

Editorial

As consumers are getting more conscious about effect of food and ingredients on health, they are demanding more healthy food products.

Government has also provided the opportunity for consumers to see nutrition information on the labels. With this many food products have made appearance in the last couple of years with a health tag providing some nutrient or healthful ingredient added to food products in order to make them healthier.

A few years ago it was difficult to get a whole wheat bread. In a food store you would get different brands of white bread prepared with refined wheat flour. The USP would be mostly the softness, volume, colour, appearance and to some extent the flavour. Today it is sometimes difficult to get a white bread whereas you would find various brands of whole wheat, brown, or multigrain breads.

Breads prepared using whole wheat flour would have more fibre, vitamins and minerals mostly coming from bran and germ present in whole wheat flour. Some manufacturers may add fibre to refined flour, others would add bran or some amount of whole wheat flour to refined flour while there are some who add other grains besides wheat.

Consumers may get confused as some manufacturers may add just a little of some of the ingredients to call it brown or whole wheat product while others may add colour to make it look like whole wheat. The label would give more information for example ingredients list which gives in descending order of composition by weight the ingredients added so one knows which was added more or less with respect to other ingredients.

There is also a provision which makes manufacturers provide the percentages of ingredients emphasised on label by name or graphics. So if the label states that bran is added, then percentage of bran will have to be declared on the label. Then the consumers can make the choice for the best product with respect to value for the money.

In spite of some examples of making the product look much better than it really is healthwise, it must be said that healthy products campaign has done a lot of good for creating awareness about health and nutrition through these advertisements and label claims. In order to make healthy ingredient a USP for the product, consumers started getting interested in nutrition and health. They started finding more about what that ingredient or nutrient does. They are now becoming aware about calcium being important for bones. They are also talking about which foods have iron and vitamins A and C etc.

Through their urge to sell more food products, they are now making health statements along with taste. Government is also introducing guidelines about the advertisements so there would not be misleading claims. All this will certainly produce nutritious and healthy food products which is a good thing for all stakeholders.

We welcome the new members Win Medicare, Urmin Pan Products, Superchem Industries, Tata Chemicals and Yasham Importers & Exporters and hope that they have a long and very useful interaction. With season's greetings

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Coming Events

43rd Annual National Conference December 2-4, 2010

Indian Dietetics Association
Theme: Dietetics - Widening Horizons
Venue: National Institute of Nutrition,
Hyderabad
Contact: Org. Secretary
Tel: 040-6526 5296 Fax: 2701 9074
Email: idahyd2010@yahoo.com

Nutrition and Health: Food Ingredients and Nutraceuticals for Performance and Well-Being December 8-9, 2010

Location: London, U.K.
Contact: London Technology Network,
Holly Parker
Phone: 0870-730-8688
Website: www.ltnetwork.org
Email: h.parker@ltnetwork.org

International Conference on Innovations in Food Processing & Ingredients towards Healthy India January 4-5, 2011

Location: Peninsula Grand Hotel,
Andheri (E), Mumbai
Org: Institute of Chemical Technology
& AFSTI-Mumbai
T: 022 3361 1111 / 2222
E: ictafst@gmail.com

Ninth World Food Technology & Innovation Forum 2011 March 1-2, 2011

Location: Brussels, Belgium
Tel: +44 20 7202 7690
Web: www.wtgevents.com
Email: simon.wright@wtgevents.com

Nutracon March 9-10, 2011

Location: Anaheim, CA, USA
Contact: New Hope Natural Media
Phone: 866-458-4935
Web: www.nutraconference.com
Email: tradeshow@newhope.com

Vitafoods May 10-12, 2011

Location: Geneva, Switzerland
Contact: Phil Hawkins
Phone: 44-20-7240-2444
Web: www.vitafoods.eu.com
Email: phil@stormcom.co.com

Cereals & Grains: the Seeds of Modern Civilisation: Part II – Wheat: Dr. J. S. Pai

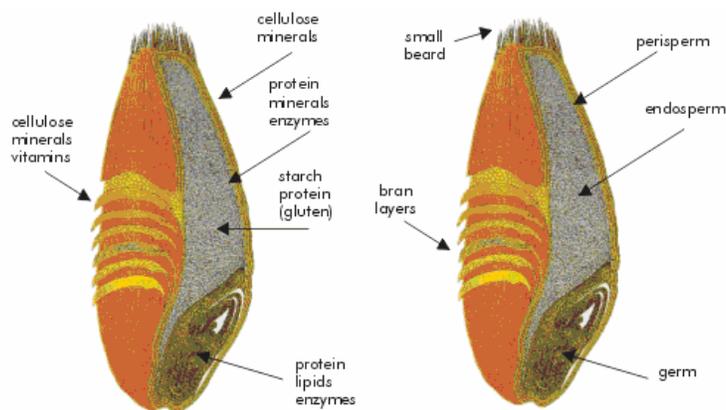
Wheat is one of the earliest domesticated cereals and probably occurred first in the parts known today as Egypt, Turkey, Syria, Israel etc. and the earliest variety Einkorn wheat dates back to 9000 B.C. It is now cultivated worldwide and its production 690 million tonnes (MT) in 2008 is second only to corn and is slightly higher than rice. Most the wheat worldwide is used for making bread in various different styles depending of regional and cultural preference. Besides bread, the other very common applications are biscuits or cookies, cakes, breakfast cereals, pasta and noodles. The worldwide popularity of many snack and other popular foods like burgers, pizza and noodles which are made of wheat has increased its demand over the last decades. Indian wheat production in 2008 was 79 MT being second only to China's 112 MT.

Although in India the main food grain is rice, wheat has become a very important grain and in north India, especially Punjab, irrigation has given a big boost to wheat output in the past decades. There have also been increases in production due to use of fertilisers as well as due to increased availability of high-yielding varieties. In India, wheat is primarily consumed for making unleavened baked and roasted foods like roti, chapatti, paratha, naan, poori, etc. which are consumed along with curried vegetables and meats. These products are more common in north India. Over the last few decades Indians have been getting used to consuming bread, biscuits and cakes which have now become quite common not only in cities but in rural India as well.

Structure of Wheat

Wheat is rarely consumed as whole seeds and is normally milled to powdered products before it is made into various products. Whole wheat flour or atta is a very common form from which roti, chapatti, paratha etc. are prepared. Bread is made using the refined wheat flour or maida in which outer bran and germ of wheat are removed to yield lighter product. Use of whole wheat flour ends in making harder bread with lower volume as bran interferes in the formation of gluten the elastic protein which helps in raising of bread dough allowing lighter and softer bread.

Wheat seed as seen in the figure is composed of outer bran layer inside of which is endosperm and at the lower end is the germ. Germ contains proteins, lipids and enzymes that would start the germination process when wheat seed is sowed in field along with water. It is a rich source of E and B vitamins as well as other useful micronutrients. Bran layers provide protection to the endosperm and are made of cellulosic materials containing minerals and vitamins. Endosperm consists mostly of protein and starch that supplies the food to the germinated plant in the initial stage.



Whole wheat flour will include all three parts so it will look darker because of bran particles and if kept long it will also become rancid as enzymes and fats are present although in minute amounts.

Hard red winter wheat (100g) contains about 12.6g protein, 1.5g fat, 71g carbohydrates, 12.2g dietary fibre and about 3.2mg iron and a good proportion of various other vitamins and minerals. When the wheat is milled to get refined wheat flour suitable for bread and biscuits, then much of the dietary fibre along with large proportions of vitamins and minerals are lost due to removal of bran and germ. Although whole wheat flour is more nutritious than refined white flour, the breads prepared are not as soft and fluffy. Whole wheat flour

also has shorter shelf life due to rancidity of oil from germ. Some of the baked products now add some whole wheat flour or bran to refined flour to restore partially the benefits of whole wheat flour.

Varieties of wheat

Common wheat or bread wheat is *Triticum aestivum* or *Triticum vulgare*, which is the most widely cultivated species in the world. Durum wheat is *Triticum durum* is the second most cultivated wheat and is commonly used for semolina and pasta products. This is very hard, translucent and light-coloured. Hard wheat varieties contain more protein and are suitable for bread and many other baked products because of higher gluten which allows easy dough rising. Softer varieties have lesser protein and so lower gluten content that are suitable for cakes, biscuits etc.

Indian wheat is largely soft/medium hard containing medium protein and suitable for bread. India also produces durum wheat. India consumes around 70 -72 million tonnes of wheat a year. Most of this is consumed in households in the form of

homemade chapattis or rotis using custom milled atta or whole wheat flour prepared mostly by small mills or chakkis. Consumers have started using branded packaged atta in urban areas. There are also around 200 large roller flour mills that produce around 15 million tonnes of refined wheat flour (maida), germ, bran etc. About 5 million tonnes of wheat are exported. As Indian wheat has lesser protein (gluten) bread making requires more fermentation with improvers.

Nutrition & Health

Wheat flour contains protein from about 9% to as high as about 15% depending on the variety grown as well as the other factors like season, geographical location and farming practices. However, when flour is compared, protein content of the refined flour goes down because germ and bran are removed by milling process and they contain good amounts of protein. Milling process attempts to get as much endosperm as possible as all the gluten is present there and that is useful for giving nice soft bread, whereas germ and bran particles interfere with rising of bread dough.

Even other nutrients like fibre, iron, B vitamins and fat soluble vitamins A, E and K are much higher in whole wheat flour than in refined flour. This makes the whole wheat bread much better than white bread. Chapatti, roti, paratha etc. are all prepared using whole wheat flour. Naan is commonly prepared using refined flour whose dough is fermented as it gives softer product as in the case of bread.

A small number of population (0.3 to 1%) from parts of Europe, India, South America, Australasia and USA were found to be allergic to gluten in several studies. African, Japanese and Chinese people were rarely diagnosed with coeliac disease which is an immune disorder of the small intestine in sensitive individuals resulting in diarrhoea, fatigue etc. These people must have gluten-free diet.

Products

There are literally hundreds of products made out of wheat mostly after preparing flour. Bread is the most popular staple with numerous variations. Refined wheat flour makes white bread in which the dough prepared with water is fermented by yeast that produces gas which is entrapped by elastic dough because of gluten. When the leavened dough is baked there is a very light, fluffy white crumb and a hard, brown crust. One can use whole wheat flour or refined flour to which different proportions of bran, germ and/or whole wheat flour are added. There is also multigrain bread which may contain wheat or rye as the main grain. Even the leavening process or agent may give different types of bread like chemically leavened or quick bread, lactic culture leavened sourdough bread, steam leavened bread and mechanically agitated aerated bread.

Biscuits and cookies (as Americans call them) are made with weaker wheat flour with lower protein as the dough does not need raising but if there is too much protein it may distort the cut pieces of dough before baking them. Here also numerous variations are possible depending on ingredients and method of preparation. There are drop cookies like chocolate chip or oatmeal cookies which are made by dough pieces being deposited and flattened before baking. Usually most biscuits are prepared by the dough being sheeted and sheets cut by dies and embossed with designs prior to baking. They can be in different shapes like round, oval, rectangular, bar shaped etc. There are also sandwiches or cream-filled biscuits. Crackers are very crisp and are not fermented whereas cream crackers are yeast fermented to make them very light.

Although certain cakes are leavened by yeast cakes are mostly chemically leavened with soda and contain sugar and fat in good proportion. The variations in cakes are mostly based on ingredients and the process used. There are cheese cakes, sponge cakes, butter cakes, chocolate cakes as well as fruit cakes. As cake making needs a lot of skills and experience in ingredients proportions, cake mixes are now available which not only take away the burden of measuring, the simple instructions make them fairly easy to make although some take pride in decorations which can be very intricate and elaborate.

Popularity of pizzas and hamburgers has made the consumption of wheat to shoot up in recent years. Pizza is oven-baked flat disc-shaped bread topped with tomato sauce, cheese and various ingredients including meats, fish, vegetables and seasonings. Hamburger is a sandwich of cooked patty of meat inside a sliced bread roll and often served with lettuce, tomato, onion, pickles, cheese and condiments. Indian market has spawned vegetarian hamburger. Pizza and hamburger have become so popular world over that there have regional variations that have appeared. One prominent example is Indian vada-pav. Although pav (small bread made by local bakeries) has been around for decades this particular combination became more popular after Indians accepted hamburgers.

Besides pav, there are also many baked wheat products prepared by many Indian bakeries. There is hard brown pav, toast, butter (and surti butter) etc. One of the most popular product is khari biscuit in which dough is folded several times to have layers interspersed with fat and when baked the product is very light and crisp.

Among the staples of wheat are chapatti and roti. As mentioned earlier they are made of whole wheat flour which is rolled. Chapatti is sometimes rolled several times with folding so when baked on a skillet it rises. While chapatti is rolled with a rolling pin to make it thin, roti is normally flattened between palms. Naan is a fermented variation using curds or yeast as ferments. Paratha is another variant which is commonly stuffed with vegetables. Puri and bhatura are variants that are deep fried the latter uses fermented dough.

The recent trend in healthier products has been the result of consumers demanding healthier products. While whole wheat products like chapatti and roti are being consumed, the bread consumers are going for whole wheat breads or multigrain breads. Awareness of nutrition and usefulness of whole grain products is making consumers look for such products. Indian food laws are making it mandatory to declare on the labels the list of ingredients and the nutrition information. If any ingredient is emphasised on the label, its amount has to be shown in the list. For example, when fibre or bran has been added and is emphasised on label stating say, fibre-enriched, then the amount of fibre has to be declared as percentage in the list of ingredients. If biscuits have cashews and there is a mention in the name or in picture, then % of cashews need to be mentioned. Although some may try to use health as a gimmick, there are many products appearing in the markets that are healthy. Addition of fibre, vitamins, minerals, probiotics/prebiotics, omega-3 fats etc. as well as making products containing less sugar, salt, fats especially saturated and trans are changing the markets so consumers have a choice of healthy products.

The Milling Process

Wheat is cleaned and conditioned before milling into flour. Cleaning is done to remove foreign material and poor quality kernels using machines that utilize air currents, magnets and screens to separate wheat from chaff and other contaminants using shape, size, density etc. of kernels.

Conditioning adjusts moisture in the grain to facilitate separation of bran. Wheat moisture is adjusted to about 16% to create a tough bran and soft endosperm. Milling process in break rolls should flatten bran into large flakes. If wheat is too dry and brittle, bran will be ground too fine rather than flaked and will be difficult to separate. If wheat is too wet, endosperm will stick to bran reducing yield.

During milling, grinding and separation takes place and in modern roller mills this is done gradually using different sets of rotating hardened steel rollers having spirals of corrugation of different sizes to break, cut or grind the particles of wheat. Endosperm is gradually reduced in particle size and is separated from bran and germ by running over sieves. All pairs of rollers will have one slow and one fast moving roller. There are five roll systems namely break, sizing, midds (or middlings), low grade and residue.

Break system cuts open the kernel, bran is flattened and endosperm is broken into large chunks. The purpose is to maximize separation of bran from endosperm. Sizing system further flattens and separates bran and germ from endosperm. Rolls are either finely corrugated or smooth. Most of the high quality flour is produced in midds system where rolls are very finely corrugated or smooth. After each pair of rolls, the milled material is run through a purifier, mostly gyratory bolters with sieves of different screen and cloth meshes. Vibration and air flow helps separation. Overs or particles not fine enough to pass through are directed to another set of rolls for further reduction or to residue stream which may contain bran, germ, shorts etc.

Finally, various streams are blended and mixed to make various grades of flour. They may then be treated with various flour improvers. Patent flour comes from streams containing least bran and germ particles and is whitest and having least ash. Clear flour has the maximum bran and germ and is darkest. Straight grade is one which has all streams patent and clear flours mixed but not the residue. This is about 72% of original wheat while bran and germ residue is about 28%.

Straight and clear flours will have more protein (coming from germ etc.) than patent flour from same wheat. Normal milling operation gives about 72% flours of all quality so called 72% extraction. Whole wheat flour (atta) is 100% extraction and will contain all the bran and germ of original wheat. Gluten is present only in endosperm and is useful in making bread and other leavened wheat products.

Bread Making

Bread is prepared by baking a dough prepared by mixing wheat flour and water along with some common additional ingredients like salt, fat, leavening agents yeast or baking soda. Some breads are steamed or fried. It may be either leavened or unleavened. Additionally it may also contain milk, egg, sugar, spice, fruit, vegetables, nuts or seeds. Bread is one of the oldest prepared foods, dating back to Neolithic era while leavened bread can be traced to prehistoric times.

Freshly baked bread has unique taste, aroma, quality, appearance and texture so keeping its freshness is important. Older bread is said to be stale and is hard. Bread is usually packaged to reduce loss of moisture that contributes to staling. Bread kept in warm and moist environment may show development of mould. Chilling may slow down mould growth but may stale faster.

Early leavening was done by yeast naturally present on grains but then it was noticed that foam from beer added to dough produced lighter bread. Modern breadmaking uses mechanical working of dough that reduces fermentation process markedly.

Bread is the staple food in most parts of the world. Even in Asia where staple is rice, bread is quite commonly consumed either as such or in some variant form. Usually bread is made using wheat flour dough that is leavened by yeast and baked in oven to form soft crumb inside and brown crust outside. Various species of wheat like durum and other grains like rye, barley, maize and oats may also be used besides common wheat variety. Because wheat has gluten which in presence of water provides elasticity to dough enabling it to hold large amount of gas produced by yeast raising the dough and producing an aerated light baked product, wheat is the most common ingredient for bread.

Wheat has three parts, endosperm, bran and germ. Endosperm has gluten and not bran and germ. So refined flour making tries to remove as much bran and germ and produce refined flour consisting as much of endosperm as possible. This gives fluffy soft white bread. When bran and germ contents increase in flour, the colour of the flour darkens and also leavening is poorer. However, bran and germ contain additional proteins and other nutrients including fibre so bread prepared using whole wheat flour is more nutritious and is brownish in colour.

Bread manufacturers try to provide different varieties of bread besides white bread. They may produce brown bread using partially added bran or may use colouring to make it brown. Whole wheat bread on the other hand is made from whole wheat flour. Some may add different grains like rye, oats etc. Rye also contains gluten although less than in wheat. Addition of rye to wheat to make rye breads adds fibre and nutrients from rye along with some of its flavour and brownish colour.

In South Asia, roti is made from whole wheat flour which is not leavened and is baked or roasted. Chapatti is a variant which is thinner and larger and may be folded several times before roasting. Naan is a leavened variant but is commonly prepared from refined flour which helps raising the dough. There are also quick breads that are commonly leavened chemically using baking powders. Some examples are pancakes, waffles, muffins etc.

The bread recipes by bakers are usually on the weight basis with flour considered as 100 units say kg to which about 50 kg of water are added for table bread and between 60 and 75 kg water for artisan formulas. More water produces more CO₂ bubbles giving coarser crumb. Wheat flour contain water soluble proteins albumin, globulin and proteoses and water insoluble glutenin and gliadin. When water is added, glutenin and gliadin by linking together form a structure called gluten upon kneading. When yeast is added to flour with water, it starts fermenting producing CO₂. The gluten structure makes the entire dough quite elastic and is able to entrap CO₂ bubbles so the dough gets aerated (leavening) increasing in volume and becoming light. If flour has lower protein content of 9 to 11%, longer mixing time will be needed to develop adequate gluten strength.

Most breads are leavened by bakers' yeast named *Saccharomyces cerevisiae*, the same species that is used for brewing alcoholic beverages like beer. While brewers' yeast strains are selected for their ability to produce more alcohol quite rapidly, the bakers' yeast is chosen on its ability to produce CO₂ rapidly in dough and producing pleasing aroma. Flour, salt and yeast are mixed with water to make a dough. The dough is allowed to rise one or more times. The longer rising time develops better flavour. The dough is then baked in the oven.

Chemically leavened or quick breads or soda breads use baking powder. This is how muffins, pancakes or American style biscuits (rolls) are made where an acid ingredient reacts with carbonate or bicarbonate in baking powder to produce CO₂ instead of yeast.

Fats like butter, vegetable oils, lard etc. affect the gluten formation as these coat proteins and hold the structure together. At about 3% level these fats will help leavening of dough and also they will tenderise the breads keeping them fresh longer after baking. There are also additional substances like ascorbic acid, sodium metabisulphate, ammonium chloride, phosphates, amylase and protease that are added as bread improvers that reduce the time required for dough rising and improve the texture and volume of breads. Salt is also commonly added to enhance flavour, control yeast activity, and improve crumb texture by strengthening gluten. Calcium propionate is added as preservative to retard the growth of moulds.

Pasta

Pasta is becoming popular all over the world with spaghetti, noodles, macaroni, lasagna, ravioli etc. and is made from wheat or buckwheat flour and water to which other ingredients like eggs may sometimes be added and is moulded into a variety of shapes and boiled. Pasta also refers to dishes in which pasta products are primary ingredients and are usually served with sauces.

There are hundreds of different shapes including rods, tubes, sheets, shells etc. Pasta is commonly prepared and dried so it could be stored for a long time. Dried pasta could be soaked and cooked by boiling before eating. Some prepare fresh pasta for immediate consumption at home or at restaurants. Italian pasta is mostly prepared using durum wheat flour or semolina and hence it is yellow in colour and firmer to bite. Other wheat varieties make softer pasta. Whole wheat pasta is now being produced which contains more fibre and other nutrients compared to refined pasta.

Oldest pasta or noodle-like foods were prepared in China from millets, wheat or rice. Many other cultures including Indian were making some sort of noodle-like foods prepared from grains.

Pasta is generally served with a sauce, the common being tomato sauce. Pasta is often paired with vegetables, meats or seafood. Besides vegetables accompaniments may include cheese, fish, nuts, spices, chilli peppers, mushrooms, eggs, meat preparations like meatballs, sausages etc.

Wheat flour, whole-grain

Nutrient	Units	Value per 100 grams
Water	g	10.74
Energy	kcal	340
Protein	g	13.21
Total lipid (fat)	g	2.50
Carbohydrate, by difference	g	71.97
Fiber, total dietary	g	10.7
Calcium, Ca	mg	34
Iron, Fe	mg	3.60
Thiamin	mg	0.502
Riboflavin	mg	0.165
Niacin	mg	4.957
Pantothenic acid	mg	0.603
Vitamin B-6	mg	0.407
Folate, total	mcg	44
Choline, total	mg	31.2
Carotene, beta	mcg	5
Vitamin A, IU	IU	9
Lutein + zeaxanthin	mcg	220
Vitamin E (alpha-tocopherol)	mg	0.71
Tocopherol, beta	mg	0.23
Tocopherol, gamma	mg	1.91
Vitamin K (phylloquinone)	mcg	1.9

Bread flour (Refined)

Nutrient	Units	Value per 100 grams
Water	g	13.36
Energy	kcal	361
Protein	g	11.98
Total lipid (fat)	g	1.66
Carbohydrate, by difference	g	72.53
Fiber, total dietary	g	2.4
Calcium, Ca	mg	15
Iron, Fe	mg	0.90
Thiamin	mg	0.080
Riboflavin	mg	0.060
Niacin	mg	1.000
Pantothenic acid	mg	0.438
Vitamin B-6	mg	0.037
Folate, total	mcg	33
Choline, total	mg	10.4
Carotene, beta	mcg	1
Vitamin A, IU	IU	2
Lutein + zeaxanthin	mcg	79
Vitamin E (alpha-tocopherol)	mg	0.40
Tocopherol, beta	mg	-
Tocopherol, gamma	mg	-
Vitamin K (phylloquinone)	mcg	0.3

Whole wheat (Hard Spring Red)

Nutrient	Units	Value per 100 grams
Water	g	12.76
Energy	kcal	329
Protein	g	15.40
Total lipid (fat)	g	1.92
Carbohydrate, by difference	g	68.03
Fiber, total dietary	g	12.2
Calcium, Ca	mg	25
Iron, Fe	mg	3.60
Thiamin	mg	0.504
Riboflavin	mg	0.110
Niacin	mg	5.710
Pantothenic acid	mg	0.935
Vitamin B-6	mg	0.336
Folate, total	mcg	43
Choline, total	mg	31.2
Carotene, beta	mcg	5
Vitamin A, IU	IU	9
Lutein + zeaxanthin	mcg	220
Vitamin E (alpha-tocopherol)	mg	1.01
Vitamin K (phylloquinone)	mcg	1.9

Durum Wheat

Nutrient	Units	Value per 100 grams
Water	g	10.94
Energy	kcal	339
Protein	g	13.68
Total lipid (fat)	g	2.47
Carbohydrate, by difference	g	71.13
Fiber, total dietary	g	-
Calcium, Ca	mg	34
Iron, Fe	mg	3.52
Thiamin	mg	0.419
Riboflavin	mg	0.121
Niacin	mg	6.738
Pantothenic acid	mg	0.935
Vitamin B-6	mg	0.419
Folate, total	mcg	43
Vitamin A, IU	IU	0

Source: USDA National Nutrient Database for Standard Reference, Release 23 (2010)

Innovative Ideas for Healthier Food Markets-

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Globally there is an epidemic of food related diseases and today is the time to take steps to bring this under control. This is the best time to intervene and make innovative foods that have a positive health effect and at the same time are appealing to the consumer. In short make sure that 'Food Industry shall not generate revenue for the Drug Industry'.

Industry needs to tackle the issues of diet related chronic diseases such as diabetes and cardiovascular heart diseases more seriously. Although these diseases cannot solely be cured by healthy food products alone but it cannot be denied that they do play a very important preventive and curative role. Healthy foods can be a precursor for your customers to be more aware towards their health. It does make a business sense when your customers would stay healthy for longer periods to use your products more.

Communication with the customer should be the key priority for a food business operator. The customer should be given the true picture so that he makes an informed choice. If you have a nutritionally not so good product which the customers enjoy, just tell them the truth and ask them to use it in moderation. This will surely have a positive response from the customers in the way of your brand value being increased, with the customers increased confidence in your products.

When we say that a certain food product is not so good or ban a commonly consumed food, it is not stopped being consumed. Thus we need to take another path; we should print an advice on the label. An appropriate example is of cigarette packs, they are injurious to health and this is declared on the packs. We make efforts to inform the consumer that primary prevention of disease is better.

Media campaign by the food industries is more focused on the children and teens, this is good but make sure the campaign of the product is done in a positive spirit. Some part of the media campaign funds needs to be diverted towards more of research and development as we need to develop more nutritious products. Also the advertisements should be evidence based and not have false claims. Today we see there are advertisements which make very high claims that are practically not achievable. Use the media campaign effectively to spread the right information based on scientific evidences.

When we know that food can be a preventive measure of chronic disease, it is also one of the causes for chronic diseases and we can't deny that. Thus, one of the prime importance for a company is to do a risk assessment for each of the products. With FSSAI looking at safety and health we need to keep risk assessment on our top priority list and go ahead with the product development if the benefits out-weigh the risks. Also we need to change our target audience and use growing children as change agents and not as attractive market. Many studies have shown that inactive lifestyle and decreased physical activities are associated with several lifestyle related complications. Industry should also take the responsibility to Promote Physical activities as CSR (Corporate Social Responsibility activity) when marketing foods for children and adolescents.

One of the attractive points for the consumer is the price of the product. Make 'Not so healthy foods' expensive. This will make the consumer incline towards the more healthy food options which are also comparatively cheaper, thus reducing their food expenses too. Government should make a conscious effort towards subsidizing the foods with good nutrition for the general public, more so for the underprivileged.

When we think of more healthy options what do we really look at in the food? Well in the present scenario, where there is global concern for health, the major modifications that the Food products should bring in them to make the foods as healthy as possible is to Moderate the salt and/or sugar content, use healthier fats, value addition to the products and adopt modern technology. Moderation of the salt intake should be done without compromising taste, as the Indian consumer still accepts the foods that are tasty and healthy and not the other way. The acceptance of a food that has been modified in taste can never be changed within a short period, there needs to be a strategic slow and steady decrease in the content of NaCl and replacing it with KCl. Care should be taken to mask the metallic and slightly bitter taste of the K salts. We consider fruits to be healthy and the fact is that they contain potassium in good amounts. When potassium enters the cell it displaces sodium and thus decreases the sodium content of the body. Taking this fact into consideration industry needs to work on similar principles. One may look at alternatives and taste enhancers which may further refine the taste and retain the product appealing the taste buds too.

Fat is a good source of energy. You cannot completely remove the fat from your diet as this may have adverse effects. Every nutrient is essential in moderation. We need to look at what fat are we consuming rather than how much are we consuming as it the quality that can be a causative agent for various diet related chronic diseases. This statement does not give one liberty to use fat in large quantity, but it states to reduce fat if possible and modify the quality of fat used and also try to eliminate Trans fats. Mixing and blending of different oils can be beneficial as they give you a large range of fatty acids. Also use of improved and new technology can be beneficial as there are many food engineering techniques available that can render the fat less absorbable. Genetic engineering is also slowly making ground. New ingredients such as plant sterols can be used to make the product heart friendly as plant Sterols/ Stanols are found to have cholesterol lowering effect.

Value addition for the food is good but it should not be indiscriminately done. Fortification of foods is one of the means for value addition; however, the vehicle for delivery of nutrients should be a commonly consumed /favoured food. This would lead to an acceptable approach by the consumers. Also there is a need to carryout studies for the bioavailability of the nutrients and a claim can be made with bioavailability data. This is a very welcome step not only from the regulatory point but also from the social responsibility as we need to look at the safety of the consumers and determine when and where to put a stop on fortification and where to encourage it.

With marketing for innovations one should also convey the message of wholesome food/meal being better for health. Using terms like 'Meal replacement' for any product meant for a healthy consumer is not appropriate as 'meal replacers' are meant only for selected groups such as convalescents, morbid obese or those with compromised health conditions and try and make a point to include a statutory warning stating that there is no better food than Natural/traditionally and freshly prepared wholesome meal.

Modern technological approach for innovations in product is also very useful. There is Marker assisted Selective Breeding or GMO's with nutritional enhancement. Industry should give a try to such useful technologies and make innovations possible. However the ethics, hazards and consumer preferences should be taken into account. There are also dietary promoters to enhance the nutrient bioavailability. Due to improvised technological advancements, Nanotechnology appears to be an enabling technology for food industry to deliver active compounds. Nano-particles can also be used for better delivery of nutrients in the human system and enhance the bioavailability of the active ingredients. When we talk of nano-particles, we are not much aware of the final results that the particle is going to have on health. Nano-particles get entry into the body systems due to their small size where as, naturally the nutrients have to pass through several cycles to reach that size and be absorbed, thus there surely should exist some variation between the two and we need to evaluate whether this difference does not have any adverse effect in the long run. Since the technology is being used by drug industry, food Industry can also look into its uses. Use of food encapsulation technology to manufacture healthy and nutritious food products with enhanced stability and shelf life in sectors such as dairy, infant foods, functional foods, nutraceuticals etc appear promising. However, since these techniques are new and there are not much of the data available, we need to spend more time and efforts in carrying out risk assessment and bio-safety evaluation of the developed products.

The food industry is of significant importance to the Nation's economy and should be supported by strong cultural traditions coupled with high quality thereby resulting in its good reputation. To keep pace with the rapid developments globally in the food sector, new thinking and innovations are essential. Ultimately we need to innovate but in a Healthy way.

Health & Nutrition News

Supplement Produces a 'Striking' Endurance Boost

Research from the University of Exeter has revealed taking a dietary supplement to boost nitric oxide in the body can significantly boost stamina during high-intensity exercise. The study has important implications for athletes, as results suggest that taking the supplement can allow people to exercise up to 20% longer and could produce a 1-2% improvement in race times.

This comes on the back of previous research from Exeter which showed that the high nitrate content of beetroot juice, which also boosts nitric oxide in the body, has a similar effect on performance. However, the latest study gets the nitric oxide into the body through a different biological process and now the researchers are hoping to find out whether combining the two methods could bring an even greater improvement in athletic performance.

Professor Andrew Jones, from the University's School of Sport and Health Sciences, said: "The research found that when the dietary supplement was used there was a striking increase in performance by altering the use of oxygen during exercise. "This is important for endurance athletes as we would expect the supplement to bring a 1-2% improvement in race times. While this may seem small, this is a very meaningful improvement particularly at elite levels where small gains can be the difference between winning and losing."

For the research, nine healthy males were put through several different physical challenges on a cycling ergometer to measure their performance under different levels of exercise intensity. Participants were randomly assigned to take either a blackcurrant cordial placebo drink or the genuine supplement, which was Ark 1 from Arkworld International Limited – which contains the L-arginine amino acid which enhances the production of nitric oxide in the body. The report, published on-line by the Journal of Applied Physiology, found taking the supplement:

- * Improves severe-intensity exercise endurance by 20%
- * Significantly reduces systolic blood pressure
- * Reduces the oxygen cost of exercise

Nutrition Horizon Aug 27 2010

Green Leafy Vegetables Reduce Diabetes Risk, Study Finds

Eating more green leafy vegetables can significantly reduce the risk of developing type 2 diabetes, finds research published online in the *British Medical Journal*. The authors, led by Patrice Carter at the University of Leicester, say there is a need for further investigation into the potential benefits of green leafy vegetables. In the last two decades there has been a dramatic increase in the number of individuals developing type 2 diabetes worldwide. Diets high in fruit and vegetables are known to help reduce both cancer and heart disease, but the relationship between fruit and vegetable intake and diabetes remains unclear, say the authors.

The researchers also note that previous research found that in 2002, 86% of UK adults consumed less than the recommended five portions of fruit and vegetables per day, with 62% consuming less than three portions. The study says that "it was estimated that inadequate consumption of fruit and vegetables could have accounted for 2.6 million deaths worldwide in the year 2000."

Patrice Carter and colleagues reviewed six studies involving over 220,000 participants that focused on the links between fruit and vegetable consumption and type 2 diabetes. The results reveal that eating one and a half extra servings of green leafy vegetables a day reduces the risk of type 2 diabetes by 14%. However, eating more fruit and vegetables combined does not significantly affect this risk. Only a small number of studies were included in the meta-analysis and the benefit of fruit and vegetables as a whole for prevention of type 2 diabetes may have been obscured.

The authors believe that fruit and vegetables can prevent chronic diseases because of their antioxidant content. Green leafy vegetables such as spinach may also act to reduce type 2 diabetes risk due to their high magnesium content. The authors argue that "our results support the evidence that 'foods' rather than isolated components such as antioxidants are beneficial for health

... results from several supplement trials have produced disappointing results for prevention of disease." In conclusion, they believe that offering tailored advice to encourage individuals to eat more green leafy vegetables should be investigated further.

In an accompanying editorial, Professor Jim Mann from the University of Otago in New Zealand, and Research Assistant Dagfinn Aune from Imperial College London, are cautious about the results and say the message of increasing overall fruit and vegetable intake must not be lost "in a plethora of magic bullets," even though green leafy vegetables clearly can be included as one of the five portions of fruit and vegetables per day. They argue that given the limited number of studies, "it may be too early to dismiss a small reduction in risk for overall fruit and vegetable intake or other specific types of fruits and vegetables and too early for a conclusion regarding green leafy vegetables."

Science Daily Aug. 20, 2010

B Vitamins and the Aging Brain Examined

B vitamins-B-6, B-12 and folate-all nourish the brain. But much remains to be discovered about the relation between these essential nutrients and our brainpower. U.S. Department of Agriculture (USDA) nutritionist Lindsay H. Allen has collaborated in ongoing research that has taken a closer look at the role these nutrients may play in preventing decline in brain function. The investigations, led by Mary N. Haan of the University of California-San Francisco, are part of the multiyear Sacramento (Calif.) Area Latino Study on Aging, or "SALSA." Begun in 1996, the study attracted nearly 1,800 Hispanic seniors, ages 60 to 101, as volunteers.

According to Allen, the research is needed because many studies of B vitamins and brain function have given inconsistent or conflicting results. Allen is director of the Agricultural Research Service (ARS) Western Human Nutrition Research Center in Davis, Calif. ARS is the chief intramural scientific research agency of USDA. Scientists from the University of California-Davis (UCD) and the UCD Medical Center also are collaborating in the research.

An analysis of volunteers' blood samples showed that lower levels of one B vitamin, folate, were associated with symptoms of dementia and poor brain function, also called "cognitive decline," as determined by standard tests of memory and other factors. The impairments were detectable even though less than 1 percent of the volunteers were actually deficient in folate.

In women, but not men, low levels of folate were associated with symptoms of depression. In fact, female volunteers whose plasma folate levels were in the lowest third were more than twice as likely to have symptoms of depression as volunteers in the highest third. That finding provided new evidence of an association between lower blood folate and depression. Depression is already known to affect brain function. In research with vitamin B-12, the SALSA team determined that a protein known as holoTC, short for holotranscobalamin, might be key to a new approach for detecting cognitive decline earlier and more accurately.

Science Daily Aug. 18, 2010

Possible Prevention of Weight Gain by Flax Consumption Warrants Further Investigation, Says New Study

Scientists discuss in 'Dietary milled flaxseed and flaxseed oil improve N-3 fatty acid status and do not affect glycemic control in individuals with well-controlled type 2 diabetes' new findings in type 2 diabetes. "To determine the effects of dietary consumption of milled flaxseed or flaxseed oil on glycemic control, n-3 fatty acid status, anthropometrics, and adipokines in individuals with type 2 diabetes. Thirty-four participants were randomized into a parallel, controlled trial," scientists in Winnipeg, Canada report (see also Type 2 Diabetes).

"The participants were adults with type 2 diabetes (age 52.4 ± 1.5 years, body mass index 32.4 ± 1.0 kg/m², n=17 men and 17 women). Participants consumed a selection of bakery products containing no flax (control group [CTL], n=9), milled flaxseed (FXS, n=13; 32 g/d), or flaxseed oil (FXO, n=12; 13 g/d) daily for 12 weeks. The FXS and FXO groups received equivalent amounts of alpha-linolenic acid (ALA; 7.4 g/day).

Measures of Outcome: The primary outcome measures were fasting plasma hemoglobin A(1c), glucose, insulin, and phospholipid fatty acid composition. The secondary outcome measures were fasting circulating leptin and adiponectin, as well

as body weight, body mass index, and waist circumference. Dietary intake assessment and calculations for homeostasis model assessment for insulin resistance and quantified insulin sensitivity check were also completed. The FXS and FXO groups had increases in plasma phospholipid n-3 fatty acids (ALA, eicosapentaenoic acid [EPA], or decosapentaenoic acid [DPA], but not docosahexaenoic acid), and the FXO group had more EPA and DPA in plasma phospholipids compared to the FXS group. All groups had similar caloric intakes; however, the CTL group experienced a 4% weight gain compared to baseline ($p < 0.05$), while both flax groups had constant body weights during the study period. All other parameters, including glycemic control, were unchanged by dietary treatment. Milled FXS and FXO intake does not affect glycemic control in adults with well-controlled type 2 diabetes," wrote C.G. Taylor and colleagues, University of Manitoba.

The researchers concluded: "Possible prevention of weight gain by flax consumption warrants further investigation."
From SoyaTech eNews July 26, 2010

Soy Saponin May Help Prevent Colon Cancer: Chinese Research

Fresh data on colon cancer are presented in the report 'Effect of soy saponin on the growth of human colon cancer cells.' In this recent study, researchers in Taipei, People's Republic of China conducted a study "To investigate the effect of extracted soybean saponins on the growth of human colon cancer cells. WiDr human colon cancer cells were treated with 150, 300, 600 or 1200 ppm of soy saponin to determine the effect on cell growth, cell morphology, alkaline phosphatase (AP) and protein kinase C (PKC) activities, and P53 protein, c-Fos and c-Jun gene expression."

"Soy saponin decreased the number of viable cells in a dose-dependent manner and suppressed 12-O-tetradecanol-phorbol-13-acetate-stimulated PKC activity ($p < 0.05$). Cells treated with saponins developed cytoplasmic vesicles and the cell membrane became rougher and more irregular in a dose-dependent manner, and eventually disassembled. At 600 and 1200 ppm, the activity of AP was increased ($p < 0.05$). However, the apoptosis markers such as c-Jun and c-Fos were not significantly affected by saponin," wrote C.Y. Tsai and colleagues, Taipei Medical University (see also Colon Cancer).

The researchers concluded: "Soy saponin may be effective in preventing colon cancer by affecting cell morphology, cell proliferation enzymes, and cell growth."

From: SoyaTech eNews July 30, 2010

DHA for Nursing Moms

Premature infants, especially those born prior to the third trimester, are prone to a number of developmental challenges. A deficiency in docosahexaenoic acid (DHA), an omega 3 fatty acid, can prove critical for brain growth and development. Premature infants can suffer from immature gastrointestinal systems, which increase the risk of malnutrition, opening a veritable Pandora's Box of health problems. Canadian researchers embarked on a study to determine if supplementing mothers' diets with DHA supplements would increase DHA levels in breastfed preemies with positive results.

"Results suggested that an early supplementation with DHA to lactating mothers with low dietary DHA was successful in increasing DHA status in very preterm infants," said lead study author, Isabelle Marc, MD, PhD, an assistant professor in the Department of Pediatrics at Laval University in Quebec, Canada, and clinician researcher at Centre Hospitalier Universitaire de Québec.

Dr. Marc said she and her colleagues set out to uncover the possible link between the consumption of DHA and brain development for babies in general and preterms in particular. "DHA is a major component of brain cell structure," she explained. "Intra-uterine accretion of DHA in tissues is absent in very preterm born with low reserves of fat. DHA milk concentration is low in Canadian women and very closed from their DHA consumption. So breastfed preterms are vulnerable to dietary deficiency since their growth rate is faster than at any other period of their life."

The study followed breastfeeding mothers of 12 infants born at 29 weeks gestation or earlier. The mothers received 1200 mg of DHA (provided by Mead Johnson Nutrition) per day until 36 weeks post-conception. Researchers compared DHA levels in the mothers' breast milk, mothers' and babies' plasma lipids, and daily DHA intakes in the preterm infants from birth to day 49 with a control group of very preterm infants and mothers who did not receive DHA supplements during lactation.

Researchers achieved a 1% DHA content in the milk provided to the preterm before reaching the third week of life and full enteral feeding. "Although there is no difference in the enteral feeding intake at day 49, infants of the DHA group received 55.2 ± 37.6 mg/kg/day of DHA compared with 7.2 ± 11.1 in the reference group," they wrote. "In infants, the intervention results in a positive significant trend in the DHA plasma concentrations over the study period ($p=0.0143$) with a significant

difference between the two groups at Day 49 (60.3ng/ml \pm 23.5 in DHA group (n=12) and 31.7ng/ml \pm 10.7 in the reference group (n=21), p=0.0014). Changes in the fatty acid composition suggested that intervention did not significantly alter AA and EPA content in preterm's plasma and mother's milk."

In summary, the study demonstrated that DHA levels in the breast milk of mothers who received supplements were almost 12 times higher than levels in the milk of mothers in the control group. Although there was no difference in the enteral (tube) feeding intake among both groups of infants, those in the intervention group received about seven times more DHA than the control group. In addition, plasma DHA concentrations in mothers and babies in the DHA group were two to three times higher than the control group.

Dr. Marc said the study underscored the developmental benefits of DHA supplementation for preterm babies. "In breastfed premature [infants], DHA intake is restricted entirely to the concentration available in mother's breast milk," she said. "Further studies must explore the role of DHA intake at all level of child development and growth particularly in at risk infants.

"Our results underline the urgent need for recommendations addressing dietary DHA intake during lactation of mothers of very preterm infants to reach optimal DHA level in milk to be delivered to the baby for optimal growth and neurodevelopment, since the human milk DHA content in mothers not consuming fish during this period is most probably insufficient," she added.

Nutraceuticals World July 22, 2010

Curcumin Benefits Osteoarthritis Patients

A proprietary curcumin extract may relieve pain and increase mobility in osteoarthritis (OA) patients at a dose much lower than prior studies on similar endpoints, according to a new study published in *Panminerva Medica* (2010 June;52(2 Suppl 1):55-62). Curcumin, the principal curcuminoid of the popular Indian spice turmeric, is a member of the ginger family. The trial involved OA given a complex of curcumin with soy phosphatidylcholine (Meriva®, from Indena SpA) at a dosage of 200 mg/d, compared to up to 8 g/d used in prior, otherwise comparable trials. The investigation was undertaken by Indena scientists in conjunction with scientists from Chieti-Pescara University, Pescara, and Università del Piemonte Orientale, Novara, both in Italy. The researchers gauged OA in 50 patients using WOMAC scores. Mobility was evaluated using walking performance (treadmill), and C-reactive protein (CRP) was measured to assess inflammatory status.

Global WOMAC score decreased by 58 percent after three months of treatment, while walking distance in the treadmill test was prolonged from 76 m to 332 m at the same interval; likewise, CRP levels decreased from 168 (\pm 18) to 11.3 (\pm 4.1) mg/L in the subpopulation with high CRP. The control group experienced only a modest 2-percent increase in WOMAC score, only a slight improvement in mobility (from 82 m to 129 m in the treadmill test), and a modest drop in CRP, from 175 \pm 12.3 to 112 \pm 22.2 mg/L). The treatment costs (use of anti-inflammatory drugs, treatment and hospitalization) were reduced significantly in the treatment group.

The researchers concluded Meriva® is "clinically effective in the management and treatment of osteoarthritis," and "the increased stability and better absorption of curcumin induced by complexation with phospholipids have clinical relevance, setting the stage for larger and more prolonged studies."

According to Indena, this study represents the first time curcumin showed clinical efficacy at low and realistic dosages, a benefit the company attributed to the phospholipid formulation obtained with the Phytosome® technology. This special type of complexation had previously been shown to improve the stability and absorption of curcumin also in humans.

"Over 2,500 preclinical investigations have shown a potential role for curcumin in the treatment of a wide array of diseases, especially of the chronic-inflammatory type," said Giovanni Appendino, professor of organic chemistry at the University of Eastern Piedmont, Novara, and scientific advisor for Indena. "However, the low water solubility of curcumin, its chemical instability at intestinal pH values, and its extremely poor oral bioavailability have so far hampered all attempts of clinical developments. Today, those problems have been largely overcome by phospholipid complexation offering improved stability and oral absorption in comparison with un-complexed curcumin."

Food Product Design July 28, 2010

Soy Isoflavones Provide Modest Benefit to Bone Health in Three-Year ARS Study

Scientists already know much about the more than 200 bones that make up your body. But mysteries remain regarding the exact role that many natural compounds in foods might play in strengthening our skeletons. Those compounds include estrogen-like substances known as soybean isoflavones.

Agricultural Research Service (ARS) physiologist Marta D. Van Loan and other researchers learned more about these compounds in a 3-year study--the longest of its kind--reported earlier this year in the *American Journal of Clinical Nutrition*. Van Loan is with the ARS Western Human Nutrition Research Center at the University of California-Davis.

Because of its potential as a possible substitute for conventional steroid hormone replacement therapy for postmenopausal women, soy has been the subject of more than two dozen studies conducted here and abroad during the past decade. According to Van Loan, some of those investigations suggest that soy enhances bone health.

Van Loan teamed up with Iowa State University researcher D. Lee Alekel and others for the 3-year investigation to determine whether isoflavones extracted from soy protein would protect postmenopausal volunteers against bone loss. Participants in the study took either a placebo tablet or a tablet containing one of two moderate amounts of the isoflavones--80 milligrams (mg) or 120 mg--for the duration of the investigation.

Overall, the isoflavones had no significant positive effect on preventing bone loss. However, the 120-mg treatment showed a modest benefit when evaluated in conjunction with lifestyle factors.

The researchers suggest that the body's response to isoflavones extracted from soy proteins may be different from responses to isoflavones in their natural matrix of soy protein or soy foods, or in a soy-protein supplement. Or, some soy-protein compound other than the extracted isoflavones may have been responsible for the bone-protecting effects seen in some previous studies. Finally, the isoflavone doses used in the 2010 study may not have been high enough to produce a bone-sparing effect.

From: SoyTech eNews August 2, 2010

PUFA Deficiency Impacts AMD

SALT LAKE CITY—A deficiency in long-chain and very long-chain polyunsaturated fatty acids (LC-PUFAs, VLC-PUFAs) may adversely affect eye health and influence the development of age-related macular degeneration, according to a new study (*J Lipid Res.* ePub 5 Aug 2010. DOI: [10.1194/jlr.M007518](https://doi.org/10.1194/jlr.M007518)). Researchers from the **Moran Eye Center** at the University of Utah noted fatty acids play important roles in normal retinal function and visual development, although the majority of research has focused on the long-chain PUFAs up to 22-carbons in length, including docosahexaenoic acid (DHA), a 22:6(n-3) fat.

The research team developed gas chromatography coupled with mass spectrometry (GC-MS) methods to detect both LC- and VLC-PUFAs and applied them to the study of changes in ocular aging and AMD. In the area of ocular aging, some VLC-PUFAs in retina and retinal pigment peaked in middle aged. Further, compared to age-matched donors, subjects with AMD had significantly lower levels of DHA and some VLC-PUFAs in their retina and pigment, and also had a significantly increased ratio of n-6 to n-3 PUFAs. They concluded a deficiency of the longer-chain PUFAs, possibly coupled with a concurrent imbalance in the n-6/n-3 ratio, could affect the development of AMD.

Food Product Design August 10, 2010

Forming Healthy Food Choices Early in Life

New research from Mahidol University reveals cartoons, tasting parties and junior cooking classes may help increase vegetable intake in kindergarten children. The findings, published in the journal *Nutrition & Dietetics*, found the type and amount of vegetables children ate improved after they took part in a program using multimedia and role models to promote healthy food.

Researchers followed 26 kindergarteners aged 4 to 5 during the 8-week study and recorded the types and amount fruit and vegetables eaten before and after the program. "We got the children planting vegetable seeds, taking part in fruit and vegetable tasting parties, cooking vegetable soup, and watching Popeye cartoons. We also sent letters to parents with tips on encouraging

their kids to eat fruit and vegetables, and teachers sat with children at lunch to role model healthy eating," wrote the lead researcher.

The researchers found vegetable intake doubled and the types of vegetables the children consumed increased from two to four. Parents also reported their children talked about vegetables more often and were proud they had eaten them in their school lunch. There was no significant change in the kinds of fruit eaten by the children; however, the researchers noted the children already were eating more fruit than vegetables at the beginning of the study.

The researchers also suggest sitting next to children and eating the same foods as them makes children feel special; tasting parties are an enjoyable way for children to compare tastes of fruit and vegetables; and involving children in food preparation activities, like measuring, pouring and stirring helps them learn the names and colors of foods and develops their hand-eye coordination.

EurekAlert: August 9, 2010

Capsaicin May Help Lower Blood Pressure

Capsaicin, the compound that gives chiles their fiery heat, also causes blood vessels to relax. In a study published in **Cell Metabolism**, researchers studied the effect of capsaicin on hypertensive rats.

"We found that long-term dietary consumption of capsaicin, one of the most abundant components in chili peppers, could reduce blood pressure in genetically hypertensive rats," said Zhiming Zhu of Third Military Medical University in Chongqing, China.

The effect of capsaicin on blood pressure depends on the chronic activation of the transient receptor potential vanilloid 1 (TRPV1) channel, found in the lining of blood vessels. Activation of the channel leads to an increase in production of nitric oxide, a gaseous molecule known to protect blood vessels against inflammation and dysfunction.

Previous studies on the link between capsaicin and blood pressure were based on acute or short-term exposure to capsaicin. The researchers say their study is the first to examine the effects of long-term capsaicin treatment in rats with high blood pressure.

The findings in rats should be confirmed in humans through epidemiological analysis, the researchers said. In fact, there were already some clues: the prevalence of hypertension is over 20% in Northeastern China compared to 10-14% in Southwestern China, including Sichuan, Guozhuo, Yunnan, Hunan, and Chongqing, where Zhu is from.

The researchers suggest that follow-up studies on humans is necessary, as well as research on the amount of capsaicin-containing chiles one would have to eat in order to maintain desired blood pressure. For hypertensives who don't care for spicy food, the researchers say the compound capsinoid is closely related to capsaicin and would likely product similar effects.

Food Product Design August 6, 2010

Combination of Soy Protein and Sago Can Delay Fatigue: Malaysian Research

"The purpose of the study was to investigate whether a combination of sago and soy protein ingested during moderate-intensity cycling exercise can improve subsequent high-intensity endurance capacity compared with a carbohydrate in the form of sago and with a placebo. The participants were 8 male recreational cyclists with age, weight, and VO₂max of 21.5 +/- 1.1 yr. 63.3 +/- 2.4 kg, and 39.9 +/- 1.1 ml. kg(-1). min(-1), respectively," scientists in Kuala Lumpur, Malaysia report (see also **Metabolism**).

"The design of the study was a randomized, double-blind placebo-controlled crossover comprising 60 min of exercise on a cycle ergometer at 60% VO₂max followed by a time-to-exhaustion ride at 90% VO₂max. The sago feeding provided 60 g of carbohydrate, and the sago-soy combination provided 52.5 g of carbohydrate and 15 g of protein, both at 20-min intervals during exercise. Times to exhaustion for the placebo, sago, and sago-soy supplementations were 4.09 +/- 1.28, 5.49 +/- 1.20, and 7.53 +/- 2.02 min, respectively. Sago-soy supplementation increased endurance by 84% (44-140%; p< .001) and by 37% (15-63%; p< .05) relative to placebo and sago, respectively. The plasma insulin response was elevated above that with placebo during sago and sago-soy supplementations," wrote A.K. Ghosh and colleagues, University of Malaya.

The researchers concluded: "The authors conclude that a combination of sago and soy protein can delay fatigue during high-intensity cycling."

SoyaTech eNews August 13, 2010

Low Folate Levels Linked to Cognitive Decline

A multiyear research project has been underway since 1996 to investigate how B vitamins, specifically vitamins B6, B12 and folate, may play a role in preventing cognitive decline.

The investigations are part of the multiyear **Sacramento Area Latino Study on Aging (SALSA)** that has attracted close to 1,800 Hispanic seniors, aged 60 to 101, as volunteers.

Researchers at the Agricultural Research Service (ARS) Western Human Nutrition Research Center in Davis, Calif., University of California-Davis and the UCD Medical Center analyzed the volunteers' blood samples and found lower levels of folate were associated with symptoms of dementia and poor brain function as determined by standard tests of memory and other factors. The impairments were detectable even though less than 1 percent of the volunteers were actually deficient in folate.

Low levels of folate in women were associated with symptoms of depression. Female volunteers whose plasma folate levels were in the lowest third were more than twice as likely to have symptoms of depression as volunteers in the highest third. The findings provided new evidence of an association between lower blood folate and depression.

In research with vitamin B12, the SALSA team determined a protein known as holoTC, short for holotranscobalamin, might be key to a new approach for detecting cognitive decline earlier and more accurately.

Food Product Design August 17, 2010

Carnitine Fuels Muscle Recovery

Supplementing a diet with L-carnitine may support muscle recovery and repair in middle-aged adult, according to a new study from researchers at the University of Connecticut.

The findings involved 18 middle-aged men and women who received 2 g/d of L-carnitine or placebo for three weeks; after a week-long washout period, they underwent the other treatment. During the crossover period and after the end of the study, the subjects performed an exercise challenge and had blood samples taken.

Researchers found the L-carnitine lowered levels of purine metabolism, free radical formation, muscle tissue disruption and muscle soreness after exercise. Physical performance during exercise was not impacted by L-carnitine supplementation. They concluded L-carnitine could help reduce muscle damage and muscle soreness in middle-aged adults, a growing segment of the U.S. population. Natural sources carnitine are found in red meat, dairy products, nuts and seeds, legumes, vegetables, fruits, cereals and grains.

Food Product Design August 12, 2010

Cinnamon Extract Reduces Diabetes Risk

Cinnamon extract might help reduce the risk of developing diabetes. For a 12-week study published in the *Journal of the American College of Nutrition*, 22 obese participants with prediabetes, or impaired blood glucose values, were divided randomly into two groups and given either a placebo or 250 milligrams (mgs) of a dried water-soluble cinnamon extract twice daily along with their usual diets. Blood was collected after an overnight fast at the beginning of the study, after six weeks, and after 12 weeks to measure the changes in blood glucose and antioxidants.

The study demonstrated that the water-soluble cinnamon extract improved a number of antioxidant variables by as much as 13 to 23 percent, and improvement in antioxidant status was correlated with decreases in fasting glucose. Prediabetes occurs when cells are resistant to the higher-than-normal levels of insulin produced by the pancreas (in an attempt to help remove elevated glucose levels from blood).

Sources: Food Product Design August 24, 2010

Ginger Inhibits Onset of Diabetic Cataract

HYDERABAD, India—Common ingredients are increasingly proving to have significant health benefits. Ginger (*Zingiber officinalis*) may prevent the development of diabetic cataract via antiglycating activity, according to a study published in *Molecular Vision*. Researchers from the **National Institute of Nutrition** in Hyderabad, India, reported the formation of advanced glycation end products (AGE) plays a key role in the pathologies of several conditions related to aging and diabetes, including arthritis, neuropathy and cataract.

In the current trial, diabetes was induced in Wistar NIN rats by intraperitoneal injection of streptozotocin (35 mg/kg body weight). The diabetic animals received either a standard diet or a diet that included 0.5 percent or 3 percent ginger for two months. After the intervention, the animals were sacrificed to evaluate non-enzymatic glycation and osmotic stress in the eye lens. Animals consuming ginger had delayed onset and slowed progression of cataract. Molecular analysis found ginger significantly inhibited formation of various AGE products in the eye lens, and helped counter hyperglycemia-induced osmotic stress in the eye.

Food Product Design August 24, 2010

Vitamin D Eases Allergies, Asthma

PITTSBURGH, Pa.—Data from a study published in the *Journal of Clinical Investigation* provided rationale for a therapeutic trial of vitamin D to prevent or treat allergic *Bronchopulmonary aspergillosis* (ABPA) in patients with cystic fibrosis (Aug. 16, 2020). ABPA is caused by a dominant Th2 immune response to antigens derived from the opportunistic mold *Aspergillus*, most commonly *Aspergillus fumigatus*. It occurs in 4 percent to 15 percent of patients with cystic fibrosis (CF). Researchers compared cohorts of *A. fumigatus*-colonized CF patients with and without ABPA to identify factors mediating tolerance versus sensitization.

The costimulatory molecule OX40 ligand (OX40L) was critical in driving Th2 responses to *A. fumigatus* in peripheral CD4+ T cells isolated from patients with ABPA. In contrast, CD4+ T cells from the non-ABPA cohort did not mount enhanced Th2 responses in vitro and contained a higher frequency of TGF-beta-expressing regulatory T cells. Heightened Th2 reactivity in the ABPA cohort correlated with lower mean serum vitamin D levels. In vitro addition of 1,25 OH-vitamin D3 substantially reduced DC expression of OX40L and increased DC expression of TGF-beta. This in vitro treatment also resulted in increased Treg TGF-beta expression and reduced Th2 responses by CD4+ T cells from patients with ABPA.

Food Product Design August 24, 2010

Omega-3s Feed a Healthy Brain

HOUSTON—Consuming nutrient-rich foods such as omega-3s, blueberries and chocolate, and engaging in regular physical and mental exercises may increase brain health and ward off Alzheimer's, a University of Texas researcher.

John H. Byrne, Ph.D., professor and chairman of the Department of Neurobiology and Anatomy at the University of Texas Health Science Center at Houston (**UTHealth**) Medical School said individuals should consume more nutrients that can support neurological function. Omega-3 fatty acids, for example, as found in oily fish are one choice; other foods rich in healthy antioxidants such as blueberries, red wine, green tea and dark chocolate also can bolster brain health. He encouraged people to maintain a healthy weight, as obesity has been linked to higher incidence of Alzheimer's disease and other related conditions.

He also noted physical exercise is not only good for the muscles and cardiovascular system, but also benefits brain function.

"There is a lot of recent evidence demonstrating that exercise itself promotes neurogenesis—the generation of new nerve cells in the brain. It had long been believed that once you lose nerve cells, they are gone for good and the brain cannot regenerate them, but exercise appears to inspire the brain's ability to generate nerve cells," he said.

Food Product Design August 20, 2010

Omega-3, Seafood Consumption Boosts Hearing

Two recent studies in populations in the Netherlands and Australia examining the link between fish or seafood omega-3 fatty acid consumption and hearing loss in older adults observed significantly less hearing loss in older adults with high intakes of fish. In one study, those with hearing loss who ate fish once to twice a week experienced about half the rate of deterioration in their hearing over five years compared with those who ate fish less than once a week.

In the Dutch study, researchers measured the participants' hearing at low and high frequencies and estimated their fish consumption from a dietary questionnaire. Three years later, they measured the hearing status of the participants to see whether any changes were related to their omega-3 intakes. They found that hearing losses were greatest in those with the lowest consumption of seafood omega-3s although the difference between those the highest and lowest omega-3 groups was small. Hearing loss occurred mainly in the low frequency range and was greater in older (age 60 to 70) than younger (age 50 to 60) participants.

In the Australian study, participants had their hearing evaluated at the beginning of the study and after five years. Their fish and seafood omega-3 intakes were assessed at enrollment in the study. In contrast to the Dutch study, participants with the highest baseline omega-3 consumption from all sources, including seafood and plants, were about 10 percent less likely to have hearing loss compared with those in the lowest intake category. This relationship was not seen for seafood omega-3s alone. After five years neither omega-3 nor omega-6 was related to the likelihood of developing hearing loss. However, eating fish frequently was associated with a 42-percent lower chance of developing hearing loss over the study period. The researchers also observed progressive hearing loss was about half as much in those who ate fish once to twice a week compared with those who ate fish less than once a week. Eating fish twice a week or more had no additional effect on the rate of progression.

Sources: food product design August 18, 2010

Zinc Deficiency Increases Pneumonia Risk in Elderly

BOSTON—Elderly individuals with low levels of blood zinc concentrations have a 50-percent greater risk of developing pneumonia than individuals with normal zinc concentrations, according to a new study published in the *American Journal of Clinical Nutrition*.

Researchers at the Nutritional Immunology Laboratory at the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA) at Tufts University have been studying immune response and respiratory infections in about 600 elderly residents in 33 nursing facilities in the Boston area. They found a high proportion of the residents had low serum (blood) zinc concentrations at baseline and after one year of follow-up. All participants had been supplemented with half of the recommended dietary allowance of essential vitamins and minerals, including zinc, during the trial.

As reported by *Newswise*, individuals with normal zinc status not only were less likely to develop pneumonia, but they also had fewer new prescriptions for antibiotics, a shorter duration of pneumonia, and fewer days of antibiotic use compared with residents who had low zinc levels. Mortality also was lower in those with adequate blood zinc levels. The researchers suggests that supplementation of zinc-deficient elderly may result in reduced risk of pneumonia.

Sources: Food Product Design August 18, 2010

Regulatory News

Nutritional Labeling and Point-of-Purchase Signs Influence Healthy Food Choices

Poor diet and physical inactivity leading to obesity are poised to overtake tobacco use as the leading cause of preventable death in the United States. With over 30% of U.S. adults obese, the significant adverse health effects of obesity (including heart disease and diabetes) are widespread throughout the country. Two studies published in the August issue of the *Journal of the American Dietetic Association* shed light on behaviors regarding food choices and good nutrition and report on how nutritional labeling and point-of-purchase signs are influencing healthy food choices.

"Food Label Use and Its Relation to Dietary Intake among U.S. Adults" by Nicholas J. Ollberding, PhD, Randi L. Wolf, PhD, and Isobel Contento, PhD, all of the Program in Nutrition, Department of Health and Behavior Studies, Teachers College, Columbia University, examined to what extent people used the nutritional label on food products and whether that use affected their nutrient intake.

Using a nationally representative sample of U.S. adults who participated in the 2005-2006 National Health and Nutrition Examination Survey (NHANES), the authors found that 61.6% of participants reported using the nutrition facts panel, 51.6% used the list of ingredients, 47.2% read the serving size, and 43.8% reviewed health claims at least sometimes when deciding to purchase a food product.

Significant differences in mean nutrient intake of total calories, total fat, saturated fat, cholesterol, sodium, dietary fiber, and sugars were observed between food label users and non-users with label users reporting healthier nutrient consumption. The greatest differences observed were for total calories and fat and for use of specific nutrient information on the food label.

"If the food label is to have a greater public health impact, rates of use will likely need to be increased among U.S. adults," commented Professor Ollberding. "Low rates of label use also suggest that national campaigns or modification of the food label may be needed to reduce the proportion of the population not using this information. Possible changes to the current label that have been suggested include bolding calorie information, reporting the total nutrient intake for foods likely to be consumed in a single sitting, and using more intuitive labeling that requires less cognitive processing such as a red, yellow, and green 'traffic light' signs on the front of the label. The food label alone is not expected to be sufficient in modifying behavior ultimately leading to improved health outcomes, but may be used by individuals and nutrition professionals as a valuable and motivating tool in our efforts to combat obesity and diet-related chronic disease."

A pilot study of a Point-of-Purchase (POP) program was shown to influence the purchasing behaviors of a multi-ethnic college population shopping at an on-campus convenience store. The results are reported in "Point-of-Purchase Nutrition Information Influences Food-Purchasing Behaviors of College Students: A Pilot Study" by Marjorie R. Freedman, PhD, and Rachel A. Connors, MS, from the Department of Nutrition, Food Science & Packaging, San Jose State University.

This 11-week study collected baseline sales data for 6 weeks during the middle of the Fall 2008 semester. After students returned from Winter break, "Eat Smart" program materials featuring the "Fuel Your Life" logo were placed in the on-campus convenience store. Sales data were collected during the middle of the Spring 2009 semester for 5 weeks, ending just before students left for Spring break.

Healthful items in seven food categories (cereal, bread, soup, cracker, canned vegetable, granola/energy bar, and salad dressing) were tagged throughout the market. There was no difference in price between the tagged and untagged items. While no significant difference in sales of any particular food item was observed between baseline and intervention, overall sales of tagged items, as a percentage of total sales in the cereal, soup, and cracker categories, increased as a result of the intervention, while sales of tagged bread items decreased. Though not statistically significant, the intervention resulted in a 3.6% increase in the percentage of sales from tagged items.

Writing in the article, Freedman and Connor state, "This pilot project was the first to use computerized sales data to examine the effect of a POP nutrition information program on the food-buying habits of multi-ethnic college students. Promising (albeit, not statistically significant) results imply that students were influenced by "Fuel Your Life" shelf tags and related materials. Despite several study limitations, the program was successful in increasing the percentage of tagged food items sold relative to other non-tagged items in the same category. Keeping all items in the same category at the same price meant that consumer choice was based on perceived nutritional benefit, not economics."

"This research indicates that a simple logo helped students identify healthful food choices, and positively influenced food choice," commented Professor Freedman. "It would be interesting to determine if a combination of point-of-purchase nutrition information, coupled with economic incentives (e.g. lower prices for healthier foods) would further drive consumers to choose these healthier food items. We must aggressively test such options in light of the increasing threat of obesity to the health of our society."

Science Daily Aug. 2, 2010

Video Study Finds Risky Food-Safety Behavior More Common Than Thought

How safe is the food we get from restaurants, cafeterias and other food-service providers? A new study from North Carolina State University -- the first study to place video cameras in commercial kitchens to see how precisely food handlers followed food-safety guidelines -- discovered that risky practices can happen more often than previously thought.

"Meals prepared outside the home have been implicated in up to 70 percent of food poisoning outbreaks, making them a vital focus area for food safety professionals," says Dr. Ben Chapman, assistant professor and food safety specialist in the department of family and consumer sciences at NC State and lead author of the paper. "We set out to see how closely food handlers were complying with food safety guidance, so that we can determine how effective training efforts are."

In order to get firsthand data on these food-safety practices, researchers placed small video cameras in unobtrusive spots around eight food-service kitchens that volunteered to participate in the study. There were as many as eight cameras in each kitchen, which recorded directly to computer files and were later reviewed by Chapman and others. What they found demonstrates the need for new food safety-focused messages and methods targeting food handlers.

"We found a lot more risky practices in some areas than we expected," Chapman says. For example, most previous studies relied on inspection results and self-reporting by food handlers to estimate instances of "cross-contamination" and found that cross-contamination was relatively infrequent. But Chapman's study found approximately one cross-contamination event per food handler per hour. In other words, the average kitchen worker committed eight cross-contamination errors, which have the potential to lead to illnesses, in the course of the typical eight-hour shift.

Cross-contamination occurs when pathogens, such as Salmonella, are transferred from a raw or contaminated source to food that is ready to eat. For example, using a knife to cut raw chicken and then using the same knife to slice a sandwich in half. Cross-contamination can also result from direct contact, such as raw meat dripping onto vegetables that are to be used in a salad.

"Each of these errors would have been deemed a violation under U.S. Food and Drug Administration Food Code inspection guidelines. But more importantly, cross-contamination has the potential to lead to foodborne illnesses and has in recent outbreaks" Chapman says. "And it's important to note that the food-service providers we surveyed in this study reflected the best practices in the industry for training their staff."

The study also confirmed the long-held supposition that more food-safety mistakes are made when things are busier in the kitchen. "During peak hours, we found increases in cross-contamination and decreases in workers complying with hand-washing guidelines," Chapman says.

But the researchers do more than identify problems in the new paper; they outline solutions that can be applied to the food service industry. One suggestion is that food-safety training for kitchen staff needs to address the "team-like" nature of a commercial kitchen, rather than focusing on food handlers as individuals. "This study shows us that each food handler is operating as part of a system," Chapman says, "and the food-safety culture of the overall organization -- the kitchen and the management -- needs to be addressed in order to effect change. For example, the general manager of a restaurant could take steps to highlight the value his or her business places on food safety."

Other steps that can be taken to address food-safety concerns include the introduction of new tools and procedures designed to minimize the risk of foodborne illness. New tools could be as simple as installing hand sanitizer units in accessible areas of the kitchen, which may be effective for reducing the likelihood of transfer of some pathogens. New procedures may include overhauling existing food-preparation schedules so that cooks face less time pressure during peak hours -- and are therefore less likely to make food-safety mistakes.

Science Daily Aug. 12, 2010

New Study Says Genetically Modified Crops Are Safe, Meet the Needs of a Growing Population

The use of biotechnology to create genetically modified crops can meet the needs of a growing population, according to a new study by the National Center for Policy Analysis, especially as the world's population grows from six billion to approximately nine billion people this century. "If the government removed bans and strict regulations on biotechnology, the world could produce more than enough food for the growing population to have minimally adequate diets," said NCPA Senior Fellow, H. Sterling Burnett.

The "precautionary principle" used by radical environmentalists to prevent the use of biotechnology, is based on the idea that precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically.

"This is just like saying 'better safe than sorry,'" Burnett said. "However, genetically modified crops are already in widespread use around the world and have been shown to have no harmful effects to date. They are already providing benefits to millions of people worldwide."

Golden rice, or rice genetically altered to contain beta carotene and new genes to overcome iron deficiency, is preventing thousands of cases of childhood blindness and reducing anemia, according to the NCPA study. Additionally, through genetic modification, crops can be altered to improve various crops' nutritional value and reduce the environmental impact of farming, which are very important factors as the population and demand for food grow, Burnett adds, noting the world will need to produce three times more food than is currently produced. "Government regulations will only serve to stifle innovation and reduce the benefits of bioengineered crops," Burnett said. "The government should not limit access to biotechnology advances in the developing world, which is most in need of these agricultural breakthroughs."

From: SoyaTech eNews July 27, 2010

Food Label Users Eat Healthier

People who read food labels are more likely than those who don't to eat healthy diets, according to a recent study published in the Journal of the American Dietetic Association. Rates of diet-related chronic disease combined with the lack of current data on patterns of food label use by the US population warrant re-examination of the use and potential influence of this public health tool, study authors said. The purpose of this study was to describe the prevalence of food label use and the association between food label use and nutrient intake in a nationally representative sample of U.S. adults who participated in the 2005-2006 National Health and Nutrition Examination Survey.

Data on food label use were collected during the interview portion of the survey, and nutrient intake was estimated using the average of two 24-hour dietary recalls. In this sample, 61.6% of participants reported using the Nutrition Facts panel, 51.6% looked at the list of ingredients, 47.2% looked at serving size, and 43.8% reviewed health claims at least sometimes when deciding to purchase a food product. There were significant differences ($P < 0.05$) in food label use across all demographic characteristics examined. Significant differences ($P < 0.05$) in mean nutrient intake of total energy, total fat, saturated fat, cholesterol, sodium, dietary fiber and sugars were observed between food label users and non-users with label users reporting healthier nutrient consumption.

The greatest differences observed were for total energy and fat and for use of specific nutrient information on the food label. Despite food label use being associated with improved dietary factors, label use alone is not expected to be sufficient in modifying behavior ultimately leading to improved health outcomes.

Nutraceuticals World August 11, 2010

Healthy Foods Hot and Regulated

Healthy foods are on the minds of consumers and on the agendas of food manufacturers, with many more products aimed at improving the lives of the individuals who consume them. An article on FoodBev.com noted the market for healthy is robust, but also faces regulatory issues.

This healthy eating focus has been driven by a few major factors including the economic recession. The article, written by Chris Brockman and Mary Gilson from Leatherhead Food Research, said the bad economic times have caused people to get nostalgic and go "back to basics." More people are cooking from scratch and discovering what ingredients are in their favorite foods. People want simpler times and simpler food items, they wrote. Consumers look to avoid processed item and synthetics, such as artificial colors, flavors and preservatives.

Consumers want those more natural ingredients to also provide health benefits, the writers said. Many more food manufacturers have started to cater to the aging population with more natural claims aimed at enhancing and prolonging cognitive ability.

Weight management is also an increasingly hot food manufacturer trend. Foods nowadays are more likely to tout their ability to promote satiety or their fiber and protein ingredients. This weight-management idea has also been tied to the functional food energy market, noted the article. This general healthy focus has more eaters looking for foods that will help boost their immunity, they wrote. Food manufacturers are answering this with pre- and probiotics, antioxidants and vitamins, and whole grain and high-fiber ingredients. Additionally, more cholesterol-lowering products (plant stanols and sterols, and oat products) are increasingly addressing heart-health issues. These products will continue to be hot, the article predicts, but noted legislative issues regarding health claims may affect this market.

The immune and brain health food market will also continue to be affected by regulatory bodies, while the high-fiber and high-protein claims are generally subject to a less-stringent regulatory hurdles. These nutrition content claims must meet minimum thresholds of certain nutrients, not demonstrate health benefits. The writers added other terms, such as "natural" and "super food," are not regulated at the European or U.S. level, but they writers expect regulation will increase in the near future.

Food Product Design July 28, 2010

Food Science & Technology News

Anti-Staling Bakery Enzymes

Bakery enzyme products help maintain oven-fresh softness, flavor and texture of bread for at least ten days after baking. Both products will be available following their official global launch at the International Baking Industry Exposition (IBIE) in Las Vegas on Sept. 26-29.

“We believe the two new products with G+ technology is the biggest news in anti-staling enzymes for a very long time—and a cost-effective alternative to the current market standard. Consumers only have to squeeze bread once to feel the difference,” says James Laughton, Vice President at Danisco Food Enzymes. “Tests completed by 21st Sensory, Inc. in June 2010, show bread is considerably fresher after 10 days and has the resilience to stay in shape when stacked on supermarket shelves.”

Food Product Design August 12, 2010

Storage Temperature Affects *E. coli* Growth

A new study published in the *Journal of Food Science* suggests proper refrigeration is important to limit the growth of disease-causing microorganisms and to maintain food safety. The findings revealed that elevated temperatures at 12°C or above significantly promoted the growth of disease-causing microorganisms while cold storage at 5°C or below curtailed the proliferation of these microorganisms.

The researchers investigated the impact of storage temperature and time on the survival and growth of *Escherichia coli* O157:H7 on commercially packaged lettuce salads, and the changes in product quality. Fresh-cut Romaine and Iceberg lettuce salads of different commercial brands were obtained from both retail and wholesale stores. The packages were cut open at one end; lettuce salad inoculated with *E. coli* via a fine mist spray; then re-sealed with or without an initial N2 flush to match the original package atmospheric levels. The products were then stored at 5°C and 12°C until their labeled "Best If Used By" dates. Microbial enumeration and product quality evaluation were conducted periodically during storage. Results indicate that storage at 5°C allowed the survival of *E. coli* on the packaged lettuce, but limited its growth, whereas storage at 12°C facilitated the proliferation of *E. coli*. Over 2.0 log CFU/g increase in *E. coli* population was noted on lettuce salads held at 12°C for 3 days, followed by additional growth during the remainder of the storage. Although there was eventually a significant decline in visual quality of lettuce held at 12°C, the quality of this lettuce was still fully acceptable when *E. coli* growth reached a significant level. This observation suggests that the visual quality of packaged fresh-cut products is a poor indicator of their food safety status. Maintaining fresh-cut products at 5°C or below is critical for reducing the food safety risks as *E. coli* grows at a rapid, temperature-dependent rate prior to significant quality deterioration.

Food Product Design August 12, 2010

Focus on Dairy-Based Snacks

Currently a \$90 billion eating occasion, snacking continues to grow. A new Innovation Center for U.S. Dairy white paper released at The 2010 IFT Annual Meeting & Food Expo explains how snacking is an attractive strategic focus area for dairy product innovation.

Drawing on 18 months of consumer and industry research, its findings provide a guide for dairy's incremental growth in this eating occasion. Today, dairy products account for just 13% of all between-meal snack choices for people 2 years and older, presenting a significant opportunity for the industry to grow its **share of the snacking eating occasion**.

“By re-imagining dairy products and ingredients in snacks, food manufacturers can take advantage of a significant business opportunity,” said Lynn Stachura, senior vice president, strategic insights with Dairy Management Inc.TM “Snack-based innovations are seemingly unlimited, especially for those incorporating dairy products and ingredients that are versatile, wholesome, natural, nutritious and delicious.”

Today, **practically everyone snacks**, with 87% of U.S. consumers reporting eating or drinking between meals. This translates into an astounding 850 million eating occasions annually, according to The NPD Group. Plus, as consumer lifestyles change,

the lines between meals and **snacking** are starting to blur. Currently, 30% of consumers claim to eat mini meals throughout the day rather than three main meals, and another quarter desire to do so.

A key focus is nutritious snacking, which makes up half the snacking eating occasion and is supported by research indicating that health is an important consideration to consumers. Dairy's nutritious profile naturally aligns with consumer demand for healthy snacks.

To fully realize the occasion's potential, the white paper recommends the dairy industry develop products that go beyond what is available today. It also identifies five key segments that best align with dairy or dairy ingredient-based products and offer the greatest opportunity for incremental growth in the dairy industry:

- Morning Energy: a quick need for energy in the morning
- Tasty PM Meals: consumed with a meal, such as chips or cheese
- Substantial Crunch: more filling snacks, usually consumed after lunch to tide the consumer over
- Naturally Nutritious: eaten between breakfast and lunch, and often less processed
- Sweet Bites: tasty and often poppable to eat between meals while doing something else

"Dairy is underdeveloped in the snacking eating occasion despite its ability to provide food and beverage manufacturers with the tools to develop great tasting and healthy snacks that consumers demand," said Stachura. "Innovations in this area will not only grow dairy's share of the occasion but also fill a void for consumers as the market continues to grow."

Food Product Design August 2, 2010

New Rice Technology Tested

New Vision/All Africa Global Media via COMTEX -- Kampala -- July 30, 2010 -- A rice training centre that will introduce a new rice technology has been set up in Namulonge, with the help of expertise from Japan.

The technology introduces a mobile pop rice machine, called a puffed cereal machine. According to Kisho Miyamoto, a Japanese promoter of the new technology at Namulonge research centre, the technology has been used in Japan for over 100 years.

Miyamoto said the machine can also pop maize, millet and sorghum and can be run using charcoal, gas or electricity. "Pop rice is a popular snack and breakfast cereal in several Asian countries," Miyamoto added.

"We are promoting rice as a way of ensuring food security," Naphtal Anguzu, a technician with Japan International Corporation Agency, said.

From: SoyaTech eNews July 31, 2010

Salt, Heat Combo Reduces Salmonella on Chicken

A researcher at the University of Arkansas Division of Agriculture discovered combining heat with an acidified organic acid salt solution significantly reduced the presence of *Salmonella* on raw chicken. The findings suggest this combined treatment may be an effective method for decontaminating poultry carcasses during processing.

The researchers applied heat at 55 degrees Celsius (131 degrees Fahrenheit) and an acidified organic acid salt solution to chicken juice, a raw chicken model medium, rather than chicken carcasses. The results tell enough of a story to draw valid conclusions, but more information will be available by taking the research to another level that uses chicken carcasses. The researcher also tried heat and salt treatments separately and found that neither one was adequate standing alone to do the job. An application of 2.5 percent organic acid salt solution did not reduce *Salmonella* appreciably.

"We did heat alone to see if that had an effect by itself and it didn't, even beyond 55 degrees C," she said. "We can screen treatments much faster in a broth-model type of situation. We're hoping the chicken juice gets us a step closer to an actual raw poultry system. But by using chicken juice initially we can screen lots of treatments and narrow down what's the most effective before we go into a more costly use of actual carcasses. I view this as using your resources efficiently."

Experiments with carcasses will come later, possibly followed later by tests to determine how the combined heat and organic acid salt treatments would apply to poultry after it has been eviscerated in the processing plant.

Sources: Food Product Design August 18, 2010

Early detection system helps FDA identify food safety problems

More than 100 food safety reports were submitted by industry to the U.S. Food and Drug Administration's new electronic portal in its first months of operation, the agency said July 28. Mandated by Congress, the Reportable Food Registry (the Registry) is a new system that requires manufacturers, processors, packers, and distributors to immediately report to the government safety problems with food and animal feed, including pet food, that are likely to result in serious health consequences.

"The FDA's new reporting system has already proven itself an invaluable tool to help prevent contaminated food from reaching the public," said FDA Deputy Commissioner for Foods Michael R. Taylor.

A report summarizing the Registry's first seven months of operation (September 2009–March 2010) finds that it logged 125 primary reports—initial reports about a safety concern with a food or animal feed (including food ingredients)—and 1,638 subsequent reports from suppliers or recipients of a food or feed for which a primary report had been submitted, from both domestic and foreign sources. These reports help the FDA and the food industry locate hazardous foods in the supply chain and prevent them from reaching consumers.

Among the 125 primary reports, *Salmonella* accounted for 37% of hazards, undeclared allergens or intolerances accounted for 35%, and *Listeria monocytogenes* accounted for 13%. Among the 11 different commodity categories involved were: 14 animal feed or pet food, 12 seafood, 11 spices and seasonings, and 10 dairy products. Because the Registry has been operational for only a short period, it is too early to draw inferences concerning patterns of food and feed adulteration.

"Industry is increasingly detecting contamination incidents through its own testing, and FDA access to this information permits us to better target our inspection resources and verify that appropriate corrective measures have been taken," Taylor said. "Ensuring that the American food supply is safe is a top priority of the FDA, and the Reportable Food Registry strengthens our ability to help prevent foodborne illness."

IFT Newsletter August 4, 2010

Health, Convenience Drive Fresh Baked Goods Market

The fresh baked goods market experienced 4% growth in 2009 to reach \$16 billion in sales, according to Packaged Facts recently released "**Fresh Baked Goods in the U.S.**" report. Steady growth was attributed to consumer interest in healthy eating, artisan foods and "localism" countered recessionary pressures. Packaged Facts projects the market for fresh baked goods will exceed \$20 billion by 2014.

According to the report, fresh baked goods sales from in-store bakeries, including warehouse clubs, also experienced steady growth, reaching \$11 billion in 2010 and comprising nearly 75% of the total retail market.

The report examined baked goods that are prepared fresh at in-store and stand-alone bakeries, using preparation methods such as made-from-scratch, mixes, par-baking (or pre-baking) and thaw-and-heat. It also analyzed trends in the key retail channels through which baked goods are sold—both stand-alone bakeries and in-store outlets—including traditional supermarkets, supercenters/mass merchandisers, natural food stores, and warehouse clubs. The report also examined activity at the foodservice level, focusing on high-growth areas including bakery cafés.

The report divided the fresh baked goods market into two major product classifications—sweet baked goods and breads. The sweet baked goods classification was comprised of cakes, cupcakes, cookies, pies, brownies and other baked dessert products. The breads classification included bread (including sliced and unsliced loaves), rolls, pitas and croissants. This report also discusses breakfast baked goods, including doughnuts, muffins, breakfast breads, bagels/bialys and sweet rolls.

“Although fresh baked goods are produced and sold in a wide variety of retail channels, certain overriding trends have affected how these products are marketed across most channels,” said Don Montuori, publisher of Packaged Facts. “For example, consumer demand for specific kinds of products—such as those that fill specific dietary needs or budgetary concerns—has led retailers to adapt in terms of both product offerings and marketing strategies. In the fresh baked goods market, those bakeries that have managed to succeed in this challenging environment have done so by evaluating and quickly responding to these shifts in consumer demand with products that fulfill a variety of consumer needs and wants.”

Food Product Design July 30, 2010

National News

India 'does not plan to ban artificial sweeteners'

The government in India has announced it has no plans to ban to use of artificial sweeteners in food and beverage products. Indian minister of health and family welfare, Ghulam Nabi Azad, was quoted by the Indo-Asian News Service as telling the parliament: "At present, there is no proposal to ban the use of artificial sweeteners." So far, the government has not received any report that artificial sweeteners are contributing to health hazards, the minister said. The government has approved the use of three different artificial sweeteners - saccharin sodium, aspartame and neotame. Aspartame sweetener is allowed in the highest amounts. It has a limit of 10,000 parts per million in sugared or sugar-free confectionery, as well as in chewing gum. Recently, a Danish study revealed the risk of premature birth is higher in mothers who drink artificially sweetened beverages. The study examined 60,000 pregnant Danish women, finding that women drinking artificially sweetened soft beverages once a day during pregnancy raised their risk of giving birth prematurely by 38 per cent. IngredientsNetwork.com **25 August 2010 316**

Alarm Over Chemicals in Veggies

How fresh and healthy are the vegetables that you consume daily? Not very, according to the Union Health ministry. In a bid to make them look garden fresh and ensure that they grow faster, farmers are using chemicals at random that threaten to become a serious health hazard for consumers. Expressing concern, minister of state for health Dinesh Trivedi said, "Eating vegetables – a must for good health – may pose serious threat to health, causing nervous breakdowns, sterility and various neurotic complications because of their chemical content."

In a letter to Union health secretary K Sujatha Rao, Trivedi has called for immediate action against farmers involved in such unscrupulous acts. The letter outlines that the health benefit of consuming green vegetables finds "a sharp contradiction in the present day context." Farmers are blatantly using hormone shots to help vegetables grow at a faster rate. "These hormones may cause irreparable damage to our health, if consumed over a period of time," Trivedi wrote.

Oxytocin, the most commonly used hormone, was earlier prescribed primarily for pregnant women. However, the drug is now banned for human consumption. The injection is mainly being administered to vegetables like pumpkin, watermelon, brinjal, gourd and cucumber, with potentially hazardous side-effects.

Times of India, New Delhi 28.07.2010
