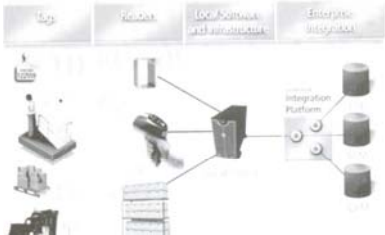
Editorial

When you travel out of Mumbai you find at several check nakas, octroi checking is taking place. At Vashi or at Thane, you see all kinds of trucks being stopped and at times there is a long parade of these trucks waiting for getting checked. I am not writing this for or against octroi although I may be having strong views about octroi. In spite of this, many unscrupulous drivers get through checking without getting caught for octroi. We also have long lines of cars at various toll booths. If the toll charges are different for different types of vehicles then there is even longer line.

Today there are many fancy electronic gadgets are available which allow us to scrutinise the goods without really going through the whole truck physically to find something valuable which has not been declared. One such gadget is RFID (Radio Frequency Identification) which is rapidly becoming useful all across the world. Already several toll collection booths in the different metro cities in western and some other countries including Mexico, Dubai, Turkey etc. have already installed them.

India is also planning to introduce these tags for toll collection purpose so the tag will allow the car to go through toll bridges without stopping. There was one experiment with Delhi-Noida Toll bridge which had several problems. Eventually these will get solved and we will have electronic toll collection at every toll booth with hardly any traffic chokes that we see today. Each car will have an RFID tag and that would be sensed by booth scanner.

Similar technology could be used in either octroi or to track any movement of goods either within the country or across the boundaries of different countries. Today, RFID tags are used for various applications including vehicle registration, payment of mobile phones, transport payments including tolls, season tickets for parking, public travel, libraries, passports, schools, animal identification and tracking and even in hospitals and healthcare.



However, the application relevant to us is product tracking in the local as well as global market. When the food is packed it will also get a tag having all the relevant details of the manufacturing including batch, date, ingredients, quality, nutrition information, any warnings etc. as well as any storage conditions recommended, destination etc.

The best part is that it is not necessary for the scanner to make visual contact. Even when there are various packages in one container each having a different tag it can be sensed and noted. Trucks do not have to be unloaded or packages opened to see what is inside or to see the label. This would expedite the movement of goods and make life very easy. There would be automatic entry of all the goods passing the check point so there is less manual work involved in writing and no mistakes. Of course to come to such a level of efficiency it would take years but this would be possible.

One of the problems of traceability in India is that marketing and distribution network is so complex that even manufacturers would find it hard to say where their products have gone. A system similar to dabbawalas in Mumbai takes over the retailing in India especially in smaller markets like villages. Using RFID would at least help companies track their products, make better estimates of market volumes and distribution and possibly take better care to design the product that would go to distant markets through such complex system.

Hopefully, such a change would come soon. And of course I would like to see the end of mad dash of cars near the toll booth to find the line that is shorter so wait is minimal or to cut into lines without waiting. Bye now

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

PFNDAI Bulletin July 2011

Enzymes in Food Processing Industry :Prof.Jagadish Pai

Enzymes are biocatalysts that help carry out complex chemical reactions in the living systems under amazingly simple conditions and at phenomenal speeds. An example is when we consume milk which contains milk sugar lactose that is composed of glucose and galactose. In our body we have enzyme lactase which catalyses the reaction of hydrolysis of lactose to glucose and galactose so they could be absorbed in the intestine. Acid hydrolysis of lactose is possible but requires very high temperature say near 100°C at very low pH which conditions cannot be tolerated by our body so enzymes are extremely useful.

Not only are these enzymes useful in our body, many enzymes are now being used for various purposes in food preparation and processing as well as in making it safe. One of the oldest applications of enzymes is in making cheese. Although cheese was prepared since several thousand years ago, enzyme rennet from calf was used more recently probably around Roman times. Since then enzymes have been used in many different products and in many different industries including textiles, leather and in modern times it has been used in medicines, detergents, paper and pulp among others.

Use of Enzymes in various industries

Out of the total enzyme market, food application accounts for almost half. However, detergent use is very big and probably single largest application of the industrial enzymes. Use of detergents has many difficulties. Use of high temperature and vigorous agitation that is needed to remove most types of dirt shortens life of clothes and also increases cost of cleaning. Use of enzymes such as proteases, amylases, lipase etc. allows use of lower temperatures, shorter times, easy removal of stains due to blood, sweat, grass, grease etc. and is very cost effective and economic as well as it is safe and environmentally friendly.

Enzymes are also used in textiles. Applications including desizing to remove starch by amylases from fabric, faded look to blue jeans and biopolishing of cotton fabrics by cellulases are among many applications in textiles. Enzymes are also used in pulp and paper industry. Xylanases are used for bleaching and cellulase is used in recycled paper to remove ink.

Leather industry traditionally used proteases for tanning. In leather processing proteases are useful in softening as well as removal of hair from hides. Lipases also have applications.

Enzymes are also used in pharmaceutical industry for certain reactions e.g. use of penicillin acylase for preparing 6 APA from penicillin for preparing semisynthetic penicillins. Even chemical industry has started using enzymes for preparing fine chemicals. Enzymes are used in newer analytical methods. Enzymes are finding newer applications in extremely diverse areas but food applications still continue to dominate the enzyme industry.

Applications of Enzymes in Food Industry

Enzymes have been used in food preparation and processing for many centuries with major applications in brewing beer, making bread, making wine and preparing cheese although the realisation of enzymatic action came much later. Early enzymes were used while they were still in cells and tissues. Only in late nineteenth century Danish chemist Hansen prepared rennet by extracting calf stomach with saline which was probably the beginning of enzyme technology.

Early enzymes were sourced from animals and plants and microbial enzymes became popular because they were inexpensive and could be produced in large quantity in short time and uniformity of activity could be ensured more easily. Enzymes like pancreatic enzymes, calf rennet, proteolytic enzymes like papain from papaya, ficin from figs, bromelain from pineapple etc. are now being replaced by various microbial enzymes.

Advantages of Enzymes

Enzymes are proteins and sometimes may also contain non-protein component. Digestive enzymes pepsin and trypsin hydrolyse proteins into peptides and amino acids. Amylases from malt hydrolyse starch into sugars and dextrins. They have several distinct advantages over chemical catalysts like acid or metals. Enzymes are highly specific e.g. proteases hydrolyse only proteins and not starch or fats. Thus side reactions are minimal with little by-products.

Enzymatic reactions are highly efficient with enzyme molecules catalysing millions of molecules of the substrate per minute into products. As mentioned earlier, these reactions are carried out under mild conditions of temperature and pH so they are not hazardous unlike chemical reactions. Hence enzymatic reactions require less energy and cheaper equipments.

Enzymatic reactions are also easier to control with respect to rate and extent of reactions so process control much better. Stopping the reaction is easy by deactivating the enzyme by using heat, pH or certain chemicals. As the modern processes use less expensive microbial enzymes the cost of the process is further reduced.

Although enzymes are not very stable and are used up in processes, newer technology is available that make them more stable and reusable by immobilising them on inert support so they could be used for continuous processes for long periods.

Dairy Industry

Calf rennet is used to clot milk for cheese making. Rennet from mature animals would not only clot milk but would cause further action on casein so bitter peptides would be formed and curd yield would be lower. About half a century ago, there were greater demands for cheese as well as for meat, so alternate microbial proteases were developed that had similar activity on casein and must be deactivated when curd is pasteurised.

In India, government banned calf rennet for religious sentiments in cheese making so for several decades manufacturers here have been using only microbial rennet. Such microbial rennet is acceptable as vegetarian rennet so cheese would be vegetarian. World over microbial rennet is being used to a large extent. There is also genetically engineered microbial rennet available now that has calf gene introduced into microbe such as Aspergillus niger which will then produce calf rennet like protease.

Another important use of enzymes in dairy industry is for lactose intolerance. Milk sugar lactose is digested in the small intestine by enzyme lactase. Certain individuals including children cannot hydrolyse lactose adequately due to deficiency of lactase so lactose remains intact when it goes to large intestine where bacteria use it and produce lot of gas resulting in cramps, bloating, vomiting, diarrhea etc. when they consume good quantities of milk and dairy products.

Microbial lactase may be used to predigest milk sugar so lactose intolerant people drinking this low or no-lactose milk will not experience any discomfort. Enzyme may be used in dairy while processing to produce lactose-free milk or enzyme may be available to consumers so they can add to milk before drinking milk. Also available are tablets or capsules of lactase preparation which could be taken before consuming dairy products so lactase will be available in the intestine when lactose comes there. Enzyme preparations however must be made so lactase does not get destroyed in stomach and also its activity is high enough in intestinal pH.

Lactose intolerant people can usually consume fermented dairy products like curd, yogurt, buttermilk etc. as in these products good proportion of lactose is already digested and used by lactic acid bacteria and lactase from these fermenting organisms will be present to take care of lactose in intestine.

Many other properties of milk products can be modified by enzymes. Proteases can modify whippability, solubility, emulsification, viscosity, suspension and dispersion of milk proteins can be altered to suit the product in which

milk protein is used. Even the allergy to milk proteins can be reduced by hydrolysis using proteases.

Cheeses can be ripened with the help of enzymes. During ripening fat is hydrolysed partially forming free fatty acids with strong flavours as in Blue, Gorgonzola and Roquefort cheeses. Traditional mould ripening is slow. Lipases can speed up the process of ripening.

Fruit & Vegetable Industry

Fruit juice industry uses enzymes for many applications. One of the early applications was clarification. Except orange and other citrus juices, most other juices are preferred clear. Clarity of apple and grape juices enhances their appeal so when there are fibrous material pectinases are quite useful. Earlier removal of fibre by microfiltration not only reduced the yield but could not remove haziness of juices. Enzymes just hydrolysed the suspended material to solubilise them which did not reduce the yield and also fibre content remained almost similar.

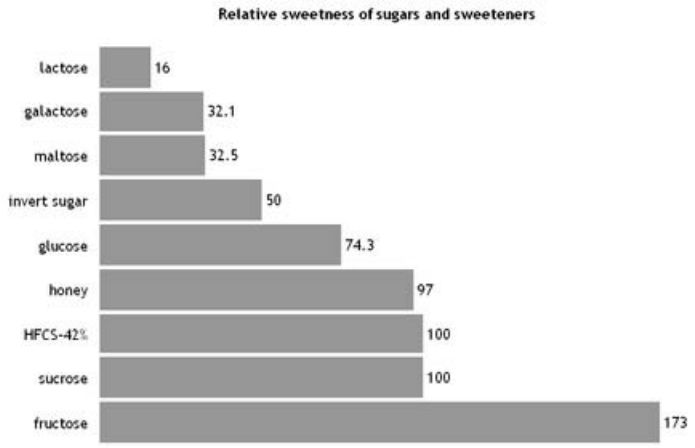
Juice in fruit is present in juice sacs which are surrounded by pectinous, cellulosic and hemicellulosic material. When fruit pulp is pressed only the part of the juice could be extracted with a good amount remaining occluded within fibrous residue. When pestinases, xylanases and cellulases were used together the enzyme yields increased substantially both due to removal cellulosic material as well as reduction in viscosity of juice which made it more free flowing. There is also an additional benefit in the process. Enzyme hydrolysis products include fructo-oligosaccharide and other soluble fibres which are beneficial in cholesterol reduction and also as prebiotics.

Fruit juices containing high pectin are difficult to concentrate as pectin causes gelling. If pectin is partially hydrolysed using pectinases juices can be concentrated and stored under frozen conditions without any gelling.

Starch & Sugar Industry

Starch is a polymer of glucose. Starch was chemically hydrolysed to corn syrup using acid. However, hydrolysis achieved is not to a great extent nor high amount of glucose is produced. Besides the high temperature process also produced many other chemicals as by-products at the expense of glucose and also produced colour. Using amylases could overcome all these problems and also maltodextrins could be produced of different sizes having different useful applications in many different food products. Using a combination of amylases and gluco-amylase, very high conversion to glucose could be achieved.

Even a complete conversion of starch to glucose does not produce a very sweet syrup as glucose is only 75% as sweet as sucrose. However, fructose is over 1½ times as sweet as sucrose so if some glucose could be converted to fructose, it would produce sweeter syrup. Enzyme glucose isomerase converts almost half of glucose to fructose giving a mixture of glucose and fructose called High Fructose Corn Syrup (HFCS). Fructose can be chromatographically separated and enriched and different combinations of glucose and fructose made.



Sugar cane grows in places which are hot and humid. Under such conditions sometimes some bacteria grow on sugar canes and produce dextran. This dextran goes into cane juice while extracting and if not removed may cause difficulties in clarification and filtration due to high viscosity. If deposited on heating surfaces it reduces heat transfer and also interferes with crystallization of sugar resulting in lower yields. It can be easily removed by dextranase which degrades it producing simpler soluble products that do not cause any problems.

Bakery Industry

When water is added to wheat flour to make dough, it also activates the diastases or wheat amylases which act on starch and produce maltose. The yeast added to leaven the dough utilises this to grow and produce CO2 that leavens the bread dough. Sometimes wheat flour lacks enzymes so yeast does not get enough sugar to grow and leaven giving poor loaf volumes. Addition of amylases and proteases produce enough yeast food so uniform results are obtained for yeast-raised products like bread, crackers, rolls etc.

Baked goods have a nice brown crust colour due to caramelisation of sugar. If there is inadequate sugar present during baking then faded brown colour is formed which is not very attractive. When enzyme amyloglucosidase is added to flour, it produces glucose which gives the most intense of colour among sugars due to caramelisation and maillard reaction.

Staling of bread is a problem. Consumers check the freshness and quality of bread by squeezing it and as bread starts to become stale it hardens and although it is not spoiled consumers reject it. Thus staling or hardening of bread crumb needs to be delayed. Staling is a complex phenomenon involving mostly loss of moisture by starch which undergoes retrogradation. Emulsifiers are useful and if they are used along with amylases e.g. maltogen exoamylase produces more soluble starch that retains moisture retarding staling.

Enzymes can also be used in biscuit manufacture. Biscuit dough is prepared by soft flour with less protein so when it is sheeted and embossed to cut discs or other shapes of unbaked dough it should remain unchanged. When hard flour is used because of greater elasticity cut dough pieces get distorted as they shrink. This may be prevented by use of sodium bisulphite to weaken the protein, but as it degrades vitamin B_1 and to avoid chemicals, proteases can be used to achieve the same results with less undesirable side effects.

Alcoholic Beverage Industry

Barley malt is used in beer production and it contains enzymes amylases and proteases along with soluble carbohydrates and proteins needed for yeast to grow. Yeast cannot use starch and protein in undegraded form. Malt enzymes then act on grains to break down starch and protein which is used by yeast to produce ethanol. Malt is expensive and its enzyme activity is variable causing variable results in brewing. To avoid this, microbial enzymes may be added to grain to get uniformly better results. Enzymes also help use of different grains as adjuncts in beer manufacture giving higher

production with benefits of quality and cost.

Wine industry also uses enzymes as colour and appearance is very important for wines. If excess pectin is present in fruit juice not only viscosity is increased affecting the processing but also affects the release of pigments from grape skin. Pectinases hydrolyse the pectin to soluble products and also improves extraction of pigment giving better colour for wine. Grape mould may produce glucan that causes problems in filtration especially when alcohol is present in the system that lowers its solubility. Glucanase breaks it down to soluble materials.

Miscellaneous Applications

The food we consume if digested by pancreatic enzymes in intestine. However, when we eat too much then external help may be necessary. Enzyme preparations from animal, plant or microbes include proteases, lipases and amylases that help digest food without cause problems or indigestion. There are certain proteases including papain that is used for meat tenderising so even tough meat becomes tender.

Lipases and esterases have been used for preparing and modifying flavour components as well as for modification of fats. Partial hydrogenation of oils and fats using metal catalysts produce trans fats as by products whereas lipases could be used to rearrange and change the composition of fats with respect to unsaturated fatty acids and even omega-3 fatty acids without the deleterious effects.
Enzymes are also useful making other foods safe and nutritious. One example is the use of asparaginase in frying of potato products like French fries and chips. Formation of acrylamide is sharply reduced when potato pieces are dipped in asparaginase solution.

Phytates are present in many cereals and legumes and can bind some essential minerals like iron, zinc etc. making them less bio-available. Use of phytase makes these minerals more available as nutrients when consumed. This makes vegetarian diet more nutritious. Use of pectinases and cellulases improves the availability of many carotenoids and healthy components in vegetarian diets.

Future

Enzymes are natural and their application is also a natural process. There are also many safety aspects of use of enzymes in food production and processing. With the focus on safety of food products in future the application of enzymes is set to grow. Many newer applications are discovered every year. With the advent of biotechnology the possibility of enzyme usefulness is set to increase tremendously. Regulatory clarity is needed about use of enzymes in food processing. Future certainly looks very bright for enzymes and for the safer and more nutritious food products.

Table:1 SOURCES OF INDUSTRIALLY IMPORTANT ENZYMES.

Enzyme	Source	Applications
Amylases	*Bacillus* and *Aspergillus* spp.	Starch liquefaction, baking, brewing, textiles, detergents, etc.
Beta-Glucanases	Bacillus spp.	Brewing and animal feedstuff
Bromelain	Pineapple	Meat tenderization, chill-proofing of beer
Cellulases	*Trichoderma* spp.	Textile biopolishing, pulp and paper, detergents
Chymosin	Calf stomach	Cheese manufacture
Ficin	Figs	Meat Tenderization
Glucose isojmerase	*Bacillus* and *Streptomyces* spp.	Glucose isomerization to fructose
Lipases	Pseudomonas spp.	Detergents, oils and fats, baking, leather, paper, etc.
Papain	Papaya latex	Meat tenderization, brewing
Pectinases	*Aspergillus* spp.	Pectin hydrolysis in fruit juice clarification
Proteases	*Bacillus* and *Aspergillus* spp.	Detergents, brewing, meat tenderization, baking, bone cleaning, hydrolyzed animal proteins, functional meat proteins, etc.
Pepsin	Stomach of slaughtered animals	Digestive aid
Transglutaminases	*Streptomyces* spp.	Protein cross-linking and gelation and meat binding.
Trypsin	Stomach of slaughtered animals	Digestive aid.

Food Safety & Standards (Licensing & Registration of Food Businesses) Regulations, 2011

By: Ms. Anita Williams, General Counsel & Prabodh Halde, Regulatory, Marico

Introduction

Indian food new food law (FSSA) was born in 2006 and final regulation came in existence in year 2011.The Food Safety and Standards Act 2006 is a new legislation that integrates eight different existing food laws and is a comprehensive enactment aimed at ensuring public health and safety. The implementation of this Act will be a major transformation that ensures to bring paradigm shift in the food regulatory scenario of India. The Food Safety and Standards Regulations, 2011 have been released now in seven chapters and are effective from 5th of August 2011. The new food law will have major impact on the food industry and food traders. The said article will cover the impact of new licensing and registration procedure on food industry.

LICENSING AND REGISTRATION.

The FSS Act 2006 compels the licensing/registration of every single entity in the food business. The entities have been categorized as petty food manufacturers and food business operators depending upon their manufacturing capacities. Petty food manufacturers, for e.g. street food vendors or small food business operators (FBOs) with annual turnover less than Rs 12 lakhs will, fall under the purview of registration and it is mandated that these petty food manufacturers must register with the Registering authority. The Licensing system has been laid down as a two tier system comprising of Central & State Licensing. The list of businesses which fall under the purview of Central Licensing Authority are enlisted in Schedule 1 of the Food Safety and Standards (Licensing &Registration) Regulations, 2011.

SCHEDULE 1 : FBOS Under Central Licensing

- Dairy units including milk chilling units equipped to handle or process more than 50,000 litres of liquid milk/day or 2500 MT of milk solid per annum
- Vegetable oil processing units and units producing vegetable oil by the process of solvent extraction and refineries including oil expeller unit having installed capacity more than 2 MT per day
- All slaughter houses equipped to slaughter more than 50 large animals or 150 or more small animals including sheep and goats or 1000 or more poultry birds per day
- Meat processing units equipped to handle or process more than 500 kg of meat per day or 150 MT per annum
- All food processing units other than mentioned under (I) to (IV) including relabellers and repackers having installed capacity more than 2 MT/day except grains, cereals and pulses milling units
- 100 % Export Oriented Units
- All Importers importing food items including food ingredients and additives for commercial use
- All food business operators manufacturing any article of food containing ingredients or substances or using technologies or processes or combination thereof whose safety has not been established through these regulations or which do not have a history of safe use or food containing ingredients which are being introduced for the first time into the country
- Food Business Operator operating in two or more states
- Food catering services in establishments and units under Central government Agencies like Railways, Air and airport, Seaport, Defence etc.

The following officers have been appointed as Designated Officers under Central Licensing for the respective jurisdiction/area provided against the names.

Sl No.	Name of the Officer	Area of Jurisdiction
1.	Dr. A.K. Singla, SMO	Delhi, Uttarakhand, Rajasthan, J&K, Himachal Pradesh
2	Dr. Bishan Chand, MO	Punjab, Haryana, Chandigarh
3	Sh. M.K. Singh, SIO	Uttar Pradesh
4	Sh. Ais Kumar, DD	Gujarat, Maharashtra, Dadra & Nagar Haveli, Daman & Diu, Goa, Madhya Pradesh
5	Dr. G. Srinivasan, SMO	Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Puduchery, Lakshadweep
6	Dr. S.K. Mohanta, SMO	West Bengal, Orissa, Bihar, Jharkhand, Sikkim, A&N Islands, Chhattisgarh
7	Sh. V.K. Pancham, SIO	Assam, Arunachal Pradesh, Tripura, Mizoram, Meghalya, Nagaland

To apply / renew a license under the FSSA act, the following needs to be done:

Firstly it needs to be checked if the business falls under Schedule I. In case yes, then the License needs to be taken from the Central Licensing authority. The details of the Central Licensing Authority are attached with this note.

The existing PFA licenses can be converted into the license/registration under these regulations by making an application to the Licensing Authority after complying with the conditions of License and Schedule 4.

The license can be taken for a period of 1 to 5 years as per our requirement. The application for renewal of license needs to be made in the manner prescribed in Form B, not later than 30 days prior to the expiry date indicated in the license, if not it would attract a late fee of Rs.100 per day of delay. *Form B is attached with this note for ready reference.*

FBOs should ensure that all conditions of license as provided in Annexure 2 of Form B in Schedule 2 as well as the safety, sanitary & hygienic requirements provided in the schedule 4 are periodically complied with.

APPLICATION FOR LICENSE TO THE LICENSING AUTHORITY

Application is to be made in Form B of Schedule 2 to the concerned Licensing Authority accompanied with the following:

Self-attested declaration in the format provided in Annexure-1
Copies of documents mentioned in Annexure 2 of Schedule-2
Applicable fees prescribed in Schedule 3

How would the license be processed?

A license shall be issued by the Licensing Authority within a period of 60 days from the date of issue of an application ID number.

The Licensing Authority on receipt of an application may ask for additional information within 15 days of the application which needs to be provided within 30 days from the day it is asked for. It shall then issue an Application ID number for future correspondences.

↓

After the issue of the Application ID number the Licensing Authority may direct the food safety officer/any other designated person to inspect the premises in accordance with the Regulations & serve a notice to the applicant with regards any alterations which are required. However, it is mentioned in the Rules that a Food Business Operator having valid certificate of an accredited food safety auditor or from an agency accredited by Food authority or any other organisation notified by food authority for this purpose will not be normally required to be inspected before renewal of license.

↓

The intimation of the alterations made have to be intimated to the Licensing Authority within 30 days.

↓

Within a period of 30 days from receipt of an inspection report the concerned Licensing Authority shall consider the application and may either grant or reject the license after giving a reasonable opportunity of being heard to the applicant.

↓

The License shall be then issued in Format C under Schedule 2 of these Regulations, a true copy of the same needs to be displayed at a prominent place at all the premises where the food business is carried out.

FBO can commence food business if the Licensing Authority does not issue a license within 60 days from the date of

making the application or does not intimate of any inadequacy or inspection report indicating defects.

Licensing Requirements

Every food business operator (FBO) needs to adhere to following requirements.

- A true copy of the FSSA license is displayed at a prominent place in the premises at all times
- Information with respect to any change or modifications in activities/license content is communicated to the Authorities
- The production process is supervised by at least one technical person, who possesses at least a degree in Science with Chemistry/Bio Chemistry/Food and Nutrition/ Microbiology or a degree or diploma in food technology or any degree or diploma related to the specific requirements of the business from a recognized university or institute or equivalent
- The periodic annual return from 1st April to 31st March is furnished within 31st May of each year
- No product other than the product(s) indicated in the license/ registration is produced in the facility
- The sanitary and hygienic standards and worker's hygiene is followed and implemented as specified in the Schedule – 4
- The daily records of production, raw materials utilization and sales are maintained in a separate register
- The source and standards of raw material used are of optimum quality
- Premises for manufacture, storage, exposure for sale of food are well separated from any urinal, drain, storage area for foul/waste matter

- Clean-In-Place systems (wherever necessary) for regular cleaning of the machine & equipments are maintained and followed
- The testing of all relevant chemical and microbiological contaminants in food products is carried out through own or NABL/FSSA recognized labs at least once in six months
- Required temperature/conditions are maintained throughout the supply chain from the place of procurement/sourcing till the consumer end including transportation, storage, etc
- The food products are bought/sold by the manufacturer/importer/distributor only from or to licensed/registered vendors and records are maintained
- A register is maintained for edible oils and solvent extracted oil, showing the quantity of oil manufactured, received, nature of oil used as applicable and the destination of each consignment of the substances sent out from the factory. Such register is furnished for inspection when required by the Licensing Authority
- Well equipped laboratory facility for analytical testing of samples is available in the premises
- No edible oil is sold/distributed/offered for sale/dispatched or delivered for purpose of sale unless it is packed, marked and labelled in the manner specified in the regulations

When does the Registration certificate / License stand suspended?

- Failure to comply with the conditions within the period mentioned in any improvement notice served under section 32 of The FSSA.
- The Licensing Authority may direct an inspection of the premises within a reasonable period not less than 14 days from the date of order of suspension. If it notices that the food business operator has still failed to rectify defects or imply conditions of the improvement notice then the license shall stand cancelled after giving an opportunity to show cause.
- It can be cancelled in the interest of public health.
- It shall not entitle the food business operator to refund of fee(s) paid in respect of any compensation or refund of fees paid in respect of registration/license/renewal.

Licensing Authority is to be informed about modifications in products/ expansion/changes in premises after grant of license

- The Licensing Authority needs to be updated about modifications in product category, layout, expansion, closure or any other information on the basis of which the license was granted before the said change occurs. If the said change is likely to alter the information contained in the license certificate then an approval in license prior to the start of business with such changes shall be required for which we need to submit the original license to the Licensing Authority along with license fee equivalent to 1yr for effecting necessary changes. The same should be approved by the Licensing Authority within 30 days.

How the payment is to be made?

- Pay order / demand draft
- Online payment

When can an appeal be made?

• If FBO is aggrieved by an order of the Licensing Authority then an appeal can be made to the Designated officer / Food Safety Commissioner as per provisions under S. 31 (8) & S. 32 (4)-(5) of the FSSA.

Annual Returns need to be filed.

- Annual Return need to be filed every year before 31st May either electronically or in a physical form as prescribed in Form D-1 provided in Schedule 2 of the Regulations in respect of each class of food products handled by us.
- Separate return needs to be filed for every license issued under the Regulations.
- Delay in filing of returns beyond 31st May attracts penalty of Rs.100/- per day

Compliance to directions / orders

If FBO fails to comply with the directions / orders issued in pursuance of any provisions of this Regulation then it shall be deemed to be contravention of the provisions of these Regulations & will attract legal action under the provisions of this Act.

Guarantee: FBO need to give a warranty (that the foods mentioned in the invoice are warranted to be of nature and quality which they purport to be) either separately or in the bill, cash memo, or label as prescribed in Form E. In the earlier Act i.e. PFA, it was implied in case it was not expressly mentioned in the invoice.

(For more details you can contact Authors on prabodh@maricoindia.net or anitasingh1968@gmail.com)

***

Research in Health & Nutrition

DHA-enriched bread: Coronary heart disease (CHD) risk factors

Nutraceuticals World July 1, 2011

The aim of this study was to assess the potential benefit of DHA supplementation on a range of CHD risk factors in Scottish men with pre-existing hypertension and/or hypercholesterolemia. Fifty-six hypertensive and/or hypercholesterolemic men were initially enrolled in the study and randomly assigned to receive either 2 grams per day of DHA or 1 gram per day of olive oil. The oils were incorporated into bread rolls, which were supplied on alternate days for a total of 5 weeks. Systolic and diastolic blood pressure, heart rate and lipid profiles were measured at the end of the supplementation period.

Of the 56 men that enrolled in the study, results from 38 of the men were available for analysis. Men given DHA-enriched bread rolls showed significant reductions in systolic (5.8%) and diastolic (3.7%) blood pressure as well as heart rate (7.5%) when compared to baseline. The olive oil group also demonstrated reductions in these parameters but these did not reach statistical significance. Analysis of serum lipid profiles also demonstrated beneficial results in the DHA supplemented group, with significant increases in HDL cholesterol (16.7%) and significant decreases in both the total cholesterol to HDL cholesterol ratio and the non-HDL cholesterol to HDL cholesterol ratio when compared to baseline. These beneficial changes in serum cholesterol composition were also demonstrated in the olive oil supplemented group.

Food makers argue against proposed marketing guidelines

According to *The Washington Post*, on May 24, food manufacturers gathered to tell regulators that the first-ever proposed guidelines for marketing to children would not stop the childhood obesity problem but would certainly hurt their businesses and abridge their right to free speech. The guidelines, ordered by Congress and written by a team from the Federal Trade Commission, the Food and Drug Administration, the Centers for Disease Control and Prevention, and the Agriculture Department, ignited a debate about the role of marketing in soaring obesity rates among children.

The regulators held the May 24 meeting to gather input from the public. They are accepting written comments until July 14 before finalizing the recommendations and submitting them in a report to Congress. The far-reaching guidelines would cover a wide array of marketing, from traditional media such as television, print, and radio to pop-up ads on Internet sites. They would apply to social media, toys in fast-food meals, ads shown in movie theaters, sponsorship of athletic teams and philanthropic activities, as well as product placement in movies and video games. The guidelines would be voluntary and implemented over a decade. But food companies and advertising firms say they would feel great pressure to follow guidelines, making them de facto regulations.

The guidelines set out that foods advertised to children cannot exceed limited amounts of added sugars, saturated fat, sodium, or *trans* fat. And they must include healthy ingredients, such as fruit and vegetables, low-fat dairy products, or whole grains.

As the scrutiny towards marketing to children grows, the focus (in the media at least) seems to have centered on McDonald's. Some cities have even gone so far as to enact bans on McDonald's Happy Meals, believing that marketing unhealthy foods to children is one of the reasons kids choose to eat such products and have become overweight. In the new *ePerspective* post, Richard F. Stier, Consulting Food Scientist, expresses his believe that this is a "lame excuse" for the condition of our children. As he explains, the target market for a Happy Meal is children ages 2 through 8, who aren't capable of driving down to McDonald's to buy their own fast food. Stier brings it all back to the parents who are making the food choices for their children. So, can we really blame Ronald McDonald and Happy Meals for America's growing obesity problem? Share your opinion today on IFT's *ePerspective* blog.

IFT Weekly Newsletter June 1, 2011

Consuming high levels of MSG may increase likelihood of obesity

A study published in the *American Journal of Clinical Nutrition* shows that people who eat more monosodium glutamate (MSG) may be more likely to be overweight or obese. Data were collected from the China Health and Nutrition Survey (CHNS), a prospective open-cohort, ongoing nationwide health and nutrition survey, consisting of 10,095 apparently healthy Chinese adults, ages 18–65 at entry in 1991. The mean follow-up was about 5.5 years. The researchers measured MSG intake directly by before-and-after weighing of products, such as bottles of soy sauce, to see how much people ate. They also asked people to estimate their intake over three 24-hr periods.

Men and women who ate the most MSG (a median of 5 g a day) were about 30% more likely to become overweight by the end of the study than those who ate the least amount of the flavoring (less than 0.5 g a day), the researchers found. After excluding people who were overweight at the start of the study, the risk rose to 33%. For a follow-up study, the researchers hope to see whether people who stop using MSG experience any health benefits attributable to the change in diet.

IFT Weekly Newsletter June 1, 2011

Sugar companies, associations join lawsuit against corn processors

Five more individual sugar companies and two trade associations have joined a lawsuit to stop the corn processors from marketing high-fructose corn syrup as a "natural" product equivalent to real sugar. The sugar companies and associations said that they joined the suit because they have witnessed increased confusion and frustration among consumers who are reacting to the high-fructose corn syrup industry's mass-media rebranding campaign.

The corn processing industry petitioned the U.S. Food and Drug Administration (FDA) last fall for approval to substitute "corn sugar" for "high-fructose corn syrup" on ingredient labels. While the FDA ponders the ruling, the industry is running an ad campaign that includes TV spots featuring parents walking through cornfields declaring that whether corn sugar or cane sugar, "your body can't tell the difference."

The suit, filed in U.S. District Court in Los Angeles, charges that the "corn sugar" rebranding campaign financed by the corn processing industry companies constitutes false advertising under federal and state law. The suit argues that the processors' $50 million campaign was launched as a way to stem declining sales of high-fructose corn syrup. The suit asks for an injunction to end the advertising campaign and undetermined damages, including compensation for corrective advertising.

Around the same time that the additional plaintiffs joined the suit, the Corn Refiners Association announced a study that shows that there is no evidence of any significant variation in the way the human body metabolizes HFCS as opposed to standard table sugar, or any difference in impact on risk factors for chronic disease.

"While there has been a lot of media attention lately focused on the claims that HFCS is somehow more likely to cause obesity and chronic disease than other sweeteners, the evidence simply does not support those claims. Recent research shows that individuals who consumed normal levels of fructose have seen no adverse effects on their weight or triglycerides," said study author James M. Rippe, Founder and Director of the Rippe Lifestyle Institute and Professor of Biomedical Sciences at the University of Central Florida.

IFT Weekly Newsletter June 1, 2011

👎👎👎

Industry-Leading Research Confirms Presence of Lutein in Key Regions of the Infant Brain

Nutrition Horizon Jul 29 2011 ---

Preliminary new researchi demonstrates for the first time that lutein, an important phytonutrient (plant-based nutrient) that supports eye health, is the predominant carotenoid present in key areas of the infant brain, including areas that regulate overall brain function, cognition, vision, hearing and speech.

"To our knowledge this is the first time that research has been conducted to demonstrate that the infant brain appears to preferentially take up more lutein compared to other carotenoids," said Dr. Johnson, who is a member of Abbott's Science Nutrition Advisory Board on the Macular Xanthophylls and DHA. "Additional studies may lead to greater understanding of the functional impact of lutein in infant brains."

Results from the abstract show that lutein concentrations in these important brain regions range from 2.5 to four times that of zeaxanthin and five to six times that of beta-carotene, depending on the specific brain region. Because lutein is not produced by the body, prior to the introduction of solid foods, infants can only obtain lutein from breast milk or formulas that are supplemented with lutein (excluding trace inherent amounts).

👎👎👎

Zinc Lozenges May Shorten Common Cold Duration

Nutrition Horizon Jul 27 2011 ---

Depending on the total dosage of zinc and the composition of lozenges, zinc lozenges may shorten the duration of common cold episodes by up to 40%, according to a study published in the Open Respiratory

Medicine Journal.

For treating the common cold, zinc lozenges are dissolved slowly in the mouth. Interest in zinc lozenges started in the early 1980s from the serendipitous observation that a cold of a young girl with leukemia rapidly disappeared when she dissolved a therapeutic zinc tablet in her mouth instead of swallowing it. Since then over a dozen studies have been carried out to find out whether zinc lozenges are effective, but the results of those studies have diverged.

Dr. Harri Hemila of the University of Helsinki, Finland, carried out a meta-analysis of all the placebo-controlled trials that have examined the effect of zinc lozenges on natural common cold infections. Of the 13 trial comparisons identified, five used a total daily zinc dose of less than 75 mg and uniformly those five comparisons found no effect of zinc. Three trials used zinc acetate in daily doses of over 75 mg, with the average indicating a 42% reduction in the duration of colds. Five trials used zinc salts other than acetate in daily doses of over 75 mg, with the average indicating a 20% decrease in the duration of colds.

In several studies, zinc lozenges caused adverse effects, such as bad taste, but there is no evidence that zinc lozenges might cause long term harm. Furthermore, in the most recent trial on zinc acetate lozenges, there were no significant differences between the zinc and placebo groups in the occurrence of adverse effects although the daily dose of zinc was 92 mg. Dr. Hemila concluded that "since a large proportion of trial participants have remained without adverse effects, zinc lozenges might be useful for them as a treatment option for the common cold."

New Research Supports Whey Protein for Weight Management

Nutrition Horizon Jul 21 2011 ---

A new study funded by USDA and the US Whey Protein Research Consortium (USWPRC) demonstrates the ability of supplemental whey protein to improve body weight and composition, without energy restriction and changes to the habitual diet of obese and overweight adults, in comparison to consuming an equal amount of calories from carbohydrates.
Previous research has demonstrated a benefit of whey protein for weight management when taken with concurrent energy restriction or physical activity. However, the research to be published in the Journal of Nutrition concluded that whey protein could play a significant role in weight management over the long term, without the need for additional changes in physical activity or diet.

"This study contributes strong evidence to support the benefits of whey protein for weight management. The design meets EFSA scientific requirements to support health claims on this area, according to the latest draft guidance," comments Suzane Leser, Nutrition Manager for Lifestyle Ingredients at Volac, whey protein suppliers and the European member of the USWPRC.

The researchers from the USDA - ARS Beltsville Human Nutrition Research Centre tracked body weight, body composition and waist circumference data from 73 overweight and obese adults. These adults were assigned to consume a 200-calorie beverage, consisting of 28g of whey or soy protein plus carbohydrate or carbohydrate alone, twice a day for 6 months. There were no significant differences between groups at the start of the trial, but by the end of the trial, the whey protein group's body weight was 2 percent lower than the carbohydrate group.

The results of the study indicate that whey protein supplementation has the potential to promote lean body composition, with results showing subjects in the whey protein group recording reduced body fat, five pounds less than the carbohydrate group, and a waist size nearly an inch less than both the carbohydrate and soy protein groups.

Study data indicates that participants compensated for the additional 400 calories per day by cutting back on

other foods, as none gained a significant amount of weight during the 23-week period. However, the whey protein group made up for the added calories more effectively, showing improvements in body weight and composition when compared to the carbohydrate group. This could be related to satiety with whey protein, as participants in the whey protein group showed significantly lower levels of hunger-stimulating hormone, ghrelin, compared to the other two groups.

👎👎👎

India Nutraceuticals Market on the Rise

Nutrition Horizon Jul 21 2011 ---

More than 200 experts from the fields of nutrition science, pharmacy and healthcare attended a conference in India last month to discuss the future of the country's food supplement and nutraceuticals market as it continues to display fast growth, with new regulation on the horizon.

The conference, co-organised by India's Health Foods and Dietary Supplements Association (HADSA) and the Federation of Indian Chambers of Commerce and Industry (FICCI), was the 3rd International Conference on Nutraceuticals, Dietary Supplements and Functional Foods and took place on 23 June in Mumbai.

Participants highlighted consumer trust through the provision of safe and sustainable products as a key factor for the nutraceuticals market, and addressed the challenges at play, such as the rapidly growing market and customisation issues.

Ajit Singh, Chairman of HADSA, said: "The market in India has good potential both locally and internationally as consumer demand for products grows across the world. Last year it was estimated to be worth US$2 billion. Therefore it is important that we address the emerging opportunities in regulation and in customising nutraceuticals."

Speaking at the event, Simon Pettman, Executive Director of the International Alliance of Dietary/Food Supplement Associations (IADSA), said: "The market in India is growing fast and with as much potential as many of the fastest growing technology sectors. Increasingly, product concepts that once would have been only local, are now starting to have a regional and global distribution."

Mr Pettman said that India's food supplement sector was still in the early stages of achieving its potential and stressed the importance of investing in product quality.
He added: "As IADSA we have experience from other regions in the world, and two big challenges globally are claims and ingredients. We see governments working on new regulation for food supplements, and this is important to protect consumers and companies and create a climate for sound investment. We work across the world on regulatory issues to ensure that these developments are in balance with the emerging food supplement market."

The conference was opened by Satej Patil, Minister of State, Home, Rural Development, Food and Drugs Administration (FDA), Government of Maharashtra.

According to the Frost & Sullivan-FICCI knowledge paper launched at the event, the Indian nutraceuticals market is expected to grow at the rate of 16 percent year-on-year for the next five years, reaching roughly US$5 billion.

👎👎👎

New Role Discovered for Vitamin C in the Eye -- and the Brain

Nutrition Horizon Jul 18 2011 ---
Nerve cells in the eye require vitamin C in order to function properly a surprising discovery that may mean

vitamin C is required elsewhere in the brain for its proper functioning, according to a study by scientists at Oregon Health & Science University recently published in the Journal of Neuroscience.

"We found that cells in the retina need to be 'bathed' in relatively high doses of vitamin C, inside and out, to function properly," said Henrique von Gersdorff, Ph.D., a senior scientist at OHSU's Vollum Institute and a co-author of the study. "Because the retina is part of the central nervous system, this suggests there's likely an important role for vitamin C throughout our brains, to a degree we had not realized before."

The brain has special receptors, called GABA-type receptors, that help modulate the rapid communication between cells in the brain. GABA receptors in the brain act as an inhibitory "brake" on excitatory neurons in the brain. The OHSU researchers found that these GABA-type receptors in the retinal cells stopped functioning properly when vitamin C was removed.

Because retinal cells are a kind of very accessible brain cell, it's likely that GABA receptors elsewhere in the brain also require vitamin C to function properly, von Gersdorff said. And because vitamin C is a major natural antioxidant, it may be that it essentially 'preserves' the receptors and cells from premature breakdown, von Gersdorff said.

The function of vitamin C in the brain is not well understood. In fact, when the human body is deprived of vitamin C, the vitamin stays in the brain longer than anyplace else in the body. "Perhaps the brain is the last place you want to lose vitamin C," von Gersdorff said. The findings also may offer a clue as to why scurvy which results from a severe lack of vitamin C acts the way it does, von Gersdorff said. One of the common symptoms of scurvy is depression, and that may come from the lack of vitamin C in the brain.

The findings could have implications for other diseases, like glaucoma and epilepsy. Both conditions are caused by the dysfunction of nerve cells in the retina and brain that become over excited in part because GABA receptors may not be functioning properly.

"For example, maybe a vitamin C-rich diet could be neuroprotective for the retina for people who are especially prone to glaucoma," von Gersdorff said. "This is speculative and there is much to learn. But this research provides some important insights and will lead to the generation of new hypotheses and potential treatment strategies."
👎👎👎

Natural Chemical Found in Grapes May Protect Against Alzheimer's Disease
Nutrition Horizon Jul 18 2011 ---

Researchers at Mount Sinai School of Medicine have found that grape seed polyphenols a natural antioxidant may help prevent the development or delay the progression of Alzheimer's disease. The research, led by Giulio Maria Pasinetti, MD, PhD, The Saunder Family Professor in Neurology, and Professor of Psychiatry and Geriatrics and Adult Development at Mount Sinai School of Medicine, was published online in the current issue of the Journal of Alzheimer's Disease.

This is the first study to evaluate the ability of grape-derived polyphenols to prevent the generation of a specific form of βamyloid (Aβ) peptide, a substance in the brain long known to cause the neurotoxicity associated with Alzheimer disease. In partnership with a team at the University of Minnesota led by Karen Hsiao Ashe, MD, PhD, Dr. Pasinetti and his collaborators administered grape seed polyphenolic extracts to mice genetically determined to develop memory deficits and Aβ neurotoxins similar to those found in Alzheimer's disease. They found that the brain content of the Aβ*56, a specific form of Aβ previously implicated in the promotion of Alzheimer's disease memory loss, was substantially reduced after treatment.

Previous studies suggest that increased consumption of grape-derived polyphenols, whose content, for example, is very high in red wine, may protect against cognitive decline in Alzheimer's. This new finding, showing a selective decrease in the neurotoxin Aβ*56 following grape-derived polyphenols treatment, corroborates those theories.

"Since naturally occurring polyphenols are also generally commercially available as nutritional supplements and have negligible adverse events even after prolonged periods of treatment, this new finding holds significant promise as a preventive method or treatment, and is being tested in translational studies in Alzheimer's disease patients," said Dr. Pasinetti.

High Folate Intake May Reduce Risk of Colorectal Cancer

Nutrition Horizon 7/6/2011 ---

Intake of high levels of folate may reduce colorectal cancer risk, according to a new study in Gastroenterology, the official journal of the American Gastroenterological Association (AGA) Institute. Folate is a water-soluble B vitamin that occurs naturally in food.

"We found that all forms and sources of folate were associated with lower risk of colorectal cancer," said Victoria Stevens, PhD, of the American Cancer Society and lead author of this study. "The strongest association was with total folate, which suggests that total folate intake is the best measure to define exposure to this nutrient because it encompasses all forms and sources." Total folate includes naturally occurring food folate and folic acid from fortified foods and dietary supplements.

A research team investigated the association between folate intake and colorectal cancer among 99,523 participants in the Cancer Prevention Study II Nutrition Cohort; a total of 1,023 participants were diagnosed with colorectal cancer between 1999 and 2007, a period entirely after folate fortification began. Neither higher nor lower risk was observed during the first two years of follow-up (1999 to 2001), while associations were statistically significantly inverse for the subsequent years (2002 to 2007).

EFSA Issues Positive Opinion on Toothfriendly Labeling

Nutrition Horizon 7/5/2011 ---

Toothfriendly International has announced that its article 13.1 filed claim for the Toothfriendly health claim gained positive evaluations by the European Food Safety Authority (EFSA). Within its fifth batch of Scientific Opinions on health claims EFSA has published a favorable opinion on the “Toothfriendly” claim for foods and beverages that are demonstrably non-cariogenic and non-erosive. EFSA’s positive scientific opinion builds the basis for the continued use of the Toothfriendly quality seal, a registered trademark since 1982. The seal is coupled with the explanatory term “Toothfriendly” for use on foods which neither contain fermentable carbohydrates nor excessive amounts of food acids.

Dr. Albert Bär, the Director of Toothfriendly International is relieved to receive the backing of EFSA for the "Toothfriendly" health claim. Initially EFSA declined to evaluate this claim saying the dental benefits of toothfriendly foods are not the result of an active effect of an ingredient or component. "Evidently, EFSA has now found a clever though somewhat twisted way to resolve this problem" says Bär. In its report, EFSA makes reference to the US FDA which has accepted the "Toothfriendly" health claim in 1997.

To qualify for the "Toothfriendly" claim, foods should not lower the pH of the dental plaque below 5.7 during consumption and for up to 30 minutes after consumption. Moreover, foods containing acids should not expose the teeth to excessive amounts of acid (not more than 40 µmol H+ x min) during consumption. The tests which are required to determine compliance with these criteria are conducted in human volunteers. Three university institutes (one in Switzerland and two in Germany) are equipped to perform such tests. A fourth institute will be inaugurated in Beijing later this year.

The "Toothfriendly" quality seal is licensed to food manufacturers for use on the label and in the promotion of their qualifying foods by Toothfriendly International, an internationally acting organisation located in Switzerland.

Leading confectionery manufacturers use the "Toothfriendly" seal for more than twenty years on product labels around the World to inform consumers about the proven dental benefits of their chewing gums, candies and chocolates.

TV Food Advertising Increases Children's Preference for Unhealthy Foods

Nutrition Horizon 7/1/2011 ---

Researchers at the University of Liverpool have found that children who watch adverts for unhealthy food on television are more likely to want to eat high-fat and high-sugar foods.

The study by researchers in the Institute of Psychology, Health and Society examined the food preferences of a group of 281 children aged six to 13 years old from the North West of England.

The children were shown an episode of a popular cartoon before being shown it again two weeks later. In each case, the cartoon was preceded by five minutes of commercials – one set showing toy adverts and one showing mainly snacks and fast food. After each showing the children were given lists of various food items, both branded and unbranded, and asked what they would like to eat.

The study found that after viewing the food commercials the children were more likely to pick unhealthy foods. All the children chose more branded and non-branded fat-rich and carbohydrate-rich items from the food preference lists compared with those they chose after viewing the toy adverts. The study also found that children who watched television for more than 21 hours a week were more likely to be affected by the food adverts than those children who watched a lesser amount of television. These children also had a significantly greater body mass index than those who were less frequent viewers.

Emma Boyland, from the University's Kissileff Laboratory for the Study of Human Ingestive Behaviour, said: "Obesity in young children is now a major health concern around the world. Our studies highlight that there are global connections between advertising, food preferences and consumption. This is a beyond-brand effect, increasing children's selections of all unhealthy foods – not just those shown in adverts.
"This study demonstrates that children are far more likely to eat unhealthy foods if they watch a lot of television. This suggests that it would be beneficial to reduce the amount of television that children watch. These findings also have implications for the regulation of television food advertising to children. A 9pm watershed should be introduced so that children are not exposed to high fat, high sugar and high salt food advertising during popular family viewing."

IOM makes recommendations for preventing childhood obesity

The U.S. Institute of Medicine (IOM) has released a report recommending ways to prevent childhood obesity. The report outlines steps that should be taken by childcare centers, preschools, pediatricians' offices, federal nutrition programs, and other facilities and programs that shape children's activities and behaviors. Although the recommendations are directed to policymakers and healthcare and childcare providers, these professionals can counsel and support parents in promoting healthy habits in the home as well, said the committee that wrote the report.

Healthy eating is just one of the policy recommendations suggested by the report. The committee also suggests potential actions for implementation designed to prevent obesity in infancy and early childhood by promoting healthy environments for young children. Here are some of the goals and recommendations for implementation:

Goal: Promote the consumption of a variety of nutritious foods, and encourage and support breastfeeding

during infancy.

- Adults who work with infants and their families should promote and support exclusive breastfeeding for six months and continuation of breastfeeding in conjunction with complementary foods for 1 year or more.
- To ensure that childcare facilities provide a variety of healthy foods and age-appropriate portion sizes in an environment that encourages children and staff to consume a healthy diet, childcare regulatory agencies should require that all meals, snacks, and beverages served by early childhood programs be consistent with the Child and Adult Care Food Program meal patterns and safe drinking water be available and accessible to the children.
- The Department of Health and Human Services and the U.S. Department of Agriculture should establish dietary guidelines for children from birth to age two years in future releases of the *Dietary Guidelines for Americans*.

Goal: Create a healthful eating environment that is responsive to children's hunger and fullness cues.

State childcare regulatory agencies should require that childcare providers and early childhood educators practice responsive feeding.

Goal: Ensure access to affordable healthy foods for all children.

Government agencies should promote access to affordable healthy foods for infants and young children from birth to age five in all neighborhoods, including those in low-income areas, by maximizing participation in federal nutrition assistance programs and increasing access to healthy foods at the community level.

Goal: Help adults increase children's healthy eating.

Health and education professionals providing guidance to parents of young children and those working with young children should be trained and educated and have the right tools to increase children's healthy eating and counsel parents about their children's diet.

IFT Weekly Newsletter June 29, 2011

2011 World Food Prize honors former Presidents of Ghana, Brazil

Two former presidents who led the drastic reduction of hunger and poverty in their countries were named the winners of the 2011 World Food Prize in a ceremony at the U.S. State Department June 21.

The World Food Prize Foundation is honoring John Agyekum Kufuor, former President of Ghana, and Luiz Inácio Lula da Silva, former President of Brazil, for creating and implementing government policies that alleviated hunger and poverty in their countries. They were commended in remarks by Secretary of State Hillary Rodham Clinton, Secretary of Agriculture Tom Vilsack, and USAID Administrator Rajiv Shah.

Under President Kufuor's leadership, Ghana became the first sub-Saharan African country to cut in half the proportion of its people who suffer from hunger, and the proportion of people living on less than a dollar per day, on course to meet UN Millennium Development Goal 1. Continuing Ghana's tradition of stability, President Kufuor prioritized national agricultural policies: Ghana saw a reduction in its poverty rate from 51.7% in 1991 to 26.5% in 2008, and hunger was reduced from 34% in 1990 down to 9% in 2004.

A guiding principle for President Kufuor during the entirety of his two terms as President of the Republic of Ghana (2001–2009) was to improve food security and reduce poverty through public and private sector initiatives. To that end, he implemented major economic and educational policies that increased the quality and quantity of food to Ghanaians, enhanced farmers' incomes, and improved school attendance and child nutrition

through a nationwide feeding program.

President Lula da Silva made it clear, even before he took office as President of Brazil in 2003, that fighting hunger and poverty would be a top priority of his government. More than 10 government ministries were focused on the expansive Zero Hunger programs, which provided greater access to food, strengthened family farms and rural incomes, increased enrollment of primary school children, and empowered the poor. Zero Hunger very quickly became one of the most successful food and nutritional security policies in the world through its broad network of programs, including: the Bolsa Familia Program; the Food Purchase Program; and the School Feeding Program.

Over the eight years of his administration, President Lula da Silva's commitment and vision achieved dramatic reductions in hunger, extreme poverty, and social exclusion, thereby greatly enhancing the lives of Brazil's people. During his tenure, UN Millennium Development Goal 1 was exceeded as Brazil reduced by half its proportion of hungry people, with 93% of children and 82% of adults eating three meals a day, and also reduced the percentage of Brazilians living in extreme poverty from 12% in 2003 down to 4.8% in 2009.

IFT Weekly Newsletter June 22, 2011

👎👎👎

Overcoming the challenges of natural high-potency sweeteners

Thanks to their zero-calorie profile and sourcing from plants, the natural sweeteners Rebaudioside A and luo han guo (monk fruit) have hit a sweet spot with consumers and product developers alike. But using these ingredients in formulated foods and beverages presents challenges.

At an IFT Annual Meeting session on June 13, three presenters described recent developments in the incorporation of these natural sweeteners in food products and how to reduce any associated negative attributes. Robert Sobel, Fona Intl., discussed taste masking (e.g., strong taste molecules, congruent flavors, phantom aromas) and taste blocking techniques (e.g., small molecule interactions) to modify the taste of natural high-potency sweeteners. He mentioned how the use of a proprietary phantom aroma was able to reduce the bitterness of a tangerine-flavored lozenge sweetened with Reb A.

Alexander H. Woo, Sweet Green Fields, discussed the formulation of a Reb A-sweetened beverage. About 1–2% Reb A can be added to beverages; bitterness becomes a problem beyond that level. The stevia-derived sweetener delivers about 50% of the sweetness level required. Lou han guo is added to increase the sweetness level, achieving a sugar sweetness equivalent of 70–90%. Adding phantom aromas such as honey, vanilla, or maple complete the sweetness profile. To achieve the desired viscosity or mouthfeel properties, formulators can add natural bulking agents such as inulin and FOS.
Sanjay Holay, NSM Research Inc., discussed a sensory analysis study of a Reb A-sweetened cereal product against a control (sugar-sweetened) cereal. While internal sensory panelists were able to match the sweetness levels between the two products, high school students were more sensitive and found major differences of sweetness, crunchiness, and bitterness between the two products. For students, the control had an overall liking score of 72% versus only 28% for the Reb-A sweetened cereal.

IFT Weekly Newsletter June 22, 2011

👎👎👎

How Vitamins and Minerals May Prevent Age-Related Diseases

ScienceDaily (June 1, 2011) — Severe deficiency of the vitamins and minerals required for life is relatively uncommon in developed nations, but modest deficiency is very common and often not taken seriously. A new research published online in the *FASEB Journal*, however, may change this thinking as it examines moderate

selenium and vitamin K deficiency to show how damage accumulates over time as a result of vitamin and mineral loss, leading to age-related diseases.

"Understanding how best to define and measure optimum nutrition will make the application of new technologies to allow each person to optimize their own nutrition a much more realistic possibility than it is today." said Joyce C. McCann, Ph.D., a co-author of the study from the Nutrition and Metabolism Center at Children's Hospital Oakland Research Institute in Oakland, California. "If the principles of the theory, as demonstrated for vitamin K and selenium, can be generalized to other vitamins and minerals, this may provide the foundation needed."

McCann and colleagues reached their conclusions by compiling and assessing several general types of scientific evidence. They tested whether selenium-dependent proteins that are essential from an evolutionary perspective are more resistant to selenium deficiency than those that are less essential. They discovered a highly sophisticated array of mechanisms at cellular and tissue levels that, when selenium is limited, protect essential selenium-dependent proteins at the expense of those that are nonessential. They also found that mutations in selenium-dependent proteins that are lost on modest selenium deficiency result in characteristics shared by age-related diseases including cancer, heart disease, and loss of immune or brain function. Results should inform attempts to locate mechanistic linkages between vitamin or mineral deficiencies and age-related diseases by focusing attention on the vitamin and mineral-dependent proteins that are nonessential from an evolutionary perspective. Such mechanistic linkages are likely to present opportunities for treatment.

"This paper should settle any debate about the importance of taking a good, complete, multivitamin every day," said Gerald Weissmann, M.D., Editor-in-Chief of the *FASEB Journal*. "As this report shows, taking a multivitamin that contains selenium is a good way to prevent deficiencies that, over time, can cause harm in ways that we are just beginning to understand."

High-Fat Diet During Pregnancy Programs Child for Future Diabetes, Study Suggests

ScienceDaily (June 3, 2011) — A high-fat diet during pregnancy may program a woman's baby for future diabetes, even if she herself is not obese or diabetic, says a new University of Illinois study published in the *Journal of Physiology*.

"We found that exposure to a high-fat diet before birth modifies gene expression in the livers of offspring so they are more likely to overproduce glucose, which can cause early insulin resistance and diabetes," said Yuan-Xiang Pan, a U of I professor of nutrition. The high-fat diet that caused these changes was a typical Western diet that contained 45 percent fat, which is not at all unusual, he said. "In recent years, the American diet has shifted to include many high-energy, high-fat, cafeteria-type, and fast foods," he noted.

Because the epigenetic marks can be easily evaluated, Pan hopes that the study will give doctors a diagnostic tool to screen newborns born with this propensity so they can help children keep their blood sugar in a normal range and give them their best chance of avoiding diabetes.
In the study, Pan and doctoral student Rita Strakovsky fed obesity-resistant rats either a high-fat or a control diet from the first day of gestation. Because the animals were not obese before the study began, the scientists were able to determine that diet alone had produced these effects. "At birth, offspring in the high-fat group had blood sugar levels that were twice as high as those in the control group, even though their mothers had normal levels," Strakovsky said. The high-fat offspring also had epigenetic modifications to genes that regulate glucose metabolism. One of these modifications, the acetylation of histones, acts by loosening the DNA, making it easier for the gene to be transcribed, she said.

Pan said these epigenetic marks would not be erased easily. However, if people were aware of them, they could change their diet and lifestyle to compensate for their predisposition, delaying or even preventing the development of diabetes. "We'd like to see if diet after birth could alleviate this problem that was programmed before birth," he said.

Although their study points to using epigenetics as a diagnostic tool, Strakovsky stressed the importance of making dietary recommendations for pregnant women more available so they are able to prevent this health problem. "Obstetrics patients rarely see a dietitian unless they're having medical problems like gestational diabetes or pre-eclampsia. Doctors now tend to focus on how much weight a woman should gain in a healthy pregnancy. Although healthy weight gain is extremely important, nutritional guidance could be invaluable for all pregnant women and their babies," she said.

Pregnant women should consume a balanced diet low in saturated fats, which are usually found in fattier cuts of meat, fast foods, pastries, and desserts. But they should also consume appropriate amounts of healthy fats, including good sources of omega-3 and -6 fatty acids, which are important for their baby's brain and neuron development.

Cold-water fish that are low in mercury, flaxseeds and flaxseed oil, soybean and cod liver oils, walnuts and winter squash are good sources of omega-3 fatty acids. Eggs, corn oil, whole-grain bread, poultry, and sunflower seeds and oil provide omega-6 fatty acids.

"Until now we didn't realize that a mother's diet during pregnancy had a long-term effect on the metabolic pathways that affect her child's glucose production," Pan said. "Now that we know this, we urge pregnant women to eat a balanced low-fat diet that follows government guidelines. Then a woman can prime her child for a healthy life instead of future medical struggles."

How High-Fat Diet During Pregnancy Increases Risk of Stillbirth

ScienceDaily (June 3, 2011) — Eating a high-fat diet during pregnancy increases the chance of stillbirth, according to new research at Oregon Health & Science University. The new data show eating a typical American diet, which is high in fat, decreases blood flow from the mother to the placenta, the temporary organ that nourishes the unborn fetus. Prior to this study, exactly how a fatty diet contributes to stillbirth was unclear.

The findings are published in the June edition of the journal *Endocrinology*.

The study was conducted at the OHSU Oregon National Primate Research Center. Because the placental structure of the Japanese macaque is very similar to that in humans, cause and effect can be better established. The researchers hope their work will inform expectant moms and their physicians about the inherent dangers of a high-calorie, high-fat diet.

"This study demonstrates that maternal diet during pregnancy has a profound influence on both placental and fetal development. The high-calorie, high-fat diet common in our society has negative effects on placental function and may be a significant contributor to adverse pregnancy outcomes, such as stillbirth," said Antonio Frias, M.D., principal investigator and assistant professor of obstetrics and gynecology (perinatology/maternal-fetal medicine) in the OHSU School of Medicine.

Previous studies have shown that nearly all adverse outcomes during pregnancy -- abnormal fetal growth, preeclampsia, preterm labor and stillbirth -- are in some way associated with an abnormally developed, or damaged, placenta, the temporary organ that nourishes the unborn fetus. In addition, maternal obesity has been associated with placental inflammation and dysfunction and an increased risk of stillbirth. Considering these findings, the researchers hypothesized that eating a diet high in fat during pregnancy also may increase the risk of placental inflammation and the risk of stillbirth.

Frias and colleagues observed 24 pregnant Japanese macaques that ate either a diet comprising 32 percent calories from fat or a control diet with 14 percent fat calories for at least four years.

The researchers found the monkeys that ate a high-fat diet experienced a significant decrease in blood flow from

the uterus to the placenta, a reduction of 38 percent to 56 percent, and a rise in placental inflammation. This was the case regardless of whether the monkeys were obese or slender. The risk of stillbirth was further compounded, however, when the monkeys were obese with hyper-insulinemia, or pre-diabetes.

👎👎👎

Adherence to Certain Dietary Pattern Associated With Lower BMI in Adolescent Girls

ScienceDaily (June 6, 2011) — Adolescent girls whose diet resembles one recommended for adults with hypertension appear to have smaller gains in overall body mass index (BMI) over 10 years, according to a report in the June issue of *Archives of Pediatrics & Adolescent Medicine*, one of the JAMA/Archives journals.

"Excess weight during childhood leads to numerous health problems and is even associated with premature death as an adult," the authors write as background information in the article. However, the authors note that examinations of food-based dietary patterns acknowledge that consuming various nutrients together can have positive influences on health. One such diet pattern, the Dietary Approach to Stop Hypertension (DASH), was originally studied as a treatment for adults with hypertension, according to background in the article.

Jonathan P. B. Berz, M.D., M.Sc., of Boston University Medical Center, and colleagues evaluated the effects of a DASH-style eating plan on BMI (calculated as weight in kilograms divided by height in meters squared) in a racially diverse sample of adolescent girls. The authors examined data from 2,237 girls 9 years of age who participated in the National Growth and Health Study from 1987-1988 and were followed up for 10 years. Data were gathered annually and each participant was given a DASH food group score based on individual adherence to dietary requirements.

Higher DASH scores were associated with higher total energy intake, as well as higher average intake from each food group (whole grains, vegetables, fruits, lean meats, low-fat dairy and nuts/seeds/legumes). Girls in the highest quintile of DASH scores had the smallest gains in BMI during the study, and had the lowest BMIs at the end of follow-up. Conversely, at age 19 years, girls in the lowest DASH score quintile had an average BMI that was greater than the threshold for overweight as defined by the 85th percentile for age.

"In particular, higher consumption of fruits, whole grains and low-fat dairy products led to less weight gain," the authors noted. Participants who consumed two or more servings of fruit per day had the smallest gains in BMI during the study years and had the lowest BMI at the end of follow-up. Compared with participants consuming the least amount of whole grains, those who consumed the most had lower BMI scores over time and a lower BMI at the end of follow-up. The same results were seen for girls consuming higher amounts of low-fat dairy products.

"We found that higher adherence to a DASH-style diet resulted in a consistently lower BMI between the ages of 9 and 19 years," the authors conclude. "Such an eating pattern may help prevent excess weight gain during adolescence."

👎👎👎

Desserts With a Low Glycemic Index May Benefit Weight-Loss Efforts for Obese Children

ScienceDaily (June 7, 2011) — Overweight girls lose more weight and can better stay on a healthy diet if they eat sugar-free, low-fat desserts several times weekly, as opposed to any dessert once a week, a new study finds. The results are being presented at The Endocrine Society's 93rd Annual Meeting in Boston.
"Dieters commonly splurge on dessert once a week, usually choosing fattening items," said lead investigator Antonia Dastamani, MD, PhD, a pediatrician and research fellow at Athens University School of Medicine in Athens, Greece. "However, we found a positive effect of more frequent consumption of desserts that have a low glycemic index and low glycemic load."

Carbohydrates have a low glycemic index (GI) if they raise glucose, or blood sugar, levels more slowly

than other carbohydrates do. The glycemic load (GL), which depends on serving size, is the food's total effect on blood sugar. "Studies suggest that low GI/GL diets have a positive effect on weight control and improving insulin resistance," Dastamani said.

Obesity can cause insulin resistance, in which the body does not properly use the hormone insulin. This results in high blood sugar levels and sets the stage for development of diabetes. Dastamani and her colleagues tested the effects of incorporating into a balanced diet certain low-calorie, low-GI/GL desserts containing sugar substitutes such as sucralose. The products are made by the Giotis Company, a food production company in Athens, which donated the desserts and helped fund the study.

The investigators studied the effects of two diets in 29 girls, ages 10 to 14 years, who had a body mass index (BMI) in the 85th percentile or above, considered overweight or obese. A group of 15 girls ate a diet consisting of 45 percent carbohydrates, 35 percent fats and 20 percent proteins, including the low-GI/GL desserts four times a week. The other group of 14 girls followed the same diet except, instead of the low-GI/GL desserts, they ate desserts of their choice once a week.

After three months on the diet, both groups improved their BMI (body composition). Compared with the second group, however, the group that ate the low-GI/GL desserts lost significantly more weight and had better average BMI and systolic blood pressure (the first number in a blood pressure reading), the authors reported.

Girls who ate the low-GI/GL desserts also had significantly improved levels of the appetite-suppressing hormone leptin, the researchers found. They also had better improvements in biochemical markers of insulin resistance (fasting insulin levels in the blood and the homeostatic model assessment, or HOMA, index).

"Childhood obesity is pandemic, and dietary changes among overweight and obese children must be a priority," Dastamani said. "Desserts with a low glycemic index and glycemic load, when eaten in moderation, are valuable tools in the treatment of pediatric obesity."

👎👎👎

B Vitamins in Mother's Diet Reduce Colorectal Cancer Risk in Offspring, Animal Study Suggests

ScienceDaily (June 10, 2011) — Mice born to mothers who are fed a diet supplemented with B vitamins are less likely to develop intestinal tumors, report scientists at the Jean Mayer USDA Human Nutrition Research Center on Aging (USDA HNRCA) at Tufts University.

Previous research in humans and mice suggests that B vitamins, particularly folate, play a role in the prevention of colorectal cancer. Using a mouse model of naturally occurring colorectal cancer, the USDA HNRCA scientists examined whether a mothers' B vitamin intake impacts her offspring's cancer risk. Mothers were fed diets containing supplemental, adequate or mildly deficient quantities of vitamins B_2, B_6, B_{12} and folate prior to conception through weaning after which all of the offspring received the same adequate diet.

"We saw, by far, the fewest intestinal tumors in the offspring of mothers consuming the supplemented diet," says Jimmy Crott, PhD, senior author and a scientist in the Vitamins and Carcinogenesis Laboratory at the USDA HNRCA. "Although the tumor incidence was similar between offspring of deficient and adequate mothers, 54% of tumors in the deficient offspring were advanced and had invaded surrounding tissue while only 18% of tumors in the offspring of adequate mothers displayed these aggressive properties." The results were published online June 9 in the journal *Gut*.

Crott and colleagues associated the tumor suppression seen in the offspring of supplemented mothers with a protection against disruptions to the Wnt signaling pathway, a network of genes commonly altered in colorectal cancer. "The strongest expression of tumor-suppressing genes in the Wnt pathway was in the offspring of supplemented mothers and the weakest was in the offspring of the mildly deficient mothers," says first author Eric Ciappio, a PhD candidate at the Friedman School of Nutrition Science and Policy at Tufts.

"We attribute these differences in gene expression to epigenetics, modifications of DNA which are sensitive to environmental factors such as diet," Ciappio continues. "In this case, changing maternal B vitamin intake had lasting epigenetic effects in offspring and may explain the differences in tumor incidence and aggressiveness we observed."

It remains unclear whether maternal consumption of the four B vitamins could impact tumor development in humans. ""While evidence is beginning to accumulate to suggest that maternal consumption of supplements containing folate may afford some protection against childhood cancers in offspring, we don't yet have the ability to determine whether the same holds true for cancers that normally present in the mid to late decades of life," explains Crott, who is also an assistant professor at the Friedman School.

Crott adds, "Aside from the known protective effect of maternal folate against neural tube defects such as spina bifida, our results suggest that mothers consuming supplemental quantities of these B vitamins may also be protecting her children against colorectal cancer."

Energy Drinks Linked to Substance Use in Musicians, Study Shows

ScienceDaily (June 21, 2011) — Frequent use of energy drinks is associated with binge drinking, alcohol-related social problems and misuse of prescription drugs among musicians, according to researchers at the University at Buffalo's Research Institute on Addictions.

In survey results published in the *Journal of Caffeine Research* this spring, UB research scientists Kathleen E. Miller and Brian M. Quigley examined substance use by 226 Western New York professional and amateur musicians aged 18-45. In the sample, 94 % were caffeine users and 57 % reported use of energy drinks specifically.

Sixty-eight percent of the musicians surveyed reported heavy binge drinking at least once or twice a year and 74 % reported experiencing at least one alcohol-related social problem, such as hangovers, arguing with others about their drinking, or doing something while drinking that they later regretted. Most of those surveyed also reported recreational drug use, including prescription drugs (23 %), marijuana (52 %), psychedelic drugs (25 %), or cocaine (21 %).

Musicians who used energy drinks reported significantly more misuse of legal substances than those who did not use energy drinks. For example, 31 %of energy drink users misused prescription drugs (compared to 13 %of nonusers) and 76 %reported binge drinking (compared to 59 %of nonusers).

Consistent with previous studies of athletes and college students, this study suggests that the unique relationships between energy drink consumption and other substance use represent more than merely a repackaging of the U.S. public's longstanding love affairs with coffee and soft drinks. "No question, we've got quite a caffeine habit," observes Miller. "But energy drinks bring something more to the equation."

Manufacturers of popular energy drink brands appear to target actual or aspiring musicians as a niche market for their products, evoking music in their names, sponsoring music tours, and incorporating music-related logos.

Edgy energy drink marketers consistently use brand naming, packaging, and advertising messages to tie the products to themes of rebellion, risk taking, and even illegal drug use, Miller points out. This may help to explain the unique associations between substance misuse and energy drinks but not other caffeinated beverages, she suggests. It may also give energy drinks a special appeal for musicians, who tend to score high on the personality trait of sensation-seeking.
Given the unconventional lifestyles often associated with paid musicianship -- such as late or irregular hours and periodic sleep deprivation -- it is likely, Miller says, that professional musicians constitute an especially fertile

demographic for energy drinks, which derive their pharmacological impact primarily from caffeine.

Caffeine in low or moderate doses is a common feature of most U.S. diets. However, because they are classed as dietary supplements and therefore not subject to FDA regulation like other caffeine products, energy drinks constitute a greater than average risk for caffeine intoxication, a recognized clinical syndrome associated with higher than average doses. High levels of caffeine use have been linked to adverse health effects ranging from anxiety, irritability and insomnia to high blood pressure, cardiac arrhythmias, seizures and even death, in rare cases.

In the current study, most participants were male (60 %) and non-Hispanic white (72 %), with an average age of 28. Approximately one-fourth had a high school diploma or less, one-fourth had attended some college, 22 %had a bachelors or postgraduate degree and the remaining 29 %were currently in school. Thirty-six percent were employed full-time or part-time as professional musicians.

👎👎👎

Vitamin D Deficiency Is Associated With Different Types of Obesity in Black and White Children

ScienceDaily (June 21, 2011) — A recent study accepted for publication in The Endocrine Society's *Journal of Clinical Endocrinology & Metabolism* (JCEM) found that while black and white children with vitamin D deficiency both had higher fat levels, black children were more likely to have higher levels of fat just under their skin and white children were more likely to have higher levels of fat between their internal organs.

Studies in adults and children have shown a link between obesity and vitamin D deficiency. However, data characterizing the racial differences in the relationship between obesity and vitamin D, particularly in fat tissue distribution are limited. This study examined the racial differences in the relationship between vitamin D status, BMI, fat levels, fat distribution and lipid levels in healthy obese and non-obese 8-18 year old black and white children.

"Vitamin D deficiency is rampant in American youth, and there is some suggestion in adults that low levels of vitamin D may be playing a role in the increasing rates of type 2 diabetes. It is possible the same may be true for youth with type 2 diabetes," said Silva Arslanian, MD, of the University of Pittsburgh and lead author of the study. "Our study found that vitamin D was associated with higher fat levels and lower levels of high-density lipoprotein (HDL), also known as good cholesterol, in both black and white children."

In this study, researchers measured vitamin D levels in 237 children and found the majority of the study participants were vitamin D deficient. Plasma vitamin D levels were associated inversely with BMI and fat levels and positively with HDL cholesterol in all subjects. Visceral adipose tissue (fat between internal organs) was higher in vitamin D deficient whites and subcutaneous adipose tissue (fat below the skin) was higher in vitamin D deficient blacks compared with their respective vitamin D non-deficient counterparts.

"Besides therapeutic interventions to correct the high rates of vitamin D deficiency in youth, benefits of vitamin D optimization on fat levels, lipid profile and risk of type 2 diabetes need to be explored," said Arslanian.

👎👎👎

Soluble Fiber Strikes a Blow to Belly Fat

ScienceDaily (June 27, 2011) — All fat is not created equal. Unsightly as it is, subcutaneous fat, the fat right under the skin, is not as dangerous to overall health as visceral fat, the fat deep in the belly surrounding vital organs.

According to a new study by researchers at Wake Forest Baptist Medical Center, the way to zero in and reduce visceral fat is simple: eat more soluble fiber from vegetables, fruit and beans, and engage in moderate activity. The study found that for every 10-gram increase in soluble fiber eaten per day, visceral fat was reduced by 3.7 percent over five years. In addition, increased moderate activity resulted in a 7.4 percent decrease in the rate of visceral fat accumulation over the same time period.

"We know that a higher rate of visceral fat is associated with high blood pressure, diabetes and fatty liver disease," said Kristen Hairston, M.D., assistant professor of internal medicine at Wake Forest Baptist and lead researcher on the study. "Our study found that making a few simple changes can have a big health impact." Ten grams of soluble fiber can be achieved by eating two small apples, one cup of green peas and one-half cup of pinto beans; moderate activity means exercising vigorously for 30 minutes, two to four times a week, Hairston added.

In the longitudinal study, published in the June 16 online issue of the journal *Obesity*, researchers examined whether lifestyle factors, such as diet and frequency of exercise, were associated with a five-year change in abdominal fat of African Americans and Hispanic Americans, populations at a disproportionally higher risk for developing high blood pressure and diabetes and accumulating visceral fat.

At the beginning of the study, which involved 1,114 people, the participants were given a physical exam, an extensive questionnaire on lifestyle issues, and a CT scan, the only accurate way to measure how much subcutaneous and visceral fat the participants had. Five years later, the exact same process was repeated. Researchers found that increased soluble fiber intake was associated with a decreased rate of accumulated visceral fat, but not subcutaneous fat.

"There is mounting evidence that eating more soluble fiber and increasing exercise reduces visceral or belly fat, although we still don't know how it works," Hairston said. "Although the fiber-obesity relationship has been extensively studied, the relationship between fiber and specific fat deposits has not. Our study is valuable because it provides specific information on how dietary fiber, especially soluble fiber, may affect weight accumulation through abdominal fat deposits."

👎👎👎

Getting Enough 'Sunshine Vitamin' May Not Just Be About Catching Rays, New Blood Test Reveals

ScienceDaily (June 30, 2011) — Researchers from London's Kingston University have developed a new highly-accurate blood test which can detect how much a patient's diet could be responsible for a lack of the so-called 'sunshine vitamin'. Vitamin D deficiencies can weaken the immune system and increase the risk of cancer and osteoporosis.

A team headed by Professor Declan Naughton spent five months developing the new test. For the first time, the different forms of vitamin D the body absorbs from diet and sunlight, known as vitamin D2 and vitamin D3 respectively, can be individually distinguished from closely related compounds.

"Many people know that the main source of vitamin D is from exposure to sunlight because humans produce a type of vitamin D naturally from the action of sun on the skin," Professor Naughton said. "But what's perhaps less well known is that another type of the vitamin can be found in foods such as salmon, mackerel, sardines and egg yolks. Our new test can individually measure all the forms of vitamin D that matter, and potentially help us to understand exactly what is causing any deficiency. Perhaps people just need more sun, or maybe they should be looking much more closely at their diet too."

Vitamin D plays a key role in forming and maintaining strong teeth and bones. Professor Naughton said vitamin D deficiency remained a major problem in the Western world, with several studies showing that between 40 and 100 per cent of elderly people in the United States and Europe do not get enough. Symptoms include fatigue, aching muscles and bones and in severe cases a deficiency can cause osteoporosis. GPs in the UK are now

routinely administering vitamin D injections to boost patients' levels.

In future, the new blood test could be used to help demonstrate the role vitamin D deficiency plays in illnesses, from diabetes to cancer. Leading cancer expert Professor Angus Dalgleish from St George's Hospital in London said he believed the importance of being able to assess vitamin D levels accurately could not be overstated. "It's crucial to have a normal vitamin D level and that is becoming increasingly apparent across a broad range of diseases, including cardiovascular, neurological and cancer cases," Professor Dalgleish, a consultant medical oncologist said. "It is therefore very important to be able to accurately and reliably measure the different forms of vitamin D in order to monitor levels and to make sure they are maintained in the normal range."

Many people completely forgot how the correction of very low levels of vitamin D completely cured the scourge of rickets, Professor Dalgleish added. "It would appear that it is not just bone that requires vitamin D for normal function but nearly all other tissues as well, particularly blood vessels and the immune system."

The blood test was devised by Professor Naughton's team after he identified the need for a more thorough analysis of the various types of vitamin D. The team reviewed two decades of research and found that the exact link between vitamin D deficiency and health and diseases was unclear, possibly because many forms of the vitamin are active, but are not always measured rigorously. "There are also question marks about just what level of vitamin D is healthy, and it may be that when we talk about deficiency in future, it should be very clearly broken down into the different forms of vitamin D arising from diet and sunlight," Professor Naughton said.

Cinnamon Extract Inhibits Progression Of Alzheimer's Disease

28 Jun 2011

Alzheimer's, the degenerative brain disorder that disrupts memory, thought and behavior, is devastating to both patients and loved ones. According to the Alzheimer's Association, one in eight Americans over the age of 65 suffers from the disease. Now Tel Aviv University has discovered that an everyday spice in your kitchen cupboard could hold the key to Alzheimer's prevention.

An extract found in cinnamon bark, called CEppt, contains properties that can inhibit the development of the disease, according to Prof. Michael Ovadia of the Department of Zoology at Tel Aviv University. His research, conducted in collaboration with Prof. Ehud Gazit, Prof. Daniel Segal and Dr. Dan Frenkel, was recently published in the journal *PLoS ONE*.

Taking a cue from the ancient world

Prof. Ovadia was inspired to investigate the healing properties of cinnamon by a passage in the Bible. It describes high priests using the spice in a holy ointment, he explains, presumably meant to protect them from infectious diseases during sacrifices. After discovering that the cinnamon extract had antiviral properties, Prof. Ovadia empirically tested these properties in both laboratory and animal Alzheimer's models.

The researchers isolated CEppt by grinding cinnamon and extracting the substance into an aqueous buffer solution. They then introduced this solution into the drinking water of mice that had been genetically altered to develop an aggressive form of Alzheimer's disease, and fruit flies that had been mutated with a human gene that also stimulated Alzheimer's disease and shortened their lifespan.

After four months, the researchers discovered that development of the disease had slowed remarkably and the animals' activity levels and longevity were comparable to that of their healthy counterparts. The extract, explains Prof. Ovadia, inhibited the formation of toxic amyloid polypeptide oligomers and fibrils, which compose deposits

of plaque found in the brains of Alzheimer's patients.

In the test-tube model, the substance was also found to break up amyloid fibers, similar to those collected in the brain to kill neurons. According to Prof. Ovadia, this finding indicates that CEppt may not just fight against the development of the disease, but may help to cure it after Alzheimer's molecules have already formed. In the future, he says, the team of researchers should work towards achieving the same result in animal models.

Adding a dash of cinnamon

Don't rush to your spice cabinet just yet, however. It would take far more than a toxic level of the spice - more than 10 grams of raw cinnamon a day - to reap the therapeutic benefits. The solution to this medical catch-22, Prof. Ovadia says, would be to extract the active substance from cinnamon, separating it from the toxic elements.

"The discovery is extremely exciting. While there are companies developing synthetic AD inhibiting substances, our extract would not be a drug with side effects, but a safe, natural substance that human beings have been consuming for millennia," says Prof. Ovadia.

Though it can't yet be used to fight Alzheimer's, cinnamon still has its therapeutic benefits - it can also prevent viral infections when sprinkled into your morning tea.

Medical News Today

2-Fisted Assault On Diabetes And Nervous System Disorders With Flavonoids

28 Jun 2011

A recent study from scientists at the Salk Institute for Biological Studies suggests that a strawberry a day (or more accurately, 37 of them) could keep not just one doctor away, but an entire fleet of them, including the neurologist, the endocrinologist, and maybe even the oncologist.

Investigations conducted in the Salk Institute's Cellular Neurobiology Laboratory (CNL) appeared in the June 27, 2011, issue of *PLoS ONE*. The report explains that fisetin, a naturally-occurring flavonoid found most abundantly in strawberries and to a lesser extent in other fruits and vegetables, lessens complications of diabetes. Previously, the lab showed that fisetin promoted survival of neurons grown in culture and enhanced memory in healthy mice. That fisetin can target multiple organs strongly suggests that a single drug could be used to mitigate numerous medical complications.

"This manuscript describes for the first time a drug that prevents both kidney and brain complications in a type 1 diabetes mouse model," says David Schubert, Ph.D., professor and head of the Cellular Neurobiology Laboratory and one of the manuscript's co-authors. "Moreover, it demonstrates the probable molecular basis of how the therapeutic is working."

Pam Maher, Ph.D., a senior staff scientist in the CNL, is the study's corresponding author. Maher initially identified fisetin as a neuroprotective flavonoid ten years ago. "In plants, flavonoids act as sunscreens and protect leaves and fruit from insects," she explains. "As foods they are implicated in the protective effect of the 'Mediterranean Diet.'" Other celebrity flavonoids include polyphenolic compounds in blueberries and red wine.

Although her group's focus is neurobiology, Maher and colleagues reasoned that, like other flavonoids, fisetin

might ameliorate a spectrum of disorders seen in diabetic patients. To test this, they evaluated effects of fisetin supplementation in Akita mice, a very robust model of type 1 diabetes, also called childhood onset diabetes.

Akita mice exhibit increased blood sugar typical of type 1 diabetes and display pathologies seen in serious human complications of both type 1 and 2 diabetes. Those include diabetic nephropathy or kidney disease, retinopathy, and neuropathies in which patients lose touch or heat sensations.

Mice fed a fisetin-enriched diet remained diabetic, but acute kidney enlargement-or hypertrophy-seen in untreated mice was reversed, and high urine protein levels, a sure sign of kidney disease, fell. Moreover, fisetin ingestion ameliorated anxiety-related behaviors seen in diabetic mice. "Most mice put in a large area become exploratory," says Maher. "But anxious mice tend not to move around. Akita mice showed enhanced anxiety behavior, but fisetin feeding restored their locomotion to more normal levels."

The study also defines a likely molecular mechanism underlying these effects. Researchers observed that blood and brain levels of sugars affixed to proteins known as advanced glycation end-products-or AGEs-were reduced in fisetin-treated compared to untreated Akita mice. These decreases were accompanied by increased activity of the enzyme glyoxalase 1, which promotes removal of toxic AGE precursors.

The discovery of an AGE-antagonizing enzyme upregulated by fisetin is very intriguing, because substantial evidence implicates high blood AGE levels with many if not most diabetic complications. "We know that fisetin increases activity of the glyoxalase enzyme and may increase its expression," says Maher. "But what is important is that ours is the first report that any compound can enhance glyoxalase 1 activity."

Interestingly, excessively high AGE levels also correlate with inflammatory activity thought to promote some cancers. In fact, studies published by others confirm that fisetin decreases tumorigenicity of prostate cancer cells both in culture and in animal models, which if supported would represent a major added incentive to eat your strawberries.

To ingest fisetin levels equivalent to those fed Akita mice, Maher estimates that humans would have to eat 37 strawberries a day, assuming that strawberry fisetin is as readily metabolizable by humans as fisetin-spiked lab chow is by mice. Rather than through diet, Maher envisions that fisetin-like drugs could be taken as a supplement.

Schubert notes that fisetin is also effective in mouse models of Alzheimer's disease. "We and others have shown that diabetes may be a risk factor for Alzheimer's disease, making identification of a safe prophylactic like fisetin highly significant," he says.

Maher acknowledges that the public may be suffering from flavonoid-fatigue, given media coverage of the promises of these compounds. "Polyphenolics like fisetin and those in blueberry extracts are found in fruits and vegetables and are related to each other chemically," she says. "There is increasing evidence that they all work in multiple diseases. Hopefully some combination of these compounds will eventually get to the clinic."

Schubert concurs that their findings only reinforce what common sense and our mothers told us was a healthy lifestyle. "Eat a balanced diet and as much freshly prepared organic food as possible, get some exercise, keep socially and mentally active and avoid sodas with sugar and highly processed foods since they can contain high levels of AGEs," he advises.

But he also worries that hoops that must be jumped through to bring a natural product like fisetin, as opposed to a totally synthetic drug, to clinical trials are daunting because it is difficult to protect patents on natural

products. "We will never know if a compound like fisetin works in humans until someone is willing to support a clinical trial."

Medical News Today

👎👎👎

Improved Understanding Of 'Natural Antifreeze' Molecules

24 Jun 2011

Scientists have made an important step forward in their understanding of cryoprotectants - compounds that act as natural 'antifreeze' to protect drugs, food and tissues stored at sub-zero temperatures. Researchers from the Universities of Leeds and Illinois, and Columbia University in New York, studied a particular type of cryoprotectants known as osmolytes. They found that small osmolyte molecules are better at protecting proteins than larger ones. The findings, published in *Proceedings of the National Academy of Sciences*, could help scientists develop better storage techniques for a range of materials, including human reproductive tissue used in IVF.

Biological systems can usually only operate within a small range of temperatures. If they get too hot or too cold, the molecules within the system can become damaged (denatured), which affects their structure and stops them from functioning. But certain species of fish, reptiles and amphibians can survive for months below freezing by entering into a kind of suspended animation. They are able to survive these extreme conditions thanks to osmolytes - small molecules within their blood that act like antifreeze - preventing damage to their vital organs.

These properties have made osmolytes attractive to scientists. They are used widely in the storage and testing of drugs and other pharmaceuticals; in food production; and to store human tissue like egg and sperm cells at very low temperatures for a long period of time. "If you put something like human tissue straight in the freezer, ice crystals start to grow in the freezing water and solutes - solid particles dissolved in the water - get forced out into the remaining liquid. This can result in unwanted high concentrations of solutes, such as salt, which can be very damaging to the tissue," said Dr Lorna Dougan from the University of Leeds, who led the study. "The addition of cryoprotectants, such as glycerol, lowers the freezing temperature of water and prevents crystallisation by producing a 'syrupy' semi-solid state. The challenge is to know which cryoprotectant molecule to use and how much of it is necessary.

"We want to get this right so that we recover as much of the biological material as possible after re-thawing. This has massive cost implications, particularly for the pharmaceutical industry because at present they lose a large proportion of their viable drug every time they freeze it."

Dr Dougan and her team tested a range of different osmolytes to find out which ones are most effective at protecting the 3D structure of a protein. They used an atomic force microscope to unravel a test protein in a range of different osmolyte environments to find out which ones were most protective. They discovered that smaller molecules, such as glycerol, are more effective than larger ones like sorbitol and sucrose. Dr Dougan said: "We've been able to show that if you want to really stabilise a protein, it makes sense to use small protecting osmolytes. We hope to use this discovery and future research to develop a simple set of rules that will allow scientists and industry to use the best process parameters for their system and in doing so dramatically increase the amount of material they recover from the freeze-thaw cycle."

Medical News Today

Changes In Specific Dietary Factors May Have Big Impact On Long-Term Weight Gain

23 Jun 2011

In a series of three separate studies looking at how changes in multiple dietary and other lifestyle factors relate to long-term weight gain, Harvard School of Public Health (HSPH) researchers found that modest changes in specific foods and beverages, physical activity, TV-watching, and sleep duration were strongly linked with long-term weight gain. Changes in diet, in particular, had the strongest associations with differences in weight gain. The study appears in the June 23, 2011, issue of the *New England Journal of Medicine.*

Prior research has often focused on methods for weight loss after obesity has developed. Less is known about factors linked to long-term term weight gain. "An average adult gains about one pound per year. Because the weight gain is so gradual and occurs over many years, it has been difficult for scientists and for individuals themselves to understand the specific factors that may be responsible," said lead author Dariush Mozaffarian, associate professor in the Department of Epidemiology at HSPH and Division of Cardiovascular Medicine, Brigham and Women's Hospital (BWH), and Harvard Medical School.

The researchers evaluated changes in multiple specific lifestyle factors and weight gain every four years over 12 to 20 years of follow-up in three separate large cohorts, the Nurses' Health Study (NHS), the Nurses' Health Study II (NHS II), and the Health Professionals Follow-up Study (HPFS). The final analyses included 50,422 women in the NHS, 47,898 women in NHS II, and 22,557 men in HPFS, all of whom were free of obesity or chronic diseases at the beginning of the study. Study participants gained an average of 3.35 lb during each four-year period, which corresponded to a weight gain of 16.8 lb over the 20-year period.

When relations of lifestyle changes with weight gain were evaluated, the findings were strikingly similar in all 3 studies. For example, the foods associated with the greatest weight gain over the 20-year study period included potato chips (for each one increased daily serving, +1.69 lb more weight gain every 4 years), other potatoes (1.28 lb), sugar-sweetened beverages (1.00 lb), unprocessed meats (0.95 lb), and processed meats (0.93 lb). Of note, several foods associated with less weight gain when their consumption was actually increased, including vegetables (-0.22 lb), whole grains (-0.37 lb), fruits (-0.49 lb), nuts (-0.57 lb) and yogurt (-0.82 lb). Evaluating all changes in diet together, participants in the lower 20% of dietary changes gained nearly 4 lbs more each 4 years than those in the top 20% -an amount equivalent to the average weight gain in the population overall.

For diet, focusing only on total calories may not be the most useful way to consume fewer calories than one expends, say the researchers. Other yardsticks, such as content of total fat, energy density, or sugars, could also be misleading. Rather, they found that eating more healthful foods and beverages-focusing on overall dietary quality-was most important.

The most useful dietary metrics for preventing long-term weight gain appeared to be:

- Focus on improving carbohydrate quality by eating less liquid sugars (e.g. soda) and other sweets, as well as fewer starches (e.g. potatoes) and refined grains (e.g. white bread, white rice, breakfast cereals low in fiber, other refined carbohydrates).
- Focus on eating more minimally processed foods (e.g. fruits, vegetables, whole grains, nuts, yogurt) and fewer highly processed foods (e.g. white breads, processed meats, sugary beverages).

Such a more healthful dietary pattern could influence long-term weight gain in many ways, including, for example, through biologic effects such as changing hunger, insulin levels, or satiety, or by improving eating

behaviors related to average portion sizes and patterns of foods and beverages consumed.

"These findings underscore the importance of making wise food choices in preventing weight gain and obesity," said Frank Hu, professor of nutrition and epidemiology at HSPH and senior author of the paper. "The idea that there are no 'good' or 'bad' foods is a myth that needs to be debunked."

The results also showed that changes in physical activity and TV-viewing influenced changes in weight. Also, those who slept 6-8 hours a night gained less weight than those who slept less than 6 or more than 8 hours. Overall, the weight-changes associated with any one lifestyle change were fairly small. However, together they added up, especially for diet. "Small dietary and other lifestyle changes can together make a big difference - for bad or good," said Mozaffarian. "This makes it easy to gain weight unintentionally, but also demonstrates the tremendous opportunity for prevention. A handful of the right lifestyle changes will go a long way."

Medical News Today

Protection Against Alzheimer's Disease Boosted By Mystery Ingredient In Coffee

22 Jun 2011 A yet unidentified component of coffee interacts with the beverage's caffeine, which could be a surprising reason why daily coffee intake protects against Alzheimer's disease. A new Alzheimer's mouse study by researchers at the University of South Florida found that this interaction boosts blood levels of a critical growth factor that seems to fight off the Alzheimer's disease process.

The findings appear in the early online version of an article to be published June 28 in the *Journal of Alzheimer's Disease*. Using mice bred to develop symptoms mimicking Alzheimer's disease, the USF team presents the first evidence that caffeinated coffee offers protection against the memory-robbing disease that is not possible with other caffeine-containing drinks or decaffeinated coffee.

Previous observational studies in humans reported that daily coffee/caffeine intake during mid-life and in older age decreases the risk of Alzheimer's disease. The USF researchers' earlier studies in Alzheimer's mice indicated that caffeine was likely the ingredient in coffee that provides this protection because it decreases brain production of the abnormal protein beta-amyloid, which is thought to cause the disease.

The new study does not diminish the importance of caffeine to protect against Alzheimer's. Rather it shows that caffeinated coffee induces an increase in blood levels of a growth factor called GCSF (granulocyte colony stimulating factor). GCSF is a substance greatly decreased in patients with Alzheimer's disease and demonstrated to improve memory in Alzheimer's mice. A just-completed clinical trial at the USF Health Byrd Alzheimer's Institute is investigating GCSF treatment to prevent full-blown Alzheimer's in patients with mild cognitive impairment, a condition preceding the disease. The results of that trial are currently being evaluated and should be known soon.

"Caffeinated coffee provides a natural increase in blood GCSF levels," said USF neuroscientist Dr. Chuanhai Cao, lead author of the study. "The exact way that this occurs is not understood. There is a synergistic interaction between caffeine and some mystery component of coffee that provides this beneficial increase in blood GCSF levels." The researchers would like to identify this yet unknown component so that coffee and other beverages could be enriched with it to provide long-term protection against Alzheimer's.

Medical News Today

Cooling System May Build Eggs' Natural Defenses Against Salmonella

22 Jun 2011

Once eggs are laid, their natural resistance to pathogens begins to wear down, but a Purdue University scientist believes he knows how to rearm those defenses. Kevin Keener, an associate professor of food science, created a process for rapidly cooling eggs that is designed to inhibit the growth of bacteria such as salmonella. The same cooling process would saturate the inside of an egg with carbon dioxide and alter pH levels, which he has found are connected to the activity of an enzyme called lysozyme, which defends egg whites from bacteria. "This enzyme activity is directly related to the carbon dioxide and pH levels," said Keener, whose results were published in the journal *Poultry Science*. "An increase in lysozyme would lead to increased safety in eggs."

Freshly laid eggs are saturated with carbon dioxide and have pH levels of about 7. Over time, the pH level rises to 9 and carbon dioxide escapes, Keener said. As that happens, lysozyme becomes less active. Keener saturated purified egg white lysozymes with carbon dioxide and tested different pH levels. He found that at both high and low pH levels, the addition of carbon dioxide would increase lysozyme activity by as much as 50 percent.

The cooling process Keener developed would create the same conditions, he said. "When we cool the eggs, carbon dioxide is sucked inside the shell," Keener said. "We're able to resaturate the white of the egg with carbon dioxide, returning it to that original condition when the chicken laid it." The additional lysozyme activity would give eggs more time to self-eliminate harmful bacteria.

Keener's cooling technology uses carbon dioxide "snow" to rapidly lower the eggs' temperature. Eggs are placed in a cooling chamber and carbon dioxide gas at about minus 110 degrees Fahrenheit is generated. The cold gas is circulated around the eggs and forms a thin layer of ice inside the eggshell. After treatment, the ice layer melts and quickly lowers an egg's internal temperature to below 45 degrees Fahrenheit. The eggshell does not crack during this process because it can resist expansion from a thin ice layer. Keener said Food and Drug Administration studies show that if eggs were cooled and stored at 45 degrees or less within 12 hours of laying, there would be an estimated 100,000 fewer salmonella illnesses from eggs in the United States each year.

Medical News Today

Dietary Changes Appear To Affect Levels Of Biomarkers Associated With Alzheimer's Disease

13 Jun 2011

Following a low-saturated fat and low-glycemic index diet appears to modulate the risk of developing dementia that proceeds to Alzheimer's disease (AD), although making a switch to this dietary pattern may not protect those already experiencing cognitive difficulty, according to a report in the June issue of *Archives of Neurology,* one of theJAMA/Archives journals.

Previous research has suggested multiple links between diet and cognitive ability, the authors note as background information. Health conditions in which insulin resistance (the body's inability to use insulin effectively) is a factor - obesity, type 2 diabetes, cardiovascular disease and high cholesterol levels - have also been associated with "pathological brain aging." However, studies of specific foods have not found conclusive evidence of an influence on Alzheimer's risk. "Thus," the authors write, "a more promising approach to the study of dietary factors in AD might entail the use of whole-diet interventions, which have greater ecologic validity and preserve

the nutritional milieu in which fat and carbohydrate consumption occurs."

Jennifer L. Bayer-Carter, M.S., from Veterans Affairs Puget Sound Health Care System, Seattle, and colleagues sought to compare a high-saturated fat/high-simple carbohydrate diet (a macronutrient pattern associated with type 2 diabetes

and insulin resistance) with a low-saturated fat/low-simple carbohydrate diet; the interventions were named HIGH and LOW, respectively. The authors evaluated the effects of these diets in 20 older adults who were healthy and 29 older adults who had amnestic mild cognitive impairment (aMCI), meaning they experienced some memory problems; the latter condition is often considered a precursor to AD. In a four-week randomized, controlled trial, 24 participants followed the HIGH diet and 25 followed the LOW diet. The researchers studied participants' performance on memory tests as well as their levels of biomarkers (biological substances indicative of AD), such as insulin, cholesterol, blood glucose levels, blood lipid levels and components of cerebrospinal fluid (CSF).

Results of the study were different for the group that had aMCI and the group of healthy participants. In the latter group, the LOW diet decreased some CSF biomarkers of AD as well as total cholesterol levels. However, among individuals with aMCI, the LOW diet increased levels of these biomarkers. Some changes to biomarkers, such as CSF insulin levels, were observed in both groups. Additionally, the LOW diet improved performance on delayed visual recall tests for both healthy and memory-impaired participants, but did not affect scores on other cognitive measures.

The findings indicate that "for healthy adults, the HIGH diet moved CSF biomarkers in a direction that may characterize a presymptomatic stage of AD," explain the authors. They believe that the different results in participants with aMCI may show that dietary interventions are not as effective in later stages of cognitive impairment. "The therapeutic effects of longer-term dietary intervention may be a promising avenue of exploration," the authors conclude. "In addition, identification of the pathophysiologic changes underlying dietary effects may reveal important therapeutic targets that can be modulated through targeted dietary or pharmacologic intervention." (*Arch Neurol*. 2011;68[6]:743-752.

Medical News Today

Pre-Diabetic? Start Eating More Fruit
01 Jun 2011

Before people develop type 2 diabetes, they almost always have "prediabetes," defined as blood glucose levels that are higher than normal but not yet high enough to be diagnosed as diabetes. There are 79 million people in the United States who have prediabetes. Recent research has shown that even during prediabetes both heart and circulatory long-term damage to the body may already be occurring.

Both pre-diabetics and diabetics are sometimes concerned about eating fruit due to its reported "high sugar content." Are fruits wrongly lumped into the catch-all phrase "carbohydrate" and incorrectly classified as a sugar food?

Regardless of which stage of diabetes one might be experiencing or not, all of us would fare far better by including more fruit consumption in our daily diets while reducing grains, breads, meal replacement bars and the plethora of refined manufactured carbohydrates that are consumed instead, according to Dian Griesel, Ph.D. and Tom Griesel, co-authors of the new book, *TurboCharged: Accelerate Your Fat Burning Metabolism, Get Lean*

Fast and Leave Diet and Exercise Rules in the Dust (BSH, 2011).

There is considerable research supporting their claims. Researchers from the Centers for Disease Control and Prevention in Atlanta completed a 20-year study that involved closely watching the diets of a group of individuals between the ages of 25 and 74. The study named the first National Health and Nutrition Examination Survey concluded that fruits and vegetables had a demonstratively positive, protective effect against diabetes.

As reported in *Preventive Medicine*, "A healthy diet including fruits and vegetables could help prevent diabetes from ever occurring. The higher levels of fruit and vegetable consumption might decrease the risk of diabetes in adults, particularly women."

The average daily intake of fruits and vegetables as well as the number of participants consuming five or more fruits and vegetables per day was lower among the participants who developed diabetes than among the participants in the study who remained free of this disease. The investigators determined that these results suggest that fruit and vegetable consumption may decrease the risk for diabetes."

"Lumping fruit into the broad category of carbohydrates is confusing to us as consumers-diabetic or not. Fruits are loaded with vitamins, minerals, fiber and perfectly filled with water that allows better absorption of their natural nutritive properties," says Tom Griesel.

The confusion with fruit eating by diabetics at any stage may have arisen because according to the Glycemic Index, some fruits, like bananas, considered by many "Nature's Perfect Food," are rated with a high glycemic index.

"Glycemic index is significantly altered by the type of food, its ripeness, processing, the length of storage, cooking methods, and its variety. Watermelon has a glycemic score of 100-which is identical to heavily processed and nutrient poor white bread," says Dian Griesel, Ph.D. The misconceptions for prediabetics and diabetics concerning fruit is twofold: Since fruit is very high in both water and naturally occurring fiber, the digestion time of any naturally contained sugars is slowed significantly. "The natural water and fiber content of fruit actually causes a slow release of sugar into the bloodstream. This is quite unlike the instant sugar impact of no-fiber, high-chemical, heavily processed white bread that is also quite dehydrating," say the Griesels.

Fruit is an excellent food. It satisfies our natural urges for something sweet. Prediabetics and diabetics would benefit from eating more fresh, raw fruits and vegetables and less refined carbohydrates, in any form.

Medical News Today

👎👎👎

Too Much Caffeine Can Trigger Hallucinations

June 8, 2011 Food Product Design

MELBOURNE, Australia—Individuals who consume five or more cups of caffeinated coffee may increase their risk of auditory hallucinations, according to a new study published in the journal *Personality and Individual Differences*. The findings suggest stress, coupled with high caffeine consumption, trigger imaginary voices in the head.

Researchers at La Trobe University's School of Psychological Sciences studied the effect of caffeine and

stress on 92 non-clinical participants who were assigned to either a high- or a low-stress condition and a high- or a low-caffeine condition on the basis of self-report. They were asked to listen to white noise and report each time they heard Bing Crosby's rendition of "White Christmas" during the white noise (which was never played). Results indicated the interaction of stress and caffeine had a significant effect on the reported frequency of hearing the song. The participants with high levels of stress or consumed high levels of caffeine were more likely to hear the song.

"High caffeine levels in association with high levels of stressful life events interacted to produce higher levels of 'hallucination' in non-clinical participants, indication that further caution needs to be exercised with the use of this overtly 'safe' drug," said lead author Professor Simon Crowe. "There is a link between high levels of stress and psychosis, and caffeine was found to correlate with hallucination proneness. The combination of caffeine and stress affect the likelihood of an individual experiencing a psychosis-like symptom."

Crowe said the findings also helped explain the mechanism by which stress may facilitate the symptoms of schizophrenia in non-clinical samples.

Baked Goods Improve Milk Allergies in Kids

June 6, 2011 Food Product Design NEW YORK—Eating baked goods that contain milk may improve milk allergies in children, according to a new study published in the *Journal of Allergy and Clinical Immunology*.

Researchers at Mount Sinai Medical Center gave 88 milk-allergic children between 2 and 17 years old baked goods that included milk, and compared them to a group of 60 allergic children who observed strict avoidance of milk products.

After three years, roughly half of the kids who ate muffins were able to eat dairy products without allergic reactions, compared with less than 25 percent of the participants who avoided milk. Researchers also found that the children who were better able to tolerate muffins from the beginning were much more likely to grow out of their allergies.