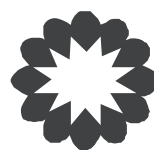


EDITORIAL BOARD

Mr. Badami M. C.
Dr. Holla K. S.
Dr. Padgaonkar S. V.
Mr. Sakhavalkar J. A.
Ms. Swati Deodhar Singh

E-mail : pfndai@pfndai.org
Website : www.pfndai.com



PFNDAI Bulletin

December 2006

INDEX

1.	Editorial	--	2
2.	Traditional India Foods: Physico-Chemical Aspects	--	3
3.	Calcium: An Important Macro Mineral For All Age Groups	--	6
4.	Flavour Trends in Functional Foods & Beverages	--	10
5.	Functional Trends: Beyond Healthy Ingredients	--	12
6.	In The News	--	14
	● Nutri-Cosmetics: Eat, Drink and Be Skeptical By Natasha Singer	--	14
	● 2007 Dieting Trends: A Survey	--	16
	● Anti-cancer Properties of Berries Studied	--	17
	● Budget food ranges 'less healthy'	--	17
	● Dieters do calories, not exercise	--	18
	● High-Protein diet good for heart	--	18
	● New crops needed to avoid famines	--	18
	● New wheat produce more magnesium	--	20
	● Teens who take Multivitamins have healthier lifestyles	--	20
	● Transformed potato produces French fries with less acrylamide	--	20
7.	COMING EVENTS	--	21
8.	PFNDAI LIBRARY	--	24

This issue of



PFNDAI Bulletin



Sponsored by

Firmenich Aromatics (India) Pvt. Ltd

Circulated to PFNDAI Members Only

PFNDAI is not responsible for the authenticity and correctness of the information published and the views expressed by the authors of the articles.

Editorial

Noted economist from Columbia University, Dr. Jagdish Bhagwati, who received several awards in Political Economy, talked about Indian farmers and globalisation. He said that our farmers could withstand challenges of globalisation. Only they need access to growth. Government must ensure the infrastructure as well as health and education in order to get proper growth among the poor rather than Employment Guarantee Schemes, which are prone to corruption and being difficult to measure its effectiveness in alleviating poverty. He also said, India was better placed than China, whose growth was on shaky grounds as their government was involved in state-run land grab and allowing infrastructure to remain poor. It was also not bothered about heavy environmental cost the country was paying.

Hearing these words makes us happy, but let us not be complacent. Just because we are doing a better job overall, although our growth rate is less than China, we have a long way to go. With farmers committing suicides in spite of sops declared by the PM himself, we know there is something wrong. State with its ineptness, insensitivity and corruption, will find it difficult to carry out the work that has deep rooted problems.

Some industrialists have shown that when determined, Indians are capable of fantastic achievements. Some in food manufacturing and retail industry have shown that farmers can be directly contracted avoiding middlemen. This not only helps consumers but also helps farmers. The roots of this were probably sown in the milk revolution started in Anand but now we see the similar efforts in many spheres like fresh produce, grains etc.

The interaction should not stop at just giving them seeds and know-how to produce and sell to industry, but also other avenues of growth mentioned above such as health and education. When there is a more complete partnership the benefits would be several magnitudes more.

At present, we do see tremendous economic development in India, but the divide between haves and have-nots is steadily increasing, its rate escalating. This kind of development is unhealthy for a country and engenders all ills and crimes. Let the industry take the lead in bridging this gap starting with the farmers.

Another responsibility the industry can take is with the consumers. Although many food companies believe in safety, nutrition and quality, there are quite a few that are concerned only with the bottom line. Let the industry as a whole not wait till authority catches up with those who will cut safety, nutrition and quality in order to cut cost and make profits, think of a way to educate consumers about these important aspects of foods. This cannot be a sporadic effort but whole industry should join hands to educate the consumers so he or she can make better and well-informed choices.

There is a lot of misinformation going around. Anyone writes articles on food and becomes expert on nutrition, without any experience or expertise. There is a need to provide authentic information, as consumers are not capable of separating science and myth. Let food industry also provide education or at least support efforts of educating consumers besides just selling them food products.

Dr. J. S. Pai
Executive Director
(Email: executivedirector@pfn dai.org)

Traditional Indian Foods : Physico-Chemical Aspects

Dr. J. S. Pai, Executive Director, PFNDAI

Based on Presentation at ICFOST 2006 at Hyderabad

Like our culture, Indians have a very long tradition of some typical foods, developed in Indian subcontinent and now eaten all over the world. There is a typical cooking style. Indians like to eat rice, chapatti or roti, with curried vegetables and meat or fish, dals, with some accompaniment of pickles, papads, chutneys, raita etc. Indians love their sweets including peda, burfi, rasogolla, sandesh, gulab jamun, jalebi, petha, carrot or wheat halwa, shrikhand, basundi, chikki, Mysore pak and a long list of a variety of sweets. They also love to eat breakfast, snack and savoury (namkeen) items like samosa, vada, idli, dosa, dhokla, pakoda, sev, bhujia, ganthia, chivda, farsan, chakli, bhelpuri etc. The variety in meal items, breakfast items, snacks, sweets, etc. is just mind boggling and a short lecture or even a seminar would not do justice to the intricacies and innovative practices followed in preparing these. More recently, there has been a further advancement I will just try to give a small glimpse into the physico-chemical aspects involved in their preparation.

The products were prepared in order to either preserve the perishable foods. Examples would be milk is converted to khoa which can last for a much longer period. Fruits and vegetables are converted to morabba, fruit leather, candy or pickles.

Another reason is to make them palatable, edible and tasty. Cereals and pulses are consumed by cooking them. Spices were added to improve their palatability but preparing a large number of savoury products improved their taste and flavour. However, again the cooked grains and pulses had limited shelf life, so in order to preserve them either moisture had to be removed. This may be done by drying but even a more tasty alternative is frying them. There is also another way of preserving them and that is by adding sugar or jaggery to them to make sweets out of them. Laddoo, Mysore pak, carrot halwa, Bombay halwa, are some examples and the both frying and sugar are used in jalebi.

Some of the products are made in order to make them more nutritious, while enjoyable. Cereals and pulses when mixed, give a better amino acid profile, which is seen in such products like idli, dosa, dhokla etc. which are also fermented so their vitamin contents are also enhanced. Even in products like chivda, farsan, certain chikkis etc. this improvement is seen.

There are many other reasons such as regional preferences and availability of certain raw materials that would also influence the types available. North, with more milk production and consumption would have sweets based on milk, and East, with preference for cow's milk has a lot of chhana based products prepared from cow's milk. South has preferences for grain and pulse based sweets, but this is now slowly disappearing. The regional specialities are now getting consumed everywhere.

There are also some products which have religious significance, example being modak preferred by Lord Ganesh. Some of the sweets have some festival connotations and some foods have acquired fasting food status.

Let us look at some examples from some typical group of products to understand the chemical aspects involved in the preparation of these products, which have the physical and sensory relevance such as colour, flavour, texture, appearance etc. for which these products are consumed.

Milk Products:

Although cow's milk is mostly consumed world over, Indians consume buffalo milk much more than cow's. Although goat milk consumption is also significant it is quite low compared to buffalo and cow. There are inherent differences in chemical and physical properties of the two milks as seen below.

Composition of Cow & Buffalo Milk

Constituent (%)	Cow Milk	Buffalo Milk
Water	86.50	83.18
Fat	4.39	6.71
Protein	3.30	4.52
Lactose	4.44	4.45
SNF	9.11	10.11
Total solids	13.50	16.82

These are only the average values. There are many differences that will be seen within these which may be due to breed, time & stage of milking, lactation period, season, feed, nutritional level, environmental conditions, health, age, exercise, medication and hormonal treatments etc.

The intrinsic quality of chemical constituents through differences in species/breeds makes their milk eminently suitable for certain specialised products.

For example, qualities such as high total solids content, superior whiteness and viscosity render buffalo milk suitable for making khoa, peda, burfi, dahi, paneer, kheer, payasam, malai, kulfi, ghee and other traditional products. Cow milk yields a soft coagulum, making it suitable for preparation of chhana and its products such as sandesh, rasogolla, chumchum and rasmalai.

In cow milk, carotene is the major pigment and it is derived from feed. It gives cow milk a pale yellow appearance. However, buffalo has the ability to convert carotene into vitamin A before passing it into milk and so it appears white. Therefore when you want whiter base such as khoa, then buffalo milk is preferred. From this one can prepare coloured sweets by adding a variety of colours.

Buffalo milk also has more protein and fat. The coagulable proteins, caseins are much more in buffalo milk, so when milk is coagulated by heat and/acid, there is firmer and denser coagulum produced which is suitable for products like paneer, peda, burfi etc. Cow's milk produces softer coagulum and gives a springy texture, which is more suitable for products like rasogolla, sandesh and rasmalai.

Traditional milk sweets

Indian mithais have been developed to preserve the nutritional goodness of milk and to extend its shelf life under high ambient temperature. Sweets are mainly prepared from three intermediate product bases: khoa (partially heat-desiccated milk), chhana (coagulated milk after draining of whey) and chakka (concentrated curd). Ghee and makkhan are traditionally prepared to conserve milk fat in areas where production of liquid milk is surplus. Much of the processing of sweets is done on a small-scale by the halwai.

Khoa is a major intermediate product base for a variety of sweets. It is obtained by rapidly evaporating milk in shallow pans to a total solids content of about 70%. The product could be preserved for several days and is also used as a base for different kinds of sweets like peda, burfi, gulab jamun, etc. Another important base is chhana. It is obtained by acid coagulation of hot milk and draining out the whey. This product is used as an ingredient in different kinds of sweets, especially in the eastern region of India. Chhana based sweets are popularly called Bengali sweets. The third major intermediate base is chakka, popular in western India. It is a fermented product obtained from dahi (curd) and is used in a variety of Gujarati and Maharashtrian desserts. Traditional dairy products in India:

Desiccated Milk-based Products: Khoa/Mawa, Gulabjamun, Kalajamun, Lalmohan, Burfi, Kalakand, Milk cake, Peda, Rabri, Khurchan, Basundi and Kulfi

For these products the starting material is khoa or mawa, which is prepared by concentrating milk to a pasty consistency by constant stirring. Thus the only constituent that is reduced is water with almost all others remaining with the product. This product is very pliable and with addition of sugar and some other minor ingredients for flavour and colour a variety of different products are prepared.

Three types of khoa are available in market, dhap, pindi and danedar. The first two have the difference only in concentration as pindi has more solids. Danedar is prepared with some acid being added towards latter part of concentration, which gives the granular texture preferred in certain types of sweets.

Types of Khoa and Products

Type	TS (%)	Fat (%)	Products
Dhap	56-63	20-23	Gulab jamun
Pindi	67-69	21-26	Burfi, Peda
Danedar	60-65	20-25	Kalakand, Milk cake

Heat-Acid Coagulated Products: Paneer, Chhana, Rasogolla, Rasomalai, Rajbhog, Khirmohan, Sandesh, Pantua, Chhana-Murki and Chamcham

The difference between paneer and chhana is traditionally the former is prepared from buffalo milk and the latter from cow's milk. Since buffalo milk has more fat and protein as well as due to the compactness and firmness of the coagulum paneer is usually much firmer or tougher than chhana, which is much softer when prepared from cow's milk. Legally there is hardly any distinction. Both are prepared by heat coagulation after lowering the pH by limejuice or acidulants like citric or lactic acid. This process leaves out whey, which contains lactose. Since the product contains very little lactose and contains mostly protein and fat, it is very spongy compared to khoa, which contains good amount of lactose.

Thus the products prepared from chhana like rasagolla, rasomalai, sandesh, etc. are quite elastic and distinctly different from peda, burfi etc.

Cultured/Fermented Products: Dahi, Mishti Doi, Shrikhand, Lassi, Mattha/Chhach/ Chhas, Kadhi, Raita, and Dahi vada

When milk is allowed to ferment, lactose (milk sugar) gets converted to lactic acid and pH drops. This

fermentation is carried out by lactic acid bacteria and one gets products like curd (dahi), yoghurt etc. The difference between the Indian curd and western yoghurt is that curd fermentation uses natural flora and commonly one gets less acidity, while yoghurt fermentation uses pure starter culture consisting of mixed lactic acid bacteria, which are rapid fermenters of lactose and one gets higher acidity. Examples of cultures for curd are *Lactococcus lactis* variants, *Lactococcus diacetylactis*, *Lactococcus cremoris* etc. and for yoghurt are *Lactobacillus delbrueckii* and *Streptococcus thermophilus*. Bigger producers are now using standard cultures for curd manufacture. The curd is usually more flavourful than yoghurt, the final product may contain some flavourants. Curd flavour will also depend on the type of microorganisms in the flora used for fermentation and thus may vary.

Whey is then drained using cloth (modern processes use basket centrifuge) which removes most of the unfermented lactose. Sweets like shrikhand, mishti doi etc. are prepared by adding sweeteners like sugar and jaggery along with flavourants and colours.

Sweeteners used in Indian sweets

Sugars used in Indian sweets have many functions including bulking agent, preservative, texturiser, humectant, dispersing agent, stabiliser, fermentation substrate, flavour carrier, browning agent and decorative agent.

Sugar cane is the major source of sweeteners from which jaggery, raw or bura sugar, khandsari and refined sugar are prepared. These have different degree of refinement, during which slowly the non-crystallisable materials are removed thus from brown to white or colourless products are obtained. Jaggery contains varying amounts of glucose+fructose to sucrose depending on the extent of hydrolysis during heat treatment to remove water. Removal of scum and use of sulphites gives lighter colour.

Jaggery is used in many sweets thus giving them its characteristic flavour and colour. Higher amount of mono-saccharides give textural attributes to products making them softer or more chewy. When these are removed during refining, the products then become harder and more brittle. A typical example is chikki, mostly prepared from ingredients like nuts, cereals, oil seeds etc. Groundnut, cashew, rajgeera (amaranth seeds), til (sesame) etc. are quite popular. When jaggery with a lot of mono-saccharides is used the chikki is softer and more chewy. The texture could be adjusted using some sucrose, making it harder. Popular cashew chikkis normally use sucrose

and/or glucose, since their flavour is neutral unlike jaggery, so you get more cashew flavour.

Jaggery is being used to lesser extent as even cottage scale sweet manufacturers have started using sucrose (common refined sugar). Jaggery has some of the micronutrients including iron and calcium. Jaggery is also produced from other sources like date, palm etc.

Sugars have other properties like preservative. Some of the fruits are preserved in the form of preserves (morabba) and jams. Of these, amla and mango are more popular. Sugars also important browning agent. Jaggery has a natural brown colour, but even sucrose when heated caramelises to give golden brown colour. In milk sweets, there is an additional opportunity for sugars to react with proteins to give brown colour. This is seen in some versions of peda especially the Dharwad Peda, which is brown and coated further with sugar crystals. Gulab jamun is fried and gets brown due to reaction between protein and lactose as sucrose is yet to be added in the form of syrup. Bulking properties of sugar became more important when efforts were on to formulate sugarless sweets using artificial sweeteners. Sugars normally forms a very significant portion of Indian sweets (which are sweeter than western sweets), and provide both the bulk and texture.

Chapatti and Roti

Wheat flour has been used to make a large number of staple products like chapatti, roti, phulka, paratha, nan, bhakri, kulcha, bhatura, puri and a large number of variants in many of these. Whole wheat flour (atta) is used in most products but in some like nan, bhatura etc. refined flour may be used, in bhakri jowar & bajra flours may be used, in roti corn flour may be used. Most of the products may be roasted or baked but bhatura and puri are fried. Although all may be classified as unleavened breads, some are fermented e.g. nan uses fermentation to make it light.

Chapatti is made typically with whole wheat flour with water, oil and salt to make a soft dough. It is rolled, folded and rolled again after applying oil before folding. Sometimes dough is allowed to be kept aside before rolling to get soft chapattis. Gluten formation may be making them pliable and soft. The rolled sheets are then roasted or pan fried.

Roti is a thicker version of chapatti. Addition of maize flour or bajra flour to wheat flour will give makeki or bajreki roti. Usually rotis are not as soft as chapattis and sometimes they are very hard. Rotis are mostly

made in north India and chapattis in western parts with some south families making them.

Advent of refined flour, maida has allowed some of the variations, especially the nan. Fermentation with yeast gives fluffy dough which makes a light nan. Curd is originally used as a source of fermenting microbes but now yeast is used in addition to ensure rapid fermentation. Bhatara also uses refined flour and fermentation. Puri is made with whole wheat flour and unfermented unlike bhatara although both are finally fried before consumption. Use of refined flour and fermentation gives added softness and fluffiness to the product. Since refined flour lacks bran present in whole wheat flour, there is nutritional compromise.

Papad

This is a typical Indian product now becoming popular world over. Made commonly from black gram, but now a large number of ingredients are being used from a variety of pulses, rice, potato, jackfruit, etc. together with spices, salt, oil, leavening agent etc. The dough made of these must have a proper consistency so it could be rolled thin circular sheet. This is then dried to stabilise under ambient

conditions. These are eaten after frying or roasting, which drives the last traces of moisture and makes them very crisp.

The dough consistency with proper amount of water added to ingredients, rolling with use of oil to prevent sticking, proper rolling to ensure proper distribution of stresses created in the dough so during drying they do not go out of shape and after frying they remain crisp and not too hard or limp. These were some of the problems the machinery developers had to solve for large scale production. But now they have not only the original papads but a huge range of papads with different flavours, colours, sizes and shapes.

Basic papads are made from black gram, which has proper amount of protein and starch together with other polysaccharides to give good stiff dough that could be rolled into fairly thin sheets with the help of oil. With proper amount of water, the dough does not disintegrate. The moment other ingredients like rice flour is added, protein content goes down and starch also is less pliable as it has more amylose. This is where ingenious combination of other legume flours becomes useful.

* * * * *

Calcium: An Important Macro Mineral For All Age Groups.

By: Ms. Ummeayman R
Food Technologist, PFNDAI

Calcium is the most abundant divalent cation in human body, making upto 1.5-2.0% of its total weight. More than 99% of body calcium is in the skeleton. The remaining 1% is in the blood and extra cellular fluids and within the cells of soft tissues, where it regulates many important metabolic functions. Calcium is responsible for structural functions involving the skeleton and soft tissues and regulatory functions such as neuromuscular transmission of chemical and electrical stimuli, cellular secretions, and blood clotting. The physiological functions of calcium are so vital to survival that in the face of severe dietary deficiency or abnormal losses, the powerful mechanisms of conserving calcium that are possessed by living things, can demineralise bone to prevent even minor hypocalcaemia. Calcium requirements are different for all. The recommended adequate intake level by the IOM for Calcium is:

- 1 -3yrs —500mg/day
- 4 -8yrs —800mg/day
- 9 -18yrs —1300mg/day
- 19-50yrs —1000mg/day
- 51+yrs —1300-1500mg/day

Net calcium absorption can be as high as 60% in infants and young children. Absorption slowly decreases to 15-20% in adulthood and even more as one ages. Because calcium absorption declines with age, recommendations for dietary intake of calcium are higher for adults aged 51 and older. Calcium absorption may be affected by the calcium status of the body, vitamin D status, age, pregnancy, and plant substances in the diet. The amount of calcium consumed at one time such as in a meal can also affect absorption.

Who requires Calcium?

Menopause often leads to increases in bone loss with the most rapid rates of bone loss occurring

during the first five years after menopause. Drop in oestrogen production after menopause result in increased bone resorption, and decreased calcium absorption. Annual decreases in bone mass of 3-5% per year are often seen during the years immediately following menopause, with decreases less than 1% per year seen in after age.

A medical problem or treatment such as renal failure, surgical removal of the stomach (which significantly decreases calcium absorption), and use of certain types of diuretics (which result in increased loss of calcium and fluid through urine) can cause calcium deficiency. Simple dietary calcium deficiency produces no signs at all. Hypocalcaemia can cause numbness and tingling in fingers, muscle cramps, convulsions, lethargy, poor appetite, and mental confusion. It can also result in abnormal heart rhythms and even death. Individuals with medical problems that result in hypocalcaemia should be under a medical doctor's care and receive specific treatment aimed at normalizing calcium levels in the blood.

Calcium helps in weight management too and thus reduces the incidences of obesity. Several studies have linked higher calcium intakes to lower body weights or less weight gain over time. Two explanations have been proposed for how calcium may help to regulate body weight. First, high-calcium intakes may reduce calcium concentrations in fat cells by lowering the production of two hormones (parathyroid hormone and an active form of vitamin D), which in turn increases fat breakdown in these cells and discourages its accumulation. In addition, calcium from food or supplements may bind to small amounts of dietary fat in the digestive tract and prevent its absorption, carrying the fat (and the calories it would otherwise provide) out in the feces.

Calcium prevents Osteoporosis:

Osteoporosis is a disorder characterized by porous, fragile bones. It is a serious public health problem. Osteoporosis is a concern because of its association with fractures of the hip, vertebrae, wrist, pelvis, ribs, and other bones. Each year, Americans suffer from 1.5 million fractures because of osteoporosis. Osteoporosis and osteopenia can result from dietary factors such as:

- chronically low calcium intake
- low vitamin D intake
- poor calcium absorption
- excess calcium excretion

When calcium intake is low or calcium is poorly absorbed, bone breakdown occurs because the body must use the calcium stored in bones to maintain normal biological functions such as nerve and muscle

function. Bone loss also occurs as a part of the aging process. A prime example is the loss of bone mass observed in post-menopausal women because of decreased amounts of the hormone estrogen. Researchers have identified many factors that increase the risk for developing osteoporosis. These factors include being female, thin, inactive, of advanced age, cigarette smoking, excessive intake of alcohol, and having a family history of osteoporosis.

Dietary sources of Calcium:

Taking a balanced diet containing large quantities of milk and milk products, soy beans and soy products and vegetables such as kale, broccoli, turnip green and Chinese cabbage will be sufficient to provide adequate calcium as these contain a high level of calcium which is readily available to the body. Although most grains are not high in calcium, they do contribute calcium to the diet.

Tofu is commonly recommended as a good source of calcium. The amount of calcium in Tofu depends on the coagulating agent used to precipitate the soy protein in the process of making tofu. Calcium sulphate and nigari (magnesium chloride) are two commonly used agents. The agent used will be listed on the label under ingredients. Tofu that is prepared with calcium sulphate will contain more calcium than tofu made with nigari. Calcium content will be listed as percent of the Daily Value, multiply the percent Daily Value by 10 will give the amount of calcium (in milligrams) in one serving. For example, tofu with 10% Daily Value for calcium would have 100 mg of calcium in one serving.

Absorption and Regulation of Calcium:

The endocrine system maintains the calcium homeostasis in vertebrates in a very complex manner. It involves the interaction of two polypeptide hormones, parathyroid hormone and calcitonin (CT), and a sterol hormone, 1,25-dihydroxycholecalciferol (calcitriol). In the skin, 7-dehydrocholesterol is converted by the action of U.V. rays of sunlight to Vitamin D, which further forms calcitriol. The biosynthesis of calcitriol from the major circulating metabolite of vitamin D, 25-hydroxycholecalciferol (calcidiol), takes place in the kidney and is regulated by PTH and CT as well as by concentrations of calcium and phosphate in the extra cellular fluid. Calcitriol increases the uptake of calcium and phosphate by acting on the intestine to increase their absorption and on the bone to increase their mobilization. Parathyroid hormone (PTH), which is released in response to low serum calcium, appears to be the mediator that stimulates the production of calcitriol by the kidney. Thus, it is proposed that a

low dietary calcium intake is reflected in lower serum calcium, which in turn affects PTH secretion and a subsequent increase in kidney synthesis of calcitriol.

Calcium is absorbed mainly in the part of duodenum where an acidic medium prevails; consequently absorption is greatly reduced in the lower part of the intestinal tract where the contents are alkaline. However calcium is absorbed only if it is in water-soluble form and is not precipitated by another dietary constituent, such as oxalate.

Factors affecting calcium absorption and excretion:

Phytic acid and oxalic acid, which are found naturally in some plants, may bind to calcium and prevent it from being absorbed optimally. These substances affect the absorption of calcium from the plant itself not the calcium found in other calcium-containing foods eaten at the same time. Examples of foods high in oxalic acid are spinach, collard greens, sweet potatoes, rhubarb, and beans. Cocoa is also high in oxalate; however the amount of cocoa in chocolate milk is not large enough to interfere significantly with calcium absorption. Examples of foods high in phytic acid are whole grain bread, beans, seeds, nuts, grains, and soy isolates. Although soybeans are high in phytic acid, the calcium present in soybeans is still partially absorbed. Fiber, particularly from wheat bran, could also prevent calcium absorption because of its content of phytate. However, the effect of fiber on calcium absorption is more of a concern for individuals with low calcium intakes. In an alkaline medium, calcium with phosphorus forms insoluble calcium phosphate. In individuals with fat malabsorption, calcium absorption decreases because of the formation of calcium fatty acid soaps.

Glucocorticoids decrease calcium absorption. States of glucocorticoid excess are associated with negative calcium balance and a marked increase in fracture risk. In a recent study, oral calcium supplements plus 1,25-dihydroxy vitamin D decreased glucocorticoid-associated bone loss. On the basis of these observations and other studies, oral calcium supplements should be considered in all patients who are receiving exogenous glucocorticoids. The specific disease for which the glucocorticoid therapy is used (e.g., rheumatoid arthritis, inflammatory bowel disease, asthma) can be a determining factor in the occurrence and degree of bone loss.

Calcium insufficiency due to low calcium intake and reduced absorption can translate into an accelerated rate of age-related bone loss in older individuals. Among the homebound elderly and persons residing

in long-term care facilities, vitamin D insufficiency has been detected and may contribute to reduced calcium absorption. Calcium intake among women later in the menopause, in the range of 1,500 mg/day, may reduce the rates of bone loss in selected sites of the skeleton such as the femoral neck.

Calcium excretion from the body is affected by many factors including dietary sodium, protein, caffeine and potassium. Typically, dietary sodium and protein increase calcium excretion as the amount of their intake is increased. Increased dietary potassium intake in the presence of a high sodium diet (>5100mg/day) may help decrease the calcium excretion particularly in postmenopausal women. Caffeine has a small effect on calcium absorption; it can temporarily increase calcium excretion and may moderately decrease the calcium absorption. However, 1 cup of coffee or 2 cups of tea per day may have no negative effects on the bones of a young woman who has adequate intake of calcium. Aluminium in the form of antacid medication, when taken in excess, may significantly increase urinary calcium loss.

Alcohol can affect calcium status by reducing the intestinal absorption of calcium. It can also inhibit enzymes in the liver that help convert vitamin D to its active form which in turn reduces calcium absorption. However, the amount of alcohol required to affect calcium absorption is unknown.

Calcium fortified foods and Calcium Supplements:

Although most people know they need dietary calcium for bone health, the actual consumption of calcium rich food is far too low. There is a substantial gap between the RDA of calcium intake and what people actually consume. To counter this disparity a wide variety of calcium fortified foods and beverages are being marketed. Orange juice, juice drinks, cereals, waffles, snack foods, calcium-fortified breads, calcium-fortified soy milk, candy, infant formulas, sports beverages, diet products, dairy foods, water and even pop corns are commonly found to be fortified with calcium. However health professionals recommend giving first priority to foods naturally containing calcium, in meeting calcium needs. Foods naturally containing calcium have high calcium bioavailability and many other essential nutrients, as well as possible other health promoting components, in addition to calcium. Some calcium fortified foods and beverages relate to unknown bioavailability and potentiate negative effects of excessively high calcium diet on other nutrients such as iron, zinc and magnesium.

An enriched insulin formulation developed by Orafit Active Food Ingredients was studied by Baylor College of Medicine in Houston. An 8g/day of product (Raftilose Synergy1) increased calcium absorption by 20%. The ingredient may be used for formulating dairy products such as ice-cream, cheese spreads, yogurt and fluid milk products. In addition it can be easily incorporated into soy products, nutraceutical beverages, bakery product and nutrition bars. In earlier studies, scientists working with Dr. Kendal Hirschi, a plant physiologist at Baylor College of Medicine, discovered that turning "on" the product of a protein called CAX1 in the cells of a tiny weed known as *Arabidopsis thaliana* increased the calcium content of the plant's leaf and root cells by 30 to 100%. Now they have identified a tiny slice of nine amino acids that gives the protein its calcium-boosting prowess, and successfully transferred the slice to similar proteins, called transporters. The researchers believe that these findings are an important step toward the development of vegetable varieties that are "naturally fortified" with calcium.

For some individuals, calcium supplements may be the preferred way to attain optimal calcium intake. In 2002, calcium supplements were the number one selling mineral supplements. Calcium supplements are available as various salts, and most preparations are well absorbed except when manufactured such that they do not disintegrate during oral ingestion. The two main forms of calcium found in supplements are carbonate and citrate. Calcium carbonate is the most common because it is inexpensive and convenient. The absorption of calcium citrate is similar to calcium carbonate. For instance, a calcium carbonate supplement contains 40% calcium while a calcium citrate supplement only contains 21% calcium. However, you have to take more pills of calcium citrate to get the same amount of calcium as you would get from a calcium carbonate pill since citrate is a larger molecule than carbonate. One advantage of calcium citrate over calcium carbonate is better absorption in those individuals who have decreased stomach acid. Calcium citrate malate is a form of calcium used in the fortification of certain juices and is also well absorbed. Other forms of calcium in supplements or fortified foods include calcium gluconate, lactate, and phosphate.

Absorption of calcium supplements is most efficient at individual doses of 500 mg or less and when taken between meals. Ingesting calcium supplements between meals supports calcium bioavailability, since food may contain certain compounds that reduce calcium absorption (e.g., oxalates). However, absorption of one form of calcium supplementation, calcium carbonate, is

impaired in fasted individuals who have an absence of gastric acid. Absorption of calcium carbonate can be improved in these individuals when it is taken with certain food. The potential for calcium supplementation to interfere with iron absorption is an important consideration when it is ingested with meals. Alternatively, calcium supplementation in the form of calcium citrate does not require gastric acid for optimal absorption and thus could be considered in older individuals with reduced gastric acid production. In individuals with adequate gastric acid production, it is preferable to ingest calcium supplements between meals. Calcium supplements are available without a prescription in a wide range of preparations and strengths, which can make selecting one a confusing experience. Choose calcium supplements with familiar brand names. Look for labels that state "purified" or have the USP (United States Pharmacopoeia) symbol. Avoid calcium from unrefined oyster shell, bone meal, or dolomite without the USP symbol, because it may contain high levels of lead or other toxic metals.

Calcium interactions:

Epidemiological studies suggest that higher dietary calcium is protective against hypercholesterolemia, non-insulin dependent diabetes, and colon and rectal cancer. However, extremely high levels of calcium intake have several potential adverse effects. The efficiency of calcium absorption decreases as intake increases, thereby providing a protective mechanism to lessen the chances of calcium intoxication. This adaptive mechanism can, however, be overcome by a calcium intake of greater than approximately 4 g/day. It is well known that calcium toxicity, with high blood calcium levels, severe renal damage, and ectopic calcium deposition (milk-alkali syndrome), can be produced by overuse of calcium carbonate, encountered clinically in the form of antacid abuse. Even at intake levels less than 4 g/day, certain otherwise healthy persons may be more susceptible to developing hypocalcaemia or hypercalciuria. Likewise, subjects with mild or subclinical illnesses marked by dysregulation of 1,25-dihydroxy vitamin D synthesis (e.g., primary hyperparathyroidism, sarcoidosis) may be at increased risk from higher calcium intakes.

A very high intake of calcium and the presence of high level of vitamin D, which may occur in children receiving supplements, is a potential source of hypocalcaemia. This may lead to excessive calcification in bone and the soft tissues. High intakes of calcium can also interfere with iron absorption. Therefore, when a person needs to consume both as supplements, the iron supplement should be taken

at a different time. The same may be true for zinc, because an antagonistic interaction occurs between calcium and zinc when these minerals are ingested in physiologic doses. There is a concern about the use of calcium supplements during pregnancy, when any deficiency of zinc could have serious consequence for the foetus.

Calcium supplements may reduce the absorption of the antibiotic tetracycline. Calcium also interferes with iron absorption. So one should not take a Calcium supplement at the same time as the iron supplement –unless it is calcium citrate. Any medication to be taken on empty stomach should not be taken with Calcium supplements.

It is very important to maintain a balance of calcium since the low levels of calcium can also be equally harmful to health as much as high levels are. Extremely low levels of calcium in the blood may increase the irritability of nerve fibers and nerve centers, resulting in muscle spasms such as leg

cramps, a condition known as tetany. It sometimes occurs during pregnancy in women who have consumed too little calcium or too much phosphorus.

In order to achieve healthy bones and maintain overall good health, an individual should take calcium as per the RDA and from natural dietary sources. Also, regular weight bearing exercises such as walking, running or aerobic dance is recommended to promote strong and healthy bones.

References:

1. Krause's Food Nutrition & Diet Therapy
2. Optimal Calcium Intake, NIH. Consensus Statement Online 1994, June 6-8; 12(4); 1-31
3. <http://ods.od.nih.gov/factsheets/vitamind.asp>
4. www.mayoclinic.com/health/calcium/AN01080
5. www.bcm.edu

* * * * *

Flavour Trends in Functional Foods & Beverages

With functional food, beverage, and even cosmeceutical development picking up steam, flavour houses have their work cut out for them

Functional foods and beverages are exciting products to develop and flavour, but offers challenges while creating a product that has true health functionality and has great taste too. Ultimately consumer acceptability depends on look and taste of any food and beverage when there are many choices.

Flavour trends depend on those in specific food or beverage category as well as on types of nutraceuticals, vitamins or minerals used in the product. Flavours work in concert with enrichments to provide the best overall product.

It is important to consider product concept and marketing story before deciding specific flavour possibilities. Flavour selection will vary based on the concept and objectives, so it is important for developer to work with flavour experts to achieve the best results.

Flavouring Functional Beverages

Fruit flavours are most popular for functional beverages in which true-to-fruit profile is essential. Consumers expect healthy products to taste natural and fresh and flavour should complement functionality. Citrus and astringent berry flavours work

well with antioxidant fortification. They nicely blend with acidity inherent in vitamin C and other antioxidant ingredients. An alternative is citrus with less acidic, milder fruit to create tropical-type blend.

In beverages for children, strawberry with banana or kiwi is flavour in trend. Kids prefer sweet-sour profile and familiarity with these fruits. Tropical fruit flavour blends are also popular.

Functional Confectionery Flavours

There is a strong trend to develop confectionery products with healthy halo. Combinations of exotic fruits, vitamins, herbs and plant extracts offer added health benefits due to consumer demands. In addition to usual ingredients, they may contain fruit and vegetable juice, colour, flavours, vitamins, minerals, herbs and other functional ingredients. Highly concentrated compounds produced specifically for confectionery products are added after the cooking process.

Flavouring these products can be challenging as flavours must work synergistically with functional components. The flavour choice depends on the type of juice used, as well as amounts of herbs, vitamins and minerals. Here one of the most significant trends is to use flavours associated with health and function. Exotic fruits with health benefits are becoming mainstream due to changing demographics like growth in ethnic population in

US. Hence, manufacturers are constantly trying to infuse popular tropical and exotic flavours into their product lines including functional products. Many fruits themselves have functional properties and the flavours of these lend themselves well to incorporate with other nutraceutical ingredients. Examples are açai, acerola, mangosteen, goji, jabotacaba and passion fruit.

As baby boomers grow old, they will continue search for good-for-you products, contributing good health and appearance. Familiarity with exotic fruits etc. is the result of such quest.

Cosmeceutical Applications

Cosmeceutical foods and beverages contain ingredients that provide direct anti-aging and other appearance enhancing benefits. This is a growing trend influenced by baby boomers. These products could accept new flavour combinations covering traditional fruit flavours and herbal and floral varieties.

Cosmeceutical ingredients include antioxidants, ones contributing to cell and tissue formation, and ones that are multi-functional. Important antioxidants playing role in appearance enhancement include lutein, lycopene, polyphenols and vitamins A and E.

Vitamin A protects the skin from UV radiation, reducing oxidative stress and effecting collagen production, thus promoting skin elasticity. Vitamin C also helps in collagen synthesis and protects skin from UV radiation, preventing premature skin aging. Vitamin E encourages skin cell growth improving circulation and promoting healing. Polyphenols protect skin from UV damage and prevent oxidative stress and tissue damage.

Working with cosmeceutical ingredients and functional products, it is important to choose flavours that fit the marketing story and benefits of the ingredients and product, and also work well with the entire ingredient system. Vitamins A and E may pose challenges due to solubility, so manufacturer must be able to handle properly emulsions and nanoemulsions. Also, other ingredients and flavours must work synergistically to achieve a stable, quality, efficacious product.

Functional ingredients promoting cell and tissue formation are in trend. Skin loses about 1% collagen and elastic tissue per year after age 25, also

becoming thinner due to aging. Ingredients like biotin, aloe vera and collagen help form new cells and tissues and fight signs of aging.

Coenzyme Q10 is multifunctional. It scavenges free radicals and is essential for body cells, tissues and organs. It is shown to decrease activity of some enzymes degrading collagen and elastin. Although useful and efficacious in many health concerns, it is very sensitive to heat and light and needs proper packaging and processing.

Most of these ingredients work well with light, fruity flavours blended with herbal/floral notes. Familiar tropical fruits like mango, pomegranate, passion fruit work well blended with ginger, aloe vera and other extracts. Delicate female-skewed flavours like vanilla-lavender and berry rose add fantasy appeal and taste to the product. Teens prefer lavender-lemonade and other citrus blends.

Keep in Mind...

Flavour developers can incorporate nutraceutical ingredients within the context of flavour or flavour system itself, adding interest and point of difference. For example, aloe vera, ginger and green tea may be included in a herbal tea flavour.

As markets demand new formats and concepts, new flavour varieties in functional foods and beverages will emerge. Flavour trends are very much evolving. Producing an overall concept acceptable to consumers is the real innovation in product development and marketing. Incorporating functional ingredients around specific health platform will continue to drive market. Consumers will get enough information about ingredients without getting confused so they can consume products giving health and appearance benefits.

Future will see health platforms emerge focusing on specific organs and functions. Brain health, circulatory health, immunity, eye health and digestive well-being will become important concepts in new functional products as demography changes. Flavour trends also reflect these changes. Although products become customised to specific health goals and market niches, present popular flavours will not completely change but will need adjustment to suit more specific target markets.

Condensed from article by Jessica Jones-Dille in
Nutraceuticals World April 2006

* * * * *

Functional Foods: Beyond Healthy Ingredients

Functional foods are still considered 'niche' market in the US, while Europe is growing quite sizeably. Cholesterol-lowering phytosterol products in Europe have the largest market in the world, being 10 times as big as in the US. There have been many predictions about lutein, lactoferrin, lycopene, beta-glucans, conjugated linoleic acid (CLA), omega 3s, plant sterols and other health ingredients. All these have not proved true showing the reality being more complex. Such ingredients like 3 DHA/EPA and CLA are showing rapid growth but they are still remaining niche. However, many others like lutein and lactoferrin showed poor performance in spite of the fact that they found their way into foods and beverages.

The Sterols/Stanol Saga

This story clearly gives lessons for everyone in functional food business. The year indicated trouble for US market for cholesterol-lowering plant sterols and stanols and the boom of European market for the same. The US market is around \$80 million and the withdrawal of cholesterol-lowering yogurt by Yoplait is a great setback to sterol producers.

Coca Cola's Minute Maid Heart Wise was expected to be a mass-market success, but 3 years after the launch, the market is still at around \$30 million, roughly the peak market achieved by Benecol (Raisio) cholesterol-lowering spread. Both Take Control (Unilever) and Benecol have been steadily declining for past few years. By contrast, Europe has become world's biggest market for sterol-based cholesterol-lowering products, worth about \$650 million. Eight years ago when such products were launched in the US, forecast was a market explosion, based on the fact that 52% of Americans have elevated cholesterol. When they failed to make headway, high price premium (400% over "regular") and the fact that sterols were launched in table spreads were blamed. However, such products have performed very well in Europe. Some of the main reasons might be as follows.

1. A me-too benefit or a new benefit:

"Cholesterol-lowering" are "me-too" products in America, where a range of products like whole grains, soy, nuts and oats etc. with FDA-approved claims are already in the supermarkets. Thus cholesterol-lowering was a common phrase in that respect. There

is no such competition in Europe for these products. Very few countries have permitted cholesterol-lowering claims for oats or soy, thus giving the benefit to products containing cholesterol-lowering plant sterols.

2. A hard-to-accept ingredient:

Plant sterols as a term is not very familiar to Americans whereas cholesterol lowering foods such as oats, nuts and soy are quite familiar ones. People like to get their health benefits from foods they can understand and accept. Although Europeans are also not familiar with sterols, brand owners there have done a better job of making the cholesterol-lowering concept acceptable and they had no other option any ways.

3. Education:

In Europe, companies promoting these products invested massive sums in consumer education, with free cholesterol-tests conducted by health professionals in supermarkets, shopping malls, country fairs and community groups. This made consumers aware about cholesterol. There was no education efforts by any US brand owner.

4. Packaging innovation:

In addition to education, packaging played an important role in Europe, where "daily dose" probiotic dairy drinks (typically around 100 ml) is worth around \$3.5 billion and rapidly increasing. So it was easy for Benecol, Unilever, Danone etc. to use daily dose dairy drink as the vehicle for beginning. US market was stuck with table spreads. Thus a convenient daily dose pack has enabled successful market that grew by over 50% in 2 ½ years. This daily dose packaging has become the format of choice in Europe as in Asia and South America for health products. Unilever has chosen 100 ml drink format for all functional foods launched in Europe recently such as omega 3 drink, blood pressure lowering drink and a drink delivering fruit and vegetable intake. In contrast, in the US market no additional convenience benefit was offered.

Healthy Ingredients Can No Longer be the Sole Point of Difference

Functional food and beverage markets are no longer virgin territory. Market is flooded with many me-too health products and ingredients offering me-too

benefits. Lactoferrin offers benefits of immunity, the same benefit offered by many probiotics (Danone' Actimel) as well as colostrums, zinc, vitamin C, cranberry, Echinacea and many others. New ingredients claiming immunity benefits appear all the time like Coenzyme Q10, goji juice, beta-glucan etc. In such situation, your ingredients' health benefit may no longer by itself be adequate to interest either food formulators or consumers. Formulators would like to see cost advantage that increases their margins or be price-competitive as well as the ease of formulating ingredient into foods & beverages (without flavour problems), processing advantages and others. Difference can also be created by helping brand owners identify new market segments to whom the benefit can be relevant. It is more important for companies to understand consumer motivations and how they can create new segments and new propositions.

Life-Stage Marketing

Life-stage marketing targets very precisely at a niche associated with a particular stage of life. This was most used in kids' nutrition, particularly as omega 3s continue to carve a position in kids' market. Omega 3 DHA (docosahexaenoic acid), from fish oil or algae, has proven benefits for both heart and brain health. Since heart health market has become crowded, brand owners are increasingly turning to the brain health benefit to create a new segment in the market. Some examples are:

- Mueller Dairy (Germany's biggest dairy company) has added omega 3 (from Ocean Nutrition) to its probiotic drink Mueller Vitality. The package refers to both heart and brain development benefits, marketing the latter to mothers. Vitality includes a 100 ml daily dose drink in its line-up.
- Nestlé has added omega 3s to its probiotic kids dairy drink (also in a daily dose format)—Munch Bunch Drink+ is marketed on a brain health platform.
- The U.K.'s Dairy Crest last year launched St. Ivel Advance omega 3 milk, with a platform of improving children's learning and concentration, using omega 3s from DSM Nutritional Products, Inc. In its first year it achieved sales of \$30 million—not a bad start in a country with a population only slightly bigger than California.
- In Canada, Danone launched Danino, which is a kid-specific yogurt that carries the Canadian Government's approved health claim that: "DHA, an omega 3 fatty acid, supports the normal development of the brain, the eyes and the nerves." Danino, says

Danone, has taken a 17% share of the kid-specific dairy market in Canada.

Even in the US, Coca Cola owned Odwalla made debut with soy milk containing DHA (from Martek) and a clear brain health benefit claim making it different from other soy milks with heart health benefit message.

CLA may not look a functional food winner, but has become for Norwegian company Natural ASA and licensing partner Cognis (Germany), which markets Tonalin brand CLA. Leading Spanish dairy group CAPSA was the first company in the west to launch products with added CLA. As per consumer research company Health Focus International, Spanish are the most health-active consumers in Europe from observing the success of omega 3 milk and country's high consumption of sterol-based cholesterol lowering drinks. CAPSA's NaturLinea brand of yogurt, milk, juice and a dairy drink marketed with weight loss message, has grown to over \$60 million in two years since launch in a population of just 40 million. Same penetration in the US would have achieved retail sales of over \$400 million. The success of NaturLinea shows the value in identifying a benefit that is compelling to the target market; Spanish women care about weight and their figure very much. The benefit is delivered in reliable and convenient format under trusted brand so it worked. When these factors come together consumers do not mind having an ingredient they never heard of.

In contrast, lutein performed only in ultra-niche market of older consumers, although Kemin Foods and others explained its naturalness (being found in spinach) and improved eye health and combated age-related macular degeneration (AMD). Majority of consumers did not find it relevant and aged were better reached through supplements not food.

Market Domination

It is a basic rule that most markets allow only two and sometimes three leading players to dominate a category controlling 80% of market leaving only 20% to niche players. It is also common for companies who are first to market to dominate. Europe's market for plant sterols/stanols estimated at \$150 to 180 million, 3 companies entering first namely Raisio Benecol, Cognis and ADM, hold 80% share between them. There are 20 other suppliers competing for the rest including new entrants (like P&G with Nutracyl brand of sterols) who are wondering how they can differentiate and build business.

It is a similar story for omega 3s, where there are at least 17 suppliers. Leaders like Ocean Nutrition (40%

share) have firmly established and new entrants may need exceptional technology or aggressive pricing or active marketing to make any headway.

Company hoping to enter crowded market with such ingredient needs extraordinary point of difference in terms of benefits or technical performance, which is very rarely achieved. In reality, the only tool available is lower price, which hastens the commoditisation process as they fight for crumbs.

One tactic that has begun and will happen more in future is that of Canada's Forbes Medi-Tech, a me-too sterol player. In partnership with a dairy company, it is positioning itself as the supplier to supermarkets, with opportunity to sell private labels versions of branded products. It has started off very well with UK's Tesco, Netherlands' Albert Heijn and Finland's Keskkö, all offering range of cholesterol-lowering products 30-40% cheaper than those of Benecol and Unilever.

Markets will expand as more food types may be fortified with sterols. However, the same hope was held out for probiotics. However, in Europe, Asia and South America dairy applications dominate consumer product market. Consumers only think dairy regarding probiotics and no other probiotic consumer products (bread, cereals, sausages, cookies) could change that. Similarly, dairy is taking control of cholesterol-lowering market in Europe with products from Benecol, Danone and Unilever, so dairy will also

become synonymous with it this application and no other food category will be able to come close to challenge it.

For every ingredient, one consumer product type will dominate with only a few suppliers enjoying real success. Ingredient companies therefore need to be early and focus on supporting formats that work.

Europe's dairy industry is again cornering new functional food market, with new products innovations, packaging and with omega 3, a new ingredient as with probiotics and plant sterols. No other food or beverage category has played a strong role in driving functional food revolution in Europe. With dairy capturing the platform of added health benefits, it might be too late for functional bread or juice. Dairy's track record sets it apart: to take an example from the U.K. market—sales of probiotic daily dose drinks exceed \$450 million; cholesterol-lowering daily-dose drinks bring in \$100 million and omega 3 milk brings over \$100 million.

It's no exaggeration to say that in terms of future developments in functional foods, what happened in the dairy sector—be it in Europe or America—may matter more than any other category.

Condensed from: an article by Julian Mellentin in Nutraceutical World December 2006

* * * * *

In The News

Nutri-Cosmetics: Eat, Drink and Be Skeptical By Natasha Singer

Published: New York Times, December 14, 2006

SCOTT-VINCENT BORBA, an entrepreneur in Woodland Hills, Calif., makes elixirs called Borba Skin Balance Water that hold all the allure of the fountain of youth. Shelves in refrigerators at Sephora stores under signs marked "Drinkable Skincare," the plastic bottles contain mixtures of vitamins and plant extracts that promise to enhance the skin. The label on the "replenishing" water, for example, says it has been "scientifically proven to improve moisture levels by an average of 66 percent," while the "firming" water advertises itself as "scientifically proven to improve elasticity by an average of 24 percent."

Last year, Americans bought about one million bottles of Borba water, which cost \$2.50 each, Mr. Borba said. They also bought the brand's "skin treatment infused" gummi bears (\$25) and powders (\$28) that promise to help improve cellulite and stretch-mark-prone areas in seven days.

"If you put good things into your body, your skin should reap the benefits," Mr. Borba said. "You already drink water and you already eat candy and chocolate, so I am putting skin care into your water and your candy and your chocolate."

For decades, cosmetic companies have manufactured face creams that offer hope in a jar. But now a growing number of beauty brands are introducing hope in a pill, a water bottle or even a candy bar. Marketers refer to this new skin-care category as "internal beauty" or "nutri-cosmetics." It includes pills, liquids and snacks formulated with

substances like biotin, niacin, omega-3 fatty acids, pomegranate and green tea that promise to improve the look of skin, hair and nails. But critics said there is little scientific proof behind the premise that these items will improve the look of the skin.

“We would all love to get smoother, younger, more elastic skin in seven days just by chugging drinks, eating candy bars or chewing gummi bear vitamins,” said Wahida Karmally, the director of nutrition at the Irving Center for Clinical Research at Columbia University Medical Center. “But skin doesn’t work that way. There is no magic bullet.” Dr. Karmally, who has a Ph.D. in public health, added that a diet of whole grains, vegetables, fruits, lean proteins and “plain old water” helps skin stay healthy. She advised consulting with a nutritionist or a doctor before taking any kind of dietary supplement because mega-doses of certain vitamins can be unhealthy, she said.

Since food helps maintain skin health, one might assume that supplements improve skin. But Dr. James M. Spencer, a dermatologist in St. Petersburg, Fla., who has studied the use of ingestible substances to inhibit skin cancer, said that there is little scientific validation for the idea that dietary supplements can beautify well-nourished people. “If you are already a healthy 55-year-old woman in New York, or if you just had pizza for lunch, I doubt you will look prettier if you take beauty vitamins,” said Dr. Spencer, a clinical professor of dermatology at Mount Sinai School of Medicine in Manhattan. He added that scientists know little about how beauty supplements affect the skin because they are considered dietary supplements, products that are not vetted by the Food and Drug Administration before they arrive in stores.

The manufacturers are responsible for the content and safety of these products and for the validity of marketing claims. But if a dietary supplement claims beneficial effects, it must bear a disclaimer that the F.D.A. has not evaluated the claims and that the product is not intended to “diagnose, treat, cure or prevent any disease.”

Five years ago, very few Americans bought nutri-cosmetics. But last year Americans spent about \$50 million on them, according to Kline & Company, a market research firm that tracks cosmetics sales. Carrie Mellage, an industry manager for consumer products at Kline, said that worldwide sales of nutri-cosmetics reached \$1 billion last year, largely because of sales in Europe and Asia. In Japan, for example, Eiwa Confectionery makes “collagen marshmallows” that claim to plump skin, and in France, Noreva

sells “gourmet anti-aging jam” in flavors like melon-mango or tomato-green tea. Ms. Mellage said that increased interest in holistic medicine and organic food is driving sales.

Mr. Borba, who has developed product ideas for beauty companies, started his business after deciding that he spent too much time drinking mineral water, applying grooming products and taking 15 different supplements a day. His idea: Combine the three in one product. In 2005, he introduced Borba waters at Fred Segal Beauty in Santa Monica, Calif. This year sales will reach 2.5 million bottles, he said. The products are based on the idea of skin bioavailability — that if nutrients are made available, skin cells will absorb them and thus improve the skin’s appearance, he said. “Consumers understand that you and your skin are what you eat,” he said. “Elixirs, droplets and effervescent tablets that fortify your skin from the inside out will become the skin care of choice in the next five years.”

Dr. Howard Murad, a dermatologist in El Segundo, Calif., who founded his own cosmetic line in 1989, is one of a number of doctors selling nutri-cosmetics. The label on Murad Optimal Health and Beauty dietary supplement says the pills are “scientifically proven to improve skin hydration by 40 percent” and “increase skin firmness by 58 percent.” Dr. Murad said he developed his supplements out of his own research, based on the idea that humans have been using nutrients to improve health for thousands of years. “The idea of food as medicine has been around forever, but we are only just rediscovering it,” said Dr. Murad, an associate clinical professor of medicine in dermatology at the Geffen School of Medicine at the University of California, Los Angeles. He said ancient Egyptians used pomegranate to treat intestinal disorders. Now, he said, “U.C.L.A. has started studying the effects of pomegranate juice on prostate cancer.”

BUT critics said that just because certain nutrients can help cure diseases does not automatically mean that their use in dietary supplements beautifies the skin. “There isn’t yet evidence to support the use of these for enhanced skin in healthy people,” said Paul M. Coates, the director of the Office of Dietary Supplements of the National Institutes of Health. “It doesn’t mean that they don’t work, but we can’t say with any certainty that they do work.” Dr. Coates, who has a Ph.D. in genetics, said that nutri-cosmetics could be validated only by clinical trials published in peer-reviewed scientific journals. But very few such rigorous tests are done on beauty supplements, he said.

Mr. Borba said that the claims on his waters are based on independent studies that he paid for. The company's Web site, www.borba.net, says that a technician visually evaluated volunteers' skin for wrinkles, dryness, elasticity and clarity over 28 days. Dr. Murad said the claims on his supplements are based on studies by an independent laboratory that used devices like a corneometer to measure hydration and a ballistometer to measure elasticity. He published a study in 2001 in the *Journal of Cosmetic Dermatology* showing that eight people who ate pomegranate supplements and used a pomegranate lotion slightly increased protection from sun damage.

"I am not claiming that this is scientific study on the level of what we expect from Harvard research," Dr. Murad said. But a recent anecdotal study of 70 of his patients found supplements improved their skin. "Ideally, the best thing you could do for your skin is to eat a lot better," he said. "But it's difficult to eat a huge amount of fresh food, so you can supplement." Dr. Spencer said nutri-cosmetics are mostly marketing. "They are unlikely to hurt you," he said. "But they may hurt your pocketbook."

(http://www.nytimes.com/2006/12/14/fashion/14skin.html?n=Top%2fNews%2fHealth%2fDiseases%2c%20Conditions%2c%20and%20Health%20Topics%2fDiet&_r=1&oref=slogin&pagewanted=all)

2007 Dieting Trends: A Survey

Shedding excess pounds is a top priority for many Americans as the media continues to proclaim the dangers of obesity. A recent **Calorie Control Council** survey found that the highest number of Americans in the past 15 years, 71 million, or 33% of the population, are currently on a diet.

The **CDC's National Center for Health Statistics** claims that 30% of U.S. adults 20 years of age and older—over 60 million people—are obese, with a **BMI of 30 or higher**. This can lead to a host of health problems, from heart disease to diabetes. The U.S. government has made the reduction of obesity among adults to less than 15% as one of its national health objectives for 2010.

To achieve this, "Consumers must be aware of the calories they are consuming and the calories they

are expending," says Robin Steagall, R.D., nutrition communications manager of the Council. "By choosing lower-calorie foods and beverages and incorporating exercise into the daily lifestyle, weight loss and improved health can be maintained for life."

Because the diet is critical to losing weight and keeping it off, the Calorie Control Council is predicting the following top 5 dieting trends in 2007:

1) Restaurants will serve more low-calorie and reduced-fat foods. A recent FDA report encouraged restaurants to sell lower-calorie foods and increase customer's calorie awareness. This will lead to an increase in lower-calorie and reduced-fat options for patrons trying to manage their weight.

2) Consumers will create personalized eating plans. Americans are discovering it is not practical to eliminate an entire food group or endure a liquid diet for long periods. People will begin to ignore fad diets and focus on sensible nutrition and controlling calories with customized meal plans, often found through dieting websites.

3) Exercise will become part of the "everyday." Busy Americans find that fitting exercise into a demanding schedule can be difficult. However, many will make small changes to incorporate fitness into their daily lifestyle and burn extra calories, such as taking the stairs and parking far away in parking lots.

4) Functional light foods will gain popularity. Low-calorie options that also provide health benefits beyond basic nutrition will increase. For example, foods and beverages that combine fewer calories with eliciting a low glycemic response provides beneficial to everyone, not necessarily just people with diabetes.

5) Healthy living will become a family matter. Families will take major steps to slow the growing rate of childhood obesity. Many will make proper nutrition and exercise a priority for the entire family. Overall, the Council calls 2007 a year of positive change for weight loss and weight maintenance. "By focusing on calories in and calories out and not being misled by the latest weight loss fad and instead adopting healthy long-term habits, the New Year can be happy and healthy," says Steagall.

From: Food Product Design 12/19/2006

Anti-cancer Properties of Berries Studied

Recent research performed at the Center for Human Nutrition, David Geffen School of Medicine, University of California, Los Angeles (UCLA), investigated the anticancer properties of various berry extracts. The results of this research were published in the Dec. 13 issue of the *Journal of Agricultural and Food Chemistry*. Researchers studied the ability of extracts from blackberries, black raspberries, blueberries, cranberries, red raspberries and strawberries to inhibit the growth of oral, breast, colon and prostate tumor cell lines, as well as their effect on apoptosis. They also evaluated the phenolic constituents—including anthocyanins, flavonols, flavanols, ellagitannins, gallotannins, proanthocyanidins and phenolic acids—of each extract.

At increasing concentrations, all extracts showed inhibition of cell proliferation. However, the researchers noted different degrees of potency between cell lines, noting that extracts of black raspberries and strawberries showed the most-significant pro-apoptotic effects.

In their report, the researchers note that berries contain a diverse range of phytochemicals with biological properties, such as antioxidant, anticancer, anti-neurodegenerative, and anti-inflammatory activities. They note that the results of this research, along with other related research, warrant further investigation into the chemopreventive and chemotherapeutic effects of berries.

Funding for this project was provided by the California Strawberry Commission, Watsonville, and the UCLA Center for Human Nutrition.

(<http://pubs.acs.org/cgi-bin/abstract.cgi/jafcau/2006/54/i25/abs/jf061750g.html>).

Budget food ranges 'less healthy'

Supermarkets may be contributing to the UK's health inequalities by selling "economy" ranges that are less healthy than standard ranges, a report warns.

Most low-cost food products are "significantly" higher in salt than standard own-brand products, the National Consumer Council (NCC) found. The ranges concerned included Morrisons Bettabuy,

Asda's Smartprice and Somerfield's Makes Sense. But the British Retail Consortium (BRC) said the report was "out of date". It said the survey was carried out six months ago and stores had made improvements since then. The NCC's research found that while 44% of supermarkets' standard products met the Food Standards Agency's sodium target levels, only 35% of economy products did.

NCC's 'HEALTH RESPONSIBILITY INDEX'

"Healthiest" supermarket first

- 1 - Sainsbury's
- 2 - Tesco
- 3 - Waitrose
- 4 - Marks & Spencer
- 5 - Asda
- 6 - Co-op
- 7 - Somerfield
- 8 - Morrisons

The survey compared products like baked beans, sliced white bread and pork sausages in both standard and cheap ranges. In many cases they found that economy sausages, for example, were higher in salt than their standard equivalents. "Consumers who rely heavily on economy ranges are clearly being short-changed on health," said NCC chairman Lord Whitty.

The NCC said Morrisons came bottom of eight supermarkets surveyed for their approach to health, for the third year running. Somerfield was second-worst, while Sainsbury's was considered the best, even though some of the products in its Basics range were found to be high in salt too. The NCC called for more price promotions on fresh fruit and vegetables, to encourage the less well off to eat more healthily.

Salt 'adds flavour'

But Richard Dodd, a spokesman for the BRC, said it was not true that consumers were being priced out of eating healthily. Stores were "discounting heavily" on fruit and vegetables, he said. He added that reducing salt levels was not always popular. "The purpose of salt in food is to add flavour and to preserve," he told BBC News. "We have to work out ways of keeping it tasty - in some products salt has been reduced and consumers didn't like the taste. "It is not always easy to reduce salt levels."

From BBC NEWS: http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/6160783.stm

Dieters do calories, not exercise

Twice as many dieters count calories to lose weight rather than exercise, a poll has found.

Calorie counting is most popular with women - half opt to count their food intake, compared with a third of men. Yet 59% of the 2,000 people surveyed by GlaxoSmithKline Nutritional Healthcare realised exercise makes the greater contribution to personal health. More choice in low-calorie foods means people are giving up exercise in favour of consuming less, nutritionists say.

John Brewer, GSK Sports Scientist, said: "The trend of people swapping the gym for a low calorie meal is very worrying. "Consuming fewer calories is no substitute for exercise. We cannot afford to become a nation of calorie-counting couch potatoes - the benefits of leading active lives are enormous." Graham Neale of GSK Nutritional Healthcare said diet food manufacturers had a responsibility to consumers. He said: "With food and drink manufacturers broadening their 'diet' ranges, we need a concerted effort to encourage consumers to focus as much on 'energy out' as 'energy in'."

Little and often

Charlene Shoneye, research dietician at Weight Concern, said: "I'm not surprised by the results. "A lot of people find the idea of going to the gym quite daunting and so reducing calorie intake seems to be an easier option. "A recent survey found only 12% of the population are gym members. "We promote physical activity as opposed to going to the gym per se. Things like taking the stairs instead of using the lift and walking when ever possible to increase your energy expenditure throughout the day.

"The recommendation is 60 minutes of activity a day. That can be done in smaller slots. There are so many low calorie, low fat products out there...and calorie counting is important, but so is exercising. Physical activity has health benefits other than weight loss."

From BBC NEWS: <http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/6183799.stm>

High-protein diet good for heart

Break out the nutcracker this Christmas, or try fish for that holiday meal. According to a report from the Harvard Medical School, there is such a thing as heart-healthy, high-protein diet. Unsurprisingly, it

doesn't focus on prime rib or eggs over-easy.

The diet described in *Healthy Eating: A Guide to the New Nutrition*, which Harvard is selling, offers what the publishers say is a healthful alternative to the old-fashioned Atkins style diets that "ooze artery-clogging saturated fat with every bite." Instead, this eating plan, one of several studied in the OmniHeart trial, includes high-protein foods from both animal and plant sources that are lower in saturated fat. Along with chicken and fish, dietary sources of protein include nuts, beans, whole-grain cereals, and fat-free dairy products.

From: IFT Weekly Newsletter December 20, 2006

New crops needed to avoid famines

By Richard Black , Environment correspondent

The global network of agricultural research centres warns that famines lie ahead unless new crop strains adapted to a warmer future are developed.

The Consultative Group on International Agricultural Research (CGIAR) says yields of existing varieties will fall. New forecasts say warming will shrink South Asia's wheat area by half. CGIAR is announcing plans to accelerate efforts aimed at developing new strains of staple crops including maize, wheat, rice and sorghum. At the network's annual meeting in Washington, scientists will also report on measures to reduce greenhouse gas emissions from farmland. CGIAR links 15 non-profit research institutes around the world working mainly on agriculture in developing countries and the tropics.

"We're talking about a major challenge here," said Louis Verchot of the World Agroforestry Centre (Icraf) in Kenya, a member institute of CGIAR. "We're talking about challenges that have to be dealt with at every level, from ideas about social justice to the technology of food production," he told the BBC News website. "We're talking about large scale human migration and the return to large-scale famines in developing countries, something which we decided 40 or 50 years ago was unacceptable and did something about."

Raining problems

The most significant impact of climate change on agriculture is probably changes in rainfall. Some regions are forecast to receive more rain, others to receive less; above all, it will become more variable. But increasing temperatures can also affect crops.

Photosynthesis slows down as the thermometer rises, which also slows the plants' growth and capacity to reproduce. Research published two years ago shows rice yields are declining by 10% for every degree Celsius increase in night-time temperature.

A study from the International Maize and Wheat Improvement Center (Cimmyt) in Mexico, yet to be published, projects a major decline in South Asia's wheat yield. The vast Indo-Gangetic plain produces about 15% of the world's wheat - but the area suitable for growing is forecast to shrink by about half over the next 50 years, even as the number of mouths to feed increases. "The livelihoods of billions of people in developing countries, particularly those in the tropics, will be severely challenged as crop yields decline due to shorter growing seasons," said Robert Zeigler, Director General of the International Rice Research Institute (Irri), a CGIAR affiliate.

Conversely, rising temperatures will open up areas of the world which are currently too cold for crop cultivation, in regions such as Siberia and northern North America. And the same Cimmyt study forecasts that wheat will become viable in parts of Alaska.

But the CGIAR figures suggest that extra yield from these regions will not fill the shortfall in the tropics - added to which there are questions of how poorer tropical countries will afford to buy food from richer temperate states. All this means, CGIAR says, that research into the technological, social and economic dimensions of future farming needs to accelerate.

Climate-proof crops

Within the CGIAR network, various research initiatives are already under way to develop "climate-proof" varieties. Scientists at Irri in the Philippines have developed strains which can survive floods of several weeks. Serious flooding is forecast to worsen in some Asian countries, notably Bangladesh. Conversely, some already arid regions of Africa are forecast to become even drier. With sorghum, the line of research being pursued at the International Crops Research Institute for the Semi-Arid Tropics (Icrisat) is to develop strains which can survive drought.

One of the most exciting initiatives aims to make a fundamental modification to rice so it becomes more efficient at using the Sun's energy. Rice is a so-called C3 plant. Other crops, including maize,

use a better photosynthesis mechanism called C4, and Irri Scientists aim to develop rice strains which also use the C4 mechanism. "Boosting the photosynthetic efficiency of rice by changing it from C3 to C4 photosynthesis will be like supercharging a car's engine by fitting a new fuel injection system," said Irri's John Sheehy.

Despite reservations in other parts of the world, notably western Europe, genetic modification is becoming one of the staple tools of researchers aiming to enhance developing world agriculture. "I can understand the opposition to GM, and I sympathise to a certain extent with it," said Dr Verchot. "But in developing countries we're dealing with a crisis situation; and whatever tool is available, we need to apply it to that situation."

Fertile ground

Away from the field of crop improvements, CGIAR scientists will also be detailing approaches to reducing greenhouse gas emissions from farming. One simple method which is proven, but which by no means all farmers are aware of, is no-till or minimum-till agriculture, where fields are ploughed and disturbed as little as possible. This keeps carbon in the soil rather than sending it into the air as carbon dioxide. Nitrous oxide (N2O) is a more potent greenhouse gas than CO2, and is released when fertiliser breaks down.

Scientists with Cimmyt and the International Center for Tropical Agriculture (Ciat) have developed a hand-held sensor using light and infra-red radiation which can tell farmers whether plants need more fertiliser or not; less fertiliser use means less N2O produced. All this and more will be discussed at the Washington meeting, along with a key question - is enough money going in to fund the acceleration which the CGIAR believes is needed?

Louis Verchot answers with a simple statistic - CGIAR centres, with a mandate to find solutions for the whole of the developing world, have less to spend on research each year than France, for example, spends on research for its own farms. "We're seeing awareness coming, we're seeing a shifting of resources, but we're clearly well below where we need to be," he said. "It's much easier to solve a problem before we get to a crisis. With climate change we're definitely talking about a crisis, and it's coming within our lifetimes."

From BBC NEWS: <http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/6200114.stm>

New wheats produce more magnesium

Newly developed low-phytate breeding lines of wheat have been found to produce flour with 25 percent more magnesium than commercial varieties, according to Agricultural Research Service (ARS) Scientists. Varying amounts of magnesium, phosphorus, zinc and other minerals occur naturally in wheat kernels.

Not only do the flours made from these new wheat lines have more magnesium in them, but lower levels of phytic acid may increase the magnesium's bioavailability, or capacity for uptake and use by people and animals. Magnesium deficiency has been linked to development of osteoporosis and Type 2 diabetes, both of which are on the rise in the United States.

ARS plant geneticist Edward J. Souza and colleagues at the University of Idaho Research and Extension Center in Aberdeen—Mary J. Gutteri and Karen M. Peterson—selected the low-phytate lines from greenhouse tests.

The researchers evaluated the low-phytate plants in field trials for two years. Since the new wheat lines have a different distribution of essential minerals, with more in the inner germ than in the outer bran, the flour made from them tends to be more nutritional, whether it is refined or whole-wheat.

Four papers by the scientists addressing various aspects of low-phytate grains appear in the November-December 2006 issue of *Crop Science*, (online at: <http://crop.scijournals.org/cgi/content/full/46/6/2403>).

From: IFT Weekly Newsletter
December 20, 2006

Teens Who Take Multivitamins Have Healthier Lifestyles

A study in the December *Journal of the American Dietetic Association* reports teenagers who take a daily multivitamin supplement have a healthier diet and lifestyle than those who don't take vitamins. As part of the Child and Adolescent Trial for Cardiovascular Health (CATCH), the researchers analyzed data on height, weight, diet and health behaviors for more than 2500 U.S. high school seniors. Their goal was to discover whether teens who took vitamin supplements differed in terms of diet, exercise and other health habits.

Twenty-five percent of the teens reported taking a daily multivitamin supplement. Females were more likely to take vitamins than males, and whites more likely than minority members. Vitamin use was related to some important differences in lifestyle behaviors, with vitamin users having healthier lifestyles. Adolescents who took vitamins had a lower rate of smoking, 29% versus 33%; and were less likely to be overweight, 31% versus 37%. Teens who took vitamins were also more physically active, including higher rates of participation in team sports and other organized sports. Vitamin use was also linked to a lower rate of television watching—less than 60% of vitamin users watched an hour of TV per day, compared with 70% of nonusers. The differences remained significant after statistical adjustment for other factors.

Taking vitamins was also associated with a healthier diet, as reflected by an overall "food index score." Adolescents who took vitamins actually consumed more calories, but got more of their calories from carbohydrates and protein and less from fats. Vitamin users ate more fiber; had more daily servings of whole grains, fruits and juices and vegetables; and ate more fish. Although teens who took vitamins had more desserts, they ate fewer fried foods and drank fewer soft drinks. The new study is one of the first to look at the relationship between vitamin supplement use among teens and diet and lifestyle factors such as physical activity and overweight.

From: Nutraceuticals World December 2006

Transformed potato produces French fries with less acrylamide

Scientists have genetically modified the Ranger Russet potato to counter storage problems that limit the tuber's use in French fry production. Ranger Russets boast higher yields and are more uniform, but have had trouble penetrating the market because of two storage problems: black spot bruise sensitivity and high levels of cold-induced sweetening.

Caius M. Rommens, Jingsong Ye, Craig Richael, and Kathy Swords genetically modified the Ranger Russet without inserting any foreign DNA into the plant genome, and transformed the potato's weaknesses into strengths. French fries from the intragenic potatoes also contained reduced amounts acrylamide while, unexpectedly, displaying enhanced sensory characteristics.

Improving Potato Storage and Processing Characteristics through All-Native DNA Transformation

J. Agric. Food Chem. **54** (26), 9882 -9887, 2006
(From: IFT Weekly Newsletter December 20, 2006)

WORLD OF FOOD INGREDIENTS

-Dec 2006

- Convenience Products: A totally new area for the European and US markets has been that of the active health drinks market.
- Sustaining Organic: Today's typical organic products aren't just the fruits, vegetables, meats, and dairy goods that fit the fresh-from-the-farm image.
- Design Trends-Confectionery: Manufacturers are allowing consumers to truly spoil themselves with pure indulgence.
- Design Trends-Beverages: Juices are great carriers for functional ingredients but some are also acquiring the image of being highly healthy.
- Design Trends-Ready Meals: The ready meal sector is increasingly offering far more than a convenient fit
- Design Trends-Soups and Sauces: 'Premium' and 'authentic' and notions such as 'gourmet convenience' are clear trends.
- Design Trends-Savoury Snacks: Alternative snacks are capitalizing on the health trend, but traditional options are also being given a makeover.
- Design Trends-Dairy: Traditional dairy products from other corners of the world are making their way onto the European Market.
- Functional Starch: Maize is the major raw material that is processed into starch with approximately 80% of total production.
- Sweetening Beverages: An analysis of applications in recent product launches.
- Novel Application: HiE (Health Ingredients-Europe) saw the launch of several new ingredients and applications
- Enzyme Innovation: Selecting enzymes for an application not only depends on the reaction required but must also take into consideration processing factors.
- Cereals and Flavours: Adding colourful particulates to cereals will increase the visual appeal while creating a textural differentiation and adding nutritional

value.

- Soy Crossroads: The key to unlocking soy's health benefits has changed in the last few months.
- Legislative concerns: Although few industry issues have been fully resolved, the basic framework by which health claims will be gained, maintained and potentially even lost has been established.
- Innovation Triumphs: The ten most creative healthy product launches of 2006 and how they are inspiring new product development trends.
- Phenolic Carriers: Many berries, especially the ones with blue and red colours, contain important phenolic phytochemicals.
- Industry Innovation: Replacing salt-Jungbunzlauer's sub4salt helps manufacturers to meet reduction targets and to come up with tasty products with sodium content reduced by up to 50%.

Functional foods and nutraceuticals

-Nov 2006

- News: Analysis and perspectives
 - Battles over GM rice continues
 - European USL debate heats up
 - 'Cocaine' fuels controversy
 - Natural preservatives booming
 - Cosmeceutical ingredients business soars
 - EU delays health claims legislation
- Cover story
 - Flavours: The history of citrus and why it is one of the world's oldest and most widespread flavourings.
 - Global dispatches: European organics: Europe's organic market is experiencing the same supply shortages as the US market, presenting numerous opportunities and challenges for outside suppliers
 - Organic outlook: Growing worldwide demand is changing the face of the organics business. Shane Starling examines the factors that have led to this change, and what they mean for the future of the business.

- Formulations: Confectionery: Some are considering confections as a new platform delivering functional ingredients.
- Mushroom magic: Researchers are beginning to uncover the vast health potential of Edible Fungus and what these findings could mean for consumers and the market place.
- Inflammation: Natural alternatives to COX-2 inhibitors

Food and Nutrition Bulletin-Supplement

-Dec 2006

- Development of an International growth standard for Preadolescent and Adolescent children.
- The 1998-2001 Peru Multimicronutrient Supplementation Study (PISA)

Food and Nutrition Bulletin

-Dec 2006

- Carotenoid content of Banana cultivars in Australia
- Iodine deficiency in Zanzibar Islands of Tanzania
- Stunning and Overweight in Latin America and Caribbean children
- Cooked vegetables as a Vitamin source in India
- Anaemia among Pregnant Women and Adolescent Girls in India
- Characteristics attributed to Complimentary Foods in Latin America and the Caribbean
- Weaning foods and Child-feeding practices in Nigeria
- Millennium Villages Project in Africa
- Good governance for Nutrition in the Philippines
- Nutritional status of Santal men in India

Nutrition Bulletin

-Dec 2006

- Editorial: Supporting sensible choices across Europe
- Health benefits of fish oils under question
- Trans fats – Should We Be Worried?
- Coffee- The Truth About The Bean
- Alcohol consumption in the New Millennium- Weighing up the risks and benefits for our health
- Labelling in Restaurants: Will it make a difference?

- Claims and Fortification- New Regulations on the way
- Oligofructose – Enriched inulin stimulates Calcium absorption and Bone mineralisation
- Peer review: What is it and Why does it matter?
- The importance of harmonizing and sustaining food composition data across Europe

Functional Foods and Nutraceuticals

- Dec 2006

- Kids nutrition takes center stage- The declining Health of American children due to poor nutrition, obesity, lack of exercise and toxic environmental chemicals was the major theme of the Third Healthy Foods Conference.
- Allergies power new products- Food intolerance and Allergies are creating growing demand for allergen free products, the factors behind the boom, and the widespread opportunities emerging.
- Young market for kid's nutrition- Manufacturers of Niche products take children's nutrition beyond the realm of dairy. Unlocking the enzyme market- Enzymes used for food processing aids are buoyant but enzymes that confer health benefits have been slow to win over both scientists and consumers.
- Fortifying beverages with fiber Who's making your product-Increasing, dietary supplements are distributed by marketing companies that don't manufacture the products themselves.
- Developing food strategies for the prevention of diabetes-Crafting foods with a healthier balance of carbohydrates, fats and proteins, as well as fortifying them with fibre and other micronutrient can help prevent the progression of this disease.
- Suppliers turn to Rosemary and Pomegranate.
- Assaying fracture risk with whey

Food technology

- Nov 2006

- Heyday in Grain Land- Regular consumption of whole grains is part of a healthy lifestyle.

- Food Nanotechnology-The Institute of Food Technologists has issued a scientific status summary on potential applications of nanotechnology in the food industry.
- A holistic approach to Product Development – Emotive research refocuses the development process from product features to consumer-product experiences, leading to successful trial and repeat purchases.
- Pampering your Pet- Pet Foods are becoming more sophisticated, with gourmet flavors and formulas that address specific nutritional needs.
- Un-junking Snack foods – Many consumers are more likely to grab that bag of chips not because the product is made with healthful sunflower oil, but rather because it is flavoured with a unique spice combination.
- Nutraceuticals Functional sweets-Ingredients like botanicals, vitamins, minerals, and cocoa flavanols are making candy, one of our guilty pleasures, a bit more justifiable.
- Laboratory- Water activity and Food Quality.
- Processing- Everything flows.
- Packaging- Sustainability and alternatives to today's food packaging
- A pinch of (iodized) salts.

Journal of Food Science

-Nov/ Dec 2006

- Concise review or hypotheses in Food science
 - Functional Materials in Food Nanotechnology
 - Organic Foods
 - Eukaryotic Antimicrobial Peptides: Promises and Premises in Food Safety
 - NMR State Diagram Concept
- Food Chemistry and Toxicology
 - Characterisation of Aroma-Active Compounds in Microwave Blanched Peanuts
 - Processing of Sugar-Coated Red Kidney Beans (*Phaseolus vulgaris*): Fate of Oligosaccharides and Phytohemagglutinin (PHA) and Evaluation of Sensory Quality

- Methionine is the Methyl Group Donor for Sulphite-Associated Methanethiol Formation in Isolated Soy Proteins.
- Quality of Alaskan Maricultured Oysters
- Influence of Lees Contact on Evolution of Amines in Chardonnay Wine
- Carbon Monoxide as a colorant in Cooked or Fermented Sausages.
- Effects of Dietary Functional Ingredients and Irradiation on the Quality of Cooked Turkey Breast Meat during Storage
- Food Engineering and Physical Properties
 - Catalytic Infrared Dehydration of Onions
 - Study on Stabilizing Mechanising of Konjac Glucomannan in Tea Infusions
 - Kinetics of Potato colour and Texture Development during Baking, Frying , and micro waving with the Addition of Liquid Smoke
 - The effect of Brine Ingredients on Carrot Texture during Thermal Processing in Relation to Pectin Depolymerisation due to the B-Elimination Reaction
 - Influence of transglutaminase-Induced Cross-Linking on Properties of Fish Gelatine Films
 - Effect of Soybean-to-Water Ratio and pH on Pasteurised Soymilk Properties
 - Crack Development in Individually Quick Froze Cut and Peel Carrots
 - Protein Associated with Thermally Induced Gelation of Turkey Breast Meat
- Sensory and Nutritive Quality of Food
 - Mouthfeel Detection Threshold and Instrumental Viscosity of Sucrose and High Corn Syrup Solutions
 - The effect of Lactates on the quality of microwave-Cooked Chicken Pattice during storage
 - Characteristic Property of low Bitterness in Protein Hydrolysates by a novel Soybean protease D3
 - Cell wall stability of Fresh Cut Fuji Apples Treated with Calcium Lactate
 - Effect of Enzyme Treatments and Drying Temperatures on Methylpyrazine Content in Cocoa Powder Extract
 - *Curcuma Aromatica* Inhibits Diabetic Nephropathy in the Rat
 - Lipid-Lowering Effect of Eriocitrin, the main Flavonoid in Lemon Fruit, in Rats on High-fat and High Cholesterol Diet

Coming Events

- **15-17 Feb 2007**
HSC North American Executive Conference, at Cancun, Mexico;
Organisers: Health Strategy Consulting (HSC)
Contact: Bill McGowan
Tel: 617-775-0759,
Email: bmcgowan@hscadvice.com
Web: www.health-strategy.com/news/conferences.php
- **8-9 Mar 2007**
Nutracon, at Anaheim, CA,
Organisers: New Hope Natural Media,
Tel: 866-458-4935,
Email: tradeshow@newhope.com
Web: www.newhope.com
- **8-11 Mar 2007**
Natural Products Expo West/
SupplyExpo, Anaheim, CA,
Organisers: New Hope Natural Media,
Tel: 866-458-4935,
Email: tradeshow@newhope.com
Web: www.newhope.com
- **19-22 Mar 2007**
DCAT Week, at New York, Waldorf Astoria, Organisers: Drug, Chemical & Associated Technologies Association,
Tel: 800-640-DCAT,
Email: dcat@dcat.org
Web: www.dcat.org
- **28-30 Mar 2007**
Food Ingredients China 2007, at Shanghai New International Expo Centre Co., Ltd, Pudong New Area.
Contact: Ms. Stella Zhong
Tel: +86 2164371178
Fax: +86 2164370982
Email:
Stellazhong@cmpsinoexpo.com
Website: www.asiachina2007.fi-events.com
- **13-16 Apr 2007**
Quality Italian Food Show in Rome, at Rome New Exhibition Centre, Contact: Information Secretariat
Tel: +390521996206/233
Fax: +390521996270
Email: cibus@fiereparma.it
- **24-26 Apr 2007**
DCAT's Nutrition & Health Forum, at Napa Valley, CA, Organisers: Drug, Chemical & Associated Technologies Association (DCAT),
Tel: 800-640-DCAT,
Email: lkuna@dcat.org
Web: www.dcat.org
- **27-29 Apr 2007**
Food Tech Kerala, at Gokulam Convention Centre, Cochin, India,
Organisers: Lanka Exhibitions (LECS),
Contact: Automobile Association Bldg, 4th floor Sir Mohamed Macan Marker Mawatha, Colombo 03 Sri Lanka
- **10-12 May 2007**
SIAL China, at Shanghai New International Expo Centre, China,
Organisers: Beatrix EDER, Contact: Communications Manager
Tel: (86) 21 6249 2028 / 603
Fax: (86) 21 6249 3414
Email: beatrix_eder@exposium-shanghai.com
Website: www.sialchina.com
- **15-17 July 2007**
Africa's Big Seven (AB7), at Johannesburg, South Africa,
Organisers: Cruz Consultants
Tel: 0484-2320290/09846121242
Email: cruz@eth.net,
cruzconsultants@rediffmail.com
Website: www.intexpo.com