practice. Not a standard |
| A. 16.41 | Fruit & Vegetable Chutney | Quid labeling. Not a standard |
| A. 18.01.01 | Fortified Atta | Not a standard. Procedure of fortification in general |
| A. 12 | Margarine | Identity Standard. |

If standards must be set they should follow a specified format, that reveals the essential characteristic or ingredient that constitutes the standard. For example the Codex standards for a given product or group of products are normally be presented in a format containing the following heading

- Name of the standard
- Scope, description
- Essential composition
- Quality factors
- Food additives
- Contaminants
- Hygiene
- Weights and measures
- Labeling
- Methods of analysis and sampling.

The Food Authority has an opportune time to re-look at why standards are set rather than what standards are needed. A structural infirmity of the standards setting process is the fundamental absence of Indian data or market realities. Most often standards are borrowed from Codex as in the case of mango chutney. While other countries seek to elaborate or amend Codex guidelines as in the case of quid labeling, India seeks unquestioned adoptions. A brief overview of some standards is given in **Table 2** which should set the criteria for when a standard is required. Industry would like to see minimum effective legislation to release the momentum of innovative products and market expansion.

In 1991, almost 15 years back the FAO/WHO reviewed the work and procedures of Codex and recommended that Codex should strengthen the horizontal work [read General Standards] of its general subject committees such as labeling, additives, contaminants and methods of analysis and sampling. Most countries for example EU, Australia and New Zealand lay emphasis on general standards. It is important that bodies so constituted under the Act engage under a predetermined policy and procedure to provide scope for food innovations coexistent with consumer safety and health.



HEALTHY FOODS SUPER FRUITS

Whether it's the television, newspaper, magazine or the web, you will almost always find an article on the health benefits of superfruits, fruits containing exceptional nutrients and antioxidants, often with a unique taste.

We all know that no matter what kind- fresh, frozen, canned or freeze-dried, fruits are good for us. But in 2005, marketers in the food and beverage industry coined the term superfruit to describe those fruits that were particularly high in nutrients especially antioxidants.

The term was usually used to describe exotic fruits. Unfortunately many of them were new to American consumers. This was unfair, as some traditional American crops have as much of antioxidants and nutrients as those that travel halfway around the globe.

These tough economic times have made consumers move to the basics and food options closer to home. This will surely make them appreciate American-grown superfoods like blueberries, strawberries, cherries, blackberries, cranberries, grapes, plums and raisins which have as many nutrients and antioxidants in their plump, compact shapes as their foreign counterparts. They also give product formulators the opportunity to deliver potent antioxidants in new products.

Fight the free radicals

Antioxidants are disease-fighting compounds believed to help prevent and repair stress that comes from oxidation, which is a natural process that occurs during normal cell function. During oxidation a small percentage of cells gets damaged and turns into free radicals. This starts a harmful chain reaction. Factors like, pollution, sunlight, smoking and alcohol also cause further oxidation. Unchecked free radical activity has been linked to cancer, heart disease, Alzheimer's disease and Parkinson's disease.

Antioxidants are nutrients (vitamins and minerals) and enzymes that fight free radicals. According to a major study assessing antioxidant levels in hundred foods, berries (blueberries, strawberries, cranberries, raspberries and blackberries) contain the most antioxidant bang for the buck, published in the Journal of Agricultural and Food Chemistry. In fact just one cup of most berries provides all the disease-fighting antioxidants you need in a day.

Oxygen Radical Absorbance Capacity (ORAC), developed by USDA, is the rating scale that measures antioxidant content in foods. USDA recommends eating foods containing at least 3,000 ORAC units daily. Berries are as a class, the stars of the list but the real leaders are spices. Ground cloves are no.1 with an ORAC value of 314,446 followed by sumac bran, ground cinnamon, sorghum bran and dried oregano. Exotic superfruit acai berry is no.6 with a score of 161,400.

Wild blueberries, among the classic American berries are the overall ORAC winner with one cup having 13,427 antioxidant units, vitamins A and C, along with flavanoids (a type of antioxidant), quercetin and anthocyanidin. That is four times the USDA's recommendation in one cup. Blueberries when cultivated have two-thirds of a cup and are equally rich in vitamins.

Cranberries are also a rich source of antioxidants (9,584), followed by black plums (6,259), blackberries (5,347), raspberries (4,882), strawberries (3,577) and cherries (3,365). Even dried versions of fruits are rich in antioxidants. Just half a cup provides quite a lot: prunes/dried plums (6,552), dates (3,895), figs (3,383) and raisins (3,037).

How do you get the most antioxidants from fruit? The antioxidant content may be high, but the body does not absorb all of it. The concept behind this is bioavailability which is the absorption or metabolism in the gut. The material absorbed is impacted by the mechanical structure of different antioxidants in food (if they're tied up with fiber or if they have sugar molecules attached). It was seen that by mildly steaming blueberries, the antioxidant level was enhanced, making more of antioxidants available to the body.

Blueberries (brainberries?)

Blueberries combine the best of what nature has to offer: nutrients and luscious flavor. They are an excellent source of vitamin C, with 80 calories per cup. A serving contains about 14mg or almost 25 percent of the daily value. They are also a good source of dietary fiber, manganese and polyphenols – specifically anthocyanins that give it the blue hue and help neutralize free radicals.

Animal studies have suggested that blueberries help protect the brain from oxidative stress and may reduce the effect of age-related conditions. Hence they have been called “brainberries.”

Another study on rats suggested that blueberries can also help in reducing belly fat, even when the rats were on a high-fat diet. By looking at fat muscle tissue it was found that blueberry intake affected genes related to fat-burning and storage and altered genes related to glucose uptake.

With the introduction of new research on the goodness of blueberries, their popularity continues to grow. There are many formats to meet a variety of formulation needs. They are: fresh, frozen, dehydrated, freeze-dried, preserved, canned, concentrate, juice and powder.

When a novel technology was developed using microwave energy, it chose blueberries as its first application for a major part because of their nutrients. Since they remove or at least reduce the amount of water in the berry, all the drying technologies concentrate the anthocyanins and other antioxidants.

The industry has had explosive growth in the export markets and new products continue to multiply rapidly. Blueberries are used in several of these products. Some of the new product ideas are stimulating new product development in North America. Blueberries are now showing up in many specialty food products because they add value and are in consumer demand.

Radiant red raspberries

They rank amongst the top ten antioxidant-rich fruits and vegetables. They provide important anti-inflammatories, including anthocyanins (pigments in red, purple and blue fruits) which may help reduce cardiovascular disease, diabetes, cancer, macular degeneration and improve memory.

One serving (1 cup) is only 70 calories and provides fifty percent of a day's requirement of vitamin C, fiber (32 percent), folate (6 percent), magnesium (3 percent), potassium (5 percent) and calcium, niacin, B6, phosphorus (4 percent) and zinc.

Red raspberries have always been a favourite ingredient in functional foods and beverages such as yogurts, ice creams, juices, teas and other beverages, much before people became aware of the value of high-antioxidant foods. They consist of around 5000 ORAC units per 100g which makes them one of the highest North American berries. The berry's high content of ellagic acid, vitamin C, vitamin A, anthocyanins and cyanidins contribute to its excellent antioxidant activity. Red raspberries taste great and are also high in fatty acids, fiber, iron, manganese, pectin, selenium and vitamin E. This makes their uses as a functional ingredient unlimited.

Red raspberries, especially the seeds may become important in the cosmeceuticals market (skin care products with health benefits) which has been one of the most exciting developments. The oil in the raspberry seeds is rich in vitamin E and omega-3 fatty acids and has a natural SPF (sun protection factor) of twenty to fifty.
Out of the bog

Cranberries are usually associated with Thanksgiving and Christmas celebrations but they actually lend their antioxidants to all kinds of foods used throughout the year. One serving (1 cup) is a great source of vitamin C, fiber (reduces level of bad cholesterol (LDL)), vitamin A and antioxidant phytonutrients that promote heart health.

The berry's complex mixtures of polyphenols, such as quercetin and unique tannins suggest that it can deliver a wide range of health benefits and a variety of different functional activities. Previously research on cranberries only focused on its role in preventing urinary tract infections but recent research suggests that the fruit has other benefits for cardiovascular, cellular, oral and gastro-intestinal health. The reason for its benefits for the whole body is the fruit's complex make-up. Unique A-linked compounds called proanthocyanidins prevent bacteria from adhering to cell walls and removing the possibilities of infection. The high antioxidant content helps fight free radicals that can damage cells throughout the body. They also have a rich combination of nutrients like fiber, vitamin C making them have multidimensional health benefits.

Blackberries always chic

In fruits, blackberries are a top source of fiber, vitamin C and are packed with antioxidant phytonutrients that helps promote heart health. It was found that by eating 10g of fruit fiber per day (blackberries give 7g) you can reduce the risk of coronary heart disease by 30 percent.

Blackberries are a great source of vitamin C which helps in protecting the body against infections, cancers and aging. In the past they were used as a cure for scurvy. One cup (144g) with only 75 calories is an excellent source vitamin E which is good for the heart and circulatory problems. It is also a good source of potassium, manganese, folate and soluble fiber pectin which helps in eliminating cholesterol and in protecting against environmental toxins.

Its high tannin content and its resultant antiseptic properties makes blackberries good for tightening tissues and for treating minor bleeding. The berry has been found to be beneficial for those suffering from diarrhea, intestinal inflammation and hemorrhoids. They are useful in treating mild infections like sore throats and mouth irritations.

Seductive strawberries

Strawberries are the most popular of the berries in the world. They contain unique antioxidant phytonutrients that are good for heart health. The anthocyanin present gives the berry its red and blue hues and also acts as a potent antioxidant. Specific antioxidants present are: quercetin, kaempferol, chlorogenic acid, p-coumaric acid, ellagic acid and vitamin C.

One serving (about eight or 1 cup) with only 50 calories is an excellent source of vitamin C (much more than that of an orange). They also contain fiber (2.9g), potassium and folate.

Research has suggested that the high antioxidant activity of the berry may help reduce levels of oxidized LDL cholesterol which causes cardiovascular disease and flavonoids may also provide cardio protection by inhibiting platelet aggregation and thromboxane synthesis. Also the anthocyanins in strawberries may help protect the neuronal cells from inflammation that is related to declines in cognitive function.

Strawberries are also rich in phenolic compounds such as flavanoids and ellagic acid. These compounds are the focus of intense studies due to their antioxidant, anticancer and antimutagenic properties. They control three of the risk factors related to heart disease: high cholesterol, high blood pressure and homocysteine levels.

Cherry picking

Almost 95 percent of cherries consumed in the U.S. are grown there itself. This advantage makes cherries an ideal ingredient for food product development in beverages, snacks and cereals.

On an average cherry tree there are about 7,000 cherries which results in more than 100 lbs. per tree per season and it takes 8 lbs. of cherries to make 1 lb. of dried cherries. They are available in dried, frozen and juice forms.

Cherries contain beta carotene (vitamin A), vitamin C, potassium, magnesium, iron, foliate, fiber and phytonutrients quercetin, kaempferol, chlorogenic acid, p-coumaric acid, gallic acid, perillyl alcohol, and D-glucaric acid. It was found that by eating just 1 ½ servings of tart cherries can significantly boost antioxidant activity in the body. In the study, healthy adults who ate a cup and a half of frozen cherries had increased levels of antioxidants, specifically five different anthocyanins - the natural antioxidants that give cherries their red color.

This study documented that the antioxidants in tart cherries do make it into the human blood stream and result in increased antioxidant activity that could have a positive impact. It is great that reasonable amount of cherries could have benefits like reducing risk factors for heart disease and inflammation.

Previous studies on animals have shown cherries and cherry compounds having other important benefits, including helping to lower risk factors for heart disease and impacting inflammation. A diet enriched with cherries can lower blood cholesterol levels and reduce triglycerides. Other benefits include a 14 percent lower body weight and less “belly fat,” the type linked with increased heart disease and type-2 diabetes.

Tart cherries are one of the few known food sources of melatonin, an antioxidant that helps regulate our circadian rhythms and natural sleep patterns.

Another study suggested that foods containing quercetin, a natural anti-histamine and anti-inflammatory compound, may be a natural way to help boost the immune system and help fight off infection during flu season.

Amazing raisins and plums

Raisins (dried grapes) rank high among antioxidant foods, as well, as they contain 3,037 ORAC units in 3.5 oz. (about 2/3 cup).

Research has shown that oxidized LDL cholesterol is more likely to be deposited on the artery wall. That buildup can cause a blockage. As such, protecting the LDL from oxidation is an important strategy for heart health. Here, raisins that are packed with antioxidants can help. In a study it was shown that one serving a day of raisins can actually help lower LDL cholesterol and its oxidation in people with high LDL levels.

Catechins, a family of readily absorbed antioxidants are also present in raisins. According to a research conducted, these catechins may promote colon health. These helpful compounds are also found in apples, grapes and raisins and beverages like chocolate, tea and red wine.

Dried plums, previously known as prunes are full of vitamins, minerals, fiber and antioxidants. With only 100 calories in a single serving (four to five) has 3g of fiber, B vitamins, potassium, magnesium, boron and

antioxidant phenolics. They also help maintain healthy blood sugar levels, healthy cholesterol and promote satiety. They may also help reduce skin wrinkles.

An animal study suggested that eating dried plums slows the development of atherosclerosis which leads to heart disease and stroke. As far as the laxative effect is concerned, research shows that generally healthy adults can eat 10 to 12 dried plums per day without any major changes in their bowel movements.

**Condensed from an article by Diane Toops in Food Processing.Com June 09
by Sonia Khudanpur**

Report on Nutrition Week Activity

by Ms. Ummeayman R., Nutritionist, PFNDAI

Nutrition week activity was organized by PFNDAI jointly with the Food Engineering and Technology Department of Institute of Chemical Technology (formerly UDCT) on Saturday, 5th Sep'09 at the Prof. K.V. Auditorium of ICT, Matunga (Mumbai)

The event was sponsored by DSM Nutritional Products, Nestle India and Marico. Nutritious Breakfast was organized by Kellogg India. It had many activities for the students such as Innovative recipe competition, Poster Making competition, Debate competition and Skit. There was an overwhelming participation of students not only from colleges of Foods Science and Nutrition but students from Management studies, Biochemistry, Quality Assurance also participated. Students had prepared '**Healthy snacks**' and they were judged on their Taste & Healthfulness of the snack, the students ability to explain the health benefits of the recipe and the ingredient used to make it more healthy than the conventional snack.

Posters prepared by the students were very artistic and also reflected a much wider awareness among the students about the '**Foods that Protect Heart**'. For debate competition and for SKIT, the students came up with very high spirit of confidence and knowledge relating the subjects of food, science and nutrition. The skit and debate created a wide awareness on many nutrition related issues and many myths about food and diet were clarified. An overwhelming response was seen both among the students and the audience. The student's competitions were judged by, Dr. Tewari G.M., Dr. Deepa Bhajekar, Dr. Samant S.K., Dr. S.V. Padgaonkar, Prof. Smita S. Lele, Prof. Rekha Singhal, Dr. Paramita Bhattacharjee, Dr. Uday Annapure, Dr. Shubhada Nayak, Ms. Nisha A., Dr. Manasi Bapat, Dr. Kavita Jadhav and Mr. Harish Mutlani. There were many delegates from industry and academia to encourage the students and to attend the seminar thereafter.

Presentations by eminent speakers from various sectors of industry and academia were highly informative. The presentation '**Fats & Oils: Which is Good and Which is Not**' by Dr. Vilas Shirhatti (Marico) was an eye opener towards the quality and quantity of fats and oils to be incorporated in the diet. The various inter-conversion cycles of the fatty acids and carbohydrates and proteins leading to the energy production gave a very clear understanding of the role of different types of fatty acids in the maintenance of health. No fat is bad, it is the proportion that we consume should be kept in consideration and one should gain enough knowledge on why the fats/oil is required and how does the body utilize it, are there any other substitute with a similar function and can they be used in a beneficial way, what is the moderate consumption level. All this and many more questions should be considered before taking a decision to completely avoid one type of fat/oil. The presentation was a complete health management plan with an emphasis on Good health being a 360 degree approach with lifestyle, regular health checkups, Physical activity, personal hygiene and many such other activities being a contributor towards Good Health.

'**The Importance of Calcium and Iron in Health**' was presented by Dr. Padmini Ghugre, SNTD Women's University, Juhu. Iron is one of the important minerals because it is required by many proteins and enzymes. There are Heme-proteins present in large quantities in the body and this protein and enzymes are required for essential metabolic reactions. The role of iron in altering the brain function was very well emphasized by Dr. Ghugre. Highlight of many studies relating to IDA were focused. Another important mineral, calcium was also emphasized upon. The importance of calcium in several physiological, intracellular and extra cellular activities were explained along with the disease conditions associated with deficient and excessive calcium intakes.

Following the knowledge of the importance of calcium in our diet, Ms. Anshu Gupta, Nestle, presented the most important source of calcium, i.e. Milk. She provided an insight on the '**Importance of Milk in Diet**'. Different forms of milk provide nutrients in varying concentrations but the range of some essential nutrients provided remains almost comparable and this comparison was illustrated very well in her presentation. Milk

provides a range of minerals and vitamins with high quality of protein and carbohydrate (lactose). It is also essential at every stage of life and in health promoting at every developmental and growth stage. Milk has many health benefits such as preventing cancer, prevention and control of type 2 diabetes, blood pressure and obesity.

Multi-micronutrient fortification is the most important tool to combat the problem of health issues of Indian Children. Ms Priyadarshini Muley-Lotankar further created awareness and presented a clear picture of the health of Indian children in her presentation of '**Multi-micronutrient Approach for Food Fortification**'. Along with many issues such as high prevalence of malnourished and underweight children in India, high prevalence of anaemia was also focused. Anaemia which is widely prevailing in most of the developing countries ranges from 70-80% in various age, sex and physiological groups. She emphasised that improving nutrition can be a driver of economic growth. Vitamin deficiencies have a direct or indirect impact on increase of nutritional anaemia as their deficiencies lead to impaired erythropoiesis. While micronutrients are required in minuscule amounts for supporting health and growth the consequence of their absence are several and produces huge burden of human suffering and enormous economic losses. It is widely accepted that micronutrient fortification is expensive. However, effective fortification is affordable where as ineffective fortification is expensive.

There was a lively discussion that followed all the presentations which showed that audience appreciated and enjoyed the presentations. **Dr. Tewari G.M, Chairman, PFNDAI** gave away the prizes to winning students and encouraged all the students to participate more actively in such future programs as they would be future industry decision makers and would help the India food industry to grow in pace with the global trends . They are the drivers of the future of India and would lead it towards a path of health and wellness.



Food Science & Nutrition News

Online Competition Launched for Improved Global Nutrition

Ashoka's Changemakers and The Global Alliance for Improved Nutrition (GAIN) are seeking the most innovative entrepreneurial ideas for improving global nutrition for their online competition, Improved Nutrition: Solutions through Innovation (www.changemakers.com/nutrition). "GAIN is proud to partner with Ashoka's Changemakers as both organizations are committed to business-like innovation with a social mission," said Marc Van Ameringen, Executive Director of GAIN.

Good nutrition for everyone is within our reach. The question is how to make this a reality for communities currently lacking access to nutritious food or unaware of its benefits. "Malnutrition is a solvable problem. Changemakers is looking forward to highlighting the solutions that will reach previously unreached populations," said Charlie Brown, Executive Director of Changemakers. "It is of utmost importance that we identify creative models that will directly and positively change the lives of millions most at risk of malnutrition," Van Ameringen added. "Each year, 3.5 million children die because they are malnourished."

The competition is open to innovators with new ideas to expand and improve nutrition – to make sure all people have access to the vital nutrients and the critical information that will help them thrive. Solutions with the potential for growth and scale are likely to come from creative community members from all corners of the globe and local, grassroots organizations. "The best ideas may lie in the creative use of technology, innovative public education programs, groundbreaking nutrition products, or other entrepreneurial approaches not yet broadly implemented," Brown said. "We expect, through this competition, to discover and support the future of global nutritional health."

Three winners will receive USD \$5000 each and media exposure; they will be prominently featured on Changemakers.com and recognized for the endorsement they have received from the world's most vigorous and engaged online social change community. Winners are chosen by the Changemakers community after a panel of expert judges reviews all the entries and shortlists finalists. Anyone is welcome to join Changemakers, to nominate innovations, submit great ideas, vote for the top finalists, and interact with a network of supporters committed to social change.

In addition, five entrants will be chosen by GAIN to attend, all-expenses paid, the GAIN Business Alliance Global Forum in May 2010, where they will have the opportunity to present their solutions to investors.

From: Nutrition Horizon 29 Sep 2009



Norman Borlaug dies at 95

According to the *Los Angeles Times*, Norman Borlaug, the father of the "Green Revolution" who is widely credited with saving millions of lives by breeding wheat, rice, and other crops that brought agricultural self-sufficiency to developing countries around the world, died Sept. 12 in Texas. He was 95.

Borlaug, who won the Nobel Peace Prize in 1970 and was hailed by *Time* magazine in 1999 as one of the 100 most influential minds of the 20th century, died at his home in Dallas from complications of cancer, a Texas A&M University spokeswoman said. In the 1940s, Borlaug collected thousands of strains of wheat from around the globe and crossbred them to produce varieties that were much higher yielding and resistant to the diseases that were destroying crops. He spearheaded efforts to spread these new strains around the world, sparking an

explosion in crop yields that helped lead countries toward food self-sufficiency. In 1960, before his techniques were widely adopted, the world produced 692 million tons of grain for 2.2 billion people. By 1992, largely as a result of Borlaug's pioneering techniques, it was producing 1.9 billion tons for 5.6 billion people—using only 1% more land. India and Pakistan are now agriculturally self-sufficient as a result of his intervention. His efforts did not go unrecognized: Borlaug became one of only five people in history to score the trifecta of humanitarian achievement, winning the Nobel Peace Prize, the Presidential Medal of Freedom, and the Congressional Gold Medal.

Borlaug was a key driver behind the establishment of the General Foods World Food Prize, which recognized individuals who have made outstanding contributions and life-saving achievements that increase the quality, quantity, or availability of food in the world. The first Prize was handed out in 1987. In 1990, in partnership with Des Moines businessman and philanthropist John Ruan, the Prize was moved to Des Moines and its name changed to the World Food Prize. Now in its 23rd year, the award is often referred to as the “Nobel Prize for Food and Agriculture.” The World Food Prize also hosts: an international symposium, The Borlaug Dialogue, which attracts leading agricultural experts from around the world to discuss cutting-edge topics in global food security; and a Youth Institute for high school students that was a special favorite of Borlaug.

“The world has lost a great hero,” said Ambassador Kenneth M. Quinn, President of the World Food Prize. “Borlaug’s tireless commitment to ending hunger had an enormous impact on the course of history. He will be remembered with love and appreciation around the globe.”

Along with his wife, the former Margaret G. Gibson, Borlaug is survived by daughter Jeanie Borlaug Laube, son William Gibson Borlaug, five grandchildren and six great-grandchildren.

From: IFT Newsletter September 16, 2009



More research needed to keep down food prices

A study published in *Science Magazine* shows that without increased investment in agricultural research and development, food will become scarcer and prices will continue to soar. University of Minnesota researchers found that agricultural productivity—that is the amount of food output compared to resource input—has been growing at a much slower rate in the last 19 years in comparison to the growth from 1961 to 1990.

The U.S. Census Bureau estimates the world’s population will hit 9 billion by 2043. This, coupled with decreasing productivity growth, poses a serious problem because food supplies will be unable to keep pace with the world’s ever growing demand. The world’s poorest populations will take the hardest hit, the researchers said, because they spend 70–80% of their income on food. Americans only spend 10–15% of their income on food.

Growing incomes are also taking a toll on the world’s food supply as people eat more meat-based products, including eggs and milk. The production of meat and meat-based products requires a greater portion of basic crops like corn and wheat to feed animals. Over the past 50 years, yields for basic crops like corn, rice, wheat and soybeans has more than doubled, according to the article. Questions arise as to whether the earth can continue to sustain the human population and are compounded by the concept that there is a limit to how much food the earth can produce.

From: IFT Newsletter September 16, 2009



Beauty Foods Gaining Momentum

CHICAGO—A recent report from Mintel Beauty Innovation reveals an increased crossover between food and beauty as global food and drink product launches with a "beauty-enhancing" claim increased by 306 percent from 2005 to 2008.

“One in five U.S. women between the ages of 18 and 25 are interested in trying beauty functional beverages,” said Taya Tomasello, senior beauty analyst at Mintel. “These numbers really point to an opportunity within this new segment in the beauty industry.”

While beauty food and drink products have seen significant growth, overall global food and drink product launches have only seen a 35-percent increase during the same timeframe. The data speaks to the impact "beauty foods" are having on the market. In 2009, nearly 300 food and drink product launches with a "beauty-enhancing" claim have been launched, surpassing the total number launched in all of 2008.

From: Food Product Design September 11, 2009



Mintel Reports on Energy Drinks

Amid the constant publicity about the potential danger of energy drink ingredients, **Mintel Global New Products Database** (GNPD) revealed the latest energy drink launches aren't getting any healthier. Despite this, the popular beverage market continues to grow with sales increasing more than 240 percent from 2004 to 2009. In the same timeframe, there has been a flood of new energy drinks to the market with new product launches up by more than 110 percent. Analyzing the ingredients in energy drinks launched between 2004 and 2008, Mintel GNPD found caffeine in nearly all energy drinks produced. Meanwhile, taurine, the other popular, yet controversial energy-boosting ingredient, was found in more than one in four (27 percent) energy drinks in 2004, but has slightly reduced to one in five (21 percent) in 2008.

"There is a significant market right now for drinks offering a boost of energy," notes Lynn Dornblaser, Mintel global new products expert. "Although consumers say they try to eat and drink better, it appears that energy drinks is not a category in which that happens, as they continue to choose options that contain sugar, caffeine and taurine, all of which can have negative effects if consumed in excess."

Mintel found suppliers are producing some new energy drinks that boast more health-focused claims, but they are in the minority. Energy drinks showing a low-, no- or reduced-calorie claim have increased from 6 percent to 11 percent between 2004 and 2008. Within the same timeframe, energy drinks featuring a low-, no- or reduced-sugar claim have held steady at one in seven new launches. In addition, better-for-you energizers like vitamin B6 and guarana have remained flat appearing in approximately 22 percent and 12 percent of new product launches, respectively.

In 2008, Ocean Spray introduced a line of Cranergy Energy Drinks billed as "naturally energizing." This line of drinks contains real fruit juice blended with natural energizers, including five B vitamins, vitamin C and green tea extract. These new non-carbonated drinks are clinically shown to improve alertness and make people feel less tired. Bazza High-Energy Tea is another new energy-inducing beverage made from green tea and EGCG antioxidants and calls itself the "smarter high-energy alternative."

According to Dornblaser, "These new, natural energy-enhancing products could threaten to steal share from their less healthy counterparts. Often they are not sold in the energy drinks aisle, but in the juice or alternative beverage aisle, which may protect them from the unhealthy stigma some consumers associate with energy drinks."

From: Food Product Design 8/31/2009



Food "Tattoos" an Alternative to Labels for Identifying Fruit

Those small and sometimes inconvenient sticky labels on produce may eventually be replaced by laser tattoo technology now being tested by the U.S. Dept. of Agriculture's Agricultural Research Service (ARS) and University of Florida (UFL) scientists. Called laser etching, the new technology puts a tattoo on grapefruit and other produce so it can be identified at the supermarket checkout lines. The technology was invented by former UFL scientist Greg Drouillard, now with Sunkist Growers. Grapefruit has always been labeled with sticky paper labels that mar the fruit and stick to one another in storage. The labels are also easily removed, making it more difficult to track a piece of produce back to the source if the need arises.

Microbiologist Jan Narciso at the ARS Citrus and Subtropical Products Laboratory in Winter Haven, Fla., and UFL researcher Ed Etxeberria investigated laser technology as an alternative to sticky paper labels. A carbon dioxide laser beam was used to etch information into the first few outer cells of the fruit peel. The mark can't be peeled off, washed off, or changed, offering a way to trace the fruit back to its original source. This permanent etching into the fruit peel does not increase water loss or the entrance of food pathogens or postharvest pathogens if the laser label is covered with wax.

Further testing shows the wax may be unnecessary, since the tiny holes etched into the grapefruit peel are effectively sealed by the carbon dioxide, preventing decay and food pathogen entry. However, wax coverage is recommended to eliminate water loss. In testing for fruit decay, the fruit was inoculated with decay organisms and then etched with the laser. No pathogens were found in the peel or the fruit interior. The scientists found that the laser cauterizes the peel, much like when a laser is used on human skin. The cauterized area is impenetrable to pathogens and decay organisms and resists water loss. Testing is also being conducted on tomatoes, avocado, and other citrus fruits. The process would have to be approved by the Food and Drug Administration before it could be used commercially.

From: USDA Agricultural Research Service News & Events August 31, 2009



Purdue launches Web site to assist small, medium food processors

Purdue University rolled out a new Web site Sept. 1 to help small- and medium-sized food processors comply with environmental regulations. The Food Processing Environmental Assistance Center's Web site, <http://www.fpeac.org/>, is an all-encompassing source for small- and medium-sized food processors on environmental regulations. It contains federal and state regulations and publications aimed at helping processors address environmental issues related to their businesses. "Large food processors have full-time staffs devoted to these regulations and activities," said Kevin Keener, Director of the center and Purdue Associate Professor of Food Science. "The small- and medium-sized processors don't. This is their resource."

The center, located in Purdue's Department of Food Science, is funded through Purdue, along with nearly \$340,000 from the U.S. Environmental Protection Agency (EPA). Keener said the Web site is just the first step. In the future, the center will offer technical services to processors. "We're looking to do training, environmental audits checks, and workshops on energy efficiency, water use and other topics," said Keener.

He said the site also will add industry news to keep processors updated on new regulations or changes in their industry. The center is one of more than a dozen EPA centers in the country aimed at different industries, such as construction, printing, and auto repair.

From: IFT Newsletter September 2, 2009



Legumes Could Be Significant Protein Powerhouse for Undernourished Populations:

Researchers discuss legumes as a nutritional powerhouse to help overcome malnutrition in an estimated 800 million undernourished people throughout developing countries in the October 2009 issue of *Comprehensive Reviews in Food Science and Food Safety*, published by the Institute of Food Technologists. Providing safe, nutritious and wholesome food for poor and undernourished populations has been an increasing challenge for the developing world. More specifically, protein-energy malnutrition is among the most serious problems. This is due, in part, to increased populations, scarcity of fertile land and degradation of natural resources.

As a result of this growing concern, wild and underutilized legumes have emerged as cost-effective alternatives to the unreliable supply of animal-based protein in developing nations. Although common legumes such as soybeans and cowpeas are available, the demand for these protein-rich sources is not being met. Consequently, researchers throughout the world are tapping into natural wild and underutilized legumes in an attempt to alleviate hunger and overcome malnutrition in developing nations.

Several species of wild and underutilized legumes, such as *Sesbania*, *Mucuna* and *Canavalia*, possess strong nutritional and pharmaceutical value. With proper processing of these legumes, food scientists are certain that with further research these plants will provide food for humans and animals as well as a potential way to overcome protein malnutrition issues that currently affect developing nations. "Further research is needed to explore the entirety of the underutilized legumes' nutritional potential and researchers hope to find them to be a source of nutraceuticals for new food formulations, biofortification and new product development," says lead researcher Rajeev Bhat.

From: SoyTech e-News September 23, 2009



Regulatory News

Tirupati Laddoo Gets Geographical Copyright

'Tirupati laddoo' offered to devotees at the Lord Venkateswara Temple in Andhra Pradesh has been awarded geographical copyright that bars others from naming or marketing the sweetmeat preparation under the same name. The Tirumala-Tirupati Devasthanams, a trust that administers the Venkateswara Temple in the Tirumala hills, had applied for Geographical Indication (GI) with the Chennai-based Geographical Indication Registry in March last year.

"The GI certificate for Tirupati Laddoo has been granted to the trust (TTD). The Laddoo is now protected under law and nobody can copy it," G L Verma, Assistant Registrar of Trade Marks and GI, told PTI from Chennai. Under GI, the right to marketing a product is tied to a definite geographical territory and the manufactured goods should be produced or processed or prepared in that territory.

From: Image Food.Com 16 Sep 2009

Reducing salt in bread has little effect on quality

A study published in *Food Research International* shows that breads produced with 0.3% and 0.6% salt were found to be comparable to the control (1.2% salt) in terms of dough rheology, baking quality characteristics, and sensory attributes. The researchers studied the effect of an incremental reduction of salt, from current usage levels (1.2%) to 0.6%, 0.3%, and 0% addition. Empirical and fundamental rheology, bread-making performance, and descriptive sensory evaluation were employed to gain practical insight into the viability of salt reduction in wheat dough and bread.

The researchers found that decreasing salt addition reduced the dough resistance to extension, extensibility, and complex modulus without affecting the ratio of liquid to solid behavior, thereby indicating that no major structural changes take place as a result of salt reduction. Changes in gas holding capabilities of doughs with reduced salt were observed, however, not affecting the final bread quality (e.g., specific volume, bake-loss, or moisture-loss). Omission of salt resulted in uneven crumb structure and high crumb hardness on day 5 post-baking. However, these effects were not present when salt was included in the formulation, even at low levels of addition (i.e., 0.6% or 0.3%). It was concluded that breads were more strongly affected by age than by level of salt addition in the sensorial evaluation.

From: Science Direct August 2009

Canada takes action to improve food safety

The Government of Canada is making investments to strengthen the country's food safety system. Agriculture Minister Gerry Ritz and Health Minister Leona Aglukkaq have announced that the Government will invest \$75 million in Canada's food safety system and act on all 57 recommendations made by Independent Investigator Sheila Weatherill.

"The Government of Canada's highest priority is the safety of Canadians," said Minister Ritz. "We are making significant investments to hire more inspectors; update technologies and protocols; and improve communication so that Canadians have the information they need to protect their families."

The new investments will improve the Government's ability to prevent, detect, and respond to future foodborne illness outbreaks. Among other improvements, the Government will:

- hire 166 new food safety staff with 70 focusing on ready-to-eat meat facilities;
- provide 24/7 availability of health risk assessment teams to improve support to food safety investigations;
- improve coordination among federal and provincial departments and agencies;
- improve communications to vulnerable populations before and during a foodborne illness outbreak;
- improve tracking of potential foodborne illness outbreaks through a national surveillance system;
- improve detection methods for *Listeria monocytogenes* and other hazards in food to reduce testing time and enable more rapid response during food safety investigations, as well as expanding the Government's ability to do additional *Listeria* testing; and
- initiate a third-party audit to make sure Canada's food inspection system has the right resources dedicated to the right priorities.

This investment builds on the Government's 2008 commitment of \$113 million for food safety. Already, the Government has made changes to Canada's *Listeria* management strategy, including making environmental testing and reporting mandatory in ready-to-eat meat plants.

From: IFT Newsletter September 16, 2009



FDA Food Safety Survey to focus on consumer response to recall alerts

The Food and Drug Administration (FDA) has announced that its 2009 Food Safety Survey will look at reasons why consumers do not always heed food recall alerts. FDA has published a notice announcing that a proposed information collection has been submitted to the Office of Management and Budget for review. Comments on the proposed survey are due by Oct. 15.

The Food Safety Survey is a nationally representative survey of consumer knowledge, attitudes, and beliefs about food safety. Survey results are used to measure trends in consumer food safety habits, to better understand consumer attitudes about novel technologies, and to evaluate educational messages directed to consumers. It is a telephone survey using a nationally representative sample of 4,000 adults. The 2009 survey will focus specifically on why consumers sometimes disregard recalls. It will also contain questions to learn about how recent food recalls have affected consumer confidence in the food supply and what effect, if any, recent recalls have had on consumers' home food safety behaviors. This information will be used by the FDA to develop strategies to communicate food recall information to the public more effectively.

From: IFT Newsletter September 16, 2009



Child Nutrition Act renewal around the corner

According to the *Los Angeles Times*, President Obama has proposed a \$1-billion increase for the Child Nutrition Act, which lawmakers will consider for renewal this fall. Many nutrition advocates and politicians hope that Congress decides to bolster the school lunch program when it takes up renewing the legislation, which expires Sept. 30. One portion of the bill would give the Department of Agriculture authority to update decades-old standards for the food children buy at school stores and vending machines, as well as foods such as pizza and French fries that are sold a la carte in cafeterias.

California and Los Angeles are ahead of the curve: The Los Angeles Unified School District banned soda—though not sports drinks—in 2002, and has mostly cut out the sale of less-nutritious food. California limits fat and sugar in food sold on campuses. However, most states have weak or no policies on less-nutritious foods.

The Child Nutrition Act programs currently cost about \$15 billion a year, and cover the government's reimbursements to school districts for meals; summer and after-school food programs; food served at many day-care facilities for children and adults; and the Special Supplemental Nutrition program for Women, Infants and Children, which provided food to more than 8 million people in 2007.

The National School Lunch Program, which feeds 30 million children a day, and the School Breakfast Program, which feeds a third that many, are getting much of the attention. Expanding the breakfast program is a priority for many. About 15% of schools that offer lunch don't offer breakfast. Several proposals are being discussed to streamline the way students are deemed eligible for free meals and to broaden the requirements so more children qualify. Currently, districts are reimbursed \$2.68 to \$2.70 (more in Alaska and Hawaii) for each free lunch they serve. Many child nutrition advocates would like to see that reimbursement raised by \$1 per child per day to enable schools to serve more whole grains and fresh produce.

From: Los Angeles Times August 26, 2009



Specific Test Now Available for Recently Detected Unauthorized GM Flax/Linseed Variety

Today the European Union (EU) Rapid Alert System for Food and Feed (RASFF) reported finding an unapproved genetically modified (GM) flax/linseed variety in cereal and bakery products in Germany. The GM flax variety, FP967 (CDC Triffid), is not authorized for food or feed use in the EU. GM flax FP967 has tolerance to soil residues of sulfonylurea-based herbicides, and was developed by the Crop Development Centre at the University of Saskatchewan in Canada. Canada supplies approximately 70% of the total flax/linseed utilized in the EU annually.

Because GM flax FP967 is not authorized in the European Union, there is zero tolerance for the variety per EU regulations. This means that any raw material or flax/linseed derivative analyzed to be positive for FP967 is not marketable in the EU.

Testing is recommended for exports of flax products to the EU. Genetic ID is currently the only GMO testing laboratory offering a specific and accredited PCR test for GM flax FP967. Genetic ID developed the test for GM flax FP967 according to the guidelines of the Joint Research Centre (JRC) and has made it available to surveillance authorities, the JRC, and the food and feed industries. The test for GM flax FP967 is included in the ISO 17025 scope of accreditation for Genetic ID laboratories in the United States and Europe. This test is now available for all flax/linseed products.

From: SoyaTech eNews September 9, 2009 –



New bill looks at labelling laws

A new bill in Australia is seeking to clarify food labelling laws for consumers and food producers. Under the proposed bill, claims such as "Australian made" will require the food itself to be 100 per cent produced in Australia. Currently, claims such as "Australian made" or "Manufactured in Australia" can be made where the goods have been "substantially transformed" in Australia and 50 per cent of the costs of production have been

carried within the country.

At the moment, displaying the origins of ingredients is regulated by Standard 1.2.11 of the Australia New Zealand Food Standards Code, as well as the general law relating to consumers, such as the Trade Practices Act 1974. Under the new proposals, foods that have one or more ingredients from a different country will have to display the percentage of imported ingredients.

The nation's parliament is currently discussing the plans, but as it simultaneously proposes significant changes to packaging and labelling claims and seeks to eliminate opportunities for industry consultation and the usual approvals from the Ministerial Council, it is not clear whether it will be passed. In Europe, the European Food Safety Authority is reviewing around 4,000 claims by food producers that their food has health benefits.

From: Ingredients Network.Com News September 09



Research in Health & Nutrition

High Fruit & Vegetable Intake Linked To Antioxidant Status And Cognitive Performance In Healthy Subjects

Researchers at the Institute of Biochemistry and Molecular Biology I of the Heinrich-Heine University, Düsseldorf, Germany, investigated the relationship between fruit and vegetable intake, plasma antioxidant micronutrient status and cognitive performance in healthy subjects aged 45 to 102 years. Their results, published in the August issue of the *Journal of Alzheimer's Disease*, indicated higher cognitive performance in individuals with high daily intake of fruits and vegetables.

Subjects with a high daily intake (about 400 g) of fruits and vegetables had higher antioxidant levels, lower indicators of free radical-induced damage against lipids as well as better cognitive performance compared to healthy subjects of any age consuming low amounts (< 100 g/day) of fruits and vegetables. Modification of nutritional habits aimed at increasing intake of fruits and vegetables, therefore, should be encouraged to lower the prevalence of cognitive impairment.

The work was performed in collaboration with the Department of Pharmacology at Temple University in Philadelphia, Pennsylvania, the Department of Geriatrics at Perugia University, Italy, and the Department of Neurology of the St. Elisabeth Hospital in Cologne, Germany.

Dr. M. Cristina Polidori, currently at the Department of Geriatrics, Marienhospital Herne, Ruhr-University of Bochum, Germany, explains: "It is known that there is a strong association between fruit and vegetable intake and the natural antioxidant defenses of the body against free radicals. It is also known that bad nutritional habits increase the risk of developing cognitive impairment with and without dementia. With this work we show a multiple link between fruit and vegetable intake, antioxidant defenses and cognitive performance, in the absence of disease and independent of age. Among other lifestyle habits, it is recommended to improve nutrition in general and fruit and vegetable intake in particular at any age, beginning as early as possible. This may increase our chances to remain free of dementia in advanced age."

These findings are independent of age, gender, body mass index, level of education, lipid profile and albumin levels, all factors able to influence cognitive and antioxidant status. The relevance of the findings is also strengthened by the large sample that included 193 healthy subjects.

Further studies are planned that will include larger subject cohorts, patients with Alzheimer's disease at different stages and patients with mild cognitive impairment without dementia.

From: Science Daily (Sep. 10, 2009)



Insufficient Levels of Vitamin D Puts Elderly at Increased Risk of Dying from Heart Disease

A new study by researchers at the University of Colorado Denver and Massachusetts General Hospital (MGH) shows vitamin D plays a vital role in reducing the risk of death associated with older age. The research, just published in the *Journal of the American Geriatrics Society*, evaluated the association between vitamin D levels in the blood and the death rates of those 65 and older. The study found that older adults with insufficient levels of vitamin D die from heart disease at greater rates than those with adequate levels of the vitamin.

"It's likely that more than one-third of older adults now have vitamin D levels associated with higher risks of death and few have levels associated with optimum survival," said Adit Ginde, MD, MPH, an assistant professor at the University of Colorado Denver School of Medicine's Division of Emergency Medicine and lead author on the study. "Given the aging population and the simplicity of increasing a person's level of vitamin D, a small improvement in death rates could have a substantial impact on public health." Older adults are at high risk for vitamin D deficiency because their skin has less exposure to the sun due to more limited outdoor activities as well as reduced ability to make vitamin D.

The study analyzed data from the Third National Health and Nutrition Examination Survey conducted by the National Center for Health Statistics. The research team analyzed vitamin D in blood samples of more than 3,400 participants that were selected to be representative of the 24 million older adults in the United States. Compared to those with optimal vitamin D status, those with low vitamin D levels were 3 times more likely to die from heart disease and 2.5 times more likely to die from any cause.

Dr. Ginde says the findings suggest that current daily recommendations of vitamin D may not be enough for older adults to maintain optimal health. The research team has applied for research funding from the National Institutes of Health to perform a large, population-based clinical trial of vitamin D supplementation in older adults to see if it can improve survival and reduce the incidence of heart disease. "Confirmation of these results in large randomized trials is critically important for advancing public health," says Carlos Camargo, MD, DrPH, of the MGH Department of Emergency Medicine, the senior author of the study and an associate professor of medicine at Harvard Medical School.

The study looking at elderly death rates is the second of two studies by the same team of researchers on vitamin D and general health. The first study, published in Archives of Internal Medicine earlier this year, identified vitamin D as playing a significant role in boosting the immune system and warding off colds and flu. "Vitamin D has health effects that go beyond strong bones," says Ginde. "It's likely that it makes a vital contribution to good health."

From: Nutrition Horizon 23 Sep 2009



Zinc Deficiencies A Global Concern

Other vitamins and nutrients may get more headlines, but experts say as many as two billion people around the world have diets deficient in zinc – and studies at Oregon State University and elsewhere are raising concerns about the health implications this holds for infectious disease, immune function, DNA damage and cancer. One new study has found DNA damage in humans caused by only minor zinc deficiency.

Zinc deficiency is quite common in the developing world. Even in the United States, about 12 percent of the population is probably at risk for zinc deficiency, and perhaps as many as 40 percent of the elderly, due to inadequate dietary intake and less absorption of this essential nutrient, experts say. Many or most people have never been tested for zinc status, but existing tests are so poor it might not make much difference if they had been. "Zinc deficiencies have been somewhat under the radar because we just don't know that much about mechanisms that control its absorption, role, or even how to test for it in people with any accuracy," said Emily Ho, an associate professor with the Linus Pauling Institute at OSU, and international expert on the role of dietary zinc.

However, studies have shown that zinc is essential to protecting against oxidative stress and helping DNA repair – meaning that in the face of zinc deficiency, the body's ability to repair genetic damage may be decreasing even as the amount of damage is going up.

Two studies recently published, in the *Journal of Nutrition* and the *American Journal of Clinical Nutrition*, found significant levels of DNA damage both with laboratory animals and in apparently healthy men who have low zinc intake. Zinc depletion caused strands of their DNA to break, and increasing the intake of zinc reversed the damage back to normal levels. "In one clinical study with men, we were able to see increases in DNA damage from zinc deficiency even before existing tests, like decreased plasma zinc levels, could spot the zinc deficiency," Ho said. "An inadequate level of zinc intake clearly has consequences for cellular health."

Many zinc studies, Ho said, have focused on prostate cancer – the second leading cause of cancer deaths in American men – because the prostate gland has one of the highest concentrations of zinc in the body, for reasons that are not clearly known. When prostate glands become cancerous, their level of zinc drops precipitously, and some studies have suggested that increasing zinc in the prostate may at least help prevent prostate cancer and could potentially be a therapeutic strategy. There are concerns about the relationship of zinc intake to esophageal, breast, and head and neck cancers. And the reduced zinc status that occurs with aging may also contribute to a higher incidence of infection and autoimmune diseases, researchers said in one study in the *Journal of Nutrition*.

Zinc is naturally found associated with proteins in such meats as beef and poultry, and in even higher levels in shellfish such as oysters. It's available in plants but poorly absorbed from them, raising additional concerns for vegetarians. And inadequate intake is so prevalent in the elderly, Ho said, that they should usually consider taking a multivitamin to ensure adequate levels. Zinc is an essential micronutrient for numerous cellular processes. But taking too much zinc can also be a concern, because in excess it can interfere with the absorption of other important nutrients such as iron and copper. The recommended daily allowance is eight milligrams a day for women, 11 for men, and anything over 50 milligrams a day could be considered excessive, Ho said.

"The consequences of zinc deficiency in adults have been understudied despite the recognition of symptoms of zinc deficiency for decades," researchers wrote in one recent report. "A considerable body of evidence suggests that zinc deficiency may increase the risk of some chronic diseases, including cancer. This link may be attributed to the role of zinc in antioxidant defense and DNA damage repair."

From: Science Daily (Sep. 17, 2009) —



Grapes and Grape Products Show Exciting Potential in Optimizing Health

While consumption of grapes and grape products has long been associated with a healthy lifestyle, a new supplement published in the September issue of the *Journal of Nutrition* provides further evidence that grapes and grape products may play a key role in optimizing health by mediating beneficial biological responses. The vast array of naturally occurring plant chemicals in grapes and grape products are thought to be responsible for the beneficial effects observed. The potential areas of beneficial impact include cardiovascular health, cognitive function in older people, cancer, inflammation, diabetes, and dental health.

The current *Journal of Nutrition* supplement highlights key presentations made at a meeting of researchers from academia and advisory members from government, who gathered together earlier this year to present and discuss research on the links between consumption of grapes and grape products, diet and health, and disease prevention. The workshop was sponsored by the National Grape and Wine Initiative (NGWI).

"Within grapes and grape products, there are chemical classes of natural compounds which are capable of mediating biological responses against a variety of targets," said Dr. John Pezzuto, Dean of the College of Pharmacy at the University of Hawaii Hilo, who moderated the Grape and Health Workshop. "In considering grapes and health, a broader view - that takes into account all of the grape's chemical components including their metabolism, biological potential, biodistribution, absorption and processing - is key to developing a comprehensive and coherent explanation of their role in improving and supporting human health." Pezzuto outlines an innovative approach for achieving this in his contribution to the supplement.

Consuming grapes and grape products may be an effective and inexpensive way for consumers to prevent such diseases as cardiovascular disease, cancer, diabetes and tooth decay while improving the immune functions and increasing cognitive and motor functions among older people. The "Grapes and Health" supplement also includes information on seven other topics regarding grapes and their many potential benefits:

- Cardiovascular health
- Immune function
- Cancer
- Cognitive function/brain health
- Anti-microbial/anti-adhesion capabilities
- Bioavailability of grape compounds in metabolism

"It was fascinating to bring such a diverse group of experts together to consider and discuss the consumption of grapes and grape products and the potential ability to optimize one's health," said Jean-Mari Peltier, President of NGWI. "The interest in grapes and health is very strong and there is no doubt that research in this area will continue at full force."

From: Nutrition Horizon 11 Sep 2009 ---



Could Soy Isoflavones Slow Aging? Newcastle University Research

Researchers from Newcastle University (UK) have discovered that the consumption of the soy isoflavone, daidzein, may activate a protein called sirtuin1 (Sirt1), previously linked to the regulation of ageing and longevity. The study supported by Alpro Foundation Masters Award and the BBSRC (Biotechnology and Biological Sciences Research Council) used observations from the inhabitants of Okinawa Island in Japan who have always consumed a low-energy diet, which had been thought to be responsible for the longevity of this population. However, since soya provides the principal source of protein in this diet, it has raised the possibility that some beneficial effects of the diet relevant to healthy ageing and long lifespan may have been the result of soybean isoflavones potentiating effects, mediated through the activity of Sirt1. (NutraIngredients.com (11/09/09). Full text in Nutrition Bulletin, September 2009, 34 (3): 303-308,

From: SoyTech e-News September 16, 2009



Researchers Designing Probiotics that Ambush Gut Pathogens

Researchers in Australia are developing diversionary tactics to fool disease-causing bacteria in the gut. Many bacteria, including those responsible for major gut infections, such as cholera, produce toxins that damage human tissues when they bind to complex sugar receptors displayed on the surface of cells in the host's intestine.

At the Society for General Microbiology's meeting at Heriot-Watt University, Edinburgh, Professor James Paton and colleagues from the University of Adelaide explained how they had added molecular mimics of these host cell receptors onto the surface of harmless bacteria capable of surviving in the human gut. If given during an infection caused by a toxin-producing bacterium, these "receptor-mimic probiotics" will bind the toxins in the gut very strongly, thereby preventing the toxins from interacting with receptors on host intestinal cells and causing disease.

Effective vaccines are not yet available for many diarrhoeal diseases; and trying to control or treat these diseases with antibiotics can lead to the development of drug-resistance. One advantage of this approach to treatment is that the pathogenic bacteria are unlikely to develop a resistance to it, as that would destroy the basic mechanism by which they cause disease.

A further advantage is that the receptor-mimic bacteria bind toxins more strongly than previous technologies in which synthetic receptors were displayed on inert silica particles. They are also more cost effective, as the bacteria can be grown cheaply in large-scale fermenters.

"We initially developed this technology to prevent disease caused by strains of E. coli bacteria that produce Shiga toxin. These include the infamous E. coli O157 strain, which causes outbreaks of severe bloody diarrhoea and the potentially fatal haemolytic uraemic syndrome. Our prototype receptor mimic probiotic provided 100% protection against otherwise fatal E. coli disease in an animal model." said Professor Paton, "We have also developed similar receptor mimic probiotics that are capable of preventing cholera and travellers' diarrhoea. As well as being able to treat disease, these probiotics could be given to vulnerable populations following natural disasters to help prevent outbreaks of diseases like cholera".

From: Nutrition Horizon 8 Sep 2009 ---



Eating chocolate may decrease risk of cardiac mortality in heart attack victims

A study published in the *Journal of Internal Medicine* shows that chocolate consumption may decrease the risk of a heart attack victim from dying from heart-related problems. In a population-based inception cohort study, the researchers followed 1,169 non-diabetic patients hospitalized with a confirmed first acute myocardial infarction (AMI) between 1992 and 1994 in Stockholm County, Sweden, as part of the Stockholm Heart Epidemiology Program. Participants self-reported usual chocolate consumption over the preceding 12 months with a standardized questionnaire distributed during hospitalization and underwent a health examination three months after discharge. Participants were followed for hospitalizations and mortality with national registries for eight years.

The researchers found that chocolate consumption had a strong inverse association with cardiac mortality. Consuming chocolate less than once per month, up to once per week, and twice or more per week was associated with 27%, 44%, and 66% reductions in cardiac mortality, respectively. Chocolate consumption generally had an inverse but weak association with total mortality and nonfatal outcomes. In contrast, intake of other sweets was not associated with cardiac or total mortality. Chocolate consumption was associated with lower cardiac mortality in a dose dependent manner in patients free of diabetes surviving their first AMI. The researchers concluded that, "Although our findings support increasing evidence that chocolate is a rich source of beneficial bioactive compounds, confirmation of this strong inverse relationship from other observational studies or large-scale, long-term, controlled randomized trials is needed."

From: IFT Newsletter September 16, 2009



Celiac Disease Raises Mortality Rate

People with a mild form of celiac disease have a slightly higher death rate, and the risk was higher in people who had had small-intestinal biopsies in childhood, according to a new study published in the *Journal of the American Medical Association (JAMA)*. According to the study, celiac disease is thought to be connected to a higher risk of disease—specifically cardiovascular disease and cancer, but less is known about "nonspecific small intestinal inflammation without villous atrophy," a kind of abnormality. Swedish researchers found the risk of death increased by 39 percent in patients with celiac disease, and 35 percent with latent celiac disease.

From: *Food Product Design* September 17, 2009



Fat from Food Tricks Brain Signals

Fat molecules cause the brain to send messages to the body's cells, warning them to ignore the appetite-suppressing signals from leptin and insulin, hormones involved in weight regulation, according to a new study from UT Southwestern Medical Center. Researchers also found that one particular type of fat—palmitic acid that is found in butter, cheese, milk and beef—is particularly effective at triggering this mechanism.

"Normally, our body is primed to say when we've had enough, but that doesn't always happen when we're eating something good," said Dr. Deborah Clegg, assistant professor of internal medicine at UT Southwestern and senior author of the rodent study appearing in the September issue of *The Journal of Clinical Investigation*. "What we've shown in this study is that someone's entire brain chemistry can change in a very short period of time. Our findings suggest that when you eat something high in fat, your brain gets 'hit' with the fatty acids, and you become resistant to insulin and leptin," Clegg said. "Since you're not being told by the brain to stop eating, you overeat." Clegg said in animals, the effect lasts about three days, potentially explaining why many people who splurge on Friday or Saturday say they're hungrier than normal on Monday.

From: *Food Product Design* September 15, 2009



Gluten-Free Diet Reduces Bone Problems in Children with Celiac Disease

Celiac disease (CD) is an inherited intestinal disorder characterized by life-long intolerance to the ingestion of gluten, a protein found in wheat, rye, and barley. Although CD can be diagnosed at any age, it commonly occurs during early childhood (between 9 and 24 months). Reduced bone mineral density is often found in individuals with CD. A new article in the journal *Nutrition Reviews* examines the literature on the topic and reveals that a gluten-free diet can affect children's recovery.

Metabolic bone disease remains a significant and common complication of CD. Reduced bone mineral density can lead to the inability to develop optimal bone mass in children and the loss of bone in adults, both of which increase the risk of osteoporosis. There also exists an additional risk of fracture in people with CD. However, evidence suggests that a gluten-free diet (GFD) promotes a rapid increase in bone mineral density that leads to complete recovery of bone mineralization in children. A GFD improves, although rarely normalizes, bone mineral density in adults.

Children may attain normal peak bone mass if the diagnosis is made and treatment is given before puberty, thereby preventing osteoporosis in later life. Also, nutritional supplements consisting of calcium and vitamin D seem to increase the bone mineral density of children and adolescents with CD. "Our findings reinforce the importance of a strict gluten-free diet, which remains the only scientific proven treatment for celiac disease to

date," the authors conclude. "Early diagnosis and therapy are critical in preventing celiac disease complications, like reduced bone mineral density." This study is published in the journal *Nutrition Reviews*.

From: "Professional News" <professionalnews@wiley.com> September 28, 2009



Green Tea Good for the Gut

Consuming five or more cups of green tea a day may reduce the risk of women developing stomach cancer by 20 percent, according to a report published in the journal *Gut*. Researchers at the National Cancer Center in Tokyo analyzed original data from six cohort studies that measured green tea consumption using validated questionnaires at baseline.

Hazard ratios (HRs) in the individual studies were calculated, with adjustment for a common set of variables, and combined using a random-effects model.

The researchers concluded that green tea's antioxidants may protect against gastric cancer and may include compounds that fight bacteria that have been linked to stomach cancer. The studies followed more than 219,000 men and women 40 years and older, who were followed between seven and 11 years. Overall, about four in five of the participants reported drinking green tea daily, with about one-third drinking five or more cups per day.

From: Food Product Design 09/30/2009



French Scientists Determine How Much Omega-3 Fatty Acid is 'Just Right' for Optimal Heart Health

A team of French scientists has found how much DHA (docosahexaenoic acid), an omega-3 fatty acid, is required to prevent cardiovascular disease in healthy men. In a new study, scientists has shown that a 200 mg dose of DHA per day is enough to affect biochemical markers that reliably predict cardiovascular problems, such as those related to aging, atherosclerosis, and diabetes. The research, published in the *FASEB*, is the first to identify how much DHA is necessary to promote optimal heart health. "This study shows that regularly consuming small amounts of DHA is likely to improve the health status of people, especially in regards to cardiovascular function," said Michel Lagarde, co-author of the study.

To determine the optimal dose of DHA, Lagarde and colleagues examined the effects of increasing doses of DHA on 12 healthy male volunteers between ages of 53 and 65. These men consumed doses of DHA at 200, 400, 800, and 1600 mg per day for two weeks for each dose amount, with DHA being the only omega-3 fatty acid in their diet. Blood and urine samples were collected before and after each dose and at eight weeks after DHA supplementation stopped. The researchers then examined these samples for biochemical markers indicating the effects of each dose on the volunteers.

"Now that we have a very good idea about how much DHA is just right, the next step is to try it out in an expanded clinical trial that involves many more people. Until then, I'll stick with tasty foods that contain DHA, like fish, rather than getting a quick fatty-acid fix at the local vitamin store," said Gerald Weissmann, M.D., Editor-in-Chief of *The FASEB Journal*.

SoyaTech eNews September 1, 2009



Whole Grains, Bran May Fight Hypertension in Men

A study published in *American Journal of Clinical Nutrition* suggests that whole grain foods and foods high in bran bring a boost to heart health in men. The researchers collected data on 31,684 men who participated in the Health Professionals Follow-Up Study. When these men were enrolled in the study, none had high blood

pressure, cancer, heart disease, or had a stroke. During 18 years of follow-up, 9,227 men developed high blood pressure.

The researchers found that men who ate the highest amount of whole grains were 19% less likely to develop high blood pressure compared with men who ate the least amount of whole grains. In addition, men who ate the most bran reduced their risk of developing high blood pressure by 15% compared with men who ate the least bran, the study found. The researchers noted that these findings remained even after adjusting their data for other healthy lifestyle and diet factors. The authors say the findings could help in evaluating diet guidelines to help lower blood pressure.

From: IFT Newsletter Sept 2, 2009



IBS: soluble fibre does the trick but avoid bran, say scientists

Soluble fibre is an effective treatment for irritable bowel syndrome, but insoluble fibre may worsen symptoms, according to new research. Scientists at University Medical Centre Utrecht in the Netherlands randomised 275 patients aged 18 to 65 years with irritable bowel syndrome to receive either 10g of psyllium (soluble fibre), bran (insoluble fibre), or placebo (rice flour) twice a day for 12 weeks. Patients were assessed at one, two and three months for symptom relief, severity of abdominal pain and quality of life, using standard scoring scales. Findings showed that psyllium was the most effective treatment for irritable bowel syndrome, with a significantly greater number of patients reporting adequate symptom relief and a reduction in symptom severity.

After three months of treatment, symptom severity was reduced by 90 points in the psyllium group, 49 points in the placebo group, and 58 points in the bran group. However, no differences were reported between the groups in abdominal pain or quality of life. The researchers said bran showed no clinically relevant benefit. "Many patients seemed not to tolerate bran and the dropout rate was highest in this group," they reported.

They added: "These results support the addition of soluble fibre such as psyllium, but not bran as an effective first treatment approach in the clinical management of irritable bowel syndrome. Indeed, bran may worsen symptoms of irritable bowel syndrome and should be advised only with caution." Irritable bowel syndrome is characterised by abdominal pain and an irregular bowel habit, and affects an estimated 10% of the population. Increased intake of dietary fibre, often in dietary supplement form, is usually recommended to help alleviate symptoms, but experts say there is limited evidence that this treatment actually works.

From: Functional Ingredients September 08, 2009



Intrinsic quality of tomatoes

The production of tomato products is an important global industry, with the USA, Italy and Spain being major producing countries. In Spain, there are many small regional producers making tomato concentrates of high quality and thus high added value.

Processed tomato products such as concentrates should be an intense red in colour, and have characteristic tomato flavour and aroma, high consistency and low separation of the liquid fraction. Lycopene is the main component responsible for the red colour and also has positive health benefits due to its antioxidative activity. Colour degradation in tomato products is caused by isomerization, oxidation or enzymic co-oxidation of

lycopene.

To help standardize products from small regional producers, it would be useful to identify physical and chemical markers which could be used to monitor properties of the concentrates during their preparation. Some properties used to characterize tomato concentrates, such colour and consistency, are time-consuming and expensive to measure. Thus, markers that can be easily, cost-effectively and quickly determined and that could represent the whole set of variables are more desirable.

A study by Ordonez-Santos *et al.*¹, investigated 18 physical and chemical variables in 25 samples of commercial tomato products, including crushed tomatoes, tomato puree, tomato paste and heavy concentrates from a range of producers in various countries. Variation and relationships among these variables were analysed by correlation analysis and multidimensional data analysis techniques. Three variables were selected that could be used to classify the sample and monitor quality, namely soluble solids content, the CIE lightness parameter (L*) and total pectic substances content.

FSTA Reports 19 September 2008



Vitamin C and Brain Development

New research at LIFE – Faculty of Life Sciences at University of Copenhagen shows that, based on animal research, vitamin C deficiency may impair the mental development of newborn babies. For a study published in the **American Journal of Clinical Nutrition**, a group of researchers showed that guinea pigs subjected to moderate vitamin C deficiency have 30 per cent less hippocampal neurones and markedly worse spatial memory than guinea pigs given a normal diet. Like guinea pigs, human beings are dependent on getting vitamin C through their diet, and the researchers therefore speculate that vitamin C deficiency in pregnant and breast-feeding women may also lead to impaired development in fetuses and newborn babies.

From: Food Product Design 9/3/2009



Whole flaxseed, but not oil, may cut cholesterol

Adding whole flaxseed to your diet, but not flaxseed oil, may help lower your cholesterol levels, hint the combined results of multiple studies. Flaxseed is seen as a heart-healthy food as it contains high amounts of omega-3 fatty acids, fiber, digestion-aiding compounds called lignans, and alpha linolenic acid, which is linked to heart health. However, individual studies on flaxseed's impact on blood cholesterol levels have yielded mixed results.

This led Dr. Xu Lin, at the Chinese Academy of Sciences in Shanghai, and colleagues, to pool results from 28 studies involving more than 1,500 men and women to try to clarify the impact whole flaxseed and its derivatives have on cholesterol levels. Average whole flaxseed or flaxseed oil intake was about one tablespoon daily. The findings, reported in the *American Journal of Clinical Nutrition*, link whole flaxseed with reductions in total cholesterol and "bad" LDL cholesterol.

Total and LDL cholesterol reductions with whole flaxseed intake were stronger in women, particularly postmenopausal women, than men, and in people with higher cholesterol concentrations at the outset, the researchers note. Whole flaxseed, however, did not appear to significantly alter levels of harmful triglycerides or "good" HDL cholesterol.

Lin's group also noted declines in total and LDL cholesterol, but not HDL cholesterol or triglycerides, associated with taking supplements of flaxseed lignans (about 430 milligrams on average), but no reductions associated with flaxseed oil supplements. The investigators suggest, based on their findings, that eating whole flaxseed may be a "worthwhile dietary approach" for preventing high cholesterol. They call for further large-scale investigations to assess the impact flaxseed and flaxseed compounds have among men and women at risk for heart disease.

From: Reuters Sep 7, 2009



Coconut Oil Extract May Be Used as Antimicrobial Agent in Food: Chinese Research

An extract from coconut oil, called monolaurin, could be used as a microbial agent in foods, according to a study. Monolaurin has been recognized as safe by the U.S. Food and Drug Administration (FDA) and is known for its antimicrobial properties. When used in combination with other antimicrobial agents, it could prove to be an effective barrier to microorganisms

Researchers from Zhejiang University in China studied the use of monolaurin as a nontraditional preservative in food products by combining it with commonly used antimicrobials in various concentrations and testing it on bacterial strains including Esherichia coli and on food components such as soy protein and water-soluble starch. And they found that monolaurin combined with ethylenediaminetetraacetic acid (EDTA) a binding agent, was effective against Esherichia coli and Bacillus subtilis but not Staphylococcus aureus. When combined with the antimicrobial nisin, monolaurin was synergistically effective against all three bacteria.

Researchers studied monolaurin's interaction with food components and found that its antibacterial effectiveness was reduced by fat or starch but was not affected by protein. "These results contribute to a better understanding on the use of monolaurin as a nontraditional preservative for antimicrobial purpose in food products. The antimicrobial effects of monolaurin can be increased if used together or in combination with other preservative systems," said lead researcher ui Zhang.

From: SoyaTech eNews September 8, 2009 --



Frozen veg 'as good for you as fresh'

According to new research, frozen vegetables can be as nutritious as eating fresh ones. The study; conducted by the Centre for Food Innovation at Sheffield Hallam University on behalf of the British Frozen Food Federation and the Local Authority Caterers Association, also uncovered problems in the food chain. It found that in some cases fresh food may actually have less nutritional value because of "significant deterioration" in the supply chain.

The research found that fresh food on average travels through a two-week distribution chain which includes being bagged and packaged and delivered to sellers. However, frozen food, according to the study, is frozen shortly after being harvested. Because of this, researchers said using frozen food in schools could be better for children who eat primary school dinners, as long as quality raw ingredients are used and food is stored and cooked correctly.

Charlotte Harden, who wrote the report, said: "We must disregard the mistaken view that fresh food is always better for us than frozen food. "Frozen food can be nutritionally comparable or in some cases nutritionally superior."

The news comes after another recent study found that organic food is no healthier than the traditionally-produced alternative, according to Food Standards Agency research.

From: Ingredients Network News Sept 09



Omega 3 Linked to AMD Prevention

Current research suggests that a diet high in omega-3 fatty acids may help prevent one of the leading causes of legal blindness among the elderly. The related report by Tuo et al, "A high omega-3 fatty acid diet reduces retinal lesions in a murine model of macular degeneration," appears in the August 2009 issue of the American Journal of Pathology.

Age-related macular degeneration (AMD), loss of vision in the center of the visual field (macula) due to retinal damage, is one of the leading causes of legal blindness among the elderly. Approximately 10% of people from 66 to 74 years of age will develop some level of macular degeneration, making it difficult for them to read or even recognize faces.

A diet high in omega-3 fatty acids has been found to protect against a variety of diseases including atherosclerosis and Alzheimer's disease. Retrospective studies have suggested that diets high in fish oil or omega-3 fatty acids may also contribute to protection against AMD. A group led by Dr. Chi-Chao Chan at the National Eye Institute in Bethesda, MD examined the direct effect of omega-3 fatty acids on a mouse model of AMD. A diet with high levels of omega-3 fatty acids resulted in slower lesion progression, with improvement in some lesions. These mice had lower levels of inflammatory molecules and higher levels of anti-inflammatory molecules, which may explain this protective effect.

Tuo et al suggest that "a diet enriched in EPA and DHA can ameliorate the progression of retinal lesions in their mouse model of AMD" and that "the results in these mice are in line with the epidemiological studies of AMD risk reduction by long chain n-3 fatty acids." The results "further provide the scientific basis for the application of omega-3 fatty acids and their biologically active derivatives in the prevention and treatment of AMD." In future studies, Dr. Chan and colleagues plan to use this murine model "to evaluate [other] therapies that might delay the development of AMD." Their ongoing projects include the "testing of systematic delivered pharmacochaperones and antioxidative molecules, as well as intraocularly delivered gene therapies."

From: Nutrition Horizon 23 Jul 2009



High-fat, high-sugar foods alter brain receptors

Overconsumption of fatty, sugary foods leads to changes in brain receptors, according to new animal research at Johns Hopkins University School of Medicine. The new research results are being presented at the 2009 annual meeting of the Society for the Study of Ingestive Behavior (SSIB), the foremost society for research into all aspects of eating and drinking behavior. The results have implications for understanding bulimia and other binge eating disorders.

Dr. Bello and colleagues report that either continuous eating or binge eating a high fat, high sugar diet alters opioid receptor levels in an area of the brain that controls food intake. Opioids are a family of chemicals with actions similar to those of morphine; however, opioids exist naturally in the brain and have been linked to feelings of pleasure and euphoria. "These results are interesting because we saw changes in opioid receptor gene expression in a brain area that controls how much we eat during a meal", said Bello. The new findings suggest that overconsumption of highly palatable foods maintains bingeing by enhancing opioids in the brain, and that increased opioids could be a factor involved in binge eating disorders. These findings may help to understand the biological basis of eating disorders.

From: Eurekalert 7/28/09



Freshly Crushed Garlic Better For The Heart Than Processed

A new study reports what scientists term the first scientific evidence that freshly crushed garlic has more potent heart-healthy effects than dried garlic. Scheduled for the Aug. 12 issue of the *Journal of Agricultural and Food Chemistry*, it also challenges the widespread belief that most of garlic's benefits are due to its rich array of antioxidants. Instead, garlic's heart-healthy effects seem to result mainly from hydrogen sulfide, a chemical signaling substance that forms after garlic is cut or crushed and relaxes blood vessels when eaten.

In the study, Dipak K. Das and colleagues point out that raw, crushed garlic generates hydrogen sulfide through a chemical reaction. Although best known as the stuff that gives rotten eggs their distinctive odor, hydrogen sulfide also acts as a chemical messenger in the body, relaxing blood vessels and allowing more blood to pass through. Processed and cooked garlic, however, loses its ability to generate hydrogen sulfide.

The scientists gave freshly crushed garlic and processed garlic to two groups of lab rats, and then studied how well the animals' hearts recovered from simulated heart attacks. "Both crushed and processed garlic reduced damage from lack of oxygen, but the fresh garlic group had a significantly greater effect on restoring good blood flow in the aorta and increased pressure in the left ventricle of the heart," Das said.

Science Daily (July 29, 2009)



Carnitine Supplements Reverse Glucose Intolerance in Animals

Supplementing obese rats with the nutrient carnitine helps the animals to clear the extra sugar in their blood, something they had trouble doing on their own, researchers at Duke University Medical Center report. A team led by Deborah Muoio (Moo-ee-oo), Ph.D., of the Duke Sarah W. Stedman Nutrition and Metabolism Center, also performed tests on human muscle cells that showed supplementing with carnitine might help older people with prediabetes, diabetes, and other disorders that make glucose (sugar) metabolism difficult.

Carnitine is made in the liver and recycled by the kidney, but in some cases when this is insufficient, dietary carnitine from red meat and other animal foods can compensate for the shortfall. After just eight weeks of supplementation with carnitine, the obese rats restored their cells' fuel-burning capacity (which was shut down by a lack of natural carnitine) and improved their glucose tolerance, a health outcome that indicates a lower risk of diabetes.

These results offer hope for a new therapeutic option for people with glucose intolerance, older people, people

with kidney disease, and those with type 2 diabetes (what used to be called adult-onset diabetes). Muoio said that soon her team of researchers will begin a small clinical trial of carnitine supplementation in people who fit the profile of those who might benefit from additional carnitine – older people (60 to 80 years) with glucose intolerance. The study is published in the Aug. 21 issue of the *Journal of Biological Chemistry*.

The Duke researchers began studying carnitine more closely when abnormalities in the nutrient emerged from blood chemistry profiles of obese and old animals. These chemical profiles report on hundreds of byproducts of cell metabolism called metabolites and give scientists an opportunity to identify markers of disease states.

Carnitine is a natural compound known for helping fatty acids enter the mitochondria, the powerhouses of cells, where fatty acids are "burned" to give cells energy for their various tasks. Carnitine also helps move excess fuel from cells into the circulating blood, which then redistributes this energy source to needier organs or to the kidneys for removal. These processes occur through the formation of acylcarnitine molecules, energy molecules that can cross membrane barriers that encase all cells.

Researchers at Duke had observed that skeletal muscle of obese rats produced high amounts of the acylcarnitines, which requires free carnitine. As these molecules started to accumulate, the availability of free, unprocessed carnitine decreased. This imbalance was linked to fuel-burning problems, that is, impairments in the cells' combustion of both fat and glucose fuel.

"We suspected that persistent increases in acylcarnitines in the rats were causing problems, and we could also see that the availability of free carnitine was decreasing with weight gain and aging," said Muoio. "It appeared that carnitine could no longer do its job when chronic metabolic disruptions were stressing the system. That's when we designed an experiment to add extra carnitine to the rats' diet."

Source: Nutrition Horizon 13 Aug 2009



U Kentucky study finds meal replacements aid weight loss

Meal replacements in a medically supervised weight loss program are successful in facilitating weight loss, according to a new study conducted at the University of Kentucky. The study appears in the August 2009 issue of the *Journal of the American Dietetic Association*.

The meal replacements are products of Health Management Resources Corporation (HMR), a privately owned national health care company specializing in weight loss and weight management.

The study assessed weight outcomes, behavioral data and side effects for obese patients enrolled in an intensive behavioral weight loss program. Two treatment options were offered, Medically Supervised and Healthy Solutions. Medically Supervised patients restricted food consumption to meal replacements, which consisted of shakes and entrees, and bars. Patients either consumed five shakes daily or three shakes and two shelf-stable entrees daily. Healthy Solutions patients limited food intake to shakes, entrees, bars, fruit and vegetables. Recommendations were to consume a minimum of three shakes, two entrees and five servings of fruit and vegetables daily. Some patients with diabetes, hypertension or medical problems necessitated the Medically Supervised option. Patients in the Medically Supervised option lost an average of 43.4 pounds in 19 weeks. Patients in the Healthy Solutions option lost an average of 37.5 pounds in 18 weeks. The study also found that patient compliance, accountability and commitment with the support of a structured program increases weight loss success.

The study's co-author, Dr. James W. Anderson, professor emeritus of internal medicine and clinical nutrition at the University of Kentucky College of Medicine, said the gold standard for weight loss by the health community is a 5 to 10 percent loss of initial body weight. "This study showed a loss of 16.4 percent of initial body weight in the Medically Supervised group and a loss of 15.8 percent of initial body weight in the Healthy Solutions group, both well above the gold standard the health community considers successful and when health improvements are seen."

From: Eurekalert (Aug. 12, 2009) –

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