

Health & Wellness Ingredients: Dr. J. S. Pai

There was a time when Indian consumers had to accept whatever food products available in the market and not expect a great change in future in quality, both nutritional and sensory. However, last decade has seen phenomenal changes in the food industry and many companies have seen the tremendous changes in quality and opportunity that was present in the Indian markets and many new food products that Indian consumers had only heard of or seen in movies, were on their plates. There have been several changes in the consumer needs and affordability that spurred these changes along with the change in governmental attitude permitting the large number of additives that have been used world over for many decades and proven safe.

Industry and consumer can now look forward for much greater changes in the market so there will be many challenges as well as opportunities for ingredients manufacturers and developmental scientists. A vast range of new ingredients are available for food products so one can request precise properties to suit the requirements. In addition, there are now many ingredients that claim to have beneficial effects in respect of certain diseases or conditions. These range from hypertension, cardio-vascular diseases, diabetes etc. to better vision, memory and alertness, healthier bones etc. Consumers are finding so many options that at times at least Indian consumers are getting a little startled at finding so many choices with so many claims to make him or her, a healthier person.

Health & Wellness Foods Industry

Indian food industry is as large as Rs. 400,000 crores and growing fast. It is just one fifth of the US food industry which is \$ 550 billion (Rs. 2200,000 crores). However, since Indian industry is growing at such rapid rate, the gap will be much smaller in future. The American and European food industry is also quite sizeable in its healthy foods character. The awareness of consumers there is quite immense and so the market is also sizeable. The US healthy foods market is more than \$ 110 billion according to Nutrition Business Journal which is 20% of all food products. This market includes the food products having added vitamins, minerals, proteins or even such products like low calorie, low fat and low sodium variants. The consumers are demanding these in order to get the best out of processed food products.

Another segment that is recently growing very rapidly is Functional Foods. This segment is very sizeable in the US, being about \$ 27 billion. The world market for functional foods is about \$ 75 billion and is mostly concentrated in north America, Europe and Japan with many other regions are fast catching up. This market is growing at over 9%. Indian market, although a little behind, is fast catching up with products like cholesterol management functional foods, diabetes management functional foods, probiotics containing yoghurt and ice cream, high fibre bakery products, breakfast cereals with fibres and other functional ingredients, herbal tea etc. The environment is ripe for offering consumers all kinds of healthy and functional food products.

Growth Potential

There are many factors that will stimulate the growth of health and wellness food products in India. The urbanisation has taken place at such rate unsurpassed in the past that family structure has not kept pace with this. So many young people are forced to eat either fast foods in the streets and resort to something very convenient to prepare that would save time and efforts. Indian cities, not just metros but also smaller cities are growing at tremendous pace. Indian economy is also helping this by putting more money in the hands of consumers.

The rapid pace of city life has caused many of the inherent problems like stress, pollution, lack of physical activity and the illnesses related to these such as hypertension, diabetes, cardiovascular diseases and cancer. Consumers are not only trying to find adequate nutrition through their foods but also looking for foods that would offer protection against these illnesses.

Already some products containing ingredients like fibre, omega-3 fatty acids, probiotics, isoflavonols, etc. are being marketed. The health claims made for such products will not only help in improving the sales but also create awareness about the problems that urban consumers are facing and the possible answers by way of many of the healthy and functional foods will enable consumers to plan their own meals using processed food products and ingredients so they would get wholesome nutritious foods as well as take care of some of their medical problems with the health and wellness food products.

With such wide array of foods of different types, origins, exotic and ethnic with phenomenal range of flavours are available to consumers world-over and as Indian consumer is also getting used to globalisation, he and she are expecting and demanding newer innovative food products that are nutritious, tasty and health-providing. Some of the ingredients that go to make them will be discussed below.

Healthy Ingredients

Although low-carb food products are on the vane, they are not yet out. The newer products will continue to attract consumers if they are still low in carbohydrates. The focus will be on trans fats as many countries are advising manufacturers to curb and declare the contents of trans fats in their products. Fibre will become a major component and various ingredients providing beneficial fibres, both soluble and insoluble will be sought after. There will be focus in low salt for its impact on hypertension and heart diseases. Protein has been shown to not only provide the essential nutrient but also satiety so there will be attention on protein quality and quantity. A big emphasis will be on natural character of most additives including flavour, colour, stabilisers etc. Consumers will also go for many ingredients and additives that have herbal character.

Nutrients

As mentioned above consumers would like to claims on the labels and manufacturers are trying to find new ways of providing information as well as marketing their products through claims. In the US, these claims are permitted by FDA so product labels can make statements regarding calcium and osteoporosis, salt and hypertension, fat and/or cholesterol and heart diseases etc. These claims have created awareness as well as generated interest among the food industry to market more such products.

Indian food laws yet are silent on claims but FDA does not permit foods and ingredients being promoted as cures for diseases. Such a reference may put the product into drug category. The new Food Safety & Standards Act has incorporated functional foods, nutraceuticals etc. and when the proper rules are made under this act, then may be food products may make more direct claims. At present fibre and other ingredients that control the cholesterol may only be promoted for cholesterol management and not for cholesterol lowering. Government should pay attention to the needs of the consumers. Prevention is better than cure both from suffering as well as cost point of view.

There is also a need for providing guidelines for claims. Whereas in the US and UK, terms like low calorie, fat-free, reduced sugar, high-fibre etc. have been defined so consumers know what to expect. Similar guidelines should be provided in India too. Today, even when product contains 5%, 10% or 50% less calorie compared to the standard product one makes the same low calorie claim.

Indian population especially women and children largely suffers from iron and calcium deficiency. Some products have started appearing with their supplementation but these are not for masses. Products like atta would be ideally suited for iron fortification as it is consumed by masses. Still because of cereal base iron absorption is not very high unless newer nutrient forms like EDTA salts are used. Calcium problem is yet to be properly acknowledged by the government. In spite of many experts suggesting higher level to be recommended for women and children, there has not been any change in its RDA.

There is also need to supplement food products with folate and other B-vitamins. Folic acid deficiency has been shown to be responsible for neural birth defects.

Some of the vitamins and minerals were earlier available through our traditional meals but since urbanisation, it is becoming difficult to get all the raw materials necessary along with the time, efforts and expertise needed to prepare them. There have been major shifts in dietary pattern and people have been eating more bread and biscuits than chapattis and rotis. The flours used for traditional products used to contain more fibre, vitamins and minerals and so the newer products must be formulated to enrich with these lost nutrients and also add some that were deficient anyways.

Protein ingredients used to be either soy protein concentrate/isolate or milk protein in the form of casein. With the advancement of technology, newer ingredients are making appearance. Soy protein in textured vegetable protein was at one time one of the few application ingredients available for industry. However, now there are so many choices including soy flour with varying percentages of fat and enzyme activity, soy concentrates, soy isolates and a whole range of proteinates and hydrolysates with different properties because of inclusion of some special additives like emulsifiers as well as presence of various healthy components like isoflavones and the absence of some undesirable substances such as flatulence and trypsin inhibitors etc. making the food scientists trying to use soy protein to develop new food products get baffled and need the help of the expertise of technical services of ingredients company to help them make proper choice.

Similar is the case of milk protein with not only the traditional choices of whole milk powder, skim milk powder, casein, caseinates, whey protein with varying concentrations of protein and presence of certain nutrients and particular amino acids composition with differing solubility, dispersibility, colour etc. makes it easy to use proper ingredients for certain applications. Infant foods can now be made with ratio of casein to whey protein close to that existing in mother's milk

and many other beverages and energy bars can have the nutrition along with desirable eating characteristics like texture, bite, aftertaste, mouthfeel, etc.

Among the fats and oils, there is a lot of talk of trans-free fats. Hydrogenated vegetable fats had highly desirable physical characteristics for making many food products and for frying. Many of the properties depended on the development of optimum proportion of trans fatty acids while hydrogenating. Shortenings used in bakery and confectionery industry gave the properties like crispiness, sponginess, melting characteristics etc. were largely based on these. Since it became known that these not only increase the cholesterol like saturated fats and further lower HDL cholesterol (good cholesterol), health professionals have been advocating avoiding these in diets. Many alternatives to trans fats have been developed by ingredients industry making the products healthier.

Among the oils, rice bran oil has been recently promoted as healthy oil not only because of its monounsaturated fatty acid composition but also the presence of oryzenol. Both these are shown to be heart friendly. There are many other oils available including safflower and sunflower oils besides the traditional groundnut, mustard, coconut oils. Since blends have now been allowed there are some health claims made due to particular fatty acid compositions.

Colours

Traditional foods had colours due to the ingredients used so red, yellow, orange, green etc. were the colours of the foods using different fruits, vegetables, herbs and spices used in food preparation. Artificial colours had advantages over these because of their stability, wide range of hue, solubility/dispersibility and cost in processed food products. However, since consumers became aware of the advantages of natural ingredients and some health concerns, especially allergies, of artificial colours there has been a steady rise in the use of natural colours in food products in spite of their higher cost.

Many colours are now extracted from natural sources although some colours like annatto and carotene were earlier used in some products. Anthocyanins from fruits are being used in many products. Their cost may be reduced by extracting them from wastes such as grape skin from winery. Many carotenoids are being made from fruit and vegetable wastes. Some colours are extracted from spices like turmeric and paprika and flowers like sunflower and marigold. Chlorophyll is also prepared from green leafy vegetables. There is a large range of colours to choose from nature, but when it is extracted from materials used as foods like fruits, vegetables, herbs, spices etc. the safety may be assumed, however, when these are relatively unknown or uncommon sources, even natural colours may have to be proved safe before use in foods.

Some natural colorants have health significance. Anthocyanins have been shown to be potent antioxidants and may have a role in protection against cancer. Health benefits have also been shown for carotenoids and curcumin with respect to some of the ailments.

Stabilisers

Stabilisers have been used traditionally to thicken foods and not allow water separation from thick, viscous foods. Pectin present in fruits is useful in making jams and jellies. Many gums are prepared from trees or seeds or sea weeds. Gum Arabic is used in flavours, while seed gums like guar and locust bean gums have been used for thickening soups etc. while carrageenan is produced from sea weeds and is used in ice cream. These all can't be digested by humans and are soluble dietary fibre. They have been shown to be quite beneficial in reducing the cholesterol level in blood and so lower risk of heart disease.

There are some stabilisers that are insoluble fibre like cellulose and derivatives. These are also useful in health promotion. They prevent colon cancer and help in controlling glucose peak in diabetics by reducing the absorption rate of glucose from intestine. Whole grain cereals have plenty of these but additives may also be used to replenish them.

Sweeteners

Sweeteners have been the most sought after chemicals in human history. Ripe fruits and juices, honey etc. were the early sweeteners. When common sugar was prepared from sugar cane and beets, it has been the most used sweetener till today. However, there are many undesirable effects of consuming sugar including increased caloric intake, elevated blood sugar in diabetics, dental caries etc. There have been many alternative sweeteners developed some with calories and others with low or no calories.

High fructose syrups are being used in industry for many commercial advantages but above problems still remain. Many artificial sweeteners are now being used including aspartame, sucralose, acesulfame K and saccharin in most

cases to avoid most problems. Many low calorie or sugarless products contain them. There are different advantages of each and are being used successfully in many products.

There are some new ones knocking the doors of industry with some having certain advantages. Fructo-oligosaccharide has a dual function as it is not digested and has about the similar sweetness as sugars, so it also contributes to fibre content. Steviosides have been used in some countries but not in most. They have the advantage of being natural and extracted from leaves that have been used traditionally in some places. There are some sweeteners that have been prepared from liquorice root. The extract has been traditionally used in making candies and has medicinal value. New sweeteners have been prepared from isolating some components and derivatising others. Another natural sweetener is thaumatin, a protein extracted from a fruit.

Opportunities

The above list is not complete by any means and there are many categories and many additives in each that need to be considered from health and wellness point of view. Some have been under a cloud because of some safety concerns. There is always a need for finding new ones as consumers now would not just like safe additives but also useful. The emphasis of usefulness has slowly shifted from useful in processing or useful for manufacturer to useful for consumers. This will give plenty of challenges to research scientists in discovering newer ingredients and additives but also developmental scientists to optimise their use in food products. Consumers have become aggressive and have been demanding better and safer food products. They are ready to pay extra for it so food scientists have their work cut out. It will certainly be a very eventful decade ahead for food industry.

Safety of Food Additives

Introduction

Food additives evoke consumer concerns. Although consumers relate them to modern processed foods, they have been used for centuries. Egyptians and Romans used colours and flavourings to improve appearance of foods, and the Romans used saltpetre (potassium nitrate) for preservation. Salting and smoking have been used for meat and fish preservation. Baking powder used as raising agent, thickeners for sauces and gravies. Even today's home cooking aims to prepare foods by using ingredient and additives to make it more appealing and also to preserve it.

Developments in food science and technology have led to application of many new substances having numerous functions in food manufacture. Many additives are available like emulsifiers, intense sweeteners, wide range of preservatives and antioxidants to minimise spoilage and produce food products with appealing taste and appearance. Additive is defined as "substance not normally consumed as food in itself and not normally used as a characteristic ingredient of food whether or not it has nutritive value, the intentional addition of which to food for a technological purpose in the manufacture, processing, preparation, treatment, packaging, transport or storage of such food results, or may be reasonably expected to result, in it or its by-products becoming directly or indirectly a component of such foods".

Food additives play an important role in food supply. Today's consumer has the widest range and choice of foods. Consumers are demanding more variety and convenience with high standard and wholesomeness at affordable prices. Food additives have proven effective and safe through long use and testing and meeting consumer expectations for foods. During food preparation and marketing, they are subjected to many environmental conditions including temperature changes, oxidation and exposure to microbes. Additives play key role in maintaining the food quality and characteristics that consumers demand, keeping them safe, wholesome and appealing from farm to table.

Evaluation of safety of food additives

All food additives must have useful purpose and proven safe before being approved for use in foods. Various food authorities at local levels and Joint Expert Committee on Food Additives (JECFA) at international level are in charge of screening this. Their assessment is based on all available toxicological data in humans and animals. From this, maximum level having no toxic effect is determine: "no-observed-adverse-effect level" (NOAEL) and is used for "Acceptable Daily Intake" (ADI) for each additive. ADI provides a large safety margin (commonly a 100-fold safety margin) and is the amount of additive that could be safely consumed everyday over a lifetime with no adverse health effects. Because of high safety margin, occasional intake above ADI does not cause any problems. Due to strict regulation and thorough testing, food additives can be considered quite safe. The ADI is usually given as a range of 0-x mg per kg bodyweight per day.

Why and how to evaluate an ADI

ADI aims to protect the health of consumers and allows easier international trade. It is a practical approach to determine safety of additives achieving some harmonisation of regulatory control. They are universally applicable in different countries and to all sectors of population.

International body addressing safety of food additives JECFA is set up by FAO and WHO and helps set international standards that will be used by Codex, the international standards for food products. The concept of ADI and the JECFA safety evaluations have been widely adopted by the EU, US and food authorities worldwide.

Food additives can only be approved if they present no hazard to human health at the level of proposed use based

on scientific evidence. All pertinent toxicological data is reviewed concerning observations in humans and mandatory tests in animals. The toxicological tests required to be reviewed include lifetime feeding studies and multigenerational studies that determine how the additive is metabolised by body. This shows any possible harmful effects of additive or its derivatives. NOAEL, the highest dietary level of an additive at which no adverse effects are observed, is determined and expressed as mg of additive per kg bodyweight per day. The NOAEL is then divided by a safety factor of 100 to give a large margin of safety in determining ADI.

NOAEL is determined in animals, not humans. Assuming that humans are more sensitive than the most sensitive test animal, and that the reliability of toxicity tests are limited by the number of animals tested and that such tests cannot represent diversity of human populations, subgroups showing even higher sensitivities like children, old and the infirm, it is prudent to adjust for all these different by taking a safety factor.

What is ADI exceeded on any given day

Intake of food additive on a given day above its ADI is not a cause for concern as it has a large built-in safety factor. In practice consumption above the ADI on a day is more than accounted for by consumption below ADI on most other days. However, if intake is regularly higher than ADI it may then be necessary to advise a reduction of levels in foods or to reduce the number of foods in which the additive is permitted.

The more vulnerable section of population that is children, older people, pregnant women etc. are advised not to consume certain foods that may have food additives with lower ADI. In the case of these sections of population, the margin of safety might be somewhat lower than the more robust sections.

Monitoring of dietary intakes of food additives

Monitoring of intake of food additives is carried out by countries and then it is compared with the ADI. Average and extreme consumption estimates in population as whole or in particular subgroup of population is observed. This is done by observing the average consumption of various food products and estimating the additives consumed from each and totalling them to get an estimated average consumption of food additives. If it is observed that the average intake is higher than the ADI then in some food products through which the additives are taken in are restricted in diet or the permitted levels in these foods is lowered. It is necessary to conduct intake studies regularly to ensure that consumers are not exceeding the ADI of any additive and also to assess any changes in intake patterns.

Do food additives cause hyperactivity, allergies or food intolerances

In 1970s some researchers suggested that changes in diet had coincided with increase in behavioural problems in children. It was suggested that food additives, and colours in particular could be linked to hyperactivity generating considerable interest and controversy. Scientific studies however, have found no association between food additives, including colours and the behavioural problems or hyperactivity.

Food additives have only rarely been shown to cause true allergic (immunological) reactions to some additives for example, tartrazine (yellow colour) and preservatives sulphites causing skin rash or asthma in sensitive individual individuals. However, such cases are extremely rare. Scientific studies have failed to show any reaction to MSG and aspartame.

Adapted from: European Food Information Council (EUFIC)
<http://www.eufic.org/article/en/page/ARCHIVE/expid/basics-food-additives/?lowres=1>

In The News

Aspartame Proven to Help Reduce Weight – Ajinomoto

Scientists in the US studied 27 rats fed food sweetened with saccharin and rats fed food sweetened with glucose, and found that the rats that ingested saccharin went on to consume more calories and put on more weight and body fat.

The significant body of scientific evidence, which demonstrates the benefit of using aspartame for weight control and weight maintenance, contradicts claims suggesting that low calorie sweeteners lead to weight gain, aspartame supplier Ajinomoto has said.

Recent reports follow a small-scale study on rats published in the journal Behavioural Neuroscience. Scientists at Purdue University in the United States studied 27 rats fed food sweetened with saccharin and rats fed food sweetened with glucose, and found that the rats that ingested saccharin went on to consume more calories and put on more weight and body fat.

While research in this area has been based on human studies for more than twenty years, the Purdue study is based on a small sample of rats. It does not necessarily follow that findings in rats are applicable in humans. In fact, evidence obtained from a broad range of human studies points to the opposite conclusion.

A meta-analysis of 16 human studies conducted by de la Hunty et al, published in 2006, concluded that "using foods and drinks sweetened with aspartame instead of sucrose results in a significant reduction in both energy intakes (calories) and body weight".

The study, published in Nutrition Bulletin, shows that by choosing one serving of soft drink with aspartame each day (in place of a serving of regular soft drink), a person could reduce their body weight by five kilograms over the course of a year.

By continuing to provide a well-liked, sweet taste, without the calories of sugar, aspartame can play a pivotal role in the fight against obesity and its associated diseases, Ajinomoto write.

Health & Nutrition News, Nutrition Horizon 26 Feb 08

http://www.nutritionhorizon.com/newsmaker_article.asp?idNewsMaker=16537&fSite=AO545&category=26&page=7

Good-For-You Snacking

Corazonas' cholesterol-reducing potato chips are actually heart healthy.

When on the receiving end of a high cholesterol diagnosis, most patients wistfully bid adieu to foods like fried chicken, cheeseburgers and French fries in favor of more heart healthy fare. Potato chips also fall onto the forbidden foods list – but for every rule there's typically an exception. Such is the case for a new line of potato chips from Los Angeles, CA-based Corazonas Foods Inc.

As more Americans move into the shadow of the rising incidence of heart disease and obesity rates, healthy snacks are a welcome alternative to fat laden options. Corazonas Heart-Healthy Potato Chips employ a patented technology that infuses plant sterols into the chips. According to the company, the product is the first and only potato chip clinically proven to reduce low density lipoprotein (LDL) cholesterol, also known as bad cholesterol, by up to 15%. The health benefit is complemented by classic potato chip taste and crunch, despite containing 40% less fat than regular potato chips.

Joe Beauprez, vice president of marketing at Corazonas, noted that the inspiration to create these heart-healthy chips was very personal in nature. "Everyone here at Corazonas has been personally touched by heart disease - none more so than our founder, Ramona Cappello who lost her father and both grandfathers to heart disease," he said. Interestingly, "Corazonas" is the Spanish word for "heart."

"In the past, people had to make compromises if they wanted to eat heart-healthy - great taste usually meant unhealthy and healthy meant poor taste," he continued. "By creating Corazonas Heart Healthy Chips, we've created snacking without compromise - great tasting snacks that are truly good for your heart."

The potato chip line is available in five world-inspired flavors: Slightly Salted, Mediterranean Garlic & Herb, Italiano Four Cheese, Pacific Rim BBQ and Spicy Rio Habanero. The all-natural potato chips have no trans fat and retail for approximately \$2.99 for a six-ounce package.

In development for more than a year before launching earlier this month, the products are appearing in leading supermarkets, natural foods retailers and club stores under the tag line, "Snack To Your Heart's Content." The timing of the launch coincides with American Heart Health Month, which is observed each February. Exactly how Corazonas created a potato chip that's so heart healthy is largely proprietary and protected by the company's Intellectual Property rights. However, Mr. Beauprez would say that the chips have 40% less fat relative to regular potato chips because of a proprietary frying process. "We also use heart-healthy canola oil and a slightly thicker cut chip," he added. "All these combine for a lower fat, healthier chip."

A potato chip fried in less artery-clogging canola oil that delivered zero trans fat would be great in and of itself, but Corazonas took its chips one step further into an even healthier realm. "Perhaps the most remarkable heart-healthy aspect of our chips is that they have been proven to lower cholesterol due to the inclusion of plant sterols," said Mr. Beauprez. "We use CardioAid plant sterols from ADM [and] we have a proprietary process during the production of the chips that ensures optimum delivery of sterols."

Experts agree that nutrition, in partnership with physical activity, is an important tool in fighting and preventing heart disease. The Heart Healthy Chips are not Corazonas' first foray into this market niche. The addition of the potato chip line expands the company's growing list of heart-healthy snack products which currently includes Corazonas Heart-Healthy Tortilla Chips in six flavors: Original, Salsa Picante, Jalapeno Jack, Margarita Lime, Cilantro Salsa Fresca and Baja Bean Dip. With visible, whole oats, Corazonas' Heart-Healthy Tortilla Chips not only lower cholesterol, but also are also a good source of fiber.

From: Nutraceuticals World January 08 by Joanna Cosgrove

<http://www.nutraceuticalsworld.com/articles/2008/01/online-exclusive-goodforyou-snacking.php>

* * *

Eating Experiences in Childhood Can Affect Acceptance of New, Healthy Foods – Nestle Research

Results indicated that daily exposure to a new food significantly increased acceptance of all new vegetables. Additionally, the frequency of vegetable change was more effective in increasing acceptance than the number of vegetables offered.

Studies conducted by scientists at the Nestlé Research Center in Lausanne, Switzerland, explore effective ways to increase the acceptance of new, healthy foods by infants. This work provides insights into building a strong foundation for long-term healthy eating habits.

Nestlé researchers performed a two-part study examining the effects of introducing a variety of vegetables early in weaning to infants six to 12 months of age. Infants from different European cultures (France and Germany) were offered vegetables for nine consecutive days. One group was given one vegetable (no changes) all nine days, while a second group was presented with three different vegetables changed every third day (low changes) and a third group was given three different vegetables changed daily (high changes). The infants' reactions to the new vegetables were quantified by the amount eaten and with liking ratings given by the mother and a neutral observer.

Results indicated that daily exposure to a new food significantly increased acceptance of all new vegetables. Additionally, the frequency of vegetable change (high changes) was more effective in increasing acceptance than the number of vegetables offered (low changes).

Subsequent to the vegetable variety trials, a second study with seven-month old infants was conducted to measure the effects of repeated exposure of an initially-disliked vegetable. Prior to the study, mothers of the infants reported stopping the presentation of a new food after two or three rejections by the infant. However, Nestlé researchers proved that after 7-8 exposures to an initially-rejected food, more than 70% of infants showed both acceptance and liking of the food. Even nine months post-intervention, 63% of mothers reported that their infants still regularly ate the initially-disliked food.

These studies strongly suggest that early experiences with food can impact food choice and preference, and that parents should actively encourage their children to try new foods. The frequency of the introduction to a new food is also an essential element to facilitate its acceptance. Parents should offer a food about 6-8 times to promote the acceptance of healthy foods.

"Infants and children may initially dislike certain vegetables, but parents shouldn't give up on introducing these foods. By consistently encouraging children to eat healthy foods, they can learn to eat and enjoy them," said Dr. Andrea Maier, Nestlé scientist leading the studies.

Research from Nestlé provides the foundation for science-based nutrition recommendations to help parents promote healthy eating habits to their children.

Nutrition & Health News, Nutrition Horizon Feb 19, 2008

http://www.nutritionhorizon.com/newsmaker_article.asp?idNewsMaker=16478&fSite=AO545&category=26&page=8

Edible Coatings for Mango Investigated

Researchers from Australia have found that various edible coatings can positively affect ripening and volatile flavor preservation in mango fruit, among other effects. The results of this research were published in the Feb. 27 issue of the *Journal of Agricultural and Food Chemistry*.

The researchers applied edible *Aloe vera*, Semperfresh or carnauba coatings to hard, mature, green Kensington Pride mango fruit to ascertain any effects on ripening and ripe fruit quality, including color, firmness, soluble solids concentrations, total acidity, ascorbic acid, total carotenoids, fatty acids and aroma volatiles. Untreated fruit served as the control.

After coating, the fruits were allowed to dry at room temperature and packed in soft-board trays to ripen at 21°C and 55.2% relative humidity until the fruit were soft enough to eat. The researchers found that carnauba wax effectively retarded fruit ripening, retaining fruit firmness, and improving fruit quality attributes, including levels of fatty acids and aroma volatiles. Both Semperfresh and *A. vera* gel slightly delayed fruit ripening, but reduced development of fruit aroma. *A. vera* gel coating did not exceed carnauba and Semperfresh in retarding fruit ripening and improving aroma volatile biosynthesis.

From: Food Product Design February 29, 2008 by Douglas J. Peckenpaugh

Farmers in 12 Developing Countries Look to GM Crops: New Report

As genetically engineered agriculture takes off worldwide, the biggest growth in its popularity in 2007 came in the developing world, according to a report released Wednesday. Farmers in 12 developing countries planted biotech crops in 2007, for the first time exceeding the number of industrialized countries where such crops are grown, according to the report from the International Service for the Acquisition of Agri-biotech Applications, an industry-supported nonprofit that promotes the use of biotechnology to alleviate poverty and hunger around the world. The report was funded by the Rockefeller Foundation and Ibercaja, a Spanish bank.

Of the 12 million farmers worldwide who sowed genetically engineered seeds, the report described 11 million as "resource-poor." Critics warned the embrace signaled greater corporate encroachment on traditional agriculture. They also said that because so few genetically engineered crop varieties exist, adopting them could trap poor farmers in a cycle of debt to the multinational companies that own patents on the seeds. And the critics said much of the harvest is used for animal feed, fabric and processed foods and not to people's plates.

"It has almost nothing to do with feeding people," said Claire Hope Cummings, a former environmental lawyer for the U.S. Department of Agriculture and author of the upcoming book "Uncertain Peril," a critique of biotech farming. "It's an industrial commodity for industrial agriculture." Feed and fiber crops typically precede food in the development of new agricultural technologies, said Clive James, the report's primary author.

More and more land will be devoted to genetically engineered foods, especially rice, as scientists make advances and regulators approve new products, James said, adding that it is not realistic to expect all of agriculture to change at the same time. The ISAAA advocacy group he was writing for counts several of the world's largest biotech agriculture companies among its donors.

In 2007, a record 282.3 million acres of the world's cropland were planted with soybeans, corn, cotton and other crops genetically altered to resist pests and herbicides, an increase of about 12 percent from the previous year, according to the report. Reduced pesticide spraying and increased yields have brought down the price of production in "a very significant way and a sustainable way," putting more money in poor farmers' pockets, James said. "Poverty today is a rural phenomenon. It is concentrated in agriculture," he said. "This technology can make a contribution."

U.S. farms continued to dominate biotech agriculture with more than 142 million acres devoted to engineered crops, led by soy. The country also saw the planting of biotech corn spike 40 percent over 2006 to nearly 20 million acres, driven mainly by the demand for ethanol. Argentina led developing countries with about 47.2 million acres in biotech corn, soy and cotton. It was second only to the U.S. in total acreage and followed by Brazil, which had just over 37 million acres of biotech cotton and soy. India grew 15.3 million acres of genetically engineered cotton in 2007, its only biotech crop. Spain ranked highest among European countries with about 173,000 acres of genetically engineered corn but 12th overall, behind Paraguay, South Africa, Uruguay and the Philippines. European countries have been among the most resistant to genetically engineered crops, where health and environmental concerns have long kept them out of farmers' fields. According to the report, eight out of 27 European countries planted biotech crops in 2007, up from six the previous year, totaling about 260,000 acres.

James predicted that European Union requirements for increased use of biofuels would cause that number to rise. "The momentum of global adoption will just bring Europe along," he said.

From: http://www.soyatech.com/news_story.php?id=6809

GLOBAL: Omega-3 drinks sales set to rise - research

Sales of drinks enriched with omega-3 look set to continue their upward trend, according to recent research. A report from food and drink consultancy Zenith International, released yesterday (27 February), highlighted that omega-3 drinks sales around the world totalled EUR5.79bn (US\$) in 2006. Preliminary figures for 2007 indicate a further year of strong growth, taking volumes up 6.5% to 2.36bn litres, the consultancy said.

"Omega-3 is a key route for functional_drinks to move into the consumer mainstream," said Zenith's market intelligence director, Gary Roethenbaugh. "Still a niche sector in relative terms, it holds considerable potential for further development, with a wide range of applications open across the food and drinks spectrum."

With a well-established interest in enriched juices and juicebased drinks, North Americans are the world's leading consumers of omega-3 beverages, where the current 2.2 litres annual average is expected to rise to at least 2.9 litres per person by 2011. Elsewhere, West Europeans drink an average 1.3 litres per year, East Europeans 0.4 litre and consumers in Asia/Australasia around 0.1 litre.

Zenith's 2008 Omega-3 Drinks report also found that North America accounted for 32.8% of global volume in 2006, followed by West Europe on 23.7% and Asia/Australasia with 22.7%. Worldwide volumes increased by 7.9% in 2005 and 7.4% in 2006, while omega-3 drink sales are forecast to rise by another 34% in the five years to 2011.

Source: just-drinks.com editorial team (28 February 2008)
<http://www.just-drinks.com/article.aspx?id=93120>

Researchers Find Another Way That Plant Sterols Help Heart Health

According to recent research from Winnipeg, Canada, "Plant sterols combined with exercise beneficially alter lipid levels in hypercholesterolemic adults (see also Hormones). The effect of this combination therapy on other indicators of coronary heart disease risk, however, has yet to be determined."

"The objective of this trial was to investigate the effect of plant sterols and exercise, alone and in combination, on levels of apolipoprotein (apo) A1 and B, adiponectin, ghrelin, and growth hormone in previously sedentary hypercholesterolemic adults. In an 8 week, parallel-arm trial, 84 subjects were randomized to 1 of 4 groups: combination, exercise, plant sterols, or control. Body mass decreased by 1.1% ($p < 0.01$) and 0.9% ($p < 0.05$) in the combination and exercise group, respectively. Low-density lipoprotein cholesterol levels decreased ($p < 0.01$) by 0.30

mmol/L in the combination group and by 0.49 mmol/L in the plant sterol group. High-density lipoprotein cholesterol levels increased by 7.5% and 9.5% ($p < 0.01$) in the combination and exercise groups, respectively. Plant sterols increased ($p < 0.05$) adiponectin levels by 16%. No change in apoA1, apoB, ghrelin, or growth hormone levels were noted in any intervention group. ApoA1 was correlated with high-density lipoprotein cholesterol ($r = 0.33$, $p = 0.01$), whereas apoB was weakly related to low-density lipoprotein cholesterol levels ($r = 0.13$, $p = 0.002$). Adiponectin was associated with body mass index ($r = -0.10$, $p = 0.006$) and high-density lipoprotein cholesterol ($r = 0.17$, $p = 0.0003$)," wrote M. Collins and colleagues, University of Manitoba.

The researchers concluded: "These findings suggest that plant sterols can increase adiponectin levels, thereby possibly reducing the risk of future coronary heart disease." Collins and colleagues published their study in *Canadian Journal of Physiology and Pharmacology* (Modulation of apolipoprotein A1 and B, adiponectin, ghrelin, and growth hormone concentrations by plant sterols and exercise in previously sedentary humans. *Canadian Journal of Physiology and Pharmacology*, 2007;85(9):903-910).

http://www.soyatech.com/news_story.php?id=6728

Soyatech eNews February 11, 2008

Soymilk Among Leading Growth Categories in UK Functional Foods: New Study

Research and Markets (<http://www.researchandmarkets.com/reports/c83055>) has announced the addition of "Functional Foods Market Assessment 2008" to their offering. Functional foods principally comprise fibre-, mineral- or vitamin-fortified breakfast cereals, probiotic yogurts and yogurt drinks, and cholesterol-lowering margarines and spreads. In recent years, use of the functional active ingredients in these foods has been extended, with cholesterol-lowering stanols and polysterols, and vitamins, being added to yogurts, yogurt drinks, milk and cheese, and omega-3 fatty acids being included in bread, spreads, soya milk and other milks. In addition, soya has become a more widely used ingredient, mainly in functional yogurts, breads and margarines.

The total functional foods market grew by 8.3% by value in the year ending 8th September 2007, which represents a substantial slowing of growth compared with the 22.1% growth in the year ending 9th September 2006. This is accounted for by a decrease in sales of yogurt drinks and almost static sales of cholesterol-lowering margarines. However, strong growth in probiotic yogurts, in soya milks and in the small fibre-fortified breads sector allowed positive overall growth, which is now much closer to that of traditional foods and drinks. Fortified breakfast cereals, probiotic yogurts and yogurt drinks together represented a 76.6% share of the total market by value in the year ending 8th September 2007, with these and some other functional variants having become mainstream products.

All manufacturers of breakfast cereals - notably Kellogg, Nestlé, Weetabix, Quaker and Jordan - produce functional breakfast cereals and cereal bars. The probiotic yogurts sector is dominated by Danone, Yeo Valley, Onken and Müller. Danone and Müller also head the yogurt drinks sector, followed by McNeil's Benecol and the pioneer, Yakult. Unilever's Flora pro.activ holds the major share within cholesterol-lowering margarines and spreads, and Alpro has a similar position within soya milks. Allied Bakeries leads in the functional bread sector.

Functional foods and drinks are targeted at various health-related conditions associated with old age; the market is, therefore, anticipated to benefit from the aging population profile in the UK. It will also benefit from the ongoing interest, not only among older persons but also among younger generations, in healthier eating.

This interest continues to be supported by the Government's concern over the obesity 'epidemic', with future predictions showing a substantial proportion of adults and children becoming obese or overweight over the next decades. This situation is likely to continue to make health the major consideration of food and drink manufacturers, and the subject of the majority of their new product development (NPD) work.

However, advertising expenditure on functional foods fell by almost 40% in the year ending June 2007; this was principally accounted for by a large decline in promotional expenditure on yogurt drinks, which accompanied their falling sales.

Sales of functional foods over the next 5 years (to 2011/2012) are predicted to increase at rates reflected by their traditional counterparts. This should not be unexpected, as many functional variants have now become mainstream.

http://www.soyatech.com/news_story.php?id=6849

Soyatech eNews February 15, 2008

Receptor Revealed that Turns on Genes After Consuming Unsaturated Fats

The most remarkable about the study is that the effects of unsaturated fatty acids are almost entirely lost in mice that lack the PPAR α receptor. From the literature it is known that numerous receptors can supposedly bind fatty acids and turn on genes. In a paper published in the scientific journal PlosONE scientists from Wageningen University in the Netherlands demonstrate the tremendous importance of dietary fat as a regulator of gene expression. Via a combination of several nutrigenomic tools Linda Sanderson and her colleagues reveal that dietary unsaturated fatty acids govern a huge number of genes and do so almost entirely via a special receptor called PPAR α .

PPAR α , which stands for Peroxisome Proliferator Activated Receptor alpha, is a receptor that can be found in numerous tissues, including liver, heart and intestine. It reacts to certain drugs by turning on specific genes, yet can also respond to fatty acids and fatty acid look-a-likes. Activation of PPAR α is known to lower levels of triglycerides in blood, providing a rationale for their use in patients suffering from altered blood lipid levels. In their nutrigenomics study, the research team led by Linda Sanderson fed mice individual fatty acids in the form of synthetic triglycerides. Using a technique called microarray, which allows for monitoring the expression of thousands of genes simultaneously, they were able to determine exactly which genes are turned on in the mouse liver and which ones are turned off. The researchers found that the fatty acid DHA has the most significant impact and changes the expression of around 600 genes. DHA is found in fatty fish and fish oil and has been associated with numerous health benefits, including lowering of plasma triglycerides and decreasing blood clotting.

The most remarkable about the study is that the effects of unsaturated fatty acids are almost entirely lost in mice that lack the PPAR α receptor. From the literature it is known that numerous receptors can supposedly bind fatty acids and turn on genes. Most of these receptors belong to the family of the so called 'nuclear hormone receptors', which includes receptors that bind steroid hormones and fat soluble vitamins. However, it was unknown how important they are in an actual living animal. The new data show that PPAR α is by far the most important. Many of the genes that are turned on by unsaturated fatty acids are involved in breaking down fatty acids to generate energy. This mechanism likely protects the liver cell from build-up of unsaturated fatty acids, which is harmful to the cell. It also likely accounts for the lowering of plasma triglycerides by fish oil. Until now, all nutritional interventions with dietary fat in either mice or human subjects involved a mixture of fatty acids. For that reason, it has been very difficult to draw clear conclusions about the effects of individual fatty acids. The mixed nutritional/pharmacological intervention with synthetic triglycerides pursued by Sanderson and colleagues represents a creative and novel way to study the molecular effects of dietary fat. They expect that their approach will set a new standard for many future nutrigenomic studies.

http://www.nutritionhorizon.com/newsmaker_article.asp?idNewsMaker=16569&fSite=AO545&category=26&page=6
Nutrition Horizon Feb 29,2008-

What dietary supplements can and can't do: By Linda Saether

You are what you eat -- and what you don't eat. And so if you are like many of us, not quite hitting the entire food pyramid, you might be trying to outwit your body by giving it nutritional supplements to make up for the sins of food-group omissions. I fall into that guilty group, trying to make healthy choices but still feeling the need to augment. Unfortunately I am an erratic supplementer at best. Each day seems to bring about a Campbell's alphabet soup-type encounter with the many bottles of nutrients I have in my house. My approach to supplements is much like eating that soup, where each spoonful offered a new combination of A's, C's or E's. Today, vitamins C and E, complemented by some fish oil. Tomorrow, who knows? Maybe some more exotic fare such as echinacea and goldenseal, with just a hint of St. John's wort. I suspect that whatever side of the supplement fence you fall on --they work versus they don't work -- my method probably won't find favor.

What's the opinion of someone in the know, certified fitness nutrition coach and personal trainer Alyte Piedra? "I don't really encourage supplements for my clients," she said. "Instead I try to get them to get their nutrients from their diet." But given today's busy lifestyles, she added, everyone could probably benefit from taking a multivitamin. The sticky issue surrounding nutritional supplements is the way they are regulated. These pills, powders and potions fall under a different set of rules when being watched by the Food and Drug Administration. According to the FDA, dietary supplements are regulated under a "different set of regulations from those covering 'conventional' food and drug products."

While it is up to the manufacturer to make sure the product is safe before it hits the shelf, the FDA does watch over that product once it has become marketed. And last year the FDA put out a stricter standard for manufacturers in which the agency ordered all supplement manufacturers to ensure that "dietary supplements are produced in a quality manner, do not contain contaminants or impurities, and are accurately labeled." Typically the FDA enters the mix and pulls a product only after a supplement has caused harm. But we're not talking just "ouch" and "yuck" side effects, but rather the dial-911, heart-grabbing, chest-heaving side effects.

What about the stuff that doesn't bring you to that level of distress, but is probably not really helping you either? Many nutritional supplements carry with them a host of non-healthy ingredients. To make sure you know just exactly what

you are getting along with the claim for more energy, less depression and certain weight loss, Piedra suggests using your eyes. "Even things that a company claims are 100 percent natural and all whole grain, it doesn't really mean it actually is," she said. "I really strongly recommend for somebody to go and actually look at the back of the package and read the ingredients. The first ingredient should not be sugar, should not be high fructose corn syrup, no artificial colors or dyes. Nothing that you can't pronounce. If you can't pronounce it, it probably isn't very good for you."

There also are pronounceable foods that could cause some harm -- those linked to food allergies.

"I think there are some regulations [about] telling people if there are peanuts in certain products, but that hasn't gotten to the point with shellfish," Piedra said. (Shellfish is a common ingredient in many supplements.) Given these concerns, the only safe way to use these products according to Piedra is to make sure you are well informed. "I tell my clients to read all the label information and if they need to look up more information, do so." Keep in mind when buying supplements, the best and safest rule of thumb may be the sad but true adage: If it sounds too good to be true, it probably is too good to be true. Drat.

CNN.com International/Health: January 11, 2008

Tomato Lycopene May Affect the IGF-System

Commenting on the role of tomato lycopene in cancer preventive health care, Vrieling stated "This research is interesting, and we hope to see the results confirmed in larger randomised intervention studies." Results of a study published in the November 2007 American Journal of Clinical Nutrition suggest that supplementing the diet with tomato lycopene may interfere with the insulin-like growth factor (IGF) system and thereby possibly decrease cancer risk.

This eight week double-blind study, funded by the Dutch Cancer Society, investigated the effect of supplementation with 30 mg/day of tomato lycopene on serum concentrations of IGF-I and -II which are associated with increased prostate, premenopausal breast, and colorectal cancer risk, and on their binding proteins (IGFBP-1, -2, and -3). Seventy-six men and women at greater risk of colorectal cancer participated in this trial using tomato lycopene capsules supplied by LycoRed Ltd., Israel.

"This is the first study known to show that lycopene supplementation may increase circulating IGFBP-1 and IGFBP-2 concentrations, thereby potentially decreasing IGF-I bioavailability." stated researcher Alina Vrieling of the Netherlands Cancer Institute in Amsterdam. "Thus, it may provide a means of ultimately reducing colorectal cancer risk, and potentially the risks of other major cancers such as prostate and premenopausal breast cancer". These results would be particularly relevant for those at greatest risk of cancer. Commenting on the role of tomato lycopene in cancer preventive health care, Vrieling stated "This research is interesting, and we hope to see the results confirmed in larger randomised intervention studies."

Nutrition Horizon Feb 19,2008

http://www.nutritionhorizon.com/newsmaker_article.asp?idNewsMaker=16477&fSite=AO545&category=26&page=8

Time the Indian farmer got hit due: Sharad Joshi

To lift Indian agriculture from its present moribund state the agricultural marketing and extension systems must be reformed immediately. Also needed are a policy to prevent fragmentation of land holdings and a farmer-friendly exit policy. There has been, as early as 1929, only one real issue in Indian agriculture. It has been a non-paying vocation. The American Civil War sucked Indian cotton into the world market. Since then, Indian agriculture has become marginalised.

After the Great Depression, the Second World War ensured low agricultural prices coexisting with food scarcity. The British followed the policy of "procuring cheap raw materials in India and importing expensive manufactured goods into India". Indian industries were also beneficiaries of this policy. Independence came with the Partition. Some of the agricultural surplus provinces went to Pakistan and the flood of refugees worsened the problem of scarcity. The dependence of the Government on the bureaucracy and the incipient mindset of socialism ensured the emergence of the licence-permit-control-quota-inspector Raj, euphemistically called "low-cost economy".

This policy had a built-in bias against the farmer. The socialistic pattern of society only made things worse because the emphasis on industrialisation required a regime of cheap raw materials and wage goods.

Green Revolution

The Green Revolution in the 1960s marked the end of food scarcity but also introduced expensive agricultural inputs like fertilisers, pesticides and electricity. The weaknesses in the marketing system and infrastructure made agriculture a losing proposition.

The establishment of the Agricultural Prices Commission (APC) and the system of Minimum Support Prices (MSP) did bring about a brief respite of about five years, from 1965 to 1970. After that, a change in the character of the APC and its successor, the Commission for Agricultural Costs and Prices (CACPC), saw a period where the Minimum Support Prices recommended by the Commission were deliberately depressed and, as a consequence, the MSP came to be the highest prices that needed to be paid to the farmer. Restrictions on export and trade, inadequate storage, processing, transport has kept Indian agriculture mired in poverty.

Economic Reforms

The economic reforms of 1990s were limited to the domain of industry and finance and left agriculture totally untouched. The period of the National Democratic Alliance (NDA) saw some reform in the marketing front. The second phase of reforms under the UPA has again left agriculture a closed and State-dominated sector. There is also talk of a Second Green Revolution. There is a general awareness of the need to reform the present of agricultural marketing. Suicides by over 1,50,000 farmers in the last decade has brought in a sense of urgency to reforms.

Unfortunately, while the mindset in the Congress party has undergone a major change; it is the voice of its Left allies that continues to dominate. As a result, the UPA government appears to be bringing in changes that are irrelevant and inappropriate. The rate of the growth of GDP is entering an era of double digits while that of agriculture is yet to cross 3 per cent. The policymakers are putting great emphasis on ensuring a rate of growth of 4 per cent in agriculture. Of course, a higher rate of growth in agriculture is welcome. But it should not be forgotten that the target of 4 per cent was fixed without any study of the correlation between the rates of growth of GDP and that of agricultural product.

Experts were talking of a target rate of 4 per cent when the GDP rate was just around 6 per cent and they continue to do the same even though the rate of GDP has gone above 9 per cent. The preoccupation with the cooperative form of business organisation for everything that is rural and agricultural will need a second look. Co-operatives, as a general rule, have failed except in cases where there was inspired leadership of a situation of monopoly advantage.

Food scarcity was a problem in the pre-Green Revolution days and it continues to be so even today despite India becoming a major producer of a number of commodities. In order to justify the talk of food security, the definition of "food security" is being enlarged. Food security no longer means mere physical non-availability of food. It is supposed to include the purchasing power to acquire it, availability of water, fuel, adequate levels of literacy and even women's empowerment.

The non-governmental organisations (NGOs) obviously have a vested interest in expanding the scope of the term "food security". The government has succumbed to popular pressure in creating a Food Security Mission. This mission is pursuing the "grow more food" strategy, similar to the one that failed in the pre-1960s period, reinforcing infrastructure and technology with little or no attention to the economic incentive for the farmer.

Small, Marginal Farmer

The influence of the Left economists has also dominated the agricultural debate by emphasising the condition of the marginal and small farmer. The fact is that the size of the holding of an individual farmer depends more on the cohesion of his family than its economic situation. The small holders generally come from families where the land gets divided between the siblings in each generation. Remarkably, these economists do not suggest any way of operational consolidation but recommend further land reforms and fragmentation. This has to stop.

There is a similar prejudice against the moneylenders in the rural scenario. The fact is that despite insistence on enforcing formal credit organisations, the informal moneylender continues to provide a major part of the agricultural credit, and that too at no cost to the government. The rates of interest that they charge and the methods of recovery they adopt are not worse than those used by the micro-finance organisations. Rather than ape the Bangladesh model it would be a much better idea to recognise the moneylenders as a formal credit institution and revive the "Usurious Loans Act" in order to eliminate unsavoury practices in rural credit.

The "the dig and fill" schemes, such as the National Rural Employment Guarantee Scheme (NREGS), that have become hot-beds of corruption, do not produce any tangible assets. On the contrary, these schemes jeopardise the agricultural labour market to the detriment of the farmer.

The Issues

Having made a sufficiently long list of issues that have ceased to have relevance since Independence, it may be useful to shortlist some of the major issues that will confront Indian agriculture in the decades to come. Most Indian farmers are trapped in agriculture because their parents left them the land. According to surveys, a majority of the farmers would, given the choice, leave agriculture. On the other hand, there are others better endowed with finances, managerial skills and technological know-how that appear to be anxious to enter agriculture.

Agricultural land is becoming increasingly scarce and there is a ready market at attractive prices for it. It would be inappropriate, under these conditions, to enforce on the farmer compulsory acquisition for schemes such as the Special Economic Zones (SEZ). It would be more appropriate to draw up a farmer-friendly exit policy under which the farmer will have the right, if he so wishes, to pursue agriculture and also have the sole authority to dispose of the land if he wishes. The process of globalisation would have little meaning unless there is some scope for inter-sectoral transfer of factors of production.

Global Warming

A new calamity for which India is largely unprepared is that of global warming. Most of the good work that has been done since the 1960s may be totally nullified by climate change. The high yielding variety seeds that paid rich dividends during Green Revolution might cease to play the same role in times when temperatures and precipitations become profoundly skewed.

As admitted by the Finance Minister during last year's Budget speech, the systems of agricultural extension and input subsidies have collapsed. The extension system must be reformed from one based on the salaries adviser to one involving commission-earning consultants. The mockery of terming subsidies, such those on food and fertilisers, as subsidies to farmers must stop. It is not difficult to ensure that the advantage of subsidies reaches the farmers directly, but only if there is the political will to do so.

Hindu Business Line New Delhi 20.02. 2008

Vitamin C can keep you healthy, looking younger: By Rachel Grumman

Remember when vitamin C was hailed as the best, and maybe only, cold remedy? Then it became the Rodney Dangerfield of vitamins: It didn't get any respect. The nutrient's glory days of curing scurvy-riddled sailors via juicy citrus fruit seemed to be the only thing keeping its reputation afloat, particularly after a massive research review found C to be virtually useless for fighting colds. But don't believe it. The truth is that scientists have taken a fresh look at C -- and have found lots of new ways it can help you stay healthy and look and feel younger. Here's the latest on what C can really do for you.

Prevent wrinkles

You can't pick up a beauty product these days without the label touting its antioxidants. There's a good reason: Antioxidants -- like vitamin C -- help turn back the clock. An October 2007 study published in the American Journal of Clinical Nutrition found that people who ate foods rich in vitamin C had fewer wrinkles and less age-related dry skin than those whose diets contained only small amounts of the vitamin. C helps form collagen, which smooths fine lines and wrinkles, according to Patricia Farris, MD, clinical assistant professor of dermatology at Tulane University in New Orleans. The key seems to be C's ability to fight free radicals, a by-product of cell metabolism in your body. Free radicals are thought to attack proteins, fats, and DNA and break down collagen. C also seems to guard against ultraviolet rays from the sun, which can lead to freckles and a mottled complexion. "Vitamin C does some repair and firming on the skin," Farris says.

Protect your heart

Experts continue to argue about whether antioxidants like vitamin C can prevent heart disease. But some of the evidence is highly persuasive. When Finnish researchers looked at studies involving nearly 300,000 people over 10 years, they found that taking more than 700 milligrams of C supplements daily reduced the risk of cardiovascular disease by 25 percent. And a recent study from Harvard University researchers hints that women who take a combo of 500 milligrams of vitamin C daily and 600 IU of vitamin E (another antioxidant) can cut their risk of stroke by 30 percent. It's possible that people who take vitamin supplements simply have healthier lifestyles than those who don't, which could explain this finding. It's also possible, experts say, that C enhances the functioning of endothelial cells (which line the inside of all blood vessels), slowing artery clogging and lowering blood pressure.

Keep cancer at bay

A diet full of vitamin C--rich fruits and vegetables isn't just good for your heart, it may also lower your risks of bladder, esophagus, stomach, and lung cancers. Even though more research is needed to find out which compounds in fruits and veggies do the trick, researchers say the association is strong. Someday, C may also be used to treat cancer. High levels of C given intravenously seem to be toxic to cancer cells (studies on vitamin C taken orally showed no effect on cancerous cells). Intravenous C appears to trigger the formation of hydrogen peroxide, which kills some cancer cells while leaving healthy cells unharmed, says lead study author Mark Levine, MD, chief of the molecular and clinical nutrition section and senior staff physician at the National Institutes of Health. Levine says doctors at the University of Kansas Medical School and Jefferson Medical College in Philadelphia are trying this therapy on cancer patients.

Boost brain power

Pairing vitamins C and E is smart for another reason: It may lessen your Alzheimer's risks by as much as 64 percent, according to research in the Archives of Neurology. Just 500 milligrams of C and 400 IU of E appear to be enough. The brain's high fat content makes it especially vulnerable to free radicals, but these antioxidants may act as shields, says study author Peter Zandi, PhD, an assistant professor at Johns Hopkins University Bloomberg School of Public Health. "Some studies suggest that vitamin E does its job reducing free radicals in the body, but then its capacity is depleted," Zandi says. "Vitamin C may recharge E."

Save your eyesight

Vitamin C can't prevent the need for reading glasses around age 45. But anti-oxidants, including C, help prevent one of the leading causes of blindness: age-related macular degeneration (AMD). More than 3.5 million Americans are thought to be in the early stages, and the disease strikes more women than men. A major clinical trial sponsored by the National Eye Institute showed that a daily supplement of 500 milligrams of vitamin C, 400 IU of vitamin E, 15 milligrams of beta-carotene, 80 milligrams of zinc, and 2 milligrams of copper reduced the risk of moderate or severe AMD-related vision loss by up to 25 percent. The antioxidants neutralize damage to the retina caused by, you guessed it, free radicals.

Help you live longer

You've probably heard that green tea boosts the body's defenses against toxins. That's important because toxins are thought to contribute to cancer, heart attack, stroke, and lots of other maladies. In fact, one to two cups a day may reduce a woman's risk of dying by about 20 per-cent, Japanese researchers say. What's the vitamin C connection? Citrus juices (lemon, lime, orange) may supercharge the immunity-boosting power of green tea. A new Purdue University study found that mixing citrus juice with green tea allowed 80 percent of the tea's anti-oxidants to stick around after simulated digestion, making the pairing healthier than thought, says study author Mario G. Ferruzzi, PhD, assistant professor in Purdue's department of food and nutrition.

From: CNN.com International/Health February 27, 2008

Regulatory News

Food Standards Agency (FSA) of UK initiates action for reduction of saturated fats

FSA has initiated steps to help people to reduce their dietary intake of saturated fat. The programme outlines how to reduce amount of saturated fat and added sugar to foods while undertaking more difficult issues like reformulation of products. It is important to develop and build on positive and collaborative partnerships with industry, along with improving consumer awareness. Partnership may be built with food industry for encouraging voluntary reformulation of certain food groups for reduction of amount of saturated fat and sugar in them, increasing range of healthy options and promoting them to consumers, ready availability of smaller portion sizes, announcing commitment to reformulation, consumer awareness programmes for healthy diet, and holding workshops.

From: <http://www.foodstandards.gov.uk/news/newsarchive/2008/feb/satfats>

EU for clearer, more relevant food labels

European Commission is proposing to make labels on food products clearer and more relevant to consumer needs. Key information will be displayed clearly on front of the package. Allergen statement for peanuts, milk, mustard and fish would have to be put on packaged products but also restaurant and café foods. Information on energy, fat, carbohydrates, sugar and salt will have to be declared per 100 ml or g (or per portion or serving of products). RDA proportion also will have to be given. Also such information will have to be given in sufficiently big font and marketing slogans should not detract from mandatory information.

From: http://ec.europa.eu/news/agriculture/080207_1_en.htm

FDA adds barley to soluble fiber health claim

The U.S. Food and Drug Administration (FDA) is amending the health claim regulation entitled "Soluble fiber from certain foods and risk of coronary heart disease (CHD)" to add barley betafiber as an additional eligible source of beta-glucan soluble fiber. Barley betafiber is the ethanol precipitated soluble fraction of cellulase and alpha-amylase hydrolyzed whole grain barley flour. FDA is taking this action in response to a health claim petition submitted by Cargill, Inc.

From: IFT News Letter February 08

Research Highlights on Diet & Health

Daily dose of beetroot juice can beat high blood pressure

Researchers at Barts and The London School of Medicine in UK have found that drinking 500ml of beetroot juice a day can significantly reduce blood pressure. The study, published online in the American Heart Association journal Hypertension.

The research indicates that it is the ingestion of dietary nitrate contained within beetroot juice - and similarly in green, leafy vegetables - which results ultimately in decreased blood pressure. Previously the protective effects of vegetable-rich diets had been attributed to their antioxidant vitamin content.

Fruit consumption may reduce Alzheimer's risk

Apples, bananas, and oranges are the most common fruits in both Western and Asian diets, and are important sources of vitamins, minerals, and fiber. A new study in the Journal of Food Science explores the additional health benefits of these fruits and reveals they also protect against neurodegenerative diseases, including Alzheimer's Disease.

Researchers at Cornell University investigated the effects of apple, banana, and orange extracts on neuron cells and found that the phenolic phytochemicals of the fruits prevented neurotoxicity on the cells. Among the three fruits, apples contained the highest content of protective antioxidants, followed by bananas then oranges.

The authors concluded "[their] study demonstrated that antioxidants in the major fresh fruits consumed in the United States and Korea protected neuronal cells from oxidative stress....Additional consumption of fresh fruits such as apple, banana, and orange may be beneficial to improve effects in neurodegenerative diseases such as Alzheimer's."

Fat rats are helped by eating low-cal sweeteners

In response to the Purdue Univ. study, Adam Drewnowski, Director, Center for Public Health Nutrition at the University of Washington, in a recent review of the scientific literature concluded that low-calorie (or no-calorie) sweeteners may be of help in resolving the obesity problem. Although they are not magic bullets, low-calorie sweeteners in beverages and foods can help people reduce their calorie (energy) intakes.

The study by Bellisle and Drewnowski, published in the European Journal of Clinical Nutrition, evaluated a variety of laboratory, clinical and epidemiological studies on low-calorie sweeteners, energy density and satiety. Their findings, based on extensive studies with humans, are completely at odds with a new study on 27 Sprague-Dawley rats eating yogurt, published in the February issue of Behavioral Neuroscience.

Whole grain diets lower risk of chronic disease

Diets with high amounts of whole grains may help achieve significant weight loss, and also reduce the risk of chronic diseases such as diabetes and cardiovascular disease, according to a team of Penn State researchers, College of Medicine. "Consumption of whole grains has been associated with a lower body weight and lower blood pressure," said researcher Penny Kris-Etherton. "We thought that incorporating whole grains into a heart-healthy weight-loss diet may provide the same benefits to people at risk from chronic diseases."

The researchers recruited 50 obese adults -- 25 male and 25 female -- between ages 20 to 65 and known to have metabolic syndrome, a cluster of symptoms that increase the risk of developing cardiovascular disease and diabetes. They were randomly assigned to either a group that received instructions to have all of their grain servings from whole grains or all of their grain servings from refined grains. The study's findings are published in the January 2008 issue of the American Journal of Clinical Nutrition.

From: IFT News Letter February 08

Eggs Without a Side of Allergens

Certain products can be a big concern for those with food allergies, leading them to assiduously study the ingredient legends of products to avoid consuming products that have the potential to cause a life-threatening allergic reaction. Eggs, currently on the “big eight” list of major food allergens, may become accessible to some people who now steer clear of them, due to the development of a new process that greatly reduces allergens in eggs.

The research (“In Vitro Determination of the Allergenic Potential of Technologically Altered Hen’s Egg,” *Journal of Agricultural Food Chemistry*, ASAP Article, 10.1021/jf0725981) describes a process that exposes raw eggs to a combination of high heat and enzymes to break down their main allergens, including ovalbumin, conalbumin, ovomucoid, and lysozyme, which make up 80% of the total egg-white protein. According to the researchers, the other proteins, such as macroglobulin, avidine and several different enzymes, are less significant in terms of food allergies. While egg allergies are not prevalent in adults, they are one of the top food allergies in infants and children. These allergies can result in severe stomach aches and rashes, and in extremely rare cases, death.

Prior research, mainly on purified proteins, has found two treatments for hens’ eggs that reduce allergenicity: thermal processing and enzymatic hydrolysis. For thermal processing, the egg age and pH can affect the outcome of heat-induced hydrolysis and adversely change the flavor. Enzymatic hydrolysis minimizes these problems, but, to effectively attack the proteins, requires a degree of heat denaturation.

To mimic an industrial egg ingredient, the German and Swiss researchers considered all the proteins in an egg and made a pooled serum mixed from 11 allergic individuals to evaluate a process combining both thermal processing and enzymatic hydrolysis to reduce eggs’ allergenic potential.

The scientists found a modified product based on pasteurized liquid whole egg was 100 times less allergenic than raw egg. Researchers said the process outlined did not significantly alter flavor and texture when used in various products.

From Food Product Design 02/27/2008 by Lynn A. Kuntz

Better Gum Health Through Dairy Intake

A recent study published in the Jan. 2008 issue of the *Journal of Periodontology*, “Intake of Dairy Products and Periodontal Disease: The Hisayama Study,” demonstrated that routine intake of dairy products may help promote periodontal health. The study analyzed the periodontal health of 942 subjects and determined that those who regularly consumed dairy products such as milk, cheese and yogurt had a lower instance of gum disease.

“Research has suggested that periodontal disease may affect overall systemic health,” said study author Dr. Yoshihiro Shimazaki, Department of Preventive Dentistry, Kyushu University, Fukuoka, Japan. “This study reinforces what much of the public already knows—the importance of dairy in helping achieve a healthy lifestyle, including a healthy mouth.”

Study participants aged 40 through 79 were examined on two periodontal parameters that can indicate gum disease, periodontal pocket depth (PD) and clinical attachment loss (CAL) of gum tissue. Researchers observed that subjects who consumed 55 or more grams of products containing lactic acid each day had a significantly lower prevalence of deep PD and severe CAL, therefore demonstrating a lower instance of periodontal disease.

“Millions of adults already suffer from periodontal disease,” says Dr. Susan Karabin, president, American Academy of Periodontology. “By regularly consuming dairy products such as cheese and milk, something many people do each day, the risk of developing gum disease may decrease. These findings are important since maintaining healthy gums is a critical component to maintaining a healthy body.”

From: Food Product Design 02/13/2008

New Research Suggests Soy Extract May Help Treat Ulcerative Colitis

New investigation results, 'Bowman-Birk inhibitor concentrate: a novel therapeutic agent for patients with active ulcerative colitis,' are detailed in a study published in *Digestive Diseases and Sciences* (see also *Ulcerative Colitis*). "Bowman-Birk inhibitor concentrate (BBIC), a soy extract with high protease inhibitor activity, is efficacious in the treatment of colitis in mice and has been used in numerous clinical trials. A randomized, double blind, placebo-controlled trial was performed to investigate the safety and possible benefits of BBIC in patients with active ulcerative colitis," scientists in the United States report.

"The Sutherland Disease Activity Index (SDAI) was used to assess disease activity, response (Index decrease ≥ 3), and remission (Index ≤ 1 with no rectal bleeding) in patients receiving 12 weeks of therapy. The Index scores of patients receiving BBIC decreased more than those of the patients receiving placebo ($p=0.067$). Beneficial trends were observed in the rates of remission ($p=0.082$) and clinical response ($p=0.22$). No severe adverse events were observed," wrote G.R. Lichtenstein and colleagues, University of Pennsylvania, Division of Gastroenterology.

The researchers concluded: "This trial suggests a potential benefit over placebo for both achieving clinical response and induction of remission in patients with active ulcerative colitis without apparent toxicity."

Lichtenstein and colleagues published their study in *Digestive Diseases and Sciences* (Bowman-Birk inhibitor concentrate: a novel therapeutic agent for patients with active ulcerative colitis. *Digestive Diseases and Sciences*, 2008; 53(1):175-80).

From: Soya Tech E-News February 18, 2008

http://www.soyatech.com/news_story.php?id=6838

Olive Compound Inhibits Cancer Cells Growth and Prevents Their Appearance

Maslinic acid is a protease inhibitor that, among other features, has the capacity of regulating cell growth. It is useful for cancer treatment, as it allows to control the hyperplasia and hypertrophy processes, typical of this disease. A research group of the University of Granada has found out that maslinic acid, a compound present in the leaf and the olive skin wax extracted from alpeorujo (crushed olive pulp), has the capacity of preventing cancer as well as regulating apoptosis in carcinogenic processes.

Maslinic acid is a protease inhibitor that, among other features, has the capacity of regulating cell growth. It is useful for cancer treatment, as it allows to control the hyperplasia and hypertrophy processes, typical of this disease. The scientists of the UGR have characterized for the first time maslinic acid action from the molecular point of view when it is applied to the development of tumour cells.

This work has been carried out by Ph D student Fernando Jesús Reyes Zurita, and directed by Professor José Antonio Lupiáñez Cara, of the department of Biochemistry and Molecular Biology I. According to them, the advantages of maslinic acid are three: Unlike other anti-carcinogenic products, highly cytotoxic, it is a natural compound and, therefore, less toxic. In addition, it is selective, this is, it only acts on carcinogenic cells, whose pH is more acid than usual. And lastly, it has a preventive nature, as it can inhibit cancer appearance in those cells with a higher predisposition to develop it.

Although the research group of Professor Lupiáñez Cara has analysed the effect of maslinic acid in the treatment of colon cancer, it can be used in different types of tumours. For the moment, their research works have been developed in colon carcinoma lines and transgenic mice, but they have not dismissed the possibility of applying them to humans in future.

Maslinic acid is a pentacyclic terpene which, besides being anti-carcinogenic, it has anti-inflammatory and antioxidant effects and can be found in high concentrations in olive skin wax. At present, the only production plant of this substance at a semi-industrial level in the whole world is at the Faculty of Sciences of the University of Granada.

http://www.nutritionhorizon.com/newsmaker_article.asp?idNewsMaker=16435&fSite=AO545&category=26&page=9
Nutrition Horizon Feb 14, 2008

Soyfood Intake May Help Reduce Incidence of Type 2 Diabetes: Shanghai Women's Health Study

Scientists discuss in 'Legume and soy food intake and the incidence of type 2 diabetes in the Shanghai Women's Health Study' new findings in type 2 diabetes. "It has been postulated that a diet high in legumes may be beneficial for the prevention of type 2 diabetes mellitus (type 2 DM). However, data linking type 2 DM risk and legume intake are limited," researchers in the United States report.

"The objective of the study was to examine the association between legume and soy food consumption and self-reported type 2 DM. The study was conducted in a population-based prospective cohort of middle-aged Chinese women. We followed 64,227 women with no history of type 2 DM, cancer, or cardiovascular disease at study recruitment for an average of 4.6 y. Participants completed in-person interviews that collected information on diabetes risk factors, including dietary intake and physical activity in adulthood. Anthropometric measurements were taken. Dietary intake was assessed with a validated food-frequency questionnaire at the baseline survey and at the first follow-up survey administered 2-3 y after study recruitment. We observed an inverse association between quintiles of total legume intake and 3 mutually exclusive legume groups (peanuts, soybeans, and other legumes) and type 2 DM incidence. The multivariate-adjusted relative risk of type 2 DM for the upper quintile compared with the lower quintile was 0.62 (95% CI: 0.51, 0.74) for total legumes and 0.53 (95% CI: 0.45, 0.62) for soybeans. The association between soy products (other than soy milk) and soy protein consumption (protein derived from soy beans and their products) with type 2 DM was not significant," wrote R. Villegas and colleagues.

The researchers concluded: "Consumption of legumes, soybeans in particular, was inversely associated with the risk type 2 DM." Villegas and colleagues published their study in *The American Journal of Clinical Nutrition* (Legume and soy food intake and the incidence of type 2 diabetes in the Shanghai Women's Health Study. *The American Journal of Clinical Nutrition*, 2008;87(1):162-7).
http://www.soyatech.com/news_story.php?id=6842
Soyatech eNews February 23, 2008

One Shot of Red Wine or Alcohol Benefits the Heart and Blood Vessels, But Two Shots are Stressful

After one drink of either red wine or alcohol, blood vessels were more "relaxed" or dilated, which reduced the amount of work the heart had to do. One drink of either red wine or alcohol slightly benefits the heart and blood vessels, but the positive effects on specific biological markers disappear with two drinks, say researchers at the Peter Munk Cardiac Centre of the Toronto General Hospital.

In a study entitled "Dose-related effects of red wine and alcohol on hemodynamics, sympathetic nerve activity, and arterial diameter", published in the February edition of the *American Journal of Physiology, Heart and Circulatory Physiology*, researchers conducted a real-time study of thirteen volunteers to determine whether a red wine with a verified high polyphenol content differs from alcohol in its effects on specific markers associated with a greater risk of high blood pressure, coronary artery disease and heart failure.

A large number of population studies have shown a protective effect of light or moderate alcohol drinking against the risk of death and the development of heart disease. Many studies have also reported specific benefits of red wine. Population surveys found lower rates of heart disease, despite high-fat diets, in some European countries where red wine was consumed regularly. Widely known as the French paradox, this has created a huge interest in exploring if and how red wine has a protective effect against heart disease.

However, the findings of this study showed virtually identical effects of red wine and alcohol on the specific markers tested. After one drink of either red wine or alcohol, blood vessels were more "relaxed" or dilated, which reduced the amount of work the heart had to do. But, after two drinks, the heart rate, amount of blood pumped out of the heart, and action of the sympathetic nervous system all increased. At the same time, the ability of the blood vessels to expand in response to an increase in blood flow diminished. This counteracted the beneficial effect of one drink of red wine or alcohol.

"We had anticipated that many of the effects of one ethanol drink would be enhanced by red wine. What was most surprising was how similar the effects were of red wine and ethanol. Any benefits that we found were not specific to red wine," said Dr. John Floras, Director of Cardiology Research at the Peter Munk Cardiac Centre, and at Mount Sinai Hospital, in whose laboratory the study was performed. However, Dr. Floras cautioned this study measured the effects of these drinks on one occasion only. The effects of daily wine or alcohol intake may be quite different. The laboratory of Dr. Floras, who holds the Canada Research Chair in Integrative Cardiovascular Biology and is a Professor of Medicine at the University of Toronto, and a Career Investigator of the Heart and Stroke Foundation, is one of the few in the world equipped to measure simultaneously a broad spectrum of factors such as blood pressure, heart rate, sympathetic nerve firing and arterial diameter.

Healthy, non-smoking adults who were not heavy drinkers or total alcohol abstainers were studied. Participants attended three separate morning sessions during which "standard" drinks of red wine, ethanol or water were administered at random, single-blind, two weeks apart. A 4-oz glass of wine (120 ml), and a 1.5-oz (44 ml) shot of spirits is considered to be one standard drink. All blood alcohol levels alcoholic were below .08, the legal limit for drivers.

The Quality Assurance Laboratory of the Liquor Control Board of Ontario selected a moderately priced pinot noir with a verified high t-resveratrol content, a polyphenol compound found in plants, including red grapes, which exhibits antioxidant properties. Alcohol or substances in alcohol such as resveratrol may improve blood vessel function and also prevent platelets in the blood from sticking together, which may reduce clot formation and the risk of heart attack or stroke.

From: Nutrition Horizon Feb 14, 2008

http://www.nutritionhorizon.com/newsmaker_article.asp?idNewsMaker=16428&fSite=AO545&category=26&page=9