

# **PFNDAI Bulletin (March 2013)**

**Protein Foods and Nutrition Development  
Association of India**

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# Editorial

The new food act in India, Food Safety & Standards Act 2006 has permitted many substances and extracts of plant and botanical origin which may have physiological activity. It is welcome change from the earlier regulation. As has been known since ages, our foods and ingredients contain some substances that have beneficial effect and will provide health benefits.

Some of these substances are already included in our foods in the form of spices and herbs but more recent scientific research has uncovered a large number of substances from plant origin having a number of health benefits which could reduce or control cholesterol, reduce the risk of some of the diseases including heart disease, diabetes, cancer, Alzheimer's disease and many of the old-age related problems.

Already Western markets are getting flooded with many such products and in India many entrepreneurs are interested in manufacturing or importing these. Regulations are being made for these products. We would like to highlight two concerns related to these.

Many products are going to be in the area which will be between food and medicine. Although medicines are defined as substances that cure diseases among other things and foods are not supposed to cure any disease but may reduce the risk of diseases.

There are many substances which are already used in foods which have the potential for cure and many ingredients with physiologic activity are used in medicines especially the alternative medicines like Ayurveda and are also at times ingredients in foods.

Consumers are definitely going to be a little confused about what is food and what is medicine as our new food law even permits capsules, tablets and powders to be used in functional foods or foods for special dietary uses. Right now there are many products

available in grey markets which at times are marketed as such products and labelled as foods.

There is a need to clearly demarcate these into medicine and foods and not only should developers, manufacturers, distributors and marketers but also the consumers and importantly the food safety officers should also be able to distinguish easily which is which. It is extremely important to realise that medicines always have a dosage mentioned for them but foods usually do not have such requirement.

Second concern is regarding safety of these substances for use in foods. Many botanicals have been used in medicines but one safety control there is not only the recommended dosages are given after evaluating them to be safe over a very rigorous safety evaluation protocols but dosages are usually not exceeded and these are used only for a limited period for the cure of the disease. Of course there are some diseases wherein medicines are taken over lifetimes but most of the cases it is not so.

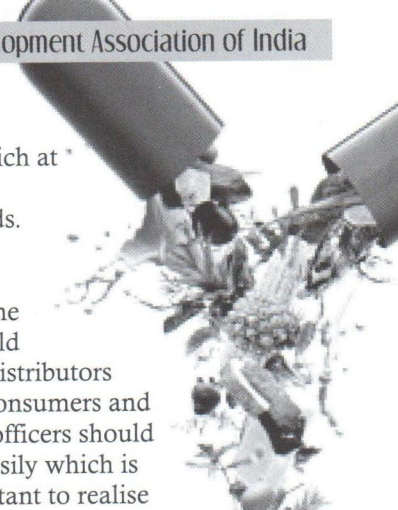
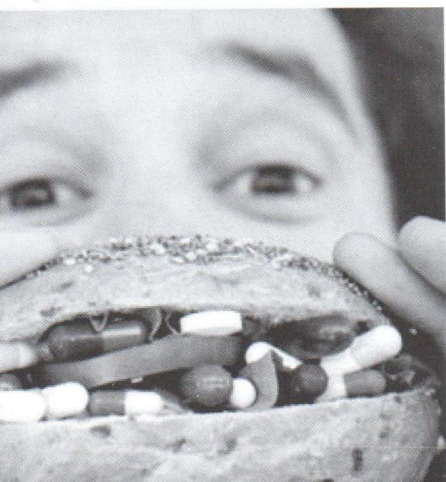
In case of foods, except those which are supposed to be taken under medical supervision or advice, consumers do not have any such directions about the quantities that could be safely consumed and how long they could be consumed. This may happen in spite of label warnings.

Under such conditions, when substances having physiological activity are allowed in foods, there must be very rigorous exercise completed regarding safety evaluation at the permitted levels. Even when these may have been shown to be safe in medicines, controls are different in medicines compared to controls in foods.

Even after the safety evaluation, it is extremely essential to create the awareness about these foods among all the stakeholders. The awareness should not be the responsibility of marketers through advertisements but there should be many programmes aimed at creating awareness. These may use different media and not just the TV.

People will certainly benefit greatly by such foods as it is well-known that prevention is always better than the cure. With season's greetings,

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## **Fast-Foods - Journey from Junk to Healthy Foods**

**Dr. R. R. Mallya Consultant – Food Industries**

Fast food is a term used for foods that could be prepared and served quickly. Although any food with low preparation time may be considered fast food, this term is typically applied to foods sold in restaurants and stores with preheated or precooked ingredients and also foods served to customers in a form packed to take away. Many of the fast foods are preferred by busy office goers and youth because these are quickly made and served so one spends very little time for its preparation. Nutritionists however look down upon these because they feel these are junk foods.

Junk food is an informal term that has been variously defined as the food that is of little nutritional value and often high in fat, sugar (calories) and Sodium. It is believed that the term Junk Food was coined by Michael Jacobson, director of the Center for Science in the Public Interest, in 1972. These foods typically contain high levels of calories from sugar or fat with little protein, vitamins or minerals.

Sugar, salt and fat contribute flavour to foods and make the foods more tasty or acceptable. However, if one keeps consuming only foods with acceptable attributes, it may have unbalanced effect on nutrient intake. Since when you have more of sugar and fat, there will be less of everything else including nutrients. Also refined flours and other ingredients would give food products with better colour, texture and appearance which further increase acceptability.

Common foods named as junk foods include salted snack foods e.g., potato chips/crisps, pretzels, high in refined e.g. gum, candy, sweet desserts and carbonated beverages and high in saturated fats e.g. cake, chocolates and fried fast food like fries. Some of these foods may also contain bad fat like trans fat. Several studies have shown undesirable effects of consumption of these foods and a study also shows that it alters brain activity in a manner similar to addiction. Junk food refers to food that tastes good but is high in calories with little nutritional value.

### **Table: Trans Fat in Fast Foods**

- One large serving of fries contains 8 grams of trans fat.
- One fast food restaurant apple pie contains 4.5 grams of trans fat.
- Four shortbread cookies contain 1.5 grams of trans fat.
- A large order of Popcorn Chicken contains 7 grams of trans fat.
- Chicken Pot Pie contains 14 grams of trans fat.
- Chicken drumstick, two thighs, potato wedges & biscuit contain 15 grams of trans fat.

### **Harmful effects of junk food**

Since junk foods are high in fat with large proportion of which being either saturated or trans, they would contribute to elevation of cholesterol especially the bad one. Trans fats also lower the good HDL cholesterol. All this contributes to plaque formation of cholesterol on inner walls of arteries contributing to atherosclerosis. Salt contributes to hypertension. Thus both contribute to heart diseases. Cardiologists recommend that junk foods be avoided.

Since these foods are mostly prepared to satisfy the palate and they taste good, there is very little thought given to nutrients. There is normally deficiency of nutrients including protein, vitamins and nutrients. Their deficiency causes many health problems including obesity, lack of concentration and attention, weakness etc. There is a long list of problems, some of which are confirmed by research studies.

Doctors recommend reduction or avoidance of consumption of junk foods. There are several ways to do this. One can note all the food consumed so the diet could be evaluated. One must develop healthy eating habits early so teaching children about healthy foods is important. While shopping for weekly grocery, one must avoid these foods. Education and awareness is very important in developing healthy eating habits. Thus one can substitute healthy foods for junk foods.

### **Functional Fast Foods**

The latest trend of adding healthy ingredients to foods has caught up in the fast food market as well. Fish fingers with omega 3 oils and adding probiotics to a whole range of foods including yoghurts and cereal bars are increasingly seen. Even crisps and snacks are being marketed as having one of wholegrain serving. This has appeal to people who like the convenience of a bag of crisps but feel guilty looking at the Nutrition Information. If fast foods and snacks are made more nutritious and healthy then consumption of healthy foods would grow making such foods more appealing.

### **Healthy Fast Food is the key**

People want to justify eating fast foods. They eat them because they provide quick, filling meal and less expensive. They want them to taste good and if they are healthier then there is less guilt consuming them. Fast food chains are now making foods which they make using healthier ingredients which they can advertise. One fried chicken fast food chain shown advertisement emphasising chicken being fresh, showing mountain of salad and they claim to have reduced salt content in their food to make it more healthy.

One of the most successful fast food outlets has been a sandwich company which utilises for fast and low cost foods ingredients that are freshly prepared and can be viewed as being healthy. Healthy eating is a big issue with this chain and their slogan "Eat Fresh" is designed to bring an image of health. It has been pushing the healthy message for years and has even been the subject of weight loss diet in the US.

### **Green Fast Foods**

Another trend consumers like to appreciate when they can afford is the trend for organic and environmentally friendly foods. The green ratings of fast food brands in the US are published by Greenopia. Sadly most of the best-known food joints making burgers and pizza and fried chicken don't appear to score very highly.

Some of the popular UK chains thrive on the hand-made and organic image and boasting of freshly prepared foods from simple ingredients delivered fresh every day. Some use Fairtrade and organic ingredients, so the consumers have guilt-free option when they consider environment although some of the choices of food are definitely not healthy.



## **Latest Happenings in Fast Food Trends**

Some countries have used unique methods to coerce people into eating healthy. Hungary has imposed a tax on packaged foods containing unhealthy concentration e.g. beverages containing more than 20mg of caffeine per 100 ml. Denmark introduced the first fat-food tax in the world by imposing a surcharge on foods containing more than 2.3% saturated fat. However a year later this was removed as implementation had some problems.

Many healthy food advocates would like government to introduce strict limits on how much fat, sugar and salt the manufacturers are allowed to put in their products. However, something more surprising is happening. The big manufacturers of junk foods are remodelling themselves as responsible, health-conscious companies contributing to the well-balanced lifestyle. They have also taken real steps, both to reduce the harm their products do to their customers and to develop new, healthier lines that challenge traditional snack foods in terms of taste.

One soft drink and fruit juice manufacturer announced the changing the product mix to treble the revenue gained from nutritional and healthy food within a decade. Fruit juices, although having high concentration of sugar, are promoted as better than soft drinks. The company also has spent millions of dollars developing other products with reduced sugar, salt and fat.

Another company has pledged to reduction of the amount of sugar in its beverages without changing the taste. It has brought out the lower sugar products that are virtually indistinguishable from their previous products.

These companies have learned to predict trends and stave off potential crises. They have moved fast and shown themselves as responsible. If they had not acted consumer pressure could provoke legislation imposing expensive burdens on them to reformulate their products.

One large biscuit company has reduced the saturated fat of their products by 75 and 80%. Another company has reduced sodium levels from their product by almost half and yet another company has reformulated or launched over 5000 products. One burger company has started giving calorie contents of its products and has reduced saturated fat and calories from burgers. Also healthier oil is used for frying and includes fruit in special meal orders in the US. Another burger company offers young customers fresh, peeled apple in the shape of chips.

## **Indian Fast Foods**

There are fast foods prepared in India some of which are not so healthy. There are some popular foods like samosa, batata vada and vada pav, pakoda, ragda patties, bhel, pani puri, sev puri, and a range of south Indian foods including idli, dosa, upma, medu vada etc.

There are variations in the preparation of many such as samosa which not only differs in size but the filling may contain potato, poha, peas or even meat. The composition of protein, carbohydrates and fat will depend on the recipe and the preparation.

Although fried products will contain good amount of fat not all fried foods will have similar fat contents. Some of the bigger size fried food like bonda or vada will have lesser fat compared to smaller as well as

irregular shaped things such as sev, corn flakes boondi, murukku, chips etc. will have more fat. The recipe and temperature of frying will also affect oil content.

Preparations made with pulses like idli, vada, dosa, dhokla etc. will have more protein. Inclusion of vegetables, herbs and spices will include additional nutrients. Although these are very general statements, actual nutritional value will depend on many factors including the ingredients used, method or preparation as well as size and portion.

It is difficult to brand these fast foods as junk foods as many may be very nutritious like idli and dosa. There are many attempts to make them more nutritious by incorporating certain ingredients like soya, flax seeds, green vegetables, into these preparations. Some fat could also be removed after frying either by letting it drain or using centrifuge which was done in case of fried snacks like sev and ganthia.

One problem with many Indian fast foods is that many times they are made and sold as street foods which are prone to hygiene problems. If these could be prepared hygienically and using ingredients and processes to make them more nutritious then people may not look at them as junk foods.

## **SUMMARY**

Fast food is popular because it is cheap, quick and has good taste. However, many lack in nutritive value being mostly high on calories, sugar, salt and fat. As people are becoming more aware, their reaction has made manufacturers take notice and improve their products making them healthy.

## **Challenges of Fortification of Processed Foods with Omega-3**

Although omega 3 has been accepted as one of the best nutraceutical substances for health foods, its utilisation is slow because of complex interactions that need monitoring in finished product. It is much easier to use omega 3 in supplements and niche products, it is important to realise that not all consumers take supplements and most would prefer these to be taken through foods.

Hence it is challenging to incorporate omega 3 in foods as DHA and EPA are endowed with most health benefits and these are from marine sources. ALA which is mostly present in terrestrial plant sources is useful only when it is converted in body to DHA and EPA and the conversion efficiency is very low.

In order to modify the lipid content of complex finished food to contain omega 3 polyunsaturated fatty acids means every aspect of food matrix needs to be changes maintaining the acceptability of food. It is a big challenge to incorporate these in a stable form in foods and ensuring the food is still acceptable to consumers. There are at least four aspects need to be considered simultaneously while doing this. Addition of omega must not alter texture, flavour, mechanical strength and breakdown rate of food in any way. One needs to identify the most important aspect e.g. flavour to be protected while working with fortification and also keep other aspect in mind so they are not affected adversely while trying to improve the flavour.

Key question to ask is whether omega 3 will be added as an extra ingredient to existing formulation or whether it will replace some of the fat in the product. If this is additional ingredient which will affect texture and overall structure as there will be more lipid in the product. It also affects the flavour balance of the product. Flavour compounds are added to food some soluble in oil and some in water phase of product. When additional oil is added this disturbs the balance directly altering the flavour.

One can use encapsulation which is used in many cases. But one can also consider flavour and texture interactions. If omega 3 is incorporated into a gel, then one can alter the strength of the gel in order to tune the flavour perception. Stronger gel reduces flavour perception as less flavour and aroma compounds are released when the products are put in the mouth. Thus one can make use of texture to solve the flavour problem. This is the main challenge for developer when trying to find solutions other than encapsulation.

Although encapsulation will solve a many problems of perception of the oil itself, developers must also consider how encapsulation itself affects the food. Whether it is added as a filler material or will the encapsulation be cross-linked to food matrix. It is important to judge the in vivo perception rather than looking at it only at its shelf life. It is a dynamic process when one eats as many structures change and will influence the perception of the consumer.

As the use of omega 3 in food increases, suppliers are using the source name like fish, krill, squid, algae and plant to differentiate their products. There is a cost factor as well as a debate about the source advantages including the bioavailability. Krill oil answered the demand for an alternative to fish oil and the smaller capsules and seemingly better experience appeared to satisfy some consumers. Krill sales increased 43% with krill accounting for 12% of total omega 3 supplement sales.

The question of potential superiority between forms – fish oil has omega 3 in triglyceride form and krill oil delivers in phospholipid form – is a more recent debate, claims being premature. The judgement of superiority primarily concerns bioavailability and EPA/DHA content.

Products that do not require digestion in order to be absorbed i.e. free fatty acid and phospholipid forms would have higher bioavailability than triglyceride and ethyl ester forms leading to more efficient incorporation of omega 3. Phospholipids also facilitate passage of fatty acids through intestinal walls increasing their bioavailability and ultimately assimilation. However, one needs to consider the quantity of omega 3 per capsule and the cost per mg.

Research studies have shown that there was a higher incorporation of EPA, DHA and total omega 3 fatty acids into plasma phospholipids after ingestion of krill oil compared with consuming re-esterified triglycerides from fish oils and ethyl ester forms although the differences did not have statistical significance. However, analysis of krill oil showed the presence of 20-22% free fatty acids which would definitely have better absorption. So the question is even if krill oil is a bit better absorbed, is the price difference justified?

Some experts feel that as long as the end results are same i.e. the health benefits of omega 3 using whichever form are same so it does not really matter which gets there first as the benefit is derived only due to long term consumption.

Some experts prefer to talk about bio-efficiency rather than bioavailability. One company claimed that the incorporation of phospholipids of omega 3 into cells is significantly superior. This was compared with ethyl esters, triglycerides etc.

One expert points out that phospholipid content of krill oil is just over 40%, the rest is fish oil made up of triglyceride. That means that greater part of krill oil is similar to other fish oils with respect to omega 3. Also the since triglyceride has three fatty acids, the amount of omega 3 in fish oil can be much more per gram of oil i.e. EPA & DHA content in krill oil is 100 to 350 mg/g while fish oil concentrates contain 500 to 700 mg/g or several times higher than krill oil although the latter is several times more expensive than concentrated fish oil.

Krill is not fish but is a small crustacean and it also provides astaxanthin along with omega 3. Consumers are choosing krill as alternative omega 3 for those that are sensitive to fish. Omega 3 in phospholipid form also offers an additional nutrient – choline, an essential nutrient for the structure of cell membranes.

Condensed from Nutra-Ingredients.Com articles in February 2013 issues



## **Vegetarian Diet Reduces Heart Disease Risk by 32%**

January 30, 2013 Food Product Design

OXFORD, England—Following a vegetarian diet may significantly reduce the risk of heart disease, according to results of a new study published in the American Journal of Clinical Nutrition that found vegetarians have a 32% lower risk of hospitalization or death from heart disease compared to people who eat meat and fish.

Researchers at the University of Oxford's Cancer Epidemiology Unit conducted the largest study ever in the United Kingdom comparing rates of heart disease between vegetarians and non-vegetarians. The analysis looked at almost 45,000 volunteers from England and Scotland enrolled in the European Prospective Investigation into Cancer and Nutrition (EPIC)-Oxford study, of whom 34% were vegetarian. Such a significant representation of vegetarians is rare in studies of this type, and allowed researchers to make more precise estimates of the relative risks between the two groups.

Participants were recruited to the study throughout the 1990s, and completed questionnaires regarding their health and lifestyle when they joined. These included detailed questions on diet and exercise, as well as other factors affecting health, such as smoking and alcohol consumption. Almost 20,000 participants also had their blood pressures recorded, and gave blood samples for cholesterol testing.

Participants were tracked until 2009, during which time researchers identified 1,235 cases of heart disease. This comprised 169 deaths and 1,066 hospital diagnoses, identified through linkage with hospital records and death certificates. Heart disease cases were validated using data from the Myocardial Ischaemia National Audit Project (MINAP).

They found vegetarians had lower blood pressures and cholesterol levels than non-vegetarians, which is thought to be the main reason behind their reduced risk of heart disease. Vegetarians typically had lower BMIs and fewer cases of diabetes as a result of their diets, although these were not found to significantly affect the results. If the results are adjusted to exclude the effects of BMI, vegetarians remain 28% less likely to develop heart disease.

The findings reinforce the idea that diet is central to prevention of heart disease, and build on previous work looking at the influence of vegetarian diets, the researchers said.



## **High Blood Sugar Levels Linked to Cancer Risk**

February 4, 2013 Food Product Design

MADRID—Scientists at the University Rey Juan Carlos have identified a key molecular mechanism through which high blood glucose increases the activity of a gene widely implicated in cancer progression, according to a new study published in the journal Molecular Cell. The findings may lead to potential novel therapies aimed at reducing cancer risk in the obese and diabetic populations.

The researchers were investigating how cells in the intestine respond to sugars and signal to the pancreas to release insulin, the key hormone that controls blood sugar levels. Sugars in the intestine trigger cells to release a hormone called GIP that enhances insulin release by the pancreas. The team showed that the ability of the intestinal cells to secrete GIP is controlled by a protein called  $\beta$ -catenin, and that the activity of  $\beta$ -catenin is strictly dependent on sugar levels.

Increased activity of  $\beta$ -catenin is known to be a major factor in the development of many cancers and can make normal cells immortal, a key step in early stages of cancer progression. The study demonstrates that high (but not normal) sugar levels induce nuclear accumulation of  $\beta$ -catenin and leads to cell proliferation. The changes induced on  $\beta$ -catenin, the molecules involved and the diversity of cancer cells susceptible to these changes are identified.

"We were surprised to realize that changes in our metabolism caused by dietary sugar impact on our cancer risk. We are now investigating what other dietary components may influence our cancer risk. Changing diet is one of easiest prevention strategies that can potentially save a lot of suffering and money," the researchers said.



### Key Nutrients Significantly Reduce ADHD Symptoms

February 12, 2013 Food Product Design

WICHITA, Kan.—Consumption of a combination of fatty acids, as well as magnesium and zinc, amino acids, vitamins and probiotics, can significantly reduce symptoms of attention deficit hyperactivity disorder (ADHD), according to a new study published in the *Journal of Functional Foods in Health and Disease*.

Researchers at the Riordan Clinic, in collaboration with scientists from the School of Public Health, Medical Sciences Campus of the University of Puerto Rico, conducted a study to determine reference values of specific biomarkers associated with behavior typical of ADHD in a group of patients before and after metabolic correction based on data from Riordan Clinic's patient history database that covered a 10-year period.

Researchers performed laboratory tests in 116 patients diagnosed with ADHD, ages 2.7 to 25 years. They compared the distributions of fatty acids, essential metals and levels of metabolic stress factors with reference ranges before and after intervention. The association between toxic metal concentrations and level of essential metals in patients also were analyzed. Patients were treated by supplementation of essential fatty acids, amino acids, magnesium, zinc, probiotics and vitamins.

Results demonstrated that after consumption of the combination of nutrients, most patients had significant reduction in markers of metabolic stress and reported less emotional problems.

"According to our data, the metabolic correction of ADHD by supplementation can ameliorate ADHD symptoms. Eighty percent of children who were treated from several weeks to one to two years, demonstrated improvement of metabolic stress level, measured by pyrrole test," said Nina Mikirova, Ph.D., director of research at the Riordan Clinic.

ADHD, the most commonly diagnosed behavioral disorder, affects 2 million American children. Nutritional deficiencies, like zinc, have been shown to influence neural function, causing defects in neuronal plasticity and impacting behavior of children with ADHD.



### Foods That Fuel Romance, Heart Health

February 12, 2013 Food Product Design

MELROSE PARK, Ill.—Just in time for Valentine's Day, the Loyola University Health System is serving up a romantic menu of healthy foods that not only promise to boost the romance but also provide heart-health benefits all year long.

According to Susan Ofria, clinical nutrition manager at Gottlieb Memorial Hospital and a registered dietitian at the Loyola University Health System's Melrose Park campus, said chocolate and red wine are ideal gifts of and for the heart. Red wine and dark chocolate with a cocoa content of 70% or higher contain resveratrol, which has been found to lower blood sugar. Red wine is also a source of catechins, which could help improve "good" HDL cholesterol.

"You are not even choosing between the lesser of two evils, red wine and dark chocolate have positive components that are actually good for your heart," she said.

Ofria recommends adding the following foods to boost heart health year-round.

**Red Wine.** Pinots, shirahs, merlots are popular red wines, but all reds wines are a good source of catechins and resveratrol to aid good cholesterol—high-density lipoprotein (HDL).

**Dark Chocolate.** Truffles, soufflés and even hot chocolate can be a good source of resveratrol and cocoa phenols as long as dark chocolate with 70% or higher cocoa content is used.

**Salmon and Tuna.** Albacore tuna and salmon are excellent sources of omega-3 fatty acids, and canned salmon contains soft bones that give an added boost of calcium intake.

**Flaxseeds.** Choose either brown or golden yellow, and have them ground for a good source of omega-3 fatty acids, fiber and phytoestrogens.

**Oatmeal.** Cooked for a breakfast porridge or used in breads or desserts, oatmeal is a good source of soluble fiber, niacin, folate and potassium.

**Black or Kidney Beans.** Beans are a good source of niacin, folate, magnesium, omega-3 fatty acids, calcium and soluble fiber.

**Walnuts and Almonds.** Both walnuts and almonds contain omega-3 fatty acids, vitamin E, magnesium, fiber and heart-favorable mono- and polyunsaturated fats.

**Blueberries, Cranberries, Raspberries and Strawberries.** Berries are a good source of beta carotene and lutein, anthocyanin, ellagic acid, vitamin C, folate, potassium and fiber.



### Mediterranean Diet Benefits Diabetics

February 8, 2013 Food Product Design

PLYMOUTH, United Kingdom—Diabetics who follow a Mediterranean diet rich in fruit, vegetables, fish, nuts, low-fat dairy, whole grains and olive oil experience better outcomes with weight loss and lower blood sugar, according to a new study published in the *American Journal of Clinical Nutrition*.

Researchers at the Department of Diabetes and Endocrinology, Peninsula College of Medicine and Dentistry assessed the effect of various diets on glycemic control, lipids, and weight loss. They reviewed results of 20 studies comparing the effect of low-carbohydrate, vegetarian, vegan, low-glycemic index (GI), high-fiber, Mediterranean, and high-protein diets with control diets, including low-fat, high-GI, American Diabetes Association, European Association for the Study of Diabetes, and low-protein diets.

The low-carbohydrate, low-GI, Mediterranean, and high-protein diets all led to a greater improvement in glycemic control. The largest effect size seen in the Mediterranean diet. Low-carbohydrate and Mediterranean diets also led to greater weight loss—an average of 4 pounds. Low-carb, low-glycemic and Mediterranean diets all led to increases in HDL cholesterol.

A 2011 study published in the journal *Age*, found individuals who follow a Mediterranean diet live an average of 23 years longer than individuals who eat more meat and animal products.



### **RTE Breakfast Cereal Helps Kids Maintain Healthy Weight**

February 7, 2013 Food Product Design

BATTLE CREEK, Mich.—Children who eat cereal for breakfast are more likely to have lower body mass indexes (BMIs) and less chance of being overweight or obese compared to children who eat other breakfasts or skip the meal entirely, according to a new study published the journal *Infant, Child, & Adolescent Nutrition*. The findings held true even if the cereal was presweetened.

The study, led by the WK Kellogg Institute for Food and Nutrition, evaluated ready-to-eat cereal (RTEC) breakfast type (presweetened and nonpresweetened) on physiological end points. The researchers analyzed data from 6, 729 individuals aged 2 to 17 years who participated in the 2003-2006 National Health and Nutrition Examination Survey (NHANES). Study participants were separated into groups based on breakfast habits: presweetened RTEC (PS-RTEC); non-presweetened RTEC (NPS-RTEC); breakfast skippers (SKs); other breakfasts (OBs). Presweetened was defined as  $\geq 9$  g of added sugars per serving.

They found children who eat cereal breakfasts, including presweetened cereal, are much more likely to have healthier body weights than those who eat other breakfasts. Children who skip breakfast or choose non-cereal options are nearly twice as likely to be overweight or obese as their cereal-eating counterparts.

"The benefits of cereal breakfast extend beyond low BMI, too. Breakfast cereals make a positive contribution to children's nutrition," said Kevin B. Miller, Ph.D., a senior nutrition scientist at Kellogg Company's W.K. Kellogg Institute for Food and Nutrition and one of the researchers who conducted the study. "A serving of cereal and milk provides kids with protein and four important nutrients they often don't get enough of: fiber, calcium, vitamin D and potassium."



### **Maternal Caffeine Consumption Linked to Low Birth Weight Babies**

February 19, 2013 Food Product Design

GOTHENBURG, Sweden—Women who consume caffeine during pregnancy may increase their risk of giving birth to low birth weight baby, according to a new study published in the British Medical Journal (BMJ). The findings also suggest caffeine consumption may prolong the length of pregnancy

The World Health Organization (WHO) currently recommends a limit of 300 mg per day during pregnancy but some countries recommend a limit of 200 mg, which can be less than a single cup of coffee from some high street cafes.

To investigate the impact of maternal caffeine during pregnancy on babies, a research team from the Norwegian Institute for Public Health used information about mother's diet and birth details collected over 10 years. After excluding women with medical and pregnancy-related conditions almost 60,000 pregnancies were included in the study. All sources of caffeine were monitored in the study, including coffee, tea, carbonated beverages, as well as food including cocoa-containing cakes, desserts and chocolate.

"Although caffeine consumption is strongly correlated with smoking, which is known to increase the risk for both preterm delivery and the baby being small for gestational age at birth (SGA). In this study we found no association between either total caffeine or coffee caffeine and preterm delivery, but we did find an association between caffeine and SGA. This association remained even when we looked only at non-smoking mothers which implies that the caffeine itself is also having an effect on birth weight," the researchers said.

The researchers found caffeine from all sources reduced birth weight. For a child of expected average weight (3.6 kg) this equates to 21-28 g lost per 100 mg caffeine per day. The source of caffeine also affected pregnancy outcomes. Caffeine from all sources increased the length of the pregnancy by five hours per 100 mg caffeine per day, but caffeine intake from coffee was associated with an extra eight hours of gestational length for every 100 mg caffeine per day.

According to the researchers, the association means it is not just the caffeine in coffee that increases gestational length, but there either must be a substance in coffee responsible for the extra time or a behavior associated with coffee drinking not present in women who drink only tea.

A 2011 study published in the journal *Brain Research* found infants with low birth weights are more likely to struggle with obesity problems later in life. The findings suggested overeating is programmed at the level of stem cells before birth when the mother has poor or inadequate nutrition.



### High Glycemic Foods Linked to Diabetes Risk

February 18, 2013 Food Product Design

NEW YORK (Reuters Health)—People who eat a lot of low-fiber and processed foods that quickly spike blood sugars may, not surprisingly, have a significantly higher risk of the most common form of diabetes, according to a new study published online January 30, in the *American Journal of Clinical Nutrition*.

"By raising blood sugar and demanding that the pancreas keep pumping more insulin, meal after meal, day after day, a high-glycemic diet can put people at risk over the edge," said Dr. David Ludwig, who studies obesity at Boston Children's Hospital but was not involved in the work.

The report analyzes 24 studies published since 1997 that tracked what 125,000 adults ate. The new study confirms links prior researchers made between those so-called high-glycemic foods - including white bread and potatoes - and diabetes.

The new report from researchers at the University of California, Los Angeles, Oxford University in the UK and others found that the 125,000 studied adults daily ate an average of 139 grams of sugar or its equivalent.

According to the U.S. Centers for Disease Control and Prevention, about 8 percent of Americans have diabetes. More than 90 percent of those cases are type-2 diabetes, which prevents the body from properly using or producing the blood sugar-regulating hormone insulin.

The analysis did not pinpoint precisely how many of the 125,000 participants actually developed the disease, but for every additional 100 grams of sugar per 2,000 daily calories, people had a 45 percent higher risk of type-2 diabetes.

"It's easy to get more than 100 grams, especially if you're not being careful to choose the right kinds of foods," says research dietitian Heidi Silver, Vanderbilt University Medical Center, Nashville.

Low-glycemic foods include fish, meat, high-fiber fruits and vegetables, nuts, cheeses and other dairy products, brown rice and other unrefined grains. The glycemic load is calculated by multiplying the total of carbohydrate grams in a given food by its assigned glycemic index, a number that can be found in online tools.

It's important for the general public to better understand what high-glycemic and low-glycemic mean, researchers said, and how to figure out their glucose intake. A very ripe banana, for example, has far more grams of sugar than one that's still green. Eaten raw, rather than cooked, sweet potatoes have a low glycemic index.

There's a "jungle of information and misinformation out there," says clinical dietitian Kari Kooi, Methodist Hospital, Houston.

"For instance, fiber (in prepackaged energy) bars is not the same thing as natural fiber you get in fruits and vegetables," said Kooi, who was not involved in the current study. "That's deceptive to consumers, who also may not realize that just having fiber...doesn't necessarily mean the same thing as being low-glycemic."

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### **Folic acid consumption during pregnancy may lower risk of autism in child**

A study published in *The Journal of the American Medical Association* shows that consuming folic acid during pregnancy may be associated with a lower risk of autistic disorder in their children.



The study sample was 85,176 children (born 2002–2008) from the Norwegian Mother and Child Cohort Study. By the end of follow-up on March 31, 2012, the age range was 3.3 years through 10.2 years with a mean of 6.4 years. Folic acid use increased by year of birth, going from 43% in 2002 to 84% in 2008.

The researchers found that of the 61,042 children whose mothers took folic acid supplements, 64, or 0.1%, had autistic disorder. Of the 24,134 children whose mothers did not take folic acid supplements, 50, or 0.21%, had autistic disorder. Use of folic acid supplements was associated with higher socioeconomic status and more health-conscious maternal behavior patterns in the study sample. The researchers noted that they cannot exclude the possibility that some portion of the inverse association represents residual, unmeasured confounding. However, if residual confounding was substantial, we would have expected to find a lowering of risk associated with fish oil supplement use as well, because the use of fish oil was associated with the same parental characteristics in the study sample. No association with reduced risk of autistic disorder was found with fish oil.

“Although these findings cannot establish causality, they do support prenatal folic acid supplementation,” the researchers concluded.

IFT Weekly February 20, 2013



### **UCLA Scientists Discover Enzymes May Help Cure Hangovers**

February 22, 2013 Food Product Design

LOS ANGELES—Researchers led by UCLA engineers have identified an enzyme combination that could be ingested as a pill, chemically altering alcohol in the digestive system, even as the liver does its work. The findings may offer some needed help for hangovers.

Researchers at UCLA’s Henry Samueli School of Engineering and Applied Science successfully placed two complementary enzymes in a tiny capsule to speed up the elimination of alcohol from the body. The enzyme combination within the capsule essentially processes alcohol the way the liver does.

“The pill acts in a way extremely similar to the way your liver does,” said Yunfeng Lu, a professor of chemical and biomolecular engineering at the UCLA Henry Samueli School of Engineering and Applied Science. “With further research, this discovery could be used as a preventative measure or antidote for alcohol intoxication.”

Researchers placed the two enzymes in a polymer capsule measuring just tens of nanometers in diameter. The wall of the polymer capsule is only one nanometer thick—about 100,000 times thinner than a strand of human hair. The capsule protects the enzymes and allows them to freely enter an alcohol molecule. In this way, the nanocapsule mimics an organelle, a structure found in cells that spurs chemical reactions.

The researchers used a mouse model to test how well the enzyme package worked as an antidote after alcohol was consumed. They found blood alcohol levels in mice that received the enzyme package fell more quickly than in mice that did not. Blood alcohol levels of the antidote test group were 15.8% lower than the control group after 45 minutes, 26.1% lower after 90 minutes, and 34.7% lower after three hours.

In a test of how well the enzyme delivery system worked as a prophylactic when consumed at the same time as alcohol, they found blood alcohol levels in the mice that received the enzymes were 10.1% lower than in control-group mice after 45 minutes, 31.8% lower after 90 minutes, and 36.8% lower after three hours.

"Considering the vast library of enzymes that are currently or potentially available, novel classes of enzyme nanocomplexes could be built for a broad range of applications," they said.

A 2012 study published in the Journal of Food Science suggests amino acids and minerals found in asparagus extract may alleviate alcohol hangover and protect liver cells against toxins.



### Scientists Find Link Between High-Fat Diets, ADHD

February 20, 2013 Food Products Design

URBANA, Ill.—New research published in the journal *Psychoneuroendocrinology* suggests a possible link between high-fat diets and childhood brain-based conditions, such as attention deficit hyperactivity disorder (ADHD) and memory-dependent learning disabilities.

Researchers at the University of Illinois found a high-fat diet rapidly affected dopamine metabolism in the brains of juvenile mice, triggering anxious behaviors and learning deficiencies. Interestingly, when methylphenidate (Ritalin) was administered, the learning and memory problems went away. They said altered dopamine signaling in the brain is common to both ADHD and the overweight or obese state.

"And an increase in the number of dopamine metabolites is associated with anxiety behaviors in children," said Gregory Freund, a professor in the U of I College of Medicine and a member of the university's Division of Nutritional Sciences.

Intrigued by the recent upsurge in both child obesity and adverse childhood psychological conditions, including impulsivity, depression, and ADHD, Freund's team examined the short-term effects of a high-fat (60% calories from fat) versus a low-fat (10% calories from fat) diet on the behavior of two groups of 4-week-old mice. A typical Western diet contains from 35% to 45% fat.

After only one week of the high-fat diet, even before they were able to see any weight gain, the behavior of the mice in the first group began to change. Evidence of anxiety included increased burrowing and wheel running, as well a reluctance to explore open spaces. The mice also developed learning and memory deficits, including decreased ability to negotiate a maze and impaired object recognition.

Switching mice from a high-fat to a low-fat diet restored memory in one week. In mice that continued on the high-fat diet, impaired object recognition remained three weeks after the onset of symptoms. But Freund knows from other studies that brain biochemistry normalizes after 10 weeks as the body appears to compensate for the diet. At that point, brain dopamine has returned to normal, and mice have become obese and developed diabetes.

"Although the mice grow out of these anxious behaviors and learning deficiencies, the study suggests to me that a high-fat diet could trigger anxiety and memory disorders in a child who is genetically or environmentally susceptible to them," Freund said.

Because the animals adapt to the high-fat diet, the researchers also hypothesized that abruptly removing fat from the diet might negatively affect anxiety, learning and memory. They had expected the high-fat diet would stimulate inflammation, which is associated with obesity, but they saw no evidence of an inflammatory response in the brain after one or three weeks on the high-fat regimen. Instead, they saw evidence that a high-fat diet initiates chemical responses that are similar to the ones seen in addiction, with dopamine, the chemical important to the addict's pleasurable experiences, increasing in the brain.



### **New Study Sheds Light On Link Between Dairy Intake and Bone Health: Not All Dairy Products Are Equal**

Feb. 1, 2013 Science Daily

A study by researchers at the Institute for Aging Research (IFAR) at Hebrew SeniorLife, an affiliate of Harvard Medical School (HMS), has found that dairy intake -- specifically milk and yogurt -- is associated with higher bone mineral density (BMD) in the hip, but not the spine. Cream, on the other hand, may be associated with lower BMD overall. Published February 1 in the journal *Archives of Osteoporosis*, these findings suggest that not all dairy products are equally beneficial in promoting bone strength.

"Dairy foods provide several important nutrients that are beneficial for bone health," says lead author Shivani Sahni, Ph.D., Musculoskeletal Research Team, IFAR. "However, cream and its products such as ice cream have lower levels of these nutrients and have higher levels of fat and sugar. In this study, 2.5 -- 3 servings of milk and yogurt intake per day were associated with better bone density. More research is needed to examine the role of cheese intake (some of which can be high in fat and sodium), and whether individual dairy foods have a significant impact in reducing fractures."

IFAR researchers based their findings on data collected from a food frequency questionnaire completed by 3,212 participants from the Framingham Offspring study. They then compared participants' dairy intake with BMD measurement, which revealed the benefits of milk and yogurt versus cream in largely middle-aged men and women. According to the study, nutrient composition varies among dairy foods. Choosing low-fat milk or yogurt over cream can increase intake of protein, calcium and vitamin D while limiting intake of saturated fats.

This study is an example of a growing area of research focused on the relationship between nutrition and bone health. Past studies suggest that dairy products contain more than one beneficial nutrient, and for this reason certain dairy products may contribute towards maintaining healthier bones.

Research like this supports the idea that proper nutrition can help combat osteoporosis and fractures. Osteoporosis is considered a major public health threat for an estimated 44 million Americans, or half of those aged 50 and older.

- An estimated 10 million in the U.S. already have the disease. Women are at higher risk than men.
- Another 34 million Americans have low bone density, putting them at increased risk for osteoporosis and fractures, especially of the hip, spine and wrist. About one-quarter of those who suffer a hip fracture die within a year of the injury.
- Osteoporosis-related fractures were responsible for an estimated \$19 billion in health care costs in 2005, with that figure expected to increase to \$25 billion by 2025.



## Overall Eating Patterns Are Most Important for Healthful Eating

Feb. 5, 2013 Science Daily

The overall pattern of food that a person eats is more important to a healthy diet than focusing on single foods or individual nutrients, according to the Academy of Nutrition and Dietetics in its newly updated position paper "Total Diet Approach to Healthy Eating."

According to the position paper: "In contrast to the total diet approach, classification of specific foods as 'good' or 'bad' is overly simplistic and may foster unhealthy eating behaviors." The Academy's position paper stresses that moderation, portion size and exercise are the key concepts for balancing food and beverage intakes.

The position paper has been published in the February *Journal of the Academy of Nutrition and Dietetics* and can be found on the Academy's website. It states: It is the position of the Academy of Nutrition and Dietetics that the total diet or overall pattern of food eaten is the most important focus of healthy eating. All foods can fit within this pattern, if consumed in moderation with appropriate portion size and combined with physical activity. The Academy strives to communicate healthy eating messages that emphasize a balance of food and beverages within energy needs, rather than any one food or meal.

The Academy's position paper has been updated to reflect the most current nutrition guidance, such as the 2010 Dietary Guidelines for Americans and the USDA's MyPlate food guidance system; the White House's *Let's Move!* campaign to reduce childhood obesity and Healthy People 2020. Each of these public policies and dietary patterns supports the total diet approach.

According to the position paper, while studies including the Academy's "Nutrition and You" national consumer survey show Americans are "conscious of the importance of healthy diets and physical activity," most people do not meet the recommendations of the Dietary Guidelines. For example, large majorities do not eat fruit (68 percent) or vegetables (74 percent) more than twice a day, and a substantial number (36 percent) engage in no leisure-time physical activity.

In that environment, according to the Academy: "Labeling specific foods in an overly simplistic manner as 'good foods' and 'bad foods' is not only inconsistent with the total diet approach, but it may cause many people to abandon efforts to make dietary improvements."

The position paper adds: "In 2011, 82 percent of U.S. adults cited not wanting to give up foods they like as a reason for not eating healthier. For these reasons, the concepts of moderation and proportionality are necessary components of a practical, action-oriented understanding of the total diet approach."

The Academy's position paper notes that the most recent Dietary Reference Intakes use a total diet approach because it allows for a broad range of foods to meet a person's nutrition needs over time. Therefore, a person can make diet choices based on individual preferences, genetic background, personal health status and food availability.

The position paper was written by registered dietitians Jeanne Freeland-Graves, Bess Heflin Centennial Professor in the department of nutritional sciences at the University of Texas -- Austin; and Susan

Nitzke, professor emerita and extension specialist in nutritional sciences at the University of Wisconsin -  
- Madison.

The Academy's position paper contains advice and recommendations for health professionals as well as consumers. It explains how food and nutrition practitioners can use behavioral theories and models to develop effective nutrition communications; and how food and beverage choices are affected by multiple factors that influence people's ability to make use of expert advice on healthy eating.

Updated sections of the position paper look at new indicators of nutrient quality, such as the Nutrient Rich Food Index, the European Union Nutrient Profiling System and the Overall Nutrient Quality Index. In addition, the Social Ecological model, used in the Dietary Guidelines, is incorporated into the Academy's position as "a guide for understanding why we eat what we do."

According to the Academy's position paper: "Food and nutrition practitioners have a responsibility to communicate unbiased food and nutrition information that is culturally sensitive, scientifically accurate, medically appropriate and tailored to the needs and preferences of the target audience. Some health and nutrition professionals and many 'pseudo-experts' promote specific types of foods to choose or avoid. A more responsible and effective approach is to help consumers understand and apply the principles of healthy diet and lifestyle choices. Unless there are extenuating circumstances (severe cognitive or physical limitations), the total diet approach is preferred because it is more consistent with research on effective communication and inclusive of cultural/personal differences."



### **Overall Eating Patterns Most Important For Healthful Eating**

February 26, 2013 Food Product Design

CHICAGO—The Academy of Nutrition and Dietetics has published its newly updated position paper "Total Diet Approach to Healthy Eating," which stresses that moderation, portion size and exercise are the key concepts for balancing food and beverage intakes. The paper suggests the overall pattern of food that a person eats is more important to a healthy diet than focusing on single foods or individual nutrients.

According to the paper published in the *Journal of the Academy of Nutrition and Dietetics*, and "In contrast to the total diet approach, classification of specific foods as 'good' or 'bad' is overly simplistic and may foster unhealthy eating behaviors. It is the position of the Academy of Nutrition and Dietetics that the total diet or overall pattern of food eaten is the most important focus of healthy eating. All foods can fit within this pattern, if consumed in moderation with appropriate portion size and combined with physical activity. The Academy strives to communicate healthy eating messages that emphasize a balance of food and beverages within energy needs, rather than any one food or meal."

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eat fruit (68%) or vegetables (74%) more than twice a day, and a substantial number (36%) engage in no leisure-time physical activity.

"Labeling specific foods in an overly simplistic manner as 'good foods' and 'bad foods' is not only inconsistent with the total diet approach, but it may cause many people to abandon efforts to make dietary improvements," the paper noted.

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### **Vitamin D, Omega-3 May Help Clear Amyloid Plaques Found in Alzheimer's**

Feb. 5, 2013 Science Daily

A team of academic researchers has pinpointed how vitamin D3 and omega-3 fatty acids may enhance the immune system's ability to clear the brain of amyloid plaques, one of the hallmarks of Alzheimer's disease.

In a small pilot study published in the Feb. 5 issue of the Journal of Alzheimer's Disease, the scientists identified key genes and signaling networks regulated by vitamin D3 and the omega-3 fatty acid DHA (docosahexaenoic acid) that may help control inflammation and improve plaque clearance.

Previous laboratory work by the team helped clarify key mechanisms involved in helping vitamin D3 clear amyloid-beta, the abnormal protein found in the plaque. The new study extends the previous findings with vitamin D3 and highlights the role of omega-3 DHA.

"Our new study sheds further light on a possible role for nutritional substances such as vitamin D3 and omega-3 in boosting immunity to help fight Alzheimer's," said study author Dr. Milan Fiala, a researcher at the David Geffen School of Medicine at UCLA.

For the study, scientists drew blood samples from both Alzheimer's patients and healthy controls, then isolated critical immune cells called macrophages from the blood. Macrophages are responsible for gobbling up amyloid-beta and other waste products in the brain and body.

The team incubated the immune cells overnight with amyloid-beta. They added either an active form of vitamin D3 called 1alpha,25-dihydroxyvitamin D3 or an active form of the omega-3 fatty acid DHA called resolvin D1 to some of the cells to gauge the effect they had on inflammation and amyloid-beta absorption.



Both 1-alpha, 25-dihydroxyvitamin D3 and resolvin D1 improved the ability of the Alzheimer's disease patients' macrophages to gobble-up amyloid-beta, and they inhibited the cell death that is induced by amyloid-beta. Researchers observed that each nutrition molecule utilized different receptors and common signaling pathways to do this.

Previous work by the team, based on the function of Alzheimer's patients' macrophages, showed that there are two groups of patients and macrophages. In the current study, researchers found that the macrophages of the Alzheimer's patients differentially expressed inflammatory genes, compared with the healthy controls, and that two distinct transcription patterns were found that further define the two groups: Group 1 had an increased transcription of inflammatory genes, while Group 2 had decreased transcription. Transcription is the first step leading to gene expression.

"Further study may help us identify if these two distinct transcription patterns of inflammatory genes could possibly distinguish either two stages or two types of Alzheimer's disease," said study author Mathew Mizwicki, an assistant researcher at the David Geffen School of Medicine at UCLA.

While researchers found that 1alpha,25-dihydroxyvitamin D3 and resolvin D1 greatly improved the clearance of amyloid-beta by macrophages in patients in both groups, they discovered subtleties in the effects the two substances had on the expression of inflammatory genes in the two groups. In Group 1, the increased-inflammation group, macrophages showed a decrease of inflammatory activation; in Group 2, macrophages showed an increase of the inflammatory genes IL1 and TLRs when either 1alpha,25-Dihydroxyvitamin D3 or resolvin D1 were added.

More study is needed, Fiala said, but these differences could be associated with the severity of patients' nutritional and/or metabolic deficiencies of vitamin D3 and DHA, as well as the omega-3 fatty acid EPA (eicosapentaenoic acid).

"We may find that we need to carefully balance the supplementation with vitamin D3 and omega-3 fatty acids, depending on each patient in order to help promote efficient clearing of amyloid-beta," Fiala said. "This is a first step in understanding what form and in which patients these nutrition substances might work best."

According to Fiala, an active (not oxidized) form of omega-3 DHA, which is the precursor of the resolvin D1 used in this study, may work better than more commercially available forms of DHA, which generally are not protected against the oxidation that can render a molecule inactive.

The next step is a larger study to help confirm the findings, as well as a clinical trial with omega-3 DHA, the researchers said.

The Alzheimer's Association contributed to the initial phase of the study. Fiala is a consultant for the Smartfish Company that is producing a drink with an active form of omega-3 DHA.



## **Green Tea and Red Wine Extracts Interrupt Alzheimer's Disease Pathway in Cells** Feb. 5, 2013 Science Daily

Natural chemicals found in green tea and red wine may disrupt a key step of the Alzheimer's disease pathway, according to new research from the University of Leeds.

In early-stage laboratory experiments, the researchers identified the process which allows harmful clumps of protein to latch on to brain cells, causing them to die. They were able to interrupt this pathway using the purified extracts of EGCG from green tea and resveratrol from red wine.

The findings, published in the *Journal of Biological Chemistry*, offer potential new targets for developing drugs to treat Alzheimer's disease, which affects some 800,000 people in the UK alone, and for which there is currently no cure.

"This is an important step in increasing our understanding of the cause and progression of Alzheimer's disease," says lead researcher Professor Nigel Hooper of the University's Faculty of

Biological Sciences. "It's a misconception that Alzheimer's is a natural part of aging; it's a disease that we believe can ultimately be cured through finding new opportunities for drug targets like this."

Alzheimer's disease is characterised by a distinct build-up of amyloid protein in the brain, which clumps together to form toxic, sticky balls of varying shapes. These amyloid balls latch on to the surface of nerve cells in the brain by attaching to proteins on the cell surface called prions, causing the nerve cells to malfunction and eventually die.

"We wanted to investigate whether the precise shape of the amyloid balls is essential for them to attach to the prion receptors, like the way a baseball fits snugly into its glove," says co-author Dr Jo Rushworth. "And if so, we wanted to see if we could prevent the amyloid balls binding to prion by altering their shape, as this would stop the cells from dying."

The team formed amyloid balls in a test tube and added them to human and animal brain cells. Professor Hooper said: "When we added the extracts from red wine and green tea, which recent research has shown to re-shape amyloid proteins, the amyloid balls no longer harmed the nerve cells. We saw that this was because their shape was distorted, so they could no longer bind to prion and disrupt cell function."

"We also showed, for the first time, that when amyloid balls stick to prion, it triggers the production of even more amyloid, in a deadly vicious cycle," he added.

Professor Hooper says that the team's next steps are to understand exactly how the amyloid-prion interaction kills off neurons.

"I'm certain that this will increase our understanding of Alzheimer's disease even further, with the potential to reveal yet more drug targets," he said.

Dr Simon Ridley, Head of Research at Alzheimer's Research UK, the UK's leading dementia research charity, which part-funded the study, said: "Understanding the causes of Alzheimer's is vital if we are to find a way of stopping the disease in its tracks. While these early-stage results should not be a signal for people to stock up on green tea and red wine, they could provide an important new lead in the search for new and effective treatments. With half a million people affected by Alzheimer's in the UK, we urgently need treatments that can halt the disease -- that means it's crucial to invest in research to take results like these from the lab bench to the clinic."



### **Eat to Dream: Study Shows Dietary Nutrients Associated With Certain Sleep Patterns** Feb. 6, 2013 Science Daily

"You are what you eat," the saying goes, but is what you eat playing a role in how much you sleep? Sleep, like nutrition and physical activity, is a critical determinant of health and well-being. With the increasing prevalence of obesity and its consequences, sleep researchers have begun to explore the factors that predispose individuals to weight gain and ultimately obesity. Now, a new study from the Perelman School of Medicine at the University of Pennsylvania shows for the first time that certain nutrients may play an underlying role in short and long sleep duration and that people who report eating a large variety of foods -- an indicator of an overall healthy diet -- had the healthiest sleep patterns.

The new research is published online, ahead-of-print in the journal *Appetite*.

"Although many of us inherently recognize that there is a relationship between what we eat and how we sleep, there have been very few scientific studies that have explored this connection, especially in a real-world situation," said Michael A. Grandner, PhD, instructor in Psychiatry and member of the Center for Sleep and Circadian Neurobiology at Penn. "In general, we know that those who report between 7 -- 8 hours of sleep each night are most likely to experience better overall health and well

being, so we simply asked the question "Are there differences in the diet of those who report shorter sleep, longer sleep, or standard sleep patterns?"

To answer this question, the research team analyzed data from the 2007-2008 National Health and Nutrition Examination Survey (NHANES) sponsored by the Centers for Disease Control and Prevention. NHANES includes demographic, socioeconomic, dietary, and health-related questions. The sample for the survey is selected to represent the U.S. population of all ages and demographics. For the current study, researchers used the survey question regarding how much sleep each participant reported getting each night to separate the sample into groups of different sleep patterns. Sleep patterns were broken out as "Very Short" (<5 h per night), "Short" (5-6 h per night), "Standard" (7-8h per night), and "Long" (9 h or more per night). NHANES participants also sat down with specially trained staff who went over, in great detail, a full day's dietary intake. This included everything from the occasional glass of water to complete, detailed records of every part of each meal. With this data, the Penn research team analyzed whether each group differed from the 7-8 hour "standard" group on any nutrients and total caloric intake. They also looked at these associations after controlling for overall diet, demographics, socioeconomics, physical activity, obesity, and other factors that could have explained this relationship.

The authors found that total caloric intake varied across groups. Short sleepers consumed the most calories, followed by normal sleepers, followed by very short sleepers, followed by long sleepers. Food variety was highest in normal sleepers, and lowest in very short sleepers. Differences across groups were found for many types of nutrients, including proteins, carbohydrates, vitamins and minerals.

In a statistical analysis, the research team found that there were a number of dietary differences, but these were largely driven by a few key nutrients. They found that very short sleep was associated with less intake of tap water, lycopene (found in red- and orange-colored foods), and total carbohydrates, short sleep was associated with less vitamin C, tap water, selenium (found in nuts, meat and shellfish), and more lutein/zeaxanthin (found in green, leafy vegetables), and long sleep was associated with less intake of theobromine (found in chocolate and tea), dodecanoic acid (a saturated fat) choline (found in eggs and fatty meats), total carbohydrates, and more alcohol.

"Overall, people who sleep 7 -- 8 hours each night differ in terms of their diet, compared to people who sleep less or more. We also found that short and long sleep are associated with lower food variety," said Dr. Grandner. "What we still don't know is if people altered their diets, would they be able to change their overall sleep pattern? This will be an important area to explore going forward as we know that short sleep duration is associated with weight gain and obesity, diabetes, and cardiovascular disease. Likewise, we know that people who sleep too long also experience negative health consequences. If we can pinpoint the ideal mix of nutrients and calories to promote healthy sleep, the healthcare community has the potential to make a major dent in obesity and other cardiometabolic risk factors."



## Fruits and Vegetables May Help Protect the Kidneys

Feb. 7, 2013 Science Daily

Adding fruits and vegetables to the diet may help protect the kidneys of patients with chronic kidney disease (CKD) with too much acid build-up, according to a study appearing in an upcoming issue of the *Clinical Journal of the American Society of Nephrology* (CJASN).

Western diets that are based in animal and grain products are highly acidic and can lead to metabolic acidosis, when too much acid builds up in the body. This is particularly common in patients with CKD because the kidneys are responsible for removing acid through the urine. Metabolic acidosis can cause rapid breathing, confusion, and lethargy. Severe cases can lead to shock or death.

Alkali supplementation therapy such as bicarbonate is used to treat CKD patients with severe metabolic acidosis, but simply adding more fruits and vegetables -- which contain alkali -- to the diet might also help.

Nimrit Goraya, MD, Donald Wesson, MD (Texas A&M College of Medicine) and their colleagues tested this by randomizing 71 patients with hypertensive stage 4 CKD to receive added fruits and vegetables or an oral alkaline medication for one year. The treatments were dosed to decrease dietary acid by half.

Among the major findings:

- Kidney function was similar between the two groups after one year.
- One-year plasma total carbon dioxide (PTCO<sub>2</sub>) increased in both groups, which is consistent with a lessening of metabolic acidosis. PTCO<sub>2</sub> was higher in patients receiving bicarbonate than in those receiving added fruits and vegetables.
- Urine measurements of kidney injury were lower after one year in both groups.
- Although fruits and vegetables are rich in potassium and might raise blood potassium to dangerous levels, levels did not increase in either group.

"We showed that by addition of alkali such as bicarbonate or alkali-inducing fruits and vegetables, patients had a favorable response by reduction of urinary kidney injury markers," said Dr. Wesson. "Our study suggests that these interventions will help maintain kidney health in those with kidney disease," added Dr. Goraya.

In an accompanying editorial, Muhammad Yaqoob, MD (Bartshealth NHS Trust and William Harvey Research Institute, in London) noted that the study is likely to have a limited impact on clinical practice. "A small group of highly motivated patients wishing to reduce their pill burden through dietary modification may benefit from the results of this study. However, many patients find it difficult to follow a diet high in fruits and vegetables and might therefore be more adherent to a supplement," he wrote. He added that a large multicenter randomized controlled trial examining the impact of supplemental bicarbonate, with and without dietary intervention, in patients with chronic kidney disease is urgently needed.



### **Iron Intake May Help To Protect Women Against PMS**

Medical News Today: 27 Feb 2013

Women who reported eating a diet rich in iron were 30 to 40 percent less likely to develop premenstrual syndrome (PMS) than women who consumed lower amounts, in a study reported this week by researchers at the University of Massachusetts Amherst School of Public Health and Health Sciences

and Harvard. It is one of the first to evaluate whether dietary mineral intake is associated with PMS development.

Senior author Elizabeth Bertone-Johnson and others at UMass Amherst, with lead author Patricia Chocano-Bedoya and colleagues at Harvard, assessed mineral intake in approximately 3,000 women in a case-control study nested within the prospective Nurses' Health Study II. Participants were free from PMS at baseline. Results appear in the early online edition of the American Journal of Epidemiology.

Women in the study completed three food frequency questionnaires over the 10-year study period. After 10 years, 1,057 women were diagnosed with PMS and 1,968 remained free from PMS. Adjusting for calcium intake and other factors, the researchers then compared previous mineral intake reported by the women diagnosed with PMS with that of women who had few or no menstrual symptoms.

"We found that women who consumed the most non-heme iron, the form found primarily in plant foods and in supplements, had a 30 to 40 percent lower risk of developing PMS than women who consumed the lowest amount of non-heme iron," says Bertone-Johnson. Women in the highest intake group for non-heme iron had a relative risk of PMS of 0.60 compared to women in the lowest intake group.

She adds, "We also saw some indication that high intake of zinc was associated with lower risk. In contrast, we were somewhat surprised to find that women consuming the highest amount of potassium had a higher risk of being diagnosed with PMS than women consuming the lowest amount of potassium. In general, results for mineral from food sources and minerals from supplements were similar."

Overall, "Our findings need to be replicated in other studies. However, women at risk for PMS should make sure they are meeting the RDA for non-heme iron and zinc."

"The level of iron intake at which we saw a lower risk of PMS, roughly greater than 20 mg per day, is higher than the current recommended daily allowance (RDA) for iron for premenopausal women, which is 18 mg per day," Bertone-Johnson says. This amount may be obtained in 1 to 1.5 servings per day of iron-fortified cereal or with supplements.

"However, as high iron intake may have adverse health consequence, women should avoid consuming more than the tolerable upper intake level of 45 mg per day unless otherwise recommended by a physician," she notes. Iron may be related to PMS because it is involved in producing serotonin, a neurotransmitter that helps to regulate mood, she and colleagues point out.

The unexpected finding of higher PMS risk with high potassium intake, even at levels below current recommendations of 4,700 mg per day, may be related to potassium's role in regulating fluid balance in the body. It may affect PMS symptoms such as swelling in the extremities and bloating by affecting fluid retention. "More studies of potassium and menstrual symptoms are needed to better understand this," they say.

"The level of zinc intake at which we saw suggestion of a lower risk of PMS, greater than 15 mg per day, was also higher than current recommendations of 8 mg per day. However, as high zinc intake may also have adverse health consequences, women should avoid consuming more than the tolerable upper intake level of 40 mg per day unless recommended by a physician."

Intake of other minerals, including magnesium, copper, sodium and manganese were not associated with PMS risk, the authors point out.



## **Babies Slow To Grow Should Not Have Their Calories Increased, Most Catch Up By Early Teens**

Medical News Today: 27 Feb 2013

New parents are pleased when their baby gains weight as expected, but if the rate of weight gain is slow parents can become worried and concerned about their child's future size.

New research from the Children of the 90s study at the University of Bristol shows that most babies who are slow to put on weight in the first nine months of life have caught up to within the normal range by the age of 13, but remain lighter and shorter than many of their peers. There are significant differences in the pattern of 'catchup', depending on the infant's age when the slow weight gain occurs.

The new findings, published in the journal *Pediatrics*, are based on data from 11,499 participants in Children of the 90s, and provide the most conclusive and reassuring evidence for parents to date that, with the right care, many infants who fail to put on weight quickly in the first nine months of life will catch up over time.

The study found that, of the 11,499 infants born at term, 507 were slow to put on weight before the age of eight weeks ('early group') and 480 were slow to gain weight between eight weeks and nine months ('late group'). Thirty children were common to both groups.

The infants in the early group recovered quickly and had almost caught up in weight by the age of two, whereas those in the later group gained weight slowly until the age of 7, then had a 'spurt' between 7 and 10 years, but remained considerably shorter and lighter than their peers and those in the early group at the age of 13. At that age, children in the later group were on average 5.5k lighter and almost 4cm shorter than their peers; those in the early group were on average 2.5k lighter and 3.25cm shorter than their peers.

Slow weight gain is often seen by parents and some healthcare professionals as a sign of underlying ill health and clinicians face a dilemma between taking steps to increase a child's energy intake and putting them at risk of obesity later in life by encouraging too rapid weight gain.

The study shows that there were very different patterns of recovery between the early and late groups, even when other factors like the mother's education, background, and her weight and height were taken into account, but that there was little difference between boys and girls.

Professor Alan Emond, the paper's main author explains:

'The reason the early group caught up more quickly may be because those infants had obvious feeding difficulties and were more readily identified at the eight-week check, resulting in early treatment leading to a more rapid recovery. However, as Children of the 90s is an observational study, there is limited information available about which infants received nutritional supplements or medical treatments.

'Those children who showed slow weight gain later in infancy took longer to recover, because of the longer period of slow growth and because their parents were smaller and lighter too.

'Overall parents can be re-assured that well babies showing slow weight gain in the first year do eventually recover to within the normal range, but at 13 years tend to be lighter and smaller than many of their peers.'



The findings highlight the importance of monitoring a baby's weight and height gain during the first few weeks and months, but not creating anxiety with parents of slow-growing babies who are well, as most of these babies will catch up to within the national average over time.

The message to health professionals is that, unless children require intervention due to ill health, their calorie intake should not be increased as this may predispose them to obesity later in life. Feeding habits in the second six months of life determine a child's future weight gain, so consuming too many calories in infancy can lead to weight problems later in life.



### **Acne Linked To High Glycemic Index Foods And Dairy Products**

Medical News Today: 22 Feb 2013

A study published in the Journal of the Academy of Nutrition and Dietetics has determined that there is increasing evidence of a connection between diet and acne, particularly from high glycemic load diets and dairy products, and that medical nutrition therapy (MNT) can play an important role in acne treatment.

More than 17 million Americans suffer from acne, mostly during their adolescent and young adult years. Acne influences quality of life, including social withdrawal, anxiety, and depression, making treatment essential. Since the late 1800s, research has linked diet to this common disease, identifying chocolate, sugar, and fat as particular culprits, but beginning in the 1960s, studies disassociated diet from the development of acne.

"This change occurred largely because of the results of two important research studies that are repeatedly cited in the literature and popular culture as evidence to refute the association between diet and acne," says Jennifer Burris, MS, RD, of the Department of Nutrition, Food Studies, and Public Health, Steinhardt School of Culture, Education, and Human Development, New York University. "More recently, dermatologists and registered dietitians have revisited the diet-acne relationship and become increasingly interested in the role of medical nutritional therapy in acne treatment."

Burris and colleagues, William Rietkerk, Department of Dermatology, New York Medical College, and Kathleen Woolf, of New York University's Department of Nutrition, Food Studies, and Public Health, conducted a literature review to evaluate evidence for the diet-acne connection during three distinctive time periods: early history, the rise of the diet-acne myth, and recent research.

Culling information from studies between 1960 and 2012 that investigated diet and acne, investigators compiled data for a number of study characteristics, including reference, design, participants, intervention method, primary outcome, results and conclusions, covariate considerations, and limitations.

They concluded that a high glycemic index/glycemic load diet and frequent dairy consumption are the leading factors in establishing the link between diet and acne. They also note that although research results from studies conducted over the last 10 years do not demonstrate that diet causes acne, it may influence or aggravate it.

The study team recommends that dermatologists and registered dietitians work collaboratively to

design and conduct quality research. "This research is necessary to fully elucidate preliminary results, determine the proposed underlying mechanisms linking diet and acne, and develop potential dietary interventions for acne treatment," says Burris. "The medical community should not dismiss the possibility of diet therapy as an adjunct treatment for acne. At this time, the best approach is to address each acne patient individually, carefully considering the possibility of dietary counseling."



### **For Colorectal Cancer Prevention, Resistant Starch Should Be On The Menu**

Medical News Today: 22 Feb 2013

As the name suggests, you can't digest resistant starch so it ends up in the bowel in pretty much the same form it entered your mouth. As unlovely as that seems, once in the bowel this resistant starch does some important things, including decreasing bowel pH and transit time, and increasing the production of short-chain fatty acids. These effects promote the growth of good bugs while keeping bad bugs at bay. A University of Colorado Cancer Center review published in this month's issue of the journal *Current Opinion in Gastroenterology*\* shows that resistant starch also helps the body resist colorectal cancer through mechanisms including killing pre-cancerous cells and reducing inflammation that can otherwise promote cancer.

"Resistant starch is found in peas, beans and other legumes, green bananas, and also in cooked and cooled starchy products like sushi rice and pasta salad. You have to consume it at room temperature or below - as soon as you heat it, the resistant starch is gone. But consumed correctly, it appears to kill pre-cancerous cells in the bowel," says Janine Higgins, PhD, CU Cancer Center investigator and associate professor of Pediatrics at the University of Colorado School of Medicine.

Higgins describes studies showing that rats fed resistant starch show decreased numbers and sizes of lesions due to colorectal cancer, and an increased number of cells that express the protein IL-10, which acts to regulate the body's inflammatory response.

"Resistant starch may also have implications for the prevention of breast cancer," Higgins says. "For example, if you let rats get obese, get them to lose the weight, and then feed half of the rats a diet high in resistant starch - these rats don't gain back the weight as fast as rats fed a regular, digestible starch diet. This effect on obesity may help to reduce breast cancer risk as well as having implications for the treatment of colorectal cancer."

"There are a lot of things that feed into the same model of resistant starch as a cancer-protective agent," Higgins says. "Much of this information currently comes from rodent models and small clinical trials but the evidence is encouraging." On the table now is a menu of benefits and while it's just now being studied which benefits, exactly, will pan out as mechanisms of cancer prevention, one thing is clear: resistant starch should be on the menu.



### **Middle-Aged Men May Need More Protein To Maintain Muscle Mass**

Medical News Today: 07 Feb 2013

People tend to lose muscle mass as they age; researchers are investigating ways to delay or counteract age-related muscle loss. A study conducted by the Exercise Metabolism Research Group at McMaster University suggests that current guidelines for meat consumption are based on the protein needed to

prevent deficiency without consideration for preservation of muscle mass, particularly for older individuals who are looking to maintain their muscle as they age. This research was published in the journal Applied Physiology, Nutrition, and Metabolism.

Thirty-five middle-aged men (~59 years old) participated in a study that found that eating a 6-ounce serving of 85% lean ground beef resulted in significant improvements in the rate of muscle protein synthesis following exercise. The investigators measured muscle protein synthesis (MPS), which is essential to the body's ongoing growth, repair and maintenance of skeletal muscle in men who did and did not lift weights. What researchers determined was that the quantity of beef needed for optimal MPS for this age group is double the current recommended serving size of meat.

"Canada's Food Guide now suggests that consuming about 3oz (0.80 g/kg/d) of meat per serving is adequate to provide protein at the recommended level," says Dr. Stuart Phillips, the study's senior author and a researcher with the Exercise Metabolism Research Group at McMaster University. "However, our work shows that the quantity of beef needed to maximize the renewal of new muscle proteins was at least 6oz in middle-aged men. Our findings have clear ramifications for the current recommendations regarding protein to prevent muscle loss in aging."



## Food Science & Industry News

### 5 tips for decoding food labels

When it comes to eating healthfully, fresh fruits and vegetables are pretty much a slam dunk. Including packaged foods in a healthful diet is trickier. But it isn't impossible if you learn how to use the Nutrition Facts on the package to judge the quality of the food inside. The vitamin or mineral content is less important as a basis for buying a product unless everything else adds up to a healthy choice.

Here are 5 ways to make food labels work for you:

1. **Size matters.** Serving size is always the first item on the label. All other information is based on that serving size. The servings per container tell you how many portions are in the whole box, package, or can. Beware: many packages contain more than one serving. Look at your orange juice for example. If the label says 125 calories per 8 ounce serving and your breakfast includes a 16 ounce glass of OJ, then you've taken in 250 calories from the juice alone. (About as many calories as you'd find in many chocolate bars.)
2. **Look for fat: the good, the bad, and the really bad.** Check the saturated fat and trans fat content of the food. For a general healthful diet, keep saturated fat and cholesterol low and avoid trans fats altogether. Look for foods that have 0 grams (g) of trans fat and are lowest in saturated fat and cholesterol. Try to stay away from foods that have the words "partially hydrogenated vegetable oil" in the ingredients list. Foods made with healthy unsaturated oils (olive, canola, safflower, etc.) are better bets.
3. **Is it worth its salt?** Compare the sodium content to the calories per serving. To keep your salt intake in check, consider products in which the sodium content is less than or equal to the calories per serving. For a food with 250 calories per serving, ideally the sodium content should be no more than 250 mg. If you need to seriously restrict your salt intake consider the low-sodium, low-salt, or unsalted versions.
4. **Figure out the fiber.** Aim for foods that have 5 g of fiber per serving, or at least one gram of fiber for every 10 grams of carbohydrate

5. **Stay away from added sugars:** Sugar, no matter what it's called, contains almost no nutrients other than pure carbohydrate. A heavy sugar intake fills you up with empty calories, keeps you from eating healthy foods, and stresses your body's ability to maintain a healthy blood sugar level. Steer clear of foods that have sugar, honey, molasses, corn syrup, corn sugar, fructose, or high-fructose corn syrup among the first three ingredients. Other names for sugar include agave nectar, brown sugar, cane sugar, corn sweetener, dextrose, maltose, fruit juice concentrate, and glucose.

From Harvard Medical School Health Beat January 31, 2013



### **Omega-3-Rich Ground Beef Available Soon**

Feb. 4, 2013 Science Daily

Thanks to Kansas State University research, part of a healthy diet can include a hamburger rich with omega-3 fatty acids.

Jim Drouillard, professor of animal sciences and industry, developed a technique that enriches ground beef with omega-3 fatty acids -- fatty acids that have been shown to reduce heart disease, cholesterol and high blood pressure. The enriched ground beef is named GreatO Premium Ground Beef and is being sold through Manhattan, Kan.-based company NBO3 Technologies LLC. It will be available mid-February at select retailers in Buffalo, N.Y., and expand to leading retailers and restaurants nationwide later this year.

Omega-3 fatty acids are found in fish and plant oils. The U.S. currently does not have a recommended daily intake of omega-3s, though many doctors and nutritionists recommend between 1,200-1,600 milligrams daily, depending on a person's age and health.

A quarter-pound hamburger made of the enriched ground beef has 200 milligrams of omega-3s and tastes the same as regular ground beef, Drouillard said. This makes the ground beef an alternative for people who want to add or increase their omega-3 fatty acids intake but do not want fish or supplements to do so.

"As a society, Americans' consumption of fish, especially fish that contributes to these omega-3 fats, is quite low compared to other proteins," Drouillard said. "Reasons for this include cost, access to fish and personal preference. Americans do, however, like hamburgers. So if we can give people a hamburger that is rich in omega-3s, it's an alternative form of a product that they already eat and does not require a lifestyle change, which is difficult to make."

The health benefits of omega-3s are not limited to humans. Studies show that dairy and beef cattle with an enriched diet of flaxseed and other omega-3 rich grains have fewer respiratory diseases. The cattle also have higher fertility rates, which helps offset infertility among dairy cattle.

The technology to enrich ground beef with omega-3s is a spinoff of flaxseed research Drouillard began in 1998. Drouillard and his students studied flax for several of its omega-3 fatty acids that may suppress inflammation and reduce diabetes in cattle. Research showed that omega-3 levels dramatically increased in the cattle as more flaxseed was introduced into their diet.

Keeping the omega-3s from becoming saturated fats in cattle's digestive system is a challenge, however. Microorganisms in the rumen -- the largest chamber in the cow's stomach -- modify most of the ingested fats and turn them into saturated fats. This causes ground beef to have low levels of omega-3s. Christian Alvarado Gilis, a doctoral candidate in animal sciences and industry, is researching how to improve omega-3 levels in cattle diets to further enhance the fat profile of beef. Gilis is from Chile.

According to Drouillard, substituting omega-3 fatty acids for saturated fats does not change the ground beef's flavor.

"Knowing that there are a lot of desirable flavor characteristics associated with the fat in beef, we performed tons of sensory panel tests with Kansas State University's meat science faculty and with the department of human nutrition throughout the years to ensure that the flavor is not compromised," Drouillard said. "We found that our panelists were never able to detect appreciable differences in the flavor profiles of the omega-3 rich beef and non-omega-3 beef, even though the fats are quite different."

The owners of NB03 Technologies LLC have worked closely with Drouillard in developing the concept, and after more than a decade of research on improving the enrichment process, have started to distribute omega-3 enriched ground beef to retailers and food vendors.

The ground beef is part of the company's line of omega-3 enriched foods, which includes pork, chicken, cheese, milk, butter and ice cream. It will be the first ground beef to carry the U.S. Food and Drug Administration's seal of approval for containing omega-3 fatty acids.

Todd Hansen, CEO of NB03 Technologies LLC, said consumer response has been positive in test markets.

"We have to leap two hurdles with GreatO Premium Ground Beef, which are that the omega-3 fatty acids are really in the beef and that it doesn't change the flavor," Hansen said. "Based on our consumer response, we've cleared those hurdles. We really believe in the health aspect of this product and are using the slogan 'When Every Bite Counts' to emphasize that. I can't wait for consumers to have it available to them."



### **Drinking Milk Can Prevent Garlic Breath, Study Finds**

Feb. 4, 2013 Science Daily

If you're planning a romantic Italian dinner this Valentine's Day, you may want to consider drinking a glass of milk along with your meal.

According to a 2010 study in the Journal of Food Science published by the Institute of Food Technologist (IFT), researchers from the department of Food Science and Technology at The Ohio State University discovered that drinking milk while eating garlic-heavy food can reduce the malodorous breath associated with garlic consumption.

Both fat-free and whole milk lowered the concentration of volatile odor-emitting compounds from garlic in the nose and mouth. Due to its higher fat content, whole milk was found to be more effective. Although drinking milk after eating a garlic-infused meal can still help, the study found that drinking it during the meal will have better results.

Garlic is an excellent source of magnesium, vitamin B6, vitamin C, and selenium and is reported to have many health benefits. It also contains a high amount of sulfur compounds, which are responsible for the characteristic odor and flavor of garlic, as well as bad breath.



## Food Safety & Regulatory News

### USDA Proposes Nutrition Rules for Snacks

February 5, 2013 Food Product Design

WASHINGTON—The United States Department of Agriculture (USDA) has proposed rules that would lower the content of fat, sugar and sodium in snacks that are sold at schools, promoting healthier treats like fruits and vegetables in the growing fight against obesity.

The proposed rules apply to foods sold à la carte, in school stores, snack bars, or vending machines, impacting schools that participate in the National School Lunch Program and the School Breakfast Program.

The Centers for Disease Control and Prevention has warned that American children are becoming increasingly overweight and obese, failing to meet the recommendations for a healthy diet. USDA said the proposed rules further an initiative by First Lady Michelle Obama to combat childhood obesity.

USDA explained the rules will establish minimum requirements and won't hamstring the ability of schools and states to impose stricter standards. The National School Lunch Program is available to more than 50 million children. Most Americans reportedly support better nutrition standards for food that is sold in schools.

"Good nutrition lays the groundwork for good health and academic success," Agriculture Secretary Tom Vilsack said in a statement Feb. 1. "Providing healthy options throughout school cafeterias, vending machines, and snack bars will complement the gains made with the new, healthy standards for school breakfast and lunch so the healthy choice is the easy choice for our kids."

USDA is encouraging the public to comment on the proposed rules, which will not take effect until at least one full school year after the comments are considered and the final rule is published. The public has 60 days to comment after the rules are published in the Federal Register.

"It is important to note that USDA has no role in foods brought from home," the agency explains in a Q&A on the proposed rules. "The proposed standards do not apply to any foods brought to school in bagged lunches, or for birthday parties and special events, including after-school bake sales and fundraisers."

USDA said the proposed rules reflect recommendations from the Institute of Medicine, healthy beverage and food offerings that are available in the marketplace, and voluntary standards that thousands of schools have implemented. Already, 39 states have adopted standards for so-called "competitive foods" — those that are offered outside of school meals.

An estimated one in three children and adolescents in the United States are considered overweight or obese, and childhood obesity rates have skyrocketed since the 1960s, USDA has observed. The rise in obesity is linked to a substantial rise in the number of children with type 2 diabetes and creates a higher risk of asthma and heart failure, according to the Alliance for a Healthier Generation, which was founded by the American Heart Association and William J. Clinton Foundation.

"Overall, children today have diets that are low in fruits, vegetables, whole grains, and dairy foods and high in sodium, fat and added sugars," USDA states in the proposed rules.





### USDA proposes school snack guidelines

According to *Reuters*, snacks sold in U.S. schools would need to be lower in fat, salt, and sugar and include more nutritious items like fruits, vegetables, and whole grains, under new potential standards released on Feb. 1, by the U.S. Dept. of Agriculture (USDA).

The proposal, more than a year overdue, also calls for the nation's public schools to ensure individual food and drink items sold in vending machines and other venues during the school day be 200 calories or less, USDA said. The proposed rules are the second step in a larger effort to improve the foods U.S. students have access to during the school day under the Healthy, Hunger-Free Kids Act of 2010, aimed at improving childhood nutrition and combating obesity.

The rules would not cover items sold at various after-hours activities, such as sporting events. In addition, they would allow for "important traditions," such as parents sending cookies or cupcakes to school for a child's birthday, or "occasional fundraisers and bake sales."

For beverages, the USDA called for schools to be able to sell water, low-fat and fat-free milk, and 100% juices, with smaller 8-oz portions created for younger students. High school students could buy 20-oz servings of various calorie-free beverages, and 12-oz servings of drinks that have less than 75 calories or less but they could not be sold during lunch or breakfast.

The public has 60 days to comment on the proposal before the USDA issues any final ruling. The USDA said schools will have at least one full school year after the final rule is issued to implement the changes.

IFT Weekly February 6, 2013



### WHO issues sodium guidelines for children

The World Health Organization (WHO) has for the first time recommended limits on children's daily consumption of sodium which it hopes will help in the global fight against diet-related diseases becoming chronic among all populations. In advice to its 194 member states, the U.N. agency noted high sodium levels were a factor behind elevated blood pressure, which increases the risk of heart disease and stroke, the number one cause of death and disability worldwide. The guidelines vary depending on the child's size, age, and energy needs, and apply to children over the age of two.

"The successful implementation of these recommendations would have an important public health impact through reductions in morbidity and mortality, improvement in the quality of life for millions of people, and substantial reductions in healthcare costs," the agency said.

It would be updating soon WHO guidelines on the consumption of fats and sugars, also linked to obesity and disease.

IFT Weekly February 6, 2013



## Food Calorie Count Labels Often Inaccurate

February 19, 2013 Food Product Design

BOSTON—Dieters who eat high-fiber foods, such as vegetables and muesli, in an attempt to lose weight often consume more calories than they think because current food labels do not factor in the calories in fiber, according to new research presented at the American Association for the Advancement of Science (AAAS).

The findings also suggest the current labeling system, based on the Atwater Convention, overestimates the content of some protein-rich foods that can take more energy to digest than simple carbohydrates by up to 20%.

"The Atwater Convention yields realistic values for foods that are highly digestible, such as white bread," said Richard Wrangham, a primatologist at Harvard University. "But the system leaves out fiber—assuming that this component of food has no energy value to the body."

As reported by the *Guardian*, the researchers also found consumers could reduce their calorie intake by eating raw rather than cooked foods. They said the way calories are assigned to foods by manufacturers needs a significant overhaul because calories are currently both over and under estimated by up to 25%.

"There is a lot of misinformation around calories, and it is crucial for the consumer, whether they are on a diet or not, to have the correct information about what they eat," Wrangham added.

He said the standard system also does not take into account the way foods are prepared and eaten. The calorie contribution from raw and cooked versions of the same food are different for example, but that is not reflected on food packaging.

For more than 100 years, calorie value in foods has been calculated using the Atwater system. "Nutritionists calculate the calorie values of individual foods by applying calorie conversion factors to each gram of protein, fat, and carbohydrate analyzed in foods," said British nutritionist Geoffrey Livesey, who also spoke on the AAAS panel.

Generally speaking, he said the system means 1 gram of protein or carbohydrate provides 4 calories, while 1 gram of fat provides 9 calories. Food manufacturers work out how much protein, carbohydrates and fat there is in a food and multiply up using the Atwater factors to get the total calories.



## Menu labels may sway those who need them most

A study published in the *International Journal of Behavioral Nutrition and Physical Activity* shows that having the calorie counts in restaurants may influence how much consumers eat, especially among the least health-conscious people. Previous studies have found that people tend to eat less when they are told how many calories are in their food, but scientists have not looked at how that breaks down across different types of diners.

The researchers randomized patrons at a restaurant on the Oklahoma State University campus to use one of three menus during a two-week period in late 2010. One group of diners received standard menus without calorie information, another group got menus showing each item's calorie count, and the last group got a menu featuring traffic light symbols representing calorie counts. A green light was printed next to foods with less than 400 calories, yellow lights next to foods with 401–800 calories, and red lights next to foods with more than 800 calories.

By the end of the meal, diners ordering off the standard menu on average ate 817 calories. That compared to the 765 calories people ate when they ordered off the menu with printed calorie counts and the 696 calories they ate when ordering from the traffic light menu. Depending on the person, cutting 121 calories per day would lead to about a one-lb weight loss over a month.

Based on customer surveys, the researchers found that the least health-conscious people seemed to cut the most calories in response to the experimental menus. The researchers hypothesized that health-conscious people might not pay as much attention to calorie information because they're already well informed about nutrition. Regardless of how health-conscious people were, the researchers found the traffic light menu seemed to have the strongest calorie-cutting influence.

IFT Weekly February 20, 2013



### China's foodservice packaging market to overtake US

Food Production Daily 13-Feb-2013

By 2011, food and beverage consumption in a foodservice context in China was double that in the US, almost 200m tonnes versus just under 100m tonnes, the report claims. Despite this, the US is currently the largest consumer of foodservice packaging, at 198bn packages compared to 158bn in 2011, according to 'The future of foodservice packaging and disposables to 2016'. However, Smithers Pira states that "China is forecast to overtake the US by 2020". And, although Japan's foodservice packaging market was ahead of China in 2011, the company predicts that it will surpass Japan too within a shorter timescale.

'Long-term growth potential'

In addition, it adds: "The US is also the largest market for disposables [packaging] and this is expected to increase by 17% between 2011 and 2016. However, China's disposables market is growing at a faster rate and has long-term growth potential." The largest global share of food consumption in a foodservice context is fresh food, at 226m tonnes and the category is set to surpass 260m tonnes within four years. Other key sectors include dairy products and dry food, while the biggest beverage areas are beer and cider, and carbonated soft drinks. All are set to achieve strong growth in the next four years.

Bags and sachets and plastic bottles

Turning to types of foodservice packaging, bags and sachets and plastic bottles were the two biggest categories in 2011, with the former just beating the latter in volume. Smithers Pira predicts strong growth from both packaging formats in the next four years, with bags and sachets maintaining their volume lead.

The market analyst claims the performance of glass, the next biggest packaging market by volume, is rocky, with market volumes actually declining from 2006-2011, but more growth predicted in the next four years. It maintains volumes will reach 60m tonnes by 2016.

It also forecasts growth for metal cans, the next biggest category, claiming the market will reach volumes of 40m tonnes within four years. The next biggest markets by volume (in order), wrapping film, film lids and plastic trays, will all also see strong growth in that period, Smithers Pira claims.

