

PFNDAI Bulletin (October 2012)

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

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Editorial

Food preparation has always been not just a necessity but it is ingrained in our culture. We take pride in home-cooked food. This is not just because it is safe and of quality it is supposed to be but also because we are used to the food cooked by our mothers and over years consider this as the best.

Because of this cultural or emotional aspect of food it was difficult to break the ice with Indian consumers to introduce some of the western foods, although we got used to bread, biscuits, ketchup etc. for quite some time.

Over the last couple of decades there have been several changes that have spurred the changes in the way we eat meals and many sectors in food industry have benefited out of this. We have globalised in the sense many Indians have gone abroad and many foreign visitors have come to India. With this exchange people have been exposed to newer foods especially the western foods.

Although we had our own fast foods such as idli, vada, dosa, samosa, and many chat items, we adopted burgers and pizzas. However, our basic taste preference still prevailed so although a big breakthrough with such foods the growth needed something more. This is how some of the Indianised spicy versions of burgers and pizzas have appeared as tastes are very difficult to change for adults.

Once the shackles of "old is gold" are broken the developers have been experimenting with many different changes, sometimes bold enough to challenge the palates of the foodies. Not only were the western foods made available in Indian spicy versions but also some of the Indian foods were then offered with western or even Chinese versions.

Even the homemakers were provided convenience by instant noodles so she could make a meal by adding the spices and vegetables in a very short time. This gave the

satisfaction to her of preparing the meal herself rather than buying a meal itself.

Indian housewives still have this mindset about wanting to prepare the meal herself rather than just heating a can or ready-to-eat packet of food. This is slowly changing as many working couples are finding it extremely difficult to manage both the job and the duties at home including cooking.



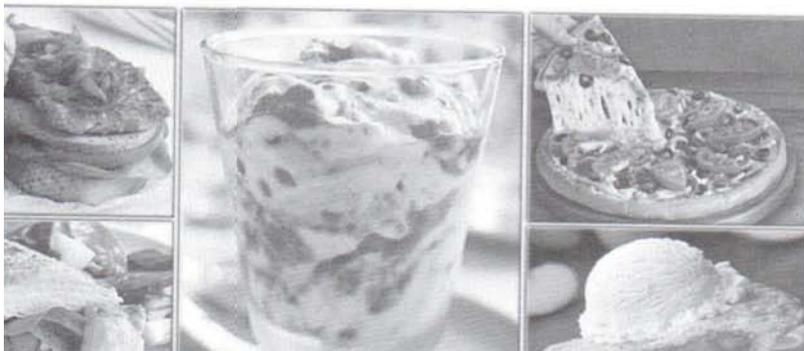
There is still some reluctance to get precooked or processed products. There are many products now in the market that make cooking so easy. Some of these might even have higher nutrients. It has been shown that vegetables that are harvested and processed to make frozen vegetables in a short time or after a time of low-temperature storage would have better vitamin and other nutrient contents especially of vitamin C and others than those vegetables which are transported in ambient hot and humid conditions and sold in open markets in cities possibly several days after harvest.

This is not to promote processed food but to show that not all that is processed may be inferior. Even when people do not like to use ready-to-eat products, there are many convenience foods and ingredients that make our lives much easier. It can still make a nutritious meal prepared by homemakers at home using ingredients that save time and efforts. With many different convenient spice products that are now available, it is easier to make the foods or meals that one prefers.

With the new regulations regarding nutrition information, it can now even tell the homemaker what nutrients are being consumed and how much. It helps plan a menu and ensure that the family gets all the nutrients it needs rather than popping the vitamin pills. Hoping that better days are here for even the fast foods with more nutritious snacks will be prepared by the food manufacturers.

With greetings,

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New Generation Foods: Emerging Technologies and Challenges

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New Generation Indians are somewhat different than the older generation. They are bolder and very confident. They want to blaze trails rather than meekly follow the traditional path. They are the ones leading the rapid growth of economy as well as they are the ones who are winning trophies and medals in sports.

They have strong preferences in styles whether in music, hair, wear or food. As they are in sync with the western world with whom they interact professionally they are not only influenced by their habits but also suffer from the problems of working late hours or unstructured hours. They have money power and the urge to verify and not take claims on face value. As there are means such internet, it is easy to find out information about anything and they are quite net-savvy.

The lifestyle has changed for this generation because of lack of time and being always on the go and subject to high stresses. Many lifestyle diseases are seen in this generation including hypertension, obesity, heart diseases, diabetes etc. They realise this and want to take care by going to health clubs and trying to eat healthy. They are quite attracted to nutraceuticals and functional foods.

Convenience is highly valued by them. They do not want to wait for anything and least of all for food. So they would like foods that are easily available anyplace and anytime. Also they may want to eat on the go so they would like to eat something that can be conveniently eaten while travelling or even standing. Most of their meals are consumed this way. So occasionally, especially on weekends and while taking break from the work; they want leisure. This is when they are spending their quality time with their family. Then the food becomes traditional eaten along with family with leisure, almost the Mediterranean style.

Tasty Fast Foods with Nutrition Although the new generation would like to have new foods, it is very difficult to entirely get rid of traditional taste preferences. Indians would always love to have spicy foods. Even Chinese food in India is quite spicy and has Indian touch. Even McDonalds decided to make exception to their global menu and standard recipes to make food palatable and acceptable to Indians. So one may take Indians away from the traditional foods but it is very difficult to take traditional tastes out of Indians.

As they realise that nutrition is very essential, they would go for tasty fast foods with nutrition when there is choice. They realise that fast foods may contain a lot sugar, salt and fat, they would go for alternatives when it is available. Many fast food places have started offering this choice now with salads, lower calorie choices, whole grain products etc.

With rapidly changing environment at workplaces where traditional dinner times are very difficult to adhere to already people have started with breakfast being consumed in the forms of nutri-bars and nutritional beverages which are supposed to be equivalent of whole breakfast. When the global interaction becomes more intense even lunch and dinner are going to fall prey to convenience.

People already have their working partners in the US so their working day starts in the evening and runs late into the night. There are many call centres which operate at odd hours of the day and night. Even TV and many places of entertainment and shopping have started having almost round-the-clock operations. So food habits are going to change. This will certainly put a big pressure on the way we traditionally eat. New Generation Foods will have to be convenient, nutritious and health providing, and more importantly very tasty. It will be a challenge for food companies to have this combination.

Low Sugar Products

Although there are many products available with artificial sweeteners like saccharin, acesulfame K, sucralose, aspartame etc. but Indians have not yet accepted them freely and would like some alternatives. Recently many new polyols including maltitol, isomalt, erythritol etc. have been permitted for use in many products. These not only provide sweetness they have reduced calorie contents compared to carbohydrates. Also they cannot be metabolised by bacteria causing dental caries they do not cause tooth decay.

There are some natural substances such as stevia now available in market, which provide intense sweetness so small amounts like artificial sweeteners may be used in food products to provide sweetness without adding calories. There are some more natural intense sweeteners awaiting clearance including monellin, thaumatin, glycyrrhizin etc.

Lower Sodium

Although there is a lot of emphasis on reducing salt, good amount of sodium is coming from many additives used in food products. Thus both ways could be explored to reduce the overall sodium intake into the diet.

There are many low sodium salts now available. Potassium chloride can reduce sodium content in salt but too much potassium gives bitterness which is unacceptable. So many low-sodium salts use other substances also. Salt not only provides salty taste, it provides flavour enhancement, mouthfeel sensation and balances the overall flavour profile. So just reducing salt will have many effects on food product acceptability.

Salt grain size affects saltiness so finer grain salt can be used at lower level without affecting flavour noticeably. Also the initial impact of salty taste is important so salt is more on surface of most popular snacks. So the strategy is to reduce particle size and to provide initial salt impact when the product is being eaten. Similarly to reduce the amount of potassium chloride to avoid bitterness, its grain size also is reduce to increase its intensity.

Umami flavour is known to enhance flavour profile partly reducing the need of salt. Besides MSG (which contains sodium) there are other substances including yeast & malt extracts, hydrolysed vegetable protein, guanylates, sea foods, fermented dairy, vegetables & meats etc. which have rich umami flavour. Use of cheese and cheese-flavour improves the appeal of low-sodium snacks.

Lower Fat

As fats not only contribute greatly to calories, certain fats such as saturated and trans are also implicated in cardiovascular diseases. So the general awareness has now penetrated into the new generation so they try to either avoid high fat foods or find foods having reduced fat or use fat substitutes.

Lowering fat content especially in fried products has been studied extensively. Oil temperature affects the oil uptake and higher temperature lowers the oil uptake. Higher moisture content of initial food allows more oil to be absorbed. Surface of food could be coated by certain proteins to reduce the oil uptake. Higher viscosity causes more oil to be absorbed. Also much of the oil is absorbed during cooling of fried product so immediately after the frying oil could be removed by absorbing material like blotter or product could be spin dried like washing machine to physically separate the unabsorbed oil.

Another means to reduce the oil content is using baking instead of frying. There are many baked snacks now available with reduced fat contents.

Use of butter increases the fat intake so there are butter substitutes developed which contain carbohydrates and proteins with absorbed water.

As fats increase acceptability of foods lower fat food products need to be formulated carefully otherwise they would not be accepted for lack of taste and flavour.

Spices

Indian food is typified by the use of spices. There was time when others were afraid of Indian cuisine but now Americans and Europeans are going for spicy chicken tikka, chhole and biryani. In the meanwhile Indians have started going for fast foods. It quickly became very convenient to go to a place and order burger or submarine or pizza and eat on the run. However, the Indian taste preference for spices prevailed so the newer foods became Indianised. Burgers, fried chicken and pizzas became hot and spicy.

Spices have a lot of health providing substances in them such as capcaisin, carotenoids, curcumin, and other materials like probiotics, prebiotics, omega-3 fats which are now recognised to be healthy. Thus the new generation foods will be having many phytochemicals and nutraceuticals many of which derived from spice and herb sources.

Fibre in Diet

Since the diet of new generation based on convenience foods there is a lack of dietary fibre both insoluble and soluble. Both are highly beneficial so they are now looking for products that are whole grain, multigrain and with added fibre.

Traditional Indian diet included plenty of whole grain products. Hand pounded rice was slowly replaced by parboiled rice. However, when white rice made entry with great taste it quickly replaced other forms of rice. Same happened to whole wheat when chapatti was replaced by white bread made with refined wheat. Other casualties were grains such as sorghum, bajra and ragi.

However, the new generation foods have started making appearance with breads made of whole wheat and multigrain. These new products are now putting back some of the fibre back into the foods and some vitamins and minerals that were lost in refining are being put back. When bread is made with a lot of bran from whole wheat flour, modification is needed to still get soft bread. High speed mixers with mechanical leavening will have to be done in addition to yeast leavening.

Earlier processes are also being modified so the fibre along with beneficial phytochemicals and vitamins and minerals are retained. Use of new technology allows use of enzymes, wherein instead of fibre separating it will be partially hydrolysed and make it soluble. Alternatively fibre could also be finely divided so it will remain suspended without settling.

Probiotics

This is another very useful and forgotten means for getting health through foods. Traditional foods contained many microbes which were beneficial for preventing and/or treating diarrhea, lactose intolerance, gastritis, constipation etc., providing immunity, reducing risk of colon cancer among other things. Consumption of yogurt, buttermilk etc. would provide many such beneficial bacteria. These and other products have started making a comeback because of their benefits. Many products including beverages, ice creams, health drink mixes etc. have been incorporated with these probiotics. These selected organisms are chosen for their proven benefits and ability to be lodged in intestine. Their presence there is enhanced by the use of prebiotics which are mostly soluble fibres.

However, one study in UK showed that most strains do not survive digestion process. Hence care must be taken to select strains in combination and use of medium containing milk protein, lactose etc. which provide protective action to them.

One of the best ways of ensuring viability of probiotics in intestines is use of enteric coating which is used for many medicines to protect them from stomach environment. The coating will dissolve in intestine where they will grow and be useful.

Omega 3 fatty acids

New Generation also needs omega 3 fatty acids with all their health benefits. They reduce hypertension and cholesterol as well as risk of various cardiac problems. They help brain development in infants and also reduce the risk of Alzheimer's disease. There is a long list of other benefits so if a person does not eat fish or omega 3 containing foods there is a need to supply these in new generation foods.

Many foods are now being enriched with ALA, DHA & EPA. However, in one study in UK revealed that considering the amounts added in some foods, a person would have to eat 16 slices of enriched bread, 5 enriched eggs, 6 enriched drinks or 1 litre of enriched milk to get daily requirements of omega 3. There are many newer technologies available to improve the omega 3 contents of certain foods.

Pigs were fed flax seeds so the pork contained higher omega 3 (over 400mg ALA per 100g) and consequently the saturated and omega 6 fats were less. Even more promising results were obtained with hens were fed with flax seeds. The eggs contained ALA (400-500mg) and DHA (100mg). However, if they were fed marine algae or fish oils DHA rose to 150mg and also the yolk contained 20mg EPA. DHA and EPA are more health benefits as ALA needs to be converted to these before giving benefits.

Feeding fish oils to hens has one problem i.e. they produce off-flavour when eggs were over-cooked. Algae oils are vegetarian with no fishy flavour and can give rich dark yolk because of higher carotenoids.

Fortification

This is an important tool when one wants to upgrade a food with respect to nutrients. Adding essential nutrients such as iodine, iron, vitamin A etc. to some of the common foods would upgrade the diet and several such successful fortifications have been carried out. Now there are opportunities to use many phytochemicals such as anthocyanins, carotenoids, flavonoids etc. to foods would allow the formulation of some new generation food that would reduce the risk of some of the diseases such as cancer, AMD, CVD etc. However, many such substances are highly reactive or sensitive to environmental conditions and need protection. There are newer technologies like encapsulation including micro- and nano-encapsulation would allow protection and use of several reactive nutrients without allowing them to come in contact with each other during manufacture and storage of foods.

There are also technologies that could be used to provide stability to sensitive substances e.g. enzymic bioconversion of anthocyanins to make them more stable to pH and temperature.

Process Improvements

Older processes would incur many losses of essential health providing phytochemicals. Modification would improve the nutrient quality of such food products. Rice bran oil was earlier chemically refined that would remove oryzanol, an excellent antioxidant that reduces risk of cancer, heart disease etc. With physical refining almost completely retains oryzanol in the oil.

Since trans fats are unhealthy which come from partially hydrogenated fats, foods are now formulated with no or less hydrogenated fats. Even processes are modified to reduce formation of trans fats in frying and baking.

Research has also shown that foods could be made more nutritious using newer techniques. Use of enzymes can change fat characteristics without formation of trans fats. Also enzyme asparaginase has been shown to reduce acrylamide during frying and enzyme phytase can reduce phytates that bind essential minerals.

New technology has the promise to make new foods suitable for new generation. These would be more convenient and nutritious with ability to reduce the risk of many diseases that torment the new generation.

Mediterranean Diet (Traditional Diet) Although the business lunches and hurried on-the-run meals may be fine for the New Generation but they also want to let their hair down and have a quality time with their family whenever they can. When they do they would want traditional food with all kinds of vegetables, dairy & meat products, with fruits along with desserts, eaten leisurely. Wine is becoming quite popular especially the red which has the health benefits. When one compares this with Mediterranean Diet that is found to be so healthful, there are many similarities with traditional Indian foods. With realisation of health benefits of many dietary preferences and needs for certain lifestyle changes, the new generation needs certain types of foods which offer many new opportunities for development.

Heart–Healthy Formulating

As food, heart health and diet are related, some people eliminate certain foods while others modify their diets when heart health is top of mind of these people. Choosing heart-healthy ingredients is one way to protect the cardiovascular system. There are some key components of heart-healthy diet which may be considered while formulating heart-healthy products.

Fats First

Any good heart-conscious diet reduces saturated fat and cholesterol. Most guidelines suggest consumption of less than 10% of calories from saturated fat and about 30% or less calories from total fat. Cholesterol should be limited to less than 300 mg per day. The guidelines are more stringent for individual foods that make claims.

US FDA allows two types of health claims the difference being the amount of expert consensus. Significant Scientific Agreement (SSA) claims have evidence widely agreed by experts. Qualified health claims have less scientific agreement and they should be qualified so as not to be misleading. Both types of claims relate specific food with a health condition.

To make heart-healthy claim, food must meet Code of Federal Regulations (CFR) Part 101.62 on fat-related nutrient content claims. A meal or main dish that claims to be low in saturated fat contains 1g or less saturated fatty acids per 100g and less than 10% calories from saturated fat, total fat and cholesterol must be declared. Claims low in cholesterol or low cholesterol etc. depends on reference amount normally consumed. If the amount is 30g or greater than 2 tablespoons and contains less than 13g of total fat per serving, the food contains 20mg or less cholesterol. Saturated fat designation is like this: A food can claim to be low in cholesterol if it contains 2g or less saturated fatty acids.

Health claim relative to dietary saturated fat and cholesterol and the risk of coronary heart disease are spelled out in CFR 101.75. The claim uses terms like “may” or “might” reduce the risk of heart disease. The claim does not attribute any degree of risk reduction for heart disease to diets low in dietary saturated fat and cholesterol, stating that heart disease risk depends on many factors. Beware that sodium levels might disqualify a health claim. For meal products, do not exceed 960 mg per serving size and for main-dish products, 720mg is the limit.

Omega-3s

Many people take fish oil supplements due to their doctor’s recommendation who prescribe omega-3 fatty acids to improve cardiovascular health. Fish oil contains key ingredients eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Alpha linolenic acid (ALA) is an omega-3 found in flaxseed, canola, soy and walnut oils and is partially converted to EPA in body.

FDA allows a qualified health claim EPA and DHA, but has not yet included ALA. “Supportive but not conclusive research shows that consumption of EPA and DHA omega-3 fatty acids may reduce the risk of coronary heart disease. One serving of [name of food] provides [x] grams of EPA and DHA omega-3 fatty acids. [See nutrition information for total fat, saturated fat and cholesterol content.]”

Those who want to incorporate heart-health benefit into their products are struggling with flax or fish oil, both having limitations due to flavor and stability. Some companies have developed oil that combines flax with proprietary high-oleic canola oil to deliver ALA with superior flavor and high stability.

Canola contains 30% omega-3 fatty acids providing at least 160mg ALA in most applications. When fortifying, product with at least 0.6g per serving of this canola oil, a “good” source of ALA omega-3 statement may be made. An “excellent” source requires food containing at least 1.2g per serving. The amount of omega-3 fatty acid in a serving and the daily value must be specified.

Sterols

Scientific evidence shows that plant sterols and stanol esters in the diet help to lower blood total and low-density lipoprotein (LDL) levels. For specific guidance in making a related heart-health claim look up CFR 101.83.

Plant sterols are offered in two versions: free sterols and sterol esters. "Plant sterols block the absorption of cholesterol and may reduce LDL cholesterol by 8% to 15%. Plant sterols may be used in a wide range of products like orange juice, milk, snacks and spreads. Free sterols are in the form of a fine waxy powder that can be used in milk, orange juice, bread and yogurt.

When fatty acid is added to free sterol to make ester, the physical properties change, making it thicker in consistency and is now fat-soluble with a lower melting point. This is better for muffins, cakes, spreads and oils. However, because fatty acid makes up 40% of the molecule, more of sterol ester is needed to achieve the cholesterol-reducing equivalency of free sterol.

As the amount of plant sterol needed to meet the health-claim minimum inclusion level is fairly low – currently 400mg free sterol per serving (FDA has proposed increase to 500mg per serving) formulation changes are rarely needed, and taste, texture and flavor are unaffected.

Any development project with sterol should involve ingredient manufacturer as sterol product needed for dairy beverage would be different from that needed for bread or sauce. Because of their waxy nature, some sterols can pose challenge for incorporation in food. Some water-dispersible products have been developed for use in beverages.

Fiber

FDA also recognizes relationship between diets that include soluble fibre from certain foods and the risk of coronary heart disease (CFR 101.81). Eligible sources of soluble fibre include beta-glucan soluble fibre from oat bran, rolled oats, whole-oat fibre, oatrim, whole-grain barley, dried mill barley, barley beta fibre and psyllium husk. Whole oat or barley foods must contain at least 0.75g of soluble fibre per serving. Psyllium food shall contain at least 1.7g soluble fibre.

Chitin-glucan fibre was the subject of an abstract presented at 2012 Annual Meeting of American Heart Association. Results suggest that chitin-glucan a novel insoluble fibre, may significantly reduce LDL-cholesterol levels. These have therapeutic implications for patients at risk for CHD or other diabetic complications. Although currently this fibre does not have FDA-approved health claim but research may support future claims for use of fibre for clean, healthy arteries.

Chitin is composed of repeating units of N-acetyl-D-glucosamine linked via beta-1,4 linkages. Beta-glucan consists of repeating units of D-glucose linked via beta-1,3 linkages. 4.5g chitin-glucan fibre contains about 2.9 to 3.15g beta-glucan and is water insoluble. Ingredient can be added to breads, muffins and cookies at the levels of 1 to 2g per serving. Fruit beverages, smoothies and juices can incorporate 1 to 4.5g per serving. This fibre is easy drop-in ingredient to work with and particularly in baking. As is the case with most fibres, water levels need to be adjusted since it absorbs about 7 times its weight of water.

It is generally accepted that diets high in fibre contribute to the heart's well-being. Researchers in Northwestern Medicine, Chicago offered confirmation at 2011 American Heart Association conference. Studies of adults between 29 and 59 years found that those with the highest intake of fibre had a significantly lower estimated lifetime risk of cardiovascular disease than those with the lowest fibre intake.

Inulin can be used as "invisible" fibre in a wide range of beverages, bakery, dairy items, snacks and confections. Inulin is extracted from chicory root and belongs to fructan group of oligo- and polysaccharides. It can be refined to powder and liquid product forms with different functional properties based on chain length or degree of polymerization (DP), giving product developers an incredibly capable fibre option for almost any product application.

Inulin can also replace sugar and fat in formulations without sacrificing taste and texture. Whether it acts as a bulking agent or fat mimetic, or helping to lower calories and sugar in products aimed at consumers looking to control the weight. Weight management is important to heart health, but looking at ways to formulate low-calorie foods is another topic for another day.

From an article by Cindy Hazen, condensed from Food Product Design July 2012

Research in Nutrition & Health

Fruits and Vegetables Versus Cancer

Report by Marie Spano September 14, 2012 Food Product Design

Conventional wisdom says five servings of fruits and vegetables each day helps prevent cancer. But does it?

The European Prospective Investigation into Cancer and Nutrition (EPIC), a study conducted in 23 centers in 10 European countries, assessed relationships between intake of total fruits, total vegetables, and total fruits and vegetables combined and cancer risk over an eight-year period in 142,605 men and 335,873 women. They found a very small inverse association between total fruit and vegetable intake and cancer risk, with a stronger association tied to an increased intake of vegetables versus fruit. Additionally, a high intake of fruits and vegetables in current smokers was associated with a decreased risk of lung cancer (*Journal of the National Cancer Institute*, 2010; 102:529-537; *European Journal of Cancer*, 2010; 46:2,555-2,562). Though these results may seem to debunk the belief that fruits and vegetables are preventive weapons in the war against cancer, the incidence of cancer in the population studied at the time of initial publication wasn't large enough to detect an association with fruit and vegetable intake and specific cancers (*Journal of the National Cancer Institute*, 2010; 102:529-537).

A systematic, comprehensive analysis of all relevant, methodologically sound research on food, nutrition, physical activity and cancer consisting of 7,000 papers and 17 systematic literature reviews, published by the World Cancer Research Fund and American Institute for Cancer Research, concluded "non-starchy vegetables and fruits probably protect against some cancers," and, because they are low in energy density, they likely protect against weight gain, an independent risk factor for some cancers. In particular, they found a convincing association between non-starchy vegetable intake and decreased risk of the following cancers: mouth, pharynx, larynx, esophagus and stomach. Additionally, non-starchy vegetable intake was associated with a probable decreased risk of nasopharynx, lung, colorectum, ovary and endometrium cancers. Fruit intake was inversely associated with a convincing decrease in risk of mouth, pharynx, larynx, esophagus, lung and stomach cancers, and a probable decreased risk of liver, colorectum, nasopharynx and pancreas cancers.

A strong association between fruit and vegetable intake and a reduced risk of renal cell cancer was found in a pooled analysis of 13 prospective studies, including 1,478 cases of renal-cell cancer among 530,469 women and 244,483 men followed for 7 to 20 years. And, a statistically significant inverse association was found for intakes of root vegetables, broccoli and carrots and renal-cell cancer risk (*Cancer Epidemiology, Biomarkers and Prevention*, 2009; 18:1,730).

Action behind the activity

Fruits and vegetables may affect cancer cells by modulating detoxification enzymes, stimulating the immune response to cancer, modulating hormones and inhibiting cancer-cell growth (*Cancer Causes Control*, 1991; 2:427-442).

Though some studies suggest antioxidants play a role, science has not elucidated many of the potential compounds within fruits and vegetables that could be responsible (American Institute of Cancer Research, 2007). However, the EPIC study found a high intake of dietary fiber was associated with decreased colorectal-cancer risk, and high plasma levels of vitamin C, some carotenoids, retinol and alpha-tocopherol were inversely associated with gastric-cancer risk (*European Journal of Cancer*, 2010; 46:2,555-2,562).

Recommended amounts and types

The World Cancer Research Fund and American Institute of Cancer Research emphasize eating mostly foods of plant origin, including non-starchy vegetables, fruits and legumes, all of which contain substantial amounts of dietary fiber,

micronutrients and are low in energy density, making them an important part of weight management. Five servings (14 oz. or 400 grams) of a variety of different colors of non-starchy vegetables and fruits, including red, green, yellow, white, purple and orange, as well as tomato-based products and allium vegetables, such as garlic, are recommended daily.

The average American adult consumes half of the recommended intake of fruits and vegetables, about 2.47 and 2.16 cups of vegetables daily (including fried potatoes), for men and women, respectively, and 0.61 cups of fruit daily for both men and women. And, Americans are falling short on variety—a very small amount of vegetables consumed consists of dark green and orange vegetables. In addition, fruit juice accounts for approximately one-fifth of total fruit intake (*Medscape Journal of Medicine*, 2009; 11(1)).

[Recent studies](#)

Though past research has, at times, been conflicting, more recent research is lending support to the association between fruit and vegetable intake and some types of cancer. A systematic review and meta-analysis of prospective studies examining fruit and vegetable intake and breast-cancer risk found a high intake of fruits, and fruits and vegetables combined, but not vegetables, was associated with a weak reduction in risk of breast cancer (*Breast Cancer Research & Treatment*, 2012; 134:479-493). And, a meta-analysis of 19 prospective studies found a weak but statistically significant nonlinear inverse association between fruit and vegetable intake and colorectal-cancer risk (*Gastroenterology*, 2011; 141:106-118). Additionally, a meta-analysis of case control studies found fruit and vegetable consumption reduced risk of pancreatic cancer (*Cancer Epidemiology*, 2012; 36:60-67). And finally, recent analysis of data from the EPIC study found an inverse association between total intake of vegetables, onion and garlic and risk of intestinal gastric cancer, and an inverse association between citrus fruit and risk of cardia gastric cancer (*International Journal of Cancer*, doi: 10.1002/ijc.27565). The latest data from EPIC also found fiber from fruit and vegetables was inversely associated with colon-cancer risk (*PLoS ONE*, 2012; 7(6):e39361). And, a small meta-analysis of seven cohort and six population-based case-control studies found fruit and vegetable intake was tied to a significantly decreased risk of prostate cancer (*International Journal of Urology*, 2012; 19:134-141).

Taken together, the current body of scientific data suggests increased intake of non-starchy vegetables and fruits can decrease risk of some cancers and possibly play a role in weight management; adult weight gain, overweight and obesity are independent risk factors for some types of cancer.



[Study Says BPA in Food Packaging Linked to Child Obesity](#)

September 18, 2012 [Food Product Design](#)

NEW YORK—Children and adolescents with the highest concentrations of urinary bisphenol A (BPA) are more than twice as likely to be obese compared to kids who have the lowest levels of urinary BPA, according to a new study published in the *Journal of the American Medical Association* (JAMA).

BPA exposure has also been associated health problems, including cardiovascular disease, breast cancer, prostate cancer, neurological disorders, diabetes and infertility. This summer the U.S. Food and Drug Administration (FDA) banned its use in the manufacture of sippy cups and baby bottles; however, it is still used as an internal coating for aluminum cans, such as those used for soft drinks and soups.

In March 2012, FDA rejected a petition to ban the much-debated chemical from food and beverage packaging. FDA said there was not enough compelling scientific evidence to impose new restrictions; however, the agency will continue to study the issue.

Researchers at the NYU School of Medicine examined associations between urinary BPA concentrations and body mass by using a sample of nearly 3,000 children and adolescents, ages 6 through 19 years, randomly selected for

measurement of urinary BPA concentration in the 2003-2008 National Health and Nutrition Examination Survey (NHANES). After controlling for race/ethnicity, age, caregiver education, poverty to income ratio, sex, serum cotinine level, caloric intake, television watching, and urinary creatinine level, the researchers found children with the highest levels of urinary BPA had 2.6 times higher odds of being obese than those with the lowest measures of urinary BPA. Among the participants with the highest levels, 22.3% were obese compared with 10.3% of the participants with the lowest levels.

They also found the association to be statistically significant in only one racial subpopulation, white children and adolescents. The researchers also found that obesity was not associated with exposure to other environmental phenols commonly used in other consumer products, such as sunscreens and soaps.

"This is the first association of an environmental chemical in childhood obesity in a large, nationally representative sample," said lead investigator Leonardo Trasande, MD, MPP, associate professor of pediatrics and environmental medicine. "Our findings further demonstrate the need for a broader paradigm in the way we think about the obesity epidemic. Unhealthy diet and lack of physical activity certainly contribute to increased fat mass, but the story clearly doesn't end there."

The researchers also said a comprehensive, cross-sectional study of dust, indoor and outdoor air, and solid and liquid food in preschool-aged children suggested that dietary sources constitute 99% of BPA exposure.

"Most people agree the majority of BPA exposure in the United States comes from aluminum cans," Trasande said. "This data adds to already existing concerns about BPA and further supports the call to limit exposure of BPA in this country, especially in children. Removing it from aluminum cans is probably one of the best ways we can limit exposure. There are alternatives that manufacturers can use to line aluminum cans."



[Morning Exercise Reduces Motivation for Food](#)

[September 17, 2012](#) [Food Product Design](#)

PROVO, Utah—Just 45 minutes of moderate-to-vigorous exercise in the morning actually reduces a person's motivation for food, according to a new study published in the journal *Medicine & Science in Sports & Exercise*. The findings seem to refute the assumption that a person can "work up an appetite" with a vigorous workout.

Researchers at Brigham Young University measured the food motivation of 18 normal-weight women and 17 clinically obese women over two separate days. On the first day, each woman briskly walked on a treadmill for 45 minutes and then, within the hour, had their brain waves measured. Electrodes were attached to each participant's scalp and an EEG machine then measured their neural activity while they looked at 240 images—120 of plated food meals and 120 of control images of flowers.

The same experiment was conducted one week later on the same day of the week and at the same time of the morning, but omitted the exercise. Individuals also recorded their food consumption and physical activity on the experiment days.

The 45-minute exercise routine not only produced lower brain responses to the food images, but also resulted in an increase in total physical activity that day, regardless of body mass index. Interestingly, the women in the experiment did not eat more food on the exercise day to "make up" for the extra calories they burned in exercise. In fact, they ate approximately the same amount of food on the non-exercise day.

"We wanted to see if obesity influenced food motivation, but it didn't," the researchers said. "However, it was clear that the exercise bout was playing a role in their neural responses to the pictures of food."



[High Dietary Fructose May Impair Liver Function](#)

September 14, 2012 [Food Product Design](#)

DURHAM, N.C.—Obese patients with type 2 diabetes who consume higher amounts of fructose display reduced levels of liver adenosine triphosphate (ATP)—a compound involved in the energy transfer between cells, according to a new study published in the journal *Hepatology*. The findings indicate elevated uric acid levels are associated with more severe hepatic ATP depletion in response to fructose intake.

The study, funded in part by grants from the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), also suggests that uric acid levels may serve as a marker for increased fructose consumption and hepatic ATP depletion. Uric acid is produced by the breakdown of purines, natural substances commonly found in foods. According to the researchers, increased dietary fructose can alter the body's metabolism and energy balance. Energy depletion in the liver may be associated with liver injury in patients with non-alcoholic fatty liver disease (NAFLD) and in those at risk for developing this metabolic condition.

Prior research reports that fructose consumption in the United States has more than doubled in the past 30 years. Studies have shown that Americans' fructose intake climbed from 15 grams per day in the early 1900s to 55 grams per day in 1994, which experts believe stems from an increase in soft drink consumption.

"There is an alarming trend of increased rates of obesity, type 2 diabetes and NAFLD in the U.S.," said lead author Dr. Manal Abdelmalek from Duke University Medical Center. "Given the concurrent rise in fructose consumption and metabolic diseases, we need to fully understand the impact of a high-fructose diet on liver function and liver disease."

For the present study, 244 obese and diabetic adults from the Look AHEAD Study were evaluated, with dietary fructose consumption estimated by the food frequency questionnaire. Liver ATP and uric acid levels were measured in 105 patients who participated in the Look AHEAD Fatty Liver Ancillary Study. Researchers assessed the change in liver ATP content using an IV fructose challenge in 25 subjects, comparing patients with low fructose consumption (less than 15 grams per day) to those with high fructose consumption (greater than 15 grams per day).

Participants with a high intake of dietary fructose had lower liver ATP levels at baseline and a greater change in ATP content following the fructose challenge than those who consumed a lower amount of fructose. Patients with high uric acid levels (5.5 mg/dL or more) displayed lower ATP stores in response to fructose.

"High fructose consumption and elevated levels of uric acid are associated with more severe depletion of liver ATP. Our findings suggest that increased dietary fructose intake may impair liver 'energy balance'," Abdelmalek said, adding further research to define the clinical implications of these findings on metabolism and NAFLD is necessary.



[Reducing Red Meat Consumption Lowers Chronic Disease Risk](#)

September 13, 2012 [Food Product Design](#)

CAMBRIDGE, United Kingdom—Reducing the consumption of red and processed meats may significantly reduce the incidence of chronic diseases, such as certain cancers, diabetes and heart disease, and reduce greenhouse emissions by 28 million tons, according to a new study published in the journal *BMJ Open*.

Consumption of red and processed meat (RPM) is a leading contributor to greenhouse gas (GHG) emissions, and high intakes of these foods increase the risks of several leading chronic diseases. Previously published evidence shows the

risks of coronary heart disease, type 2 diabetes, and bowel cancer rise by 42%, 19%, and 18% respectively, with every additional 50 g of red and processed meat eaten daily.

Researchers at the University of Cambridge's Institute of Public Health conducted a study that used newly derived estimates of habitual meat intakes in U.K. adults to assess potential co-benefits to health and the environment from reduced red and processed meat consumption.

The researchers examined responses to the 2000-2001 British National Diet and Nutrition Survey to estimate red and processed meat intake across the U.K. population and published data from life cycle analyses to quantify average greenhouse gas emissions for 45 different food categories. They devised a feasible "counterfactual" alternative, based on a doubling of the proportion of survey respondents who said they were vegetarian—to 4.7% of men and 12.3% of women—and the remainder adopting the same diet as those in the bottom fifth of red and processed meat consumption.

They found those in the top fifth of consumption ate 2.5 times as much as those in the bottom fifth. Therefore, adopting the diet of those eating the least red and processed meat would mean cutting average consumption from 91 to 53 g a day for men and from 54 to 30 g for women. The calculations showed it would significantly cut the risk of coronary artery disease, diabetes, and bowel cancer by between 3% and 12% across the population as a whole. And this reduction in risk would be more than twice as much as the population averages for those at the top end of consumption who moved to the bottom end.

The researchers noted the expected reduction in greenhouse gas emissions would amount to 0.45 tons per person per year, or just short of 28 million tons of the equivalent of CO² a year.



[Antioxidant-Rich Diet Lowers Women's Heart Attack Risk](#)

September 24, 2012 Food Product Design

STOCKHOLM—Women who consume a diet rich in antioxidants, mainly from whole grains, fruits and vegetables, may significantly reduce their risk of myocardial infarction, according to a new study published in *The American Journal of Medicine*.

Researchers at the Karolinska Institute examined how total antioxidant capacity of diet and antioxidant-containing foods were associated with incident myocardial infarction among middle-aged and elderly women. The examined data from 32,561 Swedish women aged 49 to 83 who participated in the Swedish Mammography Cohort study from September 1997 through December 2007. The women completed a food-frequency questionnaire in which they were asked how often, on average, they consumed each type of food or beverage during the last year.

Researchers calculated estimates of total antioxidant capacity from a database that measures the oxygen radical absorption capacity (ORAC) of the most common foods in the United States (no equivalent database of Swedish foods exists). The women were categorized into five groups of total antioxidant capacity of diet.

During the study, 1,114 women suffered a myocardial infarction. Women in the group with the highest total antioxidant capacity had a 20% lower risk, and they consumed almost seven servings per day of fruit and vegetables, which was nearly three times more than the women with the least antioxidant capacity, who on average consumed 2.4 servings.

The researchers concluded data suggest that dietary total antioxidant capacity, based on fruits, vegetables, coffee, and whole grains, is of importance in the prevention of myocardial infarction.



[Sesame, Rice Bran Oil Blend Lowers Blood Pressure](#)

September 24, 2012 [Food Product Design](#)

WASHINGTON—Cooking with a blend of sesame and rice bran oils may significantly lower blood pressure and cholesterol levels, according to new research presented at the American Heart Association’s High Blood Pressure Research 2012 Scientific Sessions. The findings suggest the use of the oil blend along with commonly prescribed high blood pressure medication yields even more impressive results.

Researchers at Fukuoka University Chikushi Hospital said rice bran oil, like sesame oil, is low in saturated fat and appears to improve a patient’s cholesterol profile. It also may reduce heart disease risk in other ways, including being a substitute for less healthy oils and fats in the diet.

The 60-day study in New Delhi, India, divided 300 people with mild to moderately high blood pressure into three groups. One group was treated with a commonly used blood pressure lowering medication called a calcium-channel blocker (nifedipine). The second group was given the oil blend and told to use about an ounce each day in their meals. The final group received the calcium channel blocker and the oil blend. All three groups saw drops in their systolic blood pressure.

Systolic blood pressure dropped an average of 14 points for those using only the oil blend and 16 points for those taking medication. Those using both saw a 36-point drop. Diastolic blood pressure also dropped significantly—11 points for those eating the oil, 12 for those on medication and 24 for those using both.

Those using the oils saw a 26% drop in their low-density lipoprotein (LDL) and a 9.5% increase in the high-density lipoprotein (HDL), while no changes in cholesterol were observed for the patients who used only the calcium-channel blocker. Those who took the calcium channel blocker and the oils had a 27% drop in LDL levels and a 10.9% increase in HDL.

The researchers concluded healthier fatty acids and antioxidants, such as sesamin, sesamol, sesamolol and oryzanol, in the oil blends may be responsible for the results.



[Eating Yogurt Lowers Blood Pressure Risk](#)

September 24, 2012 [Food Product Design](#)

WASHINGTON—Individuals who consume at least one 6-ounce servings of lowfat yogurt every three days have a 31% reduced risk of developing high blood pressure, according to new research presented at the American Heart Association’s High Blood Pressure Research 2012 Scientific Sessions.

Researchers at Tufts University found individuals who added more yogurt to their diet without increasing the number of calories were less likely to develop high blood pressure and on average had lower systolic blood pressure than those who didn’t eat yogurt.

During the 15 year study, researchers followed more than 2,000 volunteers who did not have high blood pressure at the start of the study. Yogurt consumption was measured by questionnaires filled out by the volunteers at three intervals over the study period. Study participants were 31% less likely to develop high blood pressure if at least 2% of their daily calories came from yogurt, which would be like eating at least one 6-ounce cup of low-fat yogurt every three days. In addition, their systolic blood pressure increased less than that of people who didn’t eat yogurt.

Consumption of lowfat dairy may help decrease the risk for elevated blood pressure and, regardless of fat content, fluid dairy foods (including lowfat and full-fat milk and yogurt) are associated with a reduced risk of elevated blood pressure. Find out more in the Nutrition and Hypertension article available in Food Product Design's Content Library.



[Brainy Beverage: Study Reveals How Green Tea Boosts Brain Cell Production to Aid Memory](#)

Science Daily Sep. 5, 2012

It has long been believed that drinking green tea is good for the memory. Now researchers have discovered how the chemical properties of China's favorite drink affect the generation of brain cells, providing benefits for memory and spatial learning.

The research is published in *Molecular Nutrition & Food Research*.

"Green tea is a popular beverage across the world," said Professor Yun Bai from the Third Military Medical University, Chongqing, China. "There has been plenty of scientific attention on its use in helping prevent cardiovascular diseases, but now there is emerging evidence that its chemical properties may impact cellular mechanisms in the brain."

Professor Bai's team focused on the organic chemical EGCG, (epigallocatechin-3 gallate) a key property of green tea. While EGCG is a known anti-oxidant, the team believed it can also have a beneficial effect against age-related degenerative diseases.

"We proposed that EGCG can improve cognitive function by impacting the generation of neuron cells, a process known as neurogenesis," said Bai. "We focused our research on the hippocampus, the part of the brain which processes information from short-term to long-term memory."

The team found that EGCG boosts the production of neural progenitor cells, which like stem cells can adapt, or differentiate, into various types of cells. The team then used laboratory mice to discover if this increased cell production gave an advantage to memory or spatial learning.

"We ran tests on two groups of mice, one which had imbibed EGCG and a control group," said Bai. "First the mice were trained for three days to find a visible platform in their maze. Then they were trained for seven days to find a hidden platform."

The team found that the EGCG treated mice required less time to find the hidden platform. Overall the results revealed that EGCG enhances learning and memory by improving object recognition and spatial memory.

"We have shown that the organic chemical EGCG acts directly to increase the production of neural progenitor cells, both in glass tests and in mice," concluded Bai. "This helps us to understand the potential for EGCG, and green tea which contains it, to help combat degenerative diseases and memory loss."

This paper is published as part of a collection of articles bringing together high quality research on the theme of food science and technology with particular relevance to China. Browse free articles from Wiley's food science and technology publications including the Journal of Food Science, Journal of the Science of Food and Agriculture and Molecular Nutrition & Food Research.



[Non-Alcoholic Red Wine May Help Reduce High Blood Pressure](#)

Science Daily Sep. 6, 2012

Men with high risk for heart disease had lower blood pressure after drinking non-alcoholic red wine every day for four weeks, according to a new study in the American Heart Association journal *Circulation Research*.

Non-alcoholic red wine increased participants' levels of nitric oxide, which helped decrease both systolic and diastolic blood pressure, researchers said. Nitric oxide is a molecule in the body that helps blood vessels relax and allows more blood to reach your heart and organs.

Researchers studied 67 men with diabetes or three or more cardiovascular risk factors who ate a common diet plus one of the following drinks: about 10 ounces of red wine, non-alcoholic red wine or about 3 ounces of gin. All of the men tried each diet/beverage combination for 4 weeks.

The red wine and nonalcoholic wine contained equal amounts of polyphenols, an antioxidant that decreases blood pressure.

During the red wine phase, the men had very little reduction in blood pressure and there was no change while drinking gin. However, after drinking non-alcoholic red wine, blood pressure decreased by about 6mmHg in systolic and 2mmHg in diastolic blood pressure -- possibly reducing the risk of heart disease by 14 percent and stroke by as much as 20 percent.

Researchers concluded that the alcohol in red wine weakens its ability to lower blood pressure. But polyphenols -- still present after alcohol is removed from wine -- are likely the beneficial element in wine.



[Exposure to Bisphenol A \(BPA\) Early in Life Results in High Levels of Anxiety; Soy Mitigates Effects, Study Shows](#)

Science Daily Sep. 7, 2012

New research led by researchers at North Carolina State University shows that exposure to the chemical bisphenol A (BPA) early in life results in high levels of anxiety by causing significant gene expression changes in a specific region of the brain called the amygdala. The researchers also found that a soy-rich diet can mitigate these effects.

"We knew that BPA could cause anxiety in a variety of species, and wanted to begin to understand why and how that happens," says Dr. Heather Patisaul, an associate professor of biology at NC State and lead author of a paper describing the work. BPA is a chemical used in a wide variety of polycarbonate plastics and epoxy resins, and is used in consumer products such as some food containers.

In the study, rats were exposed to low doses of BPA during gestation, lactation (nursing) and through puberty. One group of animals was fed only soy; one group was fed a soy-free diet; one group was fed only soy and exposed to BPA; and one group was fed no soy and exposed to BPA. Blood tests showed that the animals exposed to BPA had BPA levels well within the range found in humans. Similarly, blood tests of animals fed soy showed levels of genistein, an estrogen-like chemical found in soy, were at levels within the human range for vegetarians and others who regularly consume soy foods.

Among adolescent rats on the soy-free diet, both males and females that had been exposed to BPA exhibited significantly higher levels of anxiety. The researchers also found, for the first time, gene changes within the brain associated with this elevated anxiety.

Specifically, the study reveals that gene expression changes in the amygdala, a brain region known to play a role in mediating responses to fear and stress, are associated with the behavioral changes. Two of the affected genes were estrogen receptor beta and the melanocortin receptor 4. Both are required for oxytocin release, thus changes in oxytocin/vasopressin signaling pathways may underpin the behavioral changes. Oxytocin is a hormone and neurotransmitter that has been linked to social behavior.

However, the researchers also found that adolescent rats on the soy-rich diet did not exhibit anxiety -- suggesting that the soy-rich diet may mitigate the effects of BPA. But a soy-rich diet raises questions of its own.

"Soy contains phytoestrogens that can also affect the endocrine system, which regulates hormones," Patisaul says. "It is not clear whether these phytoestrogens are what mitigate the effect of BPA, or if it is something else entirely. That's a question we're hoping to address in future research."



[Vitamin C and Beta-Carotene Might Protect Against Dementia](#)

Science Daily Sep. 11, 2012

Forgetfulness, lack of orientation, cognitive decline ... these are among the symptoms of Alzheimer's disease (AD). Now researchers from the University of Ulm, among them the Epidemiologist Professor Gabriele Nagel and the Neurologist Professor Christine von Arnim, have discovered that the serum-concentration of the antioxidants vitamin C and beta-carotene are significantly lower in patients with mild dementia than in control persons. It might thus be possible to influence the pathogenesis of AD by a person's diet or dietary antioxidants.

A total of 74 AD-patients and 158 healthy controls were examined for the study that has been published in the *Journal of Alzheimer's Disease* (JAD).

AD is a neurodegenerative disease: Alterations in the brain caused by amyloid-beta-plaques, degeneration of fibrillae and a loss of synapses are held responsible for the characteristic symptoms. Oxidative stress, which constrains the exploitation of oxygen in the human body, is suspected to promote the development of AD. Whereas so called antioxidants might protect against neurodegeneration. In their study, the researchers have investigated whether the serum-levels of vitamin C, vitamin E, beta-carotene as well as lycopene and coenzyme Q10 are significantly lower in the blood of AD-patients. "In order to possibly influence the onset and development of Alzheimer's disease, we need to be aware of potential risk factors," says Gabriele Nagel.

Participants were recruited from the cross-sectional study IMCA ActiFE (Activity and Function in the Elderly in Ulm) for which a representative population-based sample of about 1,500 senior citizens has been examined. The 65 to 90 years old seniors from Ulm and the surrounding area underwent neuropsychological testing and answered questions regarding their lifestyle. What is more, their blood has been examined and their body mass index (BMI) was calculated. For the present study, scientists have compared 74 patients with mild dementia (average age 78.9 years) with a control group consisting of 158 healthy, gender-matched persons of the same age.

Results are quite interesting: The concentration of vitamin C and beta-carotene in the serum of AD-patients was significantly lower than in the blood of control subjects. Whereas no such difference between the groups could be found for the other antioxidants (vitamin E, lycopene, coenzyme Q10). Potential confounding factors such as education, civil status, BMI, consumption of alcohol and tobacco have been considered in the statistical analysis. Nevertheless, additional parameters such as the storage and preparation of food as well as stressors in the life of participants might have influenced the findings. Therefore, results need to be confirmed in prospective surveys. "Longitudinal studies with more participants are necessary to confirm the result that vitamin C and beta-carotene might prevent the onset and development of Alzheimer's disease," says Gabriele Nagel. Vitamin C can for example be found in citrus fruits; beta-carotene in carrots, spinach or apricots.



[Eat Dessert First? It Might Help You Control Your Diet](#)

Science Daily Sep. 11, 2012

Consumers watching their diet should pay close attention to the amount of unhealthy foods they eat, but can relax when it comes to healthier options, according to a new study in the *Journal of Consumer Research*.

"Although self-control is typically viewed as a battle between willpower and desire, consumers can't rely entirely on willpower to control their eating. They also need to create situations that will make them lose interest in food. One way is to keep better track of the quantity of unhealthy foods they eat," write authors Joseph P. Redden (University of Minnesota) and Kelly L. Haws (Texas A&M University).

Some consumers are able to exercise great self-control when it comes to their diets while millions of others can't seem to stop overindulging on unhealthy foods such as cookies and candies. Do the former have more willpower? Or are they simply satisfied more quickly?

In a series of studies, the authors found that consumers who successfully control their diets eat fewer unhealthy foods because they are satisfied sooner. They also found that many consumers with poor self-control were able to establish greater control when they paid close attention to the quantities of unhealthy foods they consumed because simply paying attention made them more quickly satisfied.

In one interesting study, a group of consumers were asked to eat either a healthy or an unhealthy snack. Some of the consumers were asked to count how many times they swallowed while eating the snack. Consumers who counted the number of times they swallowed were satisfied more quickly even if they otherwise had a low level of self-control. Monitoring how much they ate made consumers with low self-control behave like those with high self-control.

"Dieters should focus on the quantity of unhealthy foods but not the quantity of healthy foods. Monitoring healthy foods could actually be counterproductive to the goal of eating a healthier diet. So the secret to success is knowing when to monitor your eating," the authors conclude.



[People Who Read Food Labels Stay Thinner, Study Finds](#)

Science Daily Sep. 13, 2012

An international team of scientists headed from the University of Santiago de Compostela has found that reading the labels on food products is linked to obesity prevention, especially in women. According to the study which used data from the United States, female consumers who consult food labels weigh nearly 4 kilograms less.

Along with the Universities of Tennessee, Arkansas (USA) and the Norwegian Institute for Agricultural Finance Research, the University of Santiago de Compostela has participated in a study on the relationship between reading the food label and obesity.

The results indicated that the body mass index of those consumers who read that label is 1.49 points lower than those who never consider such information when doing their food shopping. This translates as a reduction of 3.91 kg for an American woman measuring 1.62 m and weighing 74 kg.

The data was taken from the annual National Health Interview Survey (NHIS) performed by the U.S. Centers for Disease Control and Prevention (CDC -- <http://www.cdc.gov/nchs/nhis.htm>). Some 25,640 observations were collected on health

and eating and shopping habits. These included various questions on whether participants read the nutritional information in supermarkets and how often.

"First we analysed which was the profile of those who read the nutritional label when purchasing foods, and then we moved on to the relationship with their weight," says María Loureiro, lead author of the study published in the journal *Agricultural Economics*.

"Obesity is one of the most serious health problems in modern day USA," outlines the researcher. "The number of overweight or obese adults has risen over the years. From 2009 to 2010, more than a third (nearly 37%) of the adult population in this country were obese and in children and adolescents this figure rises to 17%.

In terms of distribution, the highest obesity prevalence was recorded amongst the non-Latin black population (49.5%), Mexican Americans (40.4%), Latins (39.1%) and the non-Latin white population (34.3%), according to 2010 CDC data.

Greater effect on urban white women

The team found very significant differences between consumers that read labels and those that do not. On the one hand, the study shows that the smoking population pays much less attention to this information. According to the researcher, "their lifestyle involves less healthy habits and as a consequence, it could be the case that they are not so worried about the nutritional content of the food they eat, according to our results."

Furthermore, the city-dwelling population (49% of the sample) takes nutritional information into account the most. This is also the case for those with high school education (40% of those surveyed) and universities studies (17% of the total sample).

According to sex, 58% of men either habitually or always read the information contained within nutritional labels. However, this figure stands at 74% for women.

"In general, the associated impact is higher amongst women than men," adds the researcher. On average, women who read the nutritional information have a body mass index of 1.48 points lower, whereas this difference is just 0.12 points in men.

The study also touches on significant ethnic differences. In this sense, the white female consumers see the greatest reduction in the body mass of around 1.76 points.

"We know that this information can be used as a mechanism to prevent obesity. We have seen that those who read food labels are those who live in urban areas, those with high school and high education. As we would hope therefore, campaigns and public policy can be designed to promote the use of nutritional labelling on menus at restaurants and other public establishments for the benefit of those who usually eat out," concludes Loureiro.



[Epigenetics: Mother's Nutrition -- Before Pregnancy -- May Alter Function of Her Children's Genes](#)

[Science Daily Sep. 20, 2012](#)

Everyone knows that what mom eats when pregnant makes a huge difference in the health of her child. Now, new research in mice suggests that what she ate before pregnancy might be important too. According to a new research report published online in *The FASEB Journal*, what a group of female mice ate -- before pregnancy -- chemically altered their DNA and these changes were passed to her offspring. These DNA alterations, called "epigenetic" changes, drastically affected the pups' metabolism of many essential fatty acids.

These results could have a profound impact on future research for diabetes, obesity, cancer, and immune disorders.

"As parents, we have to understand better that our responsibilities to our children are not only of a social, economical, or educational nature, but that our own biological status can contribute to the fate of our children, and this effect can be long-lasting," said Mihai Niculescu, M.D., Ph.D., study author from Nutrition Research Institute at the University of North Carolina at Chapel Hill, in Chapel Hill, N.C. "My hope is that, along with many other scientists, we will reveal this tight biological relationship between us as parents, and our children, and how we can improve the lives of our children using our own biological machinery."

To make this discovery, Niculescu and colleagues split mouse females into two groups before gestation, and fed them either a control diet, or a diet deficient in alpha-linolenic acid or ALA. This was achieved by replacing the type of fats in the diet, while keeping the number of calories the same. The females were bred with mouse males kept on a control diet. Immediately after the moms delivered the pups, each of these two initial groups were further split in two, so that each half of the initial groups received a flaxseed oil supplemented diet (rich in ALA), while the other halves from each group remained on the same diet.

Researchers used blood and liver to look at polyunsaturated fatty acid (PUFA) levels and the DNA methylation of a gene called *Fads2*, which regulates PUFA metabolism. They found that in both the moms and pups, flaxseed oil induced a change in this chemical modification in the *Fads2* gene. Flaxseed oil supplementation increased the methylation of this gene, which, in turn, decreased the activation of the gene in pups. However, flaxseed oil was not the only factor with impact upon *Fads2* methylation in pups. Results demonstrated that regardless of the flaxseed oil intake, there was a correlation between the methylation of this gene in moms and in their pups, which suggested that pups also inherit this methylation from their moms. The pups' ability to transform PUFAs in their own livers was influenced by both the mother's dietary intake, and also by maternal *Fads2* methylation status.

"New York City may be laughed at by some for banning large, sugary sodas and for encouraging a healthy diet," said Gerald Weissmann, M.D., Editor-in-Chief of *The FASEB Journal*, "This report shows that future generations might not find that funny at all. This report adds to the large body of evidence that an inappropriate diet can produce changes in the function of our DNA and the DNA of our children -- a process called epigenetics. As we begin understand the effects of diet on epigenetics, New York may go from being considered a funny 'nanny-state' to becoming appreciated as a public health visionary."



[Nothing Fishy About Fish Oil Fortified Nutrition Bars](#)

Sep. 27, 2012

In today's fast-paced society, consumers often reach for nutrition bars when looking for a healthy on-the-go snack. A new study in the September issue of the *Journal of Food Science* published by the Institute of Food Technologists (IFT) found that partially replacing canola oil with fish oil in nutrition bars can provide the health benefits of omega-3 fatty acids without affecting the taste.

Producers have been hesitant to incorporate fish oil into foods because it tends to give off a fishy taste or smell, therefore requiring additional processing steps to eliminate these unwanted qualities. In the study, four levels of fish oil were evaluated to determine consumer acceptance of fish-oil fortified nutrition bars. The results showed that oat and soy-based nutrition bars fortified with the lowest replacement level (20 percent) of fish oil did not affect consumer acceptance or purchase intent.

Omega-3 fatty acids from fish oil are known to lower triglyceride levels and may help with rheumatoid arthritis.



[Diet High in Total Antioxidants Associated With Lower Risk of Myocardial Infarction in Women](#)

Science Daily Sep. 21, 2012

Coronary heart disease is a major cause of death in women. A new study has found that a diet rich in antioxidants, mainly from fruits and vegetables, can significantly reduce the risk of myocardial infarction.

The study is published in the October issue of *The American Journal of Medicine*.

"Our study was the first to look at the effect of all dietary antioxidants in relation to myocardial infarction," says lead investigator Alicja Wolk, DrMedSci, Division of Nutritional Epidemiology, Institute of Environmental Medicine, Karolinska Institute, Stockholm, Sweden. "Total antioxidant capacity measures in a single value all antioxidants present in diet and the synergistic effects between them."

The study followed 32,561 Swedish women aged 49-83 from September 1997 through December 2007. The women completed a food-frequency questionnaire in which they were asked how often, on average, they consumed each type of food or beverage during the last year. The investigators calculated estimates of total antioxidant capacity from a database that measures the oxygen radical absorption capacity (ORAC) of the most common foods in the United States (no equivalent database of Swedish foods exists). The women were categorized into five groups of total antioxidant capacity of diet.

During the study, 1,114 women suffered a myocardial infarction. Women in the group with the highest total antioxidant capacity had a 20% lower risk, and they consumed almost 7 servings per day of fruit and vegetables, which was nearly 3 times more than the women with the least antioxidant capacity, who on average consumed 2.4 servings.

Dr. Wolk notes that trials testing high doses of antioxidant supplements have failed to see any benefit on coronary heart disease and, in fact, in one study higher all-cause mortality was reported. "In contrast to supplements of single antioxidants, the dietary total antioxidant capacity reflects all present antioxidants, including thousands of compounds, all of them in doses present in our usual diet, and even takes into account their synergistic effects," she explains.

In a commentary accompanying the article, Pamela Powers Hannley, MPH, Managing Editor of *The American Journal of Medicine*, observes that with the industrialization of our food supply, Americans began to consume more total calories and more calories from processed food high in fat and sugar. As a result, obesity rates began to climb steadily. "Although weight-loss diets abound in the US, the few which emphasize increasing intake of fruits and vegetables actually may be on the right track," she says. "Yet only 14% of American adults and 9.5% of adolescents eat five or more servings of fruits or vegetables a day."



[Fish Eaters Run Lower Risk of Heart Attack, Despite Some Mercury Content, Study Suggests](#)

Science Daily Sep. 24, 2012

Eat fish, but avoid fish with the most pollutants. This is the conclusion drawn by a group of researchers at Umeå University in Sweden after having weighed the risks of mercury content against the advantages of healthful fatty acids.

The work was done as part of an international collaborative effort.

Fish is healthful food, and several studies have shown that people who eat fish have a lower risk of cardiovascular diseases than those who eat very little or no fish. At the same time, some fish contain environmental pollutants that can

be hazardous to our health. One such pollutant that is suspected of increasing the risk of cardiovascular disease is methyl mercury, which is found in varying degree in different kinds of fish. If people eat fish with much pollutants, this would lead to increased risk of disease, but at the same time if people are overly cautious and eat too little fish, the risk of disease also increases.

In order to attain a better understanding of what the golden mean might be, researchers at Umeå University, in collaboration with researchers from Finland and elsewhere, examined how the risk of heart attack (acute myocardial infarction) is contingent on the amount of omega-3 fats and mercury from fish that people have in their body. The content was measured in blood and hair samples from people that had previously participated in health studies in northern Sweden and eastern Finland. The Swedish blood samples were from the Medical Biobank in Umeå. Those who experienced a heart attack after the health check-up were compared with those who did not.

The findings are now being published in American Journal of Clinical Nutrition (AJCN). It turned out that mercury was linked to increased risk, and omega-3 fatty acids to decreased risk, of having a heart attack. The increased risk from mercury was noticeable only at high levels of this environmental pollutant in the body and if the level of the protective omega-3 fatty acids was concomitantly low. In other words, what is important is the balance between healthful and hazardous substances in fish. The environmental pollutant in this study was mercury. For organic pollutants like PCB and dioxin, the problem complex is similar, but no study of this kind has yet been undertaken.

The conclusion is simple: Eat fish, but avoid fish with the most pollutants. The Swedish National Food Agency recommends that people should eat fish 2-3 times a week, but their intake of predatory fish (e.g. pike, perch, pike-perch), which contain a great deal of mercury, should be limited (see link below). This study supports that recommendation. According to a recent study from the National Food Agency, 7 of 10 Swedes eat too little fish.



[Cinnamon may help type 2 diabetics](#)

[IFT Weekly Newsletter September 26, 2012](#)

A study published in the *International Journal of Preventive Medicine* shows that taking cinnamon supplements daily may help type 2 diabetics' glycemic status.

The researchers conducted the small trial involving 44 patients with type 2 diabetes of whom 37 completed the study. In the study, 22 patients were assigned to 3 g of cinnamon supplement per day and another 22 controls were given a placebo per day for a total of eight weeks. Weight, height, body fat mass, systolic and diastolic blood pressure, the fasting blood glucose, insulin, HbA1c (indicator for diabetes severity), total cholesterol, LDL C, HDL C, and Apo lipoprotein A I and B were measured at baseline and at the end of the eight-week trial. At the beginning of the trial, both groups had similar characteristics, dietary intakes, and physical activity.

The researchers found that at the end of the eight weeks, those receiving the cinnamon supplement improved the levels of fasting blood glucose, HbA1c, triglyceride, body weight, body mass index, and body fat mass decreased compared to baseline. The control group experienced no change in any of the parameters. The cinnamon group and the control group had similar levels of glycemic status indicators, lipid profiles, and anthropometric indicators.

The researchers concluded, "Our study shows that in type 2 diabetic patients, the intake of 3 g per day cinnamon may lead to a moderate effect on glycemic status indicators, but does not improve blood pressure, blood lipid profile, or body composition parameters."



Food Science & Industry News

Glass Shape Influences How Fast You Drink Alcohol

August 31, 2012 Food Product Design

BRISTOL, United Kingdom—New research published in the journal PLoS ONE suggests the speed at which an individual drinks alcohol may be influenced by the shape of the glass the drink is served in. Results reveal people who drink beer from a fluted or shaped glass consume their drink 60% faster compared to those who drink beer from a straight-sided glass.

Researchers at the University of Bristol's School of Experimental Psychology recruited 160 social drinkers aged 18 to 40 with no history of alcoholism to attend two experimental sessions. At one session they were asked to drink either lager or a non-alcoholic soft drink from either a straight-sided glass or a curved beer flute. Participants were almost twice as slow when drinking alcohol from the straight-sided glass compared to the curved glass. There was no difference in drinking rates from the glasses when the drink was non-alcoholic.

According to the researchers, the reason for this may be because it is more difficult to accurately judge the halfway point of shaped glasses. As a result, drinkers are less able to gauge how much they have consumed.

To test the theory, participants attended another session in which they completed a computer task that presented numerous pictures of the two glasses containing varying volumes of liquid. By asking participants to judge whether the glass was more or less than half full, the researchers were able to show that there was greater error in accurately judging the halfway point of the curved glass. The degree of this error seemed to be associated with the speed of drinking; the participants who tended to show the greatest error in their halfway judgments tended to show the greatest changes in drinking rate.

The speed at which an alcoholic beverage is drunk will influence the level of intoxication experienced, and also the number of drinks consumed in a single drinking session. Therefore, slowing drinking rates is likely to have positive impact for the individual and also at a population level.

"Due to the personal and societal harms associated with heavy bouts of drinking, there has been a lot of recent interest in alcohol-control strategies. While many people drink alcohol responsibly, it is not difficult to have 'one too many' and become intoxicated. Because of the negative effects alcohol has on decision making and control of behavior, this opens us up to a number of risks," the researchers said.



Scientists Developing 'Super Spaghetti'

August 29, 2012 Food Product Design

ADELAIDE, Australia—Researchers at the University of Adelaide are collaborating with Italian researchers on two projects to investigate the fundamental role of cell walls in durum wheat and discover how they can be better utilized to produce better quality pasta with higher nutritional value.

The first project, in conjunction with the University of Bari, will investigate how the growth of durum wheat affects the levels of starch and dietary fiber within it, and how the fiber levels in pasta can be improved. The second project, in conjunction with the University of Molise, will investigate the important roles played by two major components of dietary fiber—arabinoxylans and beta-glucans—in the quality of pasta and bread dough.

"The term 'super spaghetti' is beginning to excite scientists, nutritionists and food manufacturers around the world," said Rachel Burton, associate professor and program leader at the ARC Centre of Excellence in Plant Cell Walls. "In simple terms, 'super spaghetti' means that it contains a range of potential health benefits for the consumer, such as reducing the risk of heart disease or colorectal cancer. Our research is aimed at achieving that, but we're also looking to improve the quality of pasta as well as its health properties."

According to the researchers, the new projects could help pasta manufacturers in South Australia and Italy to carve a niche by supplying domestic markets with specialist pasta products that will benefit the health of consumers.



Ashwagandha Granted GRAS Status

[September 14, 2012](#) [Food Product Design](#)

HYDERABAD, India—Ixoreal Biomed has been granted GRAS status for its KSM-66® Ashwagandha for use as a food ingredient in cereals, cereal bars, candies, chewing gum, cookies and type I beverages at levels of 25 to 80 mg/serving.

KSM-66 is an advanced form of ashwagandha, a flagship herb used in traditional Indian ayurvedic medicine. KSM-66 is extracted from the root of the plant and is manufactured utilizing a proprietary process yielding the highest purity of active constituents (withanolides) in the world.

"A significant amount of work was completed to ensure that KSM-66® met the highest standards related to the self-affirmed GRAS determination," said Kartikeya Baldwa, director for Ixoreal Biomed. "We're extremely pleased that functional food and beverage manufacturers can now incorporate KSM-66® Ashwagandha into their products."



Enhancing Carbonation

[September 17, 2012](#) [Food Product Design](#)

Sometimes, nothing will quench a thirst like the bubbly brightness of a carbonated beverage. So, when the fizz fizzles, it can be a little disappointing.

"The gas pressure of carbonated beverages decreases during storage and upon opening," says Shuichi Muranishi, senior manager, flavor system and technology laboratory. "Also, lighter, thinner eco-friendly bottles often offer less protection and do not retain carbonation as well as the normal PET bottles."

To help avert the issue, Ogawa & Co. developed Carbosation™, a natural flavor that helps enhance carbonated mouthfeel. The flavor is purified to contain no strong, specific flavor, but enhances the carbonation sensation without changing the original flavor profile of the beverage, Muranishi says.

Ogawa conducted a sensory evaluation of the effects of Carbosation in a commercial diet cola. The flavor was added to controlled samples of diet cola drinks with gas pressure of 3.0kg/cm² (the gas pressure was adjusted from 3.7kg/cm² to 3.0kg/cm²) and compared to samples with gas pressure of 3.7kg/cm² or gas pressure of 3.0kg/cm² without Carbosation flavor. Those samples were evaluated through blind test by 32 Ogawa flavorists, who ranked the carbonated sensation on a scale of 1 to 7.

"Results showed that by adding Carbosation flavor, the carbonated sensation of carbonated beverages with gas pressure 3.0kg/cm² increased to the sensation of the control, which had gas pressure of 3.7kg/cm²," Muranishi says. "In this way, it was found that the sensation of gas pressure was enhanced by 20%. The use level for Carbosation flavor was 0.06%."

Adding this ingredient to an existing beverage requires no significant reformulation, and it is available in both liquid and powder forms for ease of use. Both forms can be used in any beverage, as long as they have some carbonation. Usage levels may vary, however, depending on the type of flavors in a beverage.

"For carbonated beverages containing fruit flavors, use levels range from 0.01% to 0.06%, but we recommend starting with 0.04%," Muranishi says. "For carbonated beverages containing spice flavors, use levels range from 0.02% to 0.08%, with a recommended starting level of 0.06%."

Carbonation is GMO-free, allergen-free and can be labeled as "natural flavor" on beverage labels.



Fish protein may help reduce fat in fried foods

[IFT Weekly Newsletter September 26, 2012](#)

Researchers at Oregon State University are working on a project that reduces the fat content in fried seafood using fish protein found in surimi. Surimi, refined fish proteins that can be made from a variety of species, is popularly used for fried dishes (fried surimi seafood) in Asian countries with a very low fat content (approximately 2%).

"After doing some initial tests with typical fried U.S. products like chicken nuggets and French fries, we saw that the fried surimi product was consistently low in fat," said Jae Park, Professor at OSU's Dept. of Food Science and Technology and OSU Seafood Research and Education Center (Astoria, Ore.). "We thought if it's the fish protein that is minimizing the fat uptake, how can we use that on other fried seafood to get the same results?"

After two years of research, Park and his team have developed a fat blocker solution from surimi protein that has successfully reduced the fat content of fried shrimp.

"Typically when you fry chicken nuggets or fish, you get a fat content of about 16% and 10%, respectively," said researcher Angee Hunt. "When we fried the breaded shrimp by coating it with our fat blocker solution, the treated shrimp had 15–20% less fat compared to untreated shrimp."

The scientists believe that the fish protein creates a protective layer around the food to reduce the fat uptake and retain the moisture, without altering the taste or texture of the product. Through more work, the researchers hope to achieve their goal of reducing fat by 50% or more.



Healthy but not wealthy

[Amrita Nair-Ghaswalla, Hindu Business Line September 13, 2012](#)

Does health food stick in your throat? Food marketers have struggled to sell products tagged as 'healthy'.

Health and wellness foods are not going down well with Indian consumers, despite marketers making a play for them. Mayank Shah insists taste scores over calories and it is a fallacy that increased consumer awareness and growing health concerns will ensure health foods grow at a healthy rate.

"The health and wellness (H&W) category of foods is primarily consumed by choice, not compulsion. The primary reason is taste. If it is not tasty, it will not be sold," says Shah. Consumers may cut down on the frequency of consumption, but will not give up on taste, he declares. He insists health-conscious consumers are not necessarily looking for products with additional benefits and nutrients, and are turning down the market's many offerings.

Though earlier estimates had suggested that demand for H&W food would rise due to the growing incidence of lifestyle diseases, wider availability and communication and marketing initiatives, the story has not gone according to plan in India.

“Yes, child nutrition is a major issue here, but we don't really understand the issue in all its magnitude. Many people in Orissa, the central part of the country and the East don't have two square meals a day. Given this scenario, how can we talk about lifestyle diseases?” asks Shah.

Naysayers

The H&W category, as a trend, has had an over-arching influence on the development of the food and beverage (F&B) industry in India. According to a research report by the Tata Strategic Management Group, the H&W F&B sector in India was estimated at Rs 16,000 crore in fiscal year 2011 and is expected to grow at nearly 22 per cent reaching Rs 36,000 crore by fiscal 2015.

The report classified H&W products into three dominant sections. The better-for-you segment comprises low-cholesterol, edible oils, 0 per cent trans fat snacks and biscuits, slim milk, curd, ice creams and diet colas; functional or fortified category, which comprises iodine-fortified salt, iron-fortified biscuits, health food drinks and breakfast cereals fortified with micro-nutrients; and the natural category, which is 100 per cent natural fruit juices and pickles without preservatives.

Concerned about lifestyle diseases, urban consumers are showing increasing preference for low-fat, low-sugar, low-carbohydrate and low-cholesterol products, it says.

Several corporates too have jumped onto the bandwagon. In the biscuits category, one MNC launched its fortified biscuits with vitamins and iron and a ‘Health Kit’. The company is attempting to convert all its products to trans-fat-free and position them as both enjoyable and healthy.

Another company placed its Marie variety in this category, as the earlier orange and Original versions have reportedly done well. Other companies came up with their popular brands in the whole grain fibre category.

Similarly, the probiotics market saw some action. An MNC launched probiotic *dahi* in 2007 to counter the stiff competition from local players which offered a range of probiotic *lassis* and ice creams. The same year, another local launched a probiotic curd. Many probiotic products started appearing on shelves.

Three years on, some of these ‘healthy’ products are unavailable in the market. A report by Euromonitor International has also alluded to the slim sales in the category. “Between 2002 and 2007, India maintained a commendable Compound Annual Growth Rate (CAGR) of 12 per cent, but the H&W market remained underdeveloped. Though India is the second most populous country in Asia Pacific, it accounts for only 4 per cent of the region’s total H&W food and beverage value sales,” the report adds.

One company attempted its own H&W offerings, but learnt the hard way. It had to withdraw Chips, a baked product. The company had tried to fuse together the ‘do good’ (biscuits) and ‘feel good’ (indulgent snacks) categories, which a super star endorsed. However, barely a year into launch, the product was off the shelves.

Wrong choice

Market research agencies had forecast that the H&W market was set to grow at 25 per cent and expected to reach \$7.5-\$10 billion by 2015. The market was expected to grow in urban centres with its established modern retail channels. But Shah insists that “it is too early to invest in the segment.”

In a country that faces the dual challenges of nutritional deficiency and obesity, a number of food players have been introducing healthier variants of their existing products or launching a completely new range of products on the H&W platform. Shah insists most have got the story all wrong.

“Take a look at what happened to one soft drink company with its excessive focus on health; it is far behind its competition. There is nothing wrong with that (health), but one needs to understand the category they are in. If you completely ignore the category code and forget about the taste, the consumer is not going to accept your ideas about looking after his health,” he adds. These soft drink variants had to be discontinued less than a year after launch.

Citing another example, Shah says, “Look at what happened to a baked snack. It was the launch of a health offering and unlike many other snacking options the health benefits were promised. They made it fortified, but the taste was horrible. It bombed. The company had to withdraw the brand.”

Stating that this case turned out to be “a good learning for another company never to compromise on taste,” Shah adds, “We cannot afford to say ‘*thoda kum taste chalega*’ (a little less tastier is fine). The consumer does not buy your theory.”

The Indian market has not yet “evolved to a stage where we have the consumer spoiled for choice,” Shah adds. “That time might come, in 25-30 years. We need to understand that these are a few pockets we are talking about, not all India. Incomes have to grow here. In the US, food contributes very little to the total spend. We still have to evolve to that level here.”

Sedentary lifestyles are only a feature of the metros and are not the real India, Shah claims. “The balance 90 per cent of India has yet to experience these luxuries and the varieties and choices on offer,” he says. Though biscuit majors have been developing healthier products with several options, Shah argues that healthier biscuits can be successful if manufacturers focus on taste.

Insisting that in the case of his company, there is absolutely no compromise on taste, Shah adds, “Though we have several big brands, and one is the world's largest selling brand in terms of volume, our only limitation is in terms of assortment. There has been a clear focus on growing each category rather than introducing new variants.”

(Brand names and company names have been removed from article)



Farmers pin hopes on Icrisat initiative to boost millet yield

Several farmers of Aagolai village in western Rajasthan have found a new means to skip lunch and work in their farms till the evening. All they have for breakfast is sogra, flat bread of pearl millet, which is enough to keep them going till evening without lunch.

Pearl millet

Pearl millet is today not only producing greater yields and income for farmers across north-western India, but has improved the productivity of the cultivators. For, packed with healthy nutrients, the cereal can, indeed, sustain hunger for hours longer than other foods.

This is largely an upshot of a programme called Harnessing Opportunities for Productivity Enhancement (HOPE), unveiled by the International Crop Research Institute for the Semi-Arid Tropics (Icrisat) and its partners across India and sub-Saharan Africa.

Headquartered in Hyderabad with two regional hubs and five country offices in sub-Saharan Africa, the institute is a non-profit organisation that conducts agricultural research for development in Asia and sub-Saharan Africa. The institute celebrated 40 years of existence here recently.

[Icrisat technology](#)

Icrisat's hybrid technology has been greatly instrumental in increasing production of pearl millet from 3.5 million tonnes in the 1950s to 9.5 mt today without a significant increase in land area.

"The average national yield of this millet is about one tonne a hectare. Just four states — Gujarat, Haryana, Maharashtra and Rajasthan — today account for more than 90 per cent of the pearl millet area of nine million hectares in India," a senior scientist with Icrisat pointed out.

Under the HOPE programme, during the last three years, about 13,000 farmer households were provided with 20 tonnes of seeds of 17 improved pearl millet hybrids.

[Higher yield](#)

"The improved technology resulted in a yield increase of 30-150 per cent over local crop management practices. Now this is not only a staple food for rural households in these states, but also used as cattle and poultry feed," the scientist said.

(This article was published in the Business Line print edition dated October 1, 2012)



[J&K to boost food processing](#)

PTI

Jammu, Sept 26:

The Jammu and Kashmir Government has invited consultancy firms to prepare a vision document for charting the growth of the food processing sector in the State, a senior official of J&K State Industrial Development Corporation (SIDCO) said.

He said J&K SIDCO had invited an Expression of Interest from consultancy organisations for preparing the document. The areas of focus for the food processing and agro-based industries in J&K include sauces, ketchups, fruit/vegetable juices, jams, jellies and pickles.



[Ready-to-eat food market growing in leaps and bounds, say experts](#)

V. Sajeew Kumar, Hindu Business Line, Kochi, Sept. 25:

Indian food sector is poised for a major take-off thanks to the growing popularity of ready-to-eat (RTE) food products and the increasing purchasing power of average Indians.

Speakers at a two-day global symposium here on RTE foods have unanimously stressed the need to tap the emerging opportunities in this sector considering its growth potential.

[New trend](#)

In his keynote address, K. Alagusundaram, director, Indian Institute of Crop Processing Technologies, Thanjavur, said that RTE products has started picking up in a big way with high purchasing power of people and the changing lifestyles and eating habits of Indians.

He said that the production of RTE food products has been witnessing radical changes from traditional methods to most modern techniques with the advent of modern technology.

Referring to the penetration of idlis in the RTE food market, he said idli making has now switched over from traditional chakkis to most modern methods to cater to the highly potential overseas Indians market.

Because of paucity of time and attraction to RTE foods, 'kitchen-less homes' will be the order of the day in India within the next 10-15 years, he said.

He also called upon RTE food companies to cater to the lower income category as million of people in India earn less than \$ 2 a day. Catering to this segment can make huge business in RTE foods as their spending will be high, he added.

Growth area

G. Chandrasekhar, Associate Editor, *The Hindu Business Line*, said that food has been identified as one of the major growth areas in the country and the volume of consumption is significant especially on account of the young generation, which constitutes 55 per cent of the population.

"Expansion of the middle class, nuclear families, rapid urbanisation, evolving food habits etc have thrown up lot of opportunities in the food market," he said.

Though India has huge market size in terms of population, he said the per capita food consumption in the country is very low. However, a positive trend has emerged in the food market of late because of the spurt in demand fuelled by organised retail.

He said that western and southern parts of the country are the major markets in food with the faster rise in per capita income.

Value chain

The two-day interactive symposium was organised by Assocom India in association with the International Crops Research Institute for the Semi Arid Tropics (Icrisat) to address the challenges and issues faced by the RTE industry with specific focus on addressing the challenges in the value chain.

The objective of the symposium was to identify the gaps in value chain and the key interventions and strategies that need to be adopted to promote RTE foods to a wider market through involvement of all the key stakeholders.



Catchy vegetable names can make kids eat more greens

PTI, Washington, Sep 17:

Kids seem to have an aversion to eating vegetables, but you can make your child have more greens by using attractive names for healthy foods, according to a new study. Researchers from the Cornell University conducted a couple of studies to explore whether a simple change such as using attractive names would influence kid's consumption of vegetables.

In the first study, plain old carrots were transformed into 'X-ray Vision Carrots' 147 students ranging from 8-11 years old from 5 schools participated in tasting the 'cool new' vegetables. Lunchroom menus were the same, except that carrots were added on three consecutive days. On the first and last days, carrots remained unnamed. On the second day, the carrots were served as either 'X-ray Vision Carrots' or 'Food of the Day'

The study found that by changing the carrots to 'X-ray vision carrots', a whopping 66 per cent were eaten, far greater than the 32 per cent eaten when labelled 'Food of the Day' and 35 per cent eaten when unnamed.

In the second study, carrots remained 'X-Ray vision carrots', broccoli became 'Power Punch Broccoli' and 'Silly Dilly Green Beans' replaced regular old green beans. Researchers looked at food sales over two months in two neighbouring NYC suburban schools. For the first month, both schools offered unnamed food items, while on the second month carrots, broccoli and green beans were given the more attractive names, only in one of the schools (the treatment school).

Of the 1,552 students involved 47.8 per cent attended the treatment school. The results were outstanding and vegetable purchases went up by 99 per cent in the treatment school, while in the other school vegetable sales declined by 16 per cent.

These results demonstrate that using attractive names for healthy foods increases kid's selection and consumption of these foods and that an attractive name intervention is robust, effective and scalable at little or no cost, researchers said in a statement.



Regulatory & Safety News

[Saffron Extract Granted Canadian Patent](#)

September 25, 2012 [Food Product Design](#)

MORRISTOWN, N.J.—P.L. Thomas & Co., Inc. announced that the Canadian Intellectual Property Office has granted Patent #CA 2648985 to INO'Réal and company founder Cédric Bourges for the use of saffron, the saffron extracts crocin and picrocrocin, and derivatives of these as a satiety agent in support of a healthy weight. P.L. Thomas is the exclusive North American distributor of Satiereal Saffron Extract.

Satiereal is a proprietary extract of saffron stigmas (*Crocus sativus L.*) that enhances the activity of the neurotransmitter serotonin, influencing satiety, appetite, mood and behaviors relating to snacking. The extract has GRAS status and is featured in a range of products designed to support a healthy weight, including supplements, gums, functional foods, snacks, smoothies and more. Satiereal Saffron Extract is the only saffron-based ingredient that has clinical studies supporting its role as a satiety-inducing nutritional ingredient.

The patent supports INO'Réal's Satiereal® Saffron Extract in Canada and extends the intellectual property protection of the ingredient into North America. Similar application patents have been filed in France and worldwide per the Patent Cooperation Treaty.



[FDA accepts acrylamide-preventing yeast as GRAS](#)

[IFT Weekly Newsletter September 12, 2012](#)

Functional Technologies Corp. has announced that the U.S. Food and Drug Administration (FDA) has accepted the company's Generally Recognized as Safe (GRAS) Notice that was submitted in February 2012 for its acrylamide-preventing yeast strains. In its GRAS submission, Functional Technologies provided experimental data to support its claim that the company's proprietary acrylamide-preventing yeast should be generally recognized as safe.

"Acrylamide mitigation is an ongoing challenge for many food and beverage products. The introduction of this proprietary yeast offers a unique approach for reducing acrylamide and will help food and beverage manufacturers with the challenge," said Carlos Barroso, member of Functional Technologies' Advisory Board.

