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

PFNDAI Bulletin

April 2006

INDEX

This issue of

PFNDAI Bulletin

Sponsored by

FINE ORGANIC INDUSTRIES

Editorial

Over the years, kariana shops are slowly giving way to departmental stores and more and more consumers find it more convenient to shop in such stores where there is variety to choose from as well as one can spend time looking at labels and decide the final choice on the basis of information provided plus the price of course. This luxury was lacking in small corner shop which did not store many brands due to lack of space and same also did not provide customers going to the goods.

Having stabilised the initial ups and downs in the modern trends in the retail business, many chains are now entering the retail business and setting up shops in most metro cities which along with other facilities like movie theatres and restaurants in a western-type shopping mall has become a place to spend time and money for young executives and their wives and children. This trend is certainly a good sign for food processing industry, as there will be more people who would shop there and will find new and convenient food products to take home and try out. Usually a person spending some time in such a store ends up buying something, which he or she otherwise would not buy. Such is the compelling buying pressure exerted by a clean, neat, cool and pleasant environment as well as attractive arrangement provided by such stores.

The success of such retail department stores and the market potential has not escaped the international giants who are waiting for an opportunity to enter Indian market. At the same time, Indian manufacturers are exploring the possibility of tapping the potential of export to western markets especially to their department food stores. Such food store chains are more organised and are more concerned about the quality and safety of the product as they feel more strongly about their image and reputation is substandard or unsafe food is sold through their outlets.

One can see on internet, sites of some of these stores which show a range of products they store. Many Indian products are now seen on the shelves of many of them as large numbers of Indians are now shopping there and stores have realised the market potential. Even the non-Indians there have developed liking for Indian cuisine and would like to buy Indian ready-to-eat foods bought in such stores. Even semi-processed foods, ingredients including spices and condiments of Indian origin are available in such stores.

British Retail Consortium (BRC) represents them and over the years has developed standards for evaluating food products marketed through their member-stores. These standards are now being regarded as benchmark elsewhere and most stores in UK and many other European countries will consider business only with suppliers having BRC certification. PFNDAI has organised a Seminar-cum-Workshop on June 5/6 in Mumbai at Taj President, wherein Head of Technical Services, Mr. Swoffer will interact with participants. This will certainly give a good opportunity for those who would like to export to UK and EU. We hope our members would take advantage of this.

With best wishes for an enjoyable Summer Vacation,

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

Specialty Grains

When it comes to grains, most consumers rely on wheat. According to Beth Arndt, manager of R&D, Con Agra Foods, 75% of the grains we eat now are wheat based. Considering that roughly two- thirds of those are refined, we're falling short of our nutritional potential.

Most grains, including barley, millet oat rice rye and wheat are the single seeded fruits of the grass family. However, some grains such as amaranth, buckwheat and flax are fruits or seeds from non-grass plants.

Grains have a bran layer composed of the seed coat and the aleurone layer, which is rich in fibre, minerals, oil, phytonutrients, protein and vitamins. The bran layer encircles the endosperm, the heart of the grain, a portion abundant in protein and carbohydrate. The tiny germ, found at the base of the grain, is a nutritional powerhouse of B vitamins, vitamin E, minerals and phytonutrients.

In refining grains, processors strip the bran and germ away leaving only the endosperm. Dave Green, Director of QC and Laboratory services, ADM, Decatur, IL, suggests that grains have been refined because of taste. Besides having a milder taste, flour with decreased bran is more shelf-stable because the oils that are susceptible to oxidation are removed. Refined flour also makes for better bread because of its enhanced ability to yeast rise and produce gluten.

If consumers prefer refined white wheat flour, the product development challenge is to provide the nutritional benefits of whole grain while retaining the flavour and textural attributes of refined flour .The difference between whole grain white wheat flour and a regular whole flour is that regular whole wheat flours have always been made out of red wheat while this is made out of white wheat .The other difference, of course, is that it's a very fine granulation. Whole grain white wheat flour has several different applications. Green says: "It's currently being used in breads .We think it has more of application for some of the flat products, pizza and tortillas in particular. That's where the colour difference and the appearance show up a little better. It's darker than a white flour: It is a shade of tan in between white flour and whole wheat flour." He note that the taste differs from that of red whole wheat flour "It's not as wheaty. Some people want to call it sweeter, but it's a less-bitter taste than a traditional whole-wheat flour."

Any whole wheat grain type product has some formulation and processing aspects to keep in mind, says Harold Ward, Manager of technical services, ConAgra Foods: "First and foremost is the increase in absorption characteristics and the need for water. Wholegrain flour tends to take up a lot more water than standard white flour. Possibly, things to strengthen your dough system-whether oxidation systems, dough strengtheners or even vital wheat gluten –are certainly ingredients you can use in any type of whole, wheat system". Processing parameters also need adjustments. He notes that products using whole- grain flours have reduced mix requirements compared to systems utilizing white flour.

Oats and Barley

Wheat is known to be very high in insoluble fiber and is really the king when it comes to digestive health. Oats and barley are both known for their beta-glucan. This has led to oats and barley sharing a common health claim. On Dec 23, 2005, the FDA announced that, as with foods containing oats, the label for foods containing at least 0.75 grams per serving of soluble fiber from barley can carry a heart-health benefit when consumed as part of a diet low in saturated fat and cholesterol. Barley has 10% to 12% fiber and beta-glucan levels between 4% to 6%. Pearled barley is the white, rounded product remaining after processors remove that outer layer. It's often used in soup and dry-mix products. Barley flour is probably used mostly in baby food application. Barley flour can also be used in extruded ready-to-eat cereals and snacks. Barley flakes are often seen in multigrain formats with oats and wheat combinations.

Unique barley product derived from selective plant breeding-The Sustagrain barley, it has 30% total dietary fiber and 15% soluble fiber, ConAgra's specially barley has a unique carbohydrate composition. Not only is the fiber very high, but also it has 30% or less starch, the protein content is at least 18% and it's a high – lysine protein, so it has more protein value compared to other common cereal grains. A multigrain cereal made with a two-thirds blend of oats and one-third blend of ConAgra's high-fiber barley would double the beta glucan and dietary fiber, according to Bonner. "As a hot cereal it is available in flaked form, " he says. "It can be blended with other flakes in hot cereals and baking applications for visual appearance similar to rolled oats in an oatmeal cookie. The only place it's going to be used at 100% is probably in some kind of a hot-cereal application. In baked goods, in extruded or expanded products, it's probably going to be used somewhere between the 15% to 40% level. The lower level of carbohydrate lowers some of the food functionally in baked applications, and expansion and extrusion for cereals and snacks. Any bread or expanded cereals product would be fairly dense, and the texture would not be acceptable." In pasta applications, this barley has been used in the 20% to 30% range. It has been used in cookies, crackers and tortillas at inclusion levels of 20% to 30%. Vegetarian burgers are another application that this grain has worked well in. Bonner

sees unique application using a very fine granulation. Smoothie-type beverages are a potential application. Barley mixes extremely well with corn, say 50: 50, to make a Cheetos-type product. Compared to oats and other grains, barley is unique in that the fiber is not just found outside the grain; the fiber is located throughout the grain in the endosperm, where the starch and the protein tend to primarily be located. That means that we can produce product that might be called refined, and they have very good level of fiber. Unlike grains like wheat or corn where processors take off the outer layer, refined barley will contain a lot of nutritional benefits. Barley's soluble fiber can also mimic oil's effects in baked goods, allowing a reduction in fat content

Oat consumption has risen significantly in the last three to four years after tailing off for a couple of years, according to Weaver. "The biggest expanded use of oats over the last few years is in cereal bars. It's a very healthy product. You want to connote the healthiness of the whole grain in these kinds of products and oats certainly do that". Most oats are consumed as flakes. Oats are available as whole grain.

Oats have a stronger flavour than barley, Bonner notes. "They're somewhat toasted in the process, when we deactivate the enzymes in oats. Oats have 7% oil throughout the entire oat berry, whereas in wheat it is concentrated just in the germ area. We deactivate the enzymes so it doesn't act on the oil in oat products. You get some of a toasted note when we deactivate the enzymes." The protein level of oats is typically around 14%. Oats contain 10% fiber. A total 4% of the fiber is soluble, 60% is insoluble.

Giving rye a try

In the upper European countries, grain consumption is roughly 80% rye based and 20% wheat based. Rye is much less understood, much less utilized. Rye has a stronger flavour that wheat and the flavour that consumers associate with rye is not actually rye, it's caraway. Most of the rye breads are made with quite a bit of caraway in them. There is a variety of rye provided by the processors- particle size of rye, from a refined to a medium-dark rye, to pumpernickel, or coarser type flakes. Pumpernickel is the coarser flour. Pumpernickel would be really dark flour. The protein in rye is typically 15% to 16%. Rye has 16% fiber. Compared to wheat, it's higher in soluble fibers. Whole-grain wheat flour has 1.4% soluble fiber whereas whole-grain rye flour has 4.1% soluble fiber. When formulating breads with rye or barley, wheat flour should be added to the product to provide gluten. Oats, barley and other grains that may be put in there do not have the gluten-forming capabilities and are going to make up a smaller proportion. Breads made out of 100% rye tend to be very dense.

Ancient grains rediscovered

Amaranth and quinoa fall into the category called "ancient grains," Amaranth was prized by the Aztecs, while quinoa was a favourite of the Incan culture. As small seeds, they are similar in appearance. Flavour will set them apart, since amaranth is often described as having a peppery taste.

"Amaranth is a powerhouse of a food," whole-grain amaranth offers higher amounts of dietary fiber, iron and calcium than most other grains. It contains higher amounts of a distinctive array of additional vitamins and minerals, including niacin, magnesium and zinc. According to the USDA Nutrient Database, 100 grams of quinoa contains 60 mg calcium, 9.25 mg iron and 410 mg phosphorous; it's a complete protein, it contains all of the essential amino acids. Quinoa contains16.2% protein, more protein than any other grain. Amaranth contains 14% protein. The protein of both grains are high in lysine, methionine and cysteine, making them more complete than most grains. Amaranth contains 15% fiber, of which 3% is soluble. Quinoa has 6% fiber. Using amaranth as a 25% replacement in an all-wheat formulation can give over a 6% increase in fiber and an 87% increase in calcium. Amaranth is outstanding from a functional-food standpoint. It works extremely well in almost any industrial application, from baby food and yogurts to cereals, snacks and baked goods.

Quinoa can be used in cereal or side dishes. Flakes are available for use in cereals. The grains can be cooked in 10 to 12 minutes for a side dish. The light grains, similar in appearance to sesame seeds, make a perfect salad topper. They also can be added to soups. Both quinoa and amaranth are ideal grains for those who must maintain a gluten-free lifestyle. Most gluten-free products are corn-, rice-, potato- or soy-based. Amaranth offers a higher degree of nutrition and variety compared to corn and rice and also holds its own compared to soy and potato. In creating gluten-free products, it combines well with rice flour, corn flour, sorghum and a variety of other gluten-free sources. Advantage can also be taken of amaranth's superior nutritional profile to boost specific nutritional aspects of a product, such as the iron content of a snack product or flatbread. Those with celiac disease also have difficulty getting enough fiber, iron and calcium in their diets. Amaranth provides all three in abundance.

Amaranth flour, toasted amaranth –bran flour and puffed amaranth are good ingredients for flat breads, in quick breads, cookies, cakes, granolas, granola bars, snacks or in other applications. Both flours can be successfully used at a 5% to 30% replacement in chemically leavened or yeast-raised breads.

Fine Grain Ideas

Don't stop at wheat, rye, barley, oats, amaranth or quinoa. There's a whole field of different grains to explore.

- **Buckwheat (Fagopyrum esculentum)**

Buckwheat goes beyond pancake mixes. Japan's soba noodles, Brittany's crapes and Russia's kasha are made with buckwheat. Buckwheat is a cousin of rhubarb, not a grain, but its nutrients; nutty flavour and appearance have led to its adoption into the family of grains.

- **Bulgur (Triticum spp.)**

Bulgur is most often made from durum wheat, but almost any wheat can be used. Because bulgur has been precooked and dried, it needs to be boiled for only about 10 minutes, making bulgur a nutritious food for quick side dishes, pilafs or salads. Bulgur's best-known use is in tabbouleh.

- **Corn (Zea mays mays)**

Though sometimes dismissed as a nutrient-poor starch, corn is lately being viewed as a healthy food. Treating corn with alkali creates masa harina and hominy and liberates the niacin. Eating corn with beans creates a complementary mix of amino acids that raises the protein value.

- **Emmer, Farro (Triticum turgidum spp. dicoccum)**

Emmer, an ancient strain of wheat, has been replaced by higher-yielding strains, except in Ethiopia, where it still constitutes about 7% of the wheat grown. In Italy, it is known as faro or grano faro. Semolina flour from emmer is still used for special soups and other dishes in Tuscany and Umbra, and faro is thought by some to make the best pasta.

- **Grano (Triticum turgaidum ssp.durum)**

When durum wheat kernels are lightly polished, they become grano, a side-dish full of nutty flavour and al dente texture. Minimal processing means that some of the outer casing is removed to cut cooking time to about 30 minutes. In Italy, grano predates pasta, but is still enjoyed in traditional dishes.

- **Kamut® grain(Triticum turgidum ssp.turanicum)**

Kamut grain is another heirloom grain. Years of selecting,testing and propagating brought Kamut, an ancient Egyptian word for wheat, to prominence. Today, millions of pounds of this rich, buttery-testing wheat are grown on organic farms and made into wholegrain products.

- **Millet (Panicum Miliaceum)**

Millet is the leading staple grain in India, and is commonly eaten in China, South America, Russia and the Himalayas. Millet has a mild flavour and is often mixed with other grains or toasted before cooking to bring out the full extent of its delicate flavour. Its tiny grain can be white, grey, yellow or red.

- **Rice (Oryza Sativa)**

White rice is refined, with the germ and bran removed. Whole-grain rice is usually brown, but can also be black, purple, red or variety of hues. Converted rice is parboiled before refining, which drives some of the B vitamins into the endosperm so that they are not lost when the bran is removed, making converted rice healthier than regular white rice. Brown rice is lower in fiber than most other whole grains.

- **Sorghum, Milo (Sorghum spp)**

Worldwide, about 50% of sorghum goes to human consumption, but most of the U.S.crop is fed to animals or finds industrial use. Sorghum, also called milo, can be eaten like popcorn, cooked into porridge, ground into flour for baked goods or brewed into beer.

- **Spelt (Triticum aestivum spelta)**

Spelt is variety of wheat formerly widely cultivated. It can replace common wheat in most recipes. It is higher in protein than common wheat. Anecdotal reports say some people sensitive to wheat can tolerate spelt, but no reliable medical studies have addressed that issue.

- **Teff (Eragrostis tef)**

Teff is the principal source of nutrition of approximately two-third of Ethiopians, who make it into spongy injera flatbread. The grains are 1/150 the size of wheat kernels. Today it gets attention for its sweet, molasses-like flavour and versatility; it can be cooked as porridge, added to baked goods, or made into "teff polenta." Teff grows in three colours, red, brown and white.

- **Triticale (x Triticosecale rimpaui)**

Triticale, a hybrid of durum wheat and rye, has been grown commercially for thirty-five years. About 80% of the world's crop is grown in Europe. It grows easily without commercial fertilizers and pesticides, making it ideal for organic farming. Bioavailability of triticale protein is slightly higher than soybeans and much higher than wheat.

- **Wild rice (Zizania spp)**

Wild rice is not technically rice at all, but the seed of an aquatic grass. The strong flavour and high price of wild rice mean that it is most often consumed in a blend

with other rice or other grains. Wild rice has twice the protein and fiber of brown rice, but less iron and calcium.

Condensed from Food Product Design March 2006: Cindy Hazen & Lynn Kuntz

Eating Right: Eight Principles of Food & Health

Mr. M.C. Badami

The benefits of a healthy lifestyle are enormous.
You can:

- Live longer
- Look and feel younger
- Have more energy
- Lose weight
- Lower your blood cholesterol
- Prevent and even reverse heart disease
- Lower your risk of prostate, breast and other cancer
- Preserve your eyesight in your later years
- Prevent and treat diabetes
- Avoid surgery in many instances
- Vastly decrease the need for pharmaceutical drugs
- Keep your bones strong
- Avoid impotence
- Avoid stroke
- Prevent kidney stones
- Keep your baby form getting type 1diabetes
- Alleviate constipation
- Lower your blood pressure
- Avoid Alzheimer's
- Beat arthritis
- And more…

The following eight principles should inform the way we do science, the way we treat the sick, the way we feed ourselves, the way we think about health and the way we perceive the world.

Principle 1

Nutrition represents the combined activities of countless food substances. The whole is greater than the sum of its parts

To illustrate this principle I take you through the biochemical perspective of a meal. Sautéed spinach with ginger and whole grain ravioli shells with butternut squash and spices, topped with a walnut tomato sauce. The spinach alone is a cornucopia of various chemical components. Following is only a partial list of what you might find in your mouth after a bite of spinach.

- Macronutrients-Water, Calories, Proteins, fat, carbohydrate, fiber
- Minerals – Calcium, Magnesium, Phosphorus, potassium, Sodium, Manganese, Selenium, Copper, Zinc
- Vitamins – C, B1, B2, B3, B6, A, E, Folate, Panthotenic acid
- Fatty Acids – Myristic acid, palmitic acid, stearic acid, palmitolic acid, Oleic acid, Eicosenic acid, Linoleic acid, Linolenic acid
- Amino acids – Tryptophan, valine, threonine, arginine, isoleucine, histidine, leucine, alanine, lysine, aspartic acid, methionine, glutamic acid, cystine, glycien, phenylalanine, proline, tyrosine, serine
- Phytosterols (many kinds)

You've just introduced a bundle of nutrients into your body. In addition when you take a bite of ravioli with tomato sauce and squash filling, you get additional chemicals, all connected in different ways in each different food- truly a biochemical bonanza.

As soon as this food hits your saliva, the process of digestion starts. Each of these food chemicals interacts with the food chemicals and your body's chemicals in very specific ways, it is literally impossible to understand precisely how each chemical interacts with every other chemical.

The main message I'm trying to get across is this: the chemicals we get from the foods we eat are engaged in a series of reactions that work in concert to produce good health. These chemicals are carefully orchestrated by intricate controls within our cells and all throughout our bodies, and these controls decide what nutrients goes where, how much of each nutrient is needed and when each reaction takes place.

Our bodies have evolved with this infinitely complex network of reactions in order to derive maximum benefit from whole foods, as they appear in nature. The misguided may trumpet the virtues of one specific nutrient or chemical, but this thinking is too simplistic. Our bodies have learned how to benefit from the chemicals in food as they are packed together, discarding some and using others as they see fit .I cannot stress this enough, as it is the foundation of understanding what good nutrition means.

Principle 2

Vitamin supplements are not a panacea for good health.
Because nutrition operates as an infinitely complex biochemical systems involving thousands of chemicals and thousand effects on your health, it makes little or no sense that isolated nutrients taken as supplements can substitute for whole foods. Supplements will not lead to long-lasting health and may cause unforeseen side effects. Further more, for those relying on

supplements, beneficial and sustained diet change is postponed.

The interest in nutrient supplements explode over the past twenty to thirty years, it has become abundantly clear why such a huge nutrient supplement industry has emerged. Embracing supplements means the media can tell people what they want to hear and doctors have something to offer their patients. As a result, a multibillion-dollar supplement industry is now part of our nutritional landscape, and the majority of consumers have been duped into believing that they are buying health. This was the late Dr. Atkins' formula. He advocated a high-protein, high-fat diet sacrificing the long-term health for short term gain- and then advocated taking this supplements to address what he called, in his own words, the "common dieters' problem" including constipation, sugar cravings, hunger, fluid retention, fatigue, nervousness and insomnia.

This strategy of gaining and maintaining health with nutrient supplements, however, started to unravel in 1994-1996 with the large-scale investigation of the effects of beta-carotene (a precursor to vitamin A) supplement on lung cancer and other diseases. After four to eight years of supplement use, lung cancer had not decreased as expected; it had increased! No benefit was found from vitamins A and E for the prevention of heart disease either.

Since then, a large number of additional trials costing hundreds of millions of dollars have been conducted to determine if vitamins A, C and E prevent heart disease and cancer. Recently, two major reviews of these trials were published. The researchers, in their words, "could not determine the balance of benefits and harms of routine use of supplements of vitamins A, C, or E; multivitamins with folic acid; or antioxidant combinations for the prevention of cancer or cardiovascular diseases. Indeed, they even recommended against the use of beta-carotene supplements.

It is not that these nutrients aren't important. They are-but only when consumed as food, not as supplements. Isolating nutrients and trying to get benefits equal to those of whole food reveals an ignorance of how nutrition operates in the body.

Principle 3

There are virtually no nutrients in animal-based foods that are not better provided by plants.

Overall, it is fair to say that any plant-based food has many more similarities in terms of nutrient compositions to other plant based foods than it does to animal based foods. The same is true the other way around; all animalbased foods are more like other animal based foods than they are to plant-based foods. For example, even though fish is significantly different from beef, fish has many more similarities to beef than it has to rice. Even the foods that are "exceptions" to these rules, such as nuts, seeds and processed low-fat animal products, remain distinct plant and animal "nutrient" groups.

Eating animals is a markedly different nutritional experience from eating plants. The amounts and kinds of nutrients in these two types of foods, shown in Chart illustrate these striking nutritional differences.

Nutrient composition of plant and animal-based foods (per 500 calories of energy)

Nutrients	Plant-Based Foods	Animal-Based Foods
Cholesterol (mg)	-	137
Fat (g)	4	36
Protein (g)	33	34
Beta-carotene (mcg)	29,919	17
Dietary Fiber (g)	31	-
Vitamin C (mg)	293	4
Folate (mcg)	1168	19
Vitamin E (mg_ATE)	11	0.5
Iron (mg)	20	2
Magnesium (mg)	548	51
Calcium (mg)	545	252

By definition, for a food chemical to be an essential nutrient, it must meet two requirements:

The chemical is necessary for healthy human functioning

The chemical must be something our bodies cannot make on their own, and therefore must be obtained from an outside source.

One example of a chemical that is not essential is cholesterol, a component of animal based food that is non-existent in plant based food. While cholesterol is essential for health, our bodies can make all that we require; so we do not need to consume any in food. Therefore it is not an essential nutrient.

There are four nutrients, which animal-based foods have that plant-based foods, for the most part, do not: cholesterol and vitamins A, D, and $B_{12.}$ Three of these are nonessential nutrients. Cholesterol is made by our bodies naturally. Vitamin A can be readily made by our bodies from beta-carotene and vitamin D can be readily made by our bodies simply by exposing our skin to about 15 minutes of sunshine every couple days.

Vitamin B_{12} is more problematic. Vitamin B_{12} is made by microorganisms found in the soil and by

microorganisms in the intestines of animals, including our own. The amount made in our intestines is not adequately absorbed, so it is recommended that we consume B_{12} in food.

Though our society's obsessions with nutrient supplements seriously detract from other, far more important nutrition information, this is not to say that supplements should always be avoided.
A healthy diet of fresh, organic plant-based food grown in rich soil and a lifestyle that regularly takes you outdoors is the best answer to these issues. Returning to our natural way of life in this small way provides innumerable other benefits, as well.

Principle 4
Genes do not determine disease on their own. Genes function only by being activated, or expressed, and nutrition plays a critical role in determining which genes, good and bad are expressed.
The origin of every single diseases is genetic .Our genes are the code to everything in our bodies, good and bad. Without genes, there would be no cancer, no obesity, diabetes or heart disease. There would be no life.
This might explain why we are spending hundreds of millions of dollars trying to figure out which gene causes which disease and how we can silence the dangerous genes. At Cornell University alone $500 million is being raised to create a "Life Sciences Initiative". This initiative promises to "forever change the way life-science research is conducted and taught at the university". It is the largest scientific effort in Cornell's history.

Much of this focus on genes, however, misses a simple but crucial point. If they aren't activated, or expressed, they remain bio chemically dormant. Dormant genes do not have any effect on our health.
What happens to cause some genes to remain dormant, and others to express themselves? The answers environment, especially diet.

Neither will genes be expressed unless they have the proper environment .In our body, nutrition is the environmental factor that determines the activity of genes .In my research group, we learned that we could turn the bad genes on and off simply by adjusting animal protein intake.

Furthermore, our China research findings showed that people of roughly the same ethnic background have hugely varying disease rates. These are people said to have similar genes, and yet they get different diseases depending on their environment. Dozens of studies have documented that as people migrate, they assume the disease risk of the country, which they move. They do to change their genes, and yet they fall prey to disease and illnesses at rates that are rare in their homeland population.

Furthermore we have seen disease rates change over time so drastically that it is biologically impossible to put the blame on genes. Diabetes, heart disease and many other diseases of affluence were rare until recent history.
So while we can say that genes are crucial to every biological process, we have some very convincing evidence that gene expression is far more important, and gene expression is controlled by environment, especially nutrition.

Expression of our genetic code represents a universe of biochemical interactions of almost infinite complexity. This biochemical "universe" interacts with many different systems, including nutrition, which itself represents whole system of complex biochemistry.

We all have different disease risks due to our different genes. But while we will never know exactly which risks we are predisposed to, we do know how to control those risks. Regardless of our genes, we can all optimise our chances of expressing the right genes by providing our bodies with the best possible environment –that is, the best possible nutrition.

Principle 5
Nutrition can substantially control the adverse effects of noxious chemicals.
Stories of cancer-causing chemicals regularly appear in the press. Acryl amide, artificial sweeteners, nitrosamines, nitrites, Alar, heterocylicamines and aflaoxin have all been linked to cancer in experimental studies.

There is a widely held perception that cancer is caused by toxic chemicals that make their way in to our bodies in a sinister way. For example, people often cite health concerns to justify their opposition to pumping antibiotics and hormones into farm animals .The assumptions is that the meat would be safe to eat if it didn't have those unnatural chemicals into it .The real damage of the meat, however, is the nutrient imbalances, regardless of the presence or absence of those nasty chemicals. Long before modern chemicals were introduced into our food, people still began to experience more cancer and more heart disease when they started to eat more animal based foods.

Another chemical carcinogen concern surrounds acrylamide, which is primarily found in processed or fried foods like potato chips. The implication is that if

we could effectively remove this chemical from potato chips, they would be safe to eat, even though they continue to be highly unhealthy, processed slices of potatoes drenched with fat and salt.

We saw that the potential effects of aflatoxin, a chemical touted as being highly carcinogenic, could be entirely controlled by nutrition. Even with large doses of aflatoxin, rats could be healthy, active and cancer free if they were fed low protein diets. We also saw how small findings can make big news every time cancer is mentioned .For example, if experimental animals have an increased incidence of cancer after gargantuan exposures, the chemical agent is trumpeted as the cause of cancer. However like genes, the activities of these chemical carcinogens are primarily controlled by the nutrients that we eat.

So what do these examples tell us? In practical terms, you aren't doing yourself much good by eating organic beef instead of conventional beef pumped full of chemicals .The organic beef might be marginally healthier, but I would never say that it was a safe choice. Both types of beef have a similar nutrient profile.

It is useful to think of this principle in another way; a chronic disease like cancer takes years to develop. Those chemicals that initiate cancer are often the ones that make the headlines. What does not make headlines however, is the fact that the disease process continues long after initiation, and can be accelerated or repressed during its promotion stage by nutrition. In other words, nutrition primarily determines whether the disease will ever do its damage.

Principle 6

The same nutrition that prevents disease in its early stages (before diagnosis) can also halt or reverse disease in its later stages (after diagnosis).

It is worth repeating that chronic diseases take several years to develop. For example, there is a general thought that breast cancer can be initiated in adolescence and not become detectable until after menopause! So we very well may have lots of middle aged women walking around with breast cancer initiated during their teens that will not be detectable until after menopause.

Cancer that is already initiated and growing in experimental animals can be slowed, halted or even reversed by good nutrition. Luckily for us, the same good nutrition maximises health at every stage of a disease. In humans, we have seen research findings showing that a whole foods, plant-based diet reverses advanced heart disease, helps obese people lose weight and helps diabetics get off their medication and return to a more normal pre-diabetes life. Research has also shown that advanced melanoma, the deadly form of skin cancer, might be attenuated or reversed by lifestyle changes.

Some diseases, of course, appear to be irreversible. The autoimmune diseases are perhaps most frightening because once the body turns against itself, it may become unstoppable.

Principle 7

Nutrition that is truly beneficial for one chronic disease will support health across the board.

Can you make specific diet plans for each disease, so that every chapter doesn't have the same recommendations? In other words, could I tell people to eat a specific way for heart disease and a different way for diabetes? The implication, of course, was that the same eating plan for multiple diseases simply wasn't catchy enough, wasn't sufficiently "marketable".

Although this might be good marketing, it is not good science. As I have come to understand more about the biochemical processes of various diseases, I have also come to see how these diseases have much in common. Because of these impressive commonalities, it only makes sense that the same good nutrition will generate health and prevent diseases across the board

Principle 8

Good nutrition creates health in all areas of our existence. All parts are interconnected.

Much has been made of "holistic" health in recent times. This concept can mean a variety of things to different people. Many people lump all of the "alternative" medicines and activities into this concept, so holistic health comes to mean acupressure, acupuncture, herbal medicines, medication, vitamin supplements, chiropractic care, yoga, aromatherapy, Feng Shui, massage and even sound therapy.

Conceptually, I believe in holistic health, but not as a catchphrase for every unconventional and oftentimes unproven medicine around. Food and nutrition, for example are of primary importance to our health. But other experiences also are important, such as physical activity, emotional and mental health and the well being of our environment. Incorporating these various spheres into our concept of health is important because they are all interconnected. Indeed, this is a holistic concept.

These expanding interconnections became apparent to me through experimentation with animals. The rats fed the low-protein diets were not only spared liver cancer, but they also had lower blood cholesterol, noticeably more energy and voluntarily exercised twice as much as the high-protein rats. This synergy between nutrition and physical activity is extremely important, and is evidence that these two parts of life are not isolated from each other. Good nutrition and regular exercise combine to offer more health per person than the sum

of each part alone.

Physical activity has an effect on emotional and mental well-being. The benefits and risks of diet are crucially important, and more sizable, than the benefits and risks of other activities.
Our food choices have an incredible impact not only on our metabolism, but also on the initiation, promotion and even reversal of disease, on our energy, on our physical activity, on our emotional and mental well-being and on our world environment .All of these seemingly separate spheres are intimately interconnected.

Who cares, anyway?

The applicability of these principles should not be underestimated. Most importantly they can help to reduce public confusion regarding food and health. The latest fads, the newest headlines and the most recent study results are put into a useful context We need not leap fromour seats every time a chemical is called carcinogen, every time a new diet book hits the shelf or every time a headline screams about solving disease through genetic research.

The benefits of understanding these principles are wide-ranging and profound for individuals, societies, our fellow animals and our planet.
(Extracted from: The China Study: Startling implications for Diet, Weight loss and Long term health by: T. Colin Campbell)

Formulating with Fruit

Some years ago, consumers would have to eat fruits that were available in the season. However, due to advancements in food science and technology, and the expansion of trade around the world, virtually all the fruits are available throughout the year, not necessarily in the fresh form but processed as canned, frozen, dried etc. More than 400 million tons of fruits are produced every year around the world. In the US markets, local apples, oranges, grapes and strawberries are available. In addition, from other countries such exotic fruits like mangoes, kiwis, sapodillas, rambutans etc. are imported.

Increased availability of amounts and variety led consumers, chefs and food scientists to formulate with fruits, creating foods that match Mom's apple pie or conceiving new visual and taste sensations. These include savoury dishes, creamy beverages and health bars. Most feature oranges, grapes, apples and bananas but others are beginning to incorporate sweet, sour, acidic or tangy fruits with beautiful-sounding names like: cherimoyas, sapodillas, carambolas, pepinos and tamarillos in salads, salsas, sauces, jams and jellies, sorbet and ice cream.

Classification

All the fruits form from flowers and in that manner, even tomato is considered a fruit by botanists. Classification is based on the differences of the seed-bearing structure. Pome fruits have an indentation at the stem end of the fruit, remnant of a flower at the other end and a core containing seeds. Examples are apples, pears, quinces etc. Apples and pears have literally several hundred varieties differing in size, colour, texture and flavour. Certain varieties retain shape and flavour after cooking and can be dried, canned, poached, stewed, broiled or baked and used in jams, jellies and fillings for baked goods. Variety of apples chosen for filling will make a difference in pastry filling e.g. Red Delicious apples tend to cook up to a sweeter, softer dice, Golden Delicious vary in texture and flavour depending on season, and Granny Smith typically a firm, tart dice in a filling.

Stone fruits or drupes include peaches, plums and cherries, have a single pit surrounded by soft, juicy flesh. Canned, frozen and dried peaches function well in many applications. Its sweet-tangy flavour and fine-textured flesh makes it a delightful ingredient in salads, chutneys, sauces, salsas, relishes and baked goods. Apricots and nectarines find similar applications. Sweet and tart cherries make tasty cake and pie fillings adding delicious flavour to beverages, sauces, salsas and meat dishes. Maraschino cherries (candied) are used in ice cream and cake toppings. Varieties of plums differ in sweetness and tartness but are all good for jams and jellies. Sloe variety is used in sloe gin.

Fresh berries including blueberries, raspberries, blackberries, strawberries, loganberries, mulberries and cranberries, make attractive garnishes and decorations for sweet and savoury dishes because of small size, bright colours and different textures. Softer berries like strawberries often lose their shape after processing. Their applications include as ingredients and flavourings for beverages, fillings in pies, cakes etc., jams and jellies and in dressings, salsas, sauces, glazes, ice creams, sorbets, stuffing, meat dishes and salads as ingredients.

Oranges and grapefruits make tasty juice. Lemon and orange oils flavour tea, baked goods and other foods. Citrus fruits are also being used in salsas and pasta. Lemons and limes complement fish and accent alcoholic drinks, dressings, marinades and desserts. Oranges like Mandarins add characteristic citrus notes to stews and marinades in meats.

Melons are traditionally used in fruit salads or garnishes, but cantaloupe, muskmelon, honeydew, watermelon etc. are increasingly being used to impart sweet taste to dressings, cream cheese and mayonnaise.

Pineapples and papayas give foods a tropical accent and they make excellent natural alternatives to chemical meat tenderisers. Enzymes bromelain in pineapples, papain in papaya and proteases in kiwis act on proteins tenderising meats.

Tropical and exotic fruits like bananas, plantains, passion fruit, pomegranates, guavas, jujubes etc. come in a variety of unusual shapes and sizes, useful in decorations. These are also used in similar applications as other fruits like in beverages and jellies etc. They are also used as ingredients in salad dressings, relishes, custards, smoothies, liqueurs and breads as well as serving them fresh, pureed, poached, baked or fried.

Nutritional aspects

Packed with vitamins, minerals and other beneficial compounds, fruits contribute significantly to good nutrition. Product designers might look at the added nutrition as one way to add value to a product. Bananas, grapes, guavas, strawberries and raspberries contain potassium. Figs, dates, apples and pomegranates are high in fibre. Most fruits, especially citrus and berries, contain vitamin C. Beta-carotene-rich fruits are mandarin oranges, mangoes and apricots. Other vitamins and minerals found in fruits are vitamin A (persimmons, papayas, mangoes and cherries), vitamin B (strawberries, figs and peaches), niacin (gooseberries, guavas, bananas and raspberries), riboflavin (bananas and raspberries) and phosphorus (gooseberries and nectarines). It is possible to develop a blend that combines a great variety of healthful fruit and vegetable characteristics, e.g. antioxidants of apple, blueberries, cranberries etc. and oat fibre can be mixed to give added advantage of healthy foods.

Another widely studied aspect of fruits is their ability to fight many diseases like cancer, heart disease and diabetes. Many fruits like plums, cherries, blueberries and strawberries contain significant levels of antioxidants that can neutralise free radicals linked to cell damage and cancer/heart diseases. Antioxidants may help to inhibit mutation of certain cancer cells and protect walls of arteries against development of plaques and further of cardiovascular diseases. Phytochemicals like flavonoids, ellagic acid, phenols and carotenoids not only contribute to colour, texture, smell and flavour but have disease-prevention capabilities.

Natural Nutrients

New products can take advantage of natural attributes of fruit based ingredients. One new product developed is naturally sweetened apple piece that has been infused with a red-wine extract, which has polyphenols accepted to reduce risk of cardiovascular disease and cancer. A mere 18 grams of these extract-infused dried apple pieces have flavonoid phenols of five glasses of wine and dietary fibre of one whole apple. Certain fruits have shown promise of having anti-inflammatory characteristics, improved older people cognitive abilities and prevention of urinary-tract infections.

One need not consume large amounts of fruit to get adequate nutritional benefits. A serving of strawberries (about 150 g) provides in terms of daily requirement, 16% of folate, 160% of vitamin C and 16% of fibre as well as high amounts of antioxidants. One kiwi provides more than daily requirement of vitamin C, a grapefruit or an orange yields almost double the requirement whereas half a mango (140 g) provides 40% of daily value of vitamin A.

American Heart Association recommends a total daily dietary fibre intake of 25 to 30 g. One medium size apple and a cup (140g) of blueberries each provide 5g fibre. Blackberries and raspberries provide more fibre. Formulators need not use the whole fruit as apple fibre can be made from waste during apple processing. Dried material contains 40% total dietary fibre (10% soluble & 30% insoluble). This has bland flavour and can be used as coating for other fruit ingredients in dry cereal applications. It helps prevent clumping. Apple fibre has high water-binding capacity and can act as thickener. It can be used in baked goods and fruit leather.

Fruit's nutrient-dense nature and disease-fighting compounds make it an excellent ingredient choice as Americans have weight problems due to which ailments like heart diseases and diabetes develop. Fruit consumption is expected to increase as consumers look for healthy, convenience foods. Food scientists, manufacturers and chefs use fruits for more than health reasons. Fresh and processed fruits, including dried, concentrates,

powders and flavours, add visual appeal and texture, enhance flavour and colour of products and act as humectants and antimicrobials.

Popularity of products

Most used forms of fruits are fresh and frozen. Consumers and foodservice tend to use fresh fruit while food processing units prefers frozen. Consumers equate fresh fruits with health and nutrition derived. Fresh fruits especially berries are popular ingredients in pies, tarts, cakes and other sweet and savoury dishes. Manufacturers and sometimes chefs use frozen or other processed fruit as ingredients. Fruits are bulk frozen, alone or with added sugar, or individually quick-frozen (IQF), which minimises textural and nutritional damage.

Optimum storage temperature for most fresh fruits is less than 8°C. At this temperature most fresh fruits last for about a week. However, apples can stay fresh for several months. Frozen fruit must be stored at temperatures between -18°C and -30°C for minimum cell damage resulting from freeze-thaw cycles. Although processing may deteriorate fruits' nutritive values, most often, frozen versions actually have more nutritive values than their fresh counterparts. The reason being, while fruits are frozen by manufacturers within a short time after harvesting, the fresh fruits spend a lot of time during warehousing, shipping and on store shelves under ambient conditions during which the deterioration of nutrients is more.

Juices and Purees

Liquid juices and purées are also common fruit ingredients and in this category are included: fresh squeezed juice, single-strength juice (fresh or frozen, fruit crushed or pressed, filtered, pasteurised, packed), juice concentrates (fresh or frozen fruit crushed, heat- or enzyme-treated to clarify, filtered, concentrated, packaged and frozen), single-strength purée (fresh or frozen fruit crushed, pasteurised, packaged and frozen) and purée concentrate (like juice concentrates).

In foodservice and retail shelves, fresh squeezed juice is popular not only as breakfast beverage but also as ingredients in flavoured drinks like martinis, daiquiris etc. as well as in non-alcoholic drinks like smoothies and mocktails. Here various citrus fruits, pome fruits and berries are quite popular in providing colour and flavour.

Concentrates and purées of apples, peaches, plums, cherries, berries, grapes and other fruits are used as sweeteners as well as for colour and flavour in baked goods, ice creams, sorbets, yoghurts, sauces and glazes, syrups for canned fruits, fillings for pies, and beverages. Concentrates besides providing colour, sweet taste etc., also provide mouthfeel, tartness and functionality of finished product. Concentrates provide more-rounded flavour to products and may reduce the amount of flavour needed.

Fructose, about 20% sweeter than sucrose, is abundant in fruits besides other sugars. Apple juice contains about 5.9% fructose, 2.7% sucrose and 2% other sugars. Fruit juice may be a natural alternative to processed sugar and some manufacturers make a claim using juice concentrate as sweetener. However, there is no cost benefit as juice concentrates are more expensive than sugar. The benefit is to make a "no added sugar" claim.

Fruit concentrates and purées also act as humectants, antimicrobials and mould inhibitors which is advantageous if one wants to avoid chemical additives. The high sorbitol content (15%) of dried-plum concentrates and purées function as effective humectant to help keep bakery goods soft and moist and meats juicy. Their malic acid also helps inhibit microbes and mould. Propionic acid content (500-600 ppm) and low pH (2-3.5) helps raising concentrate to inhibit bacteria and mould in bread.

Concentration process increases fruit solids and decreases moisture available for microbial growth. Juices even when pasteurised have a shelf life of only 2 to 4 weeks and must be refrigerated. Concentrates can be stored for a short period at ambient temperatures and for several months under refrigeration without spoilage. Concentrates provide natural sweetness, flavour, moisture and antimicrobial capabilities as well as longer shelf life. Since sugars have hygroscopic properties, one must carefully choose a concentrate not only for its flavour and colour contributions, but also for the properties that will ultimately affect the product. It can mean the difference between a soft, chewy cookie and a crisp, dry cookie.

Dried Fruits

Additional sensory and functional characteristics are offered to recipes and food products by dried fruits including dehydrated (fresh or frozen fruit dried and further processed by cutting/coating), freeze-dried, drum dried (fresh, frozen or puréed fruit dried and powdered or flaked) and infused.

Dehydrated and freeze dried fruits retain their natural flavours, colours and nutritional values upon rehydration. Freeze dried also retain particle size of the fresh fruit before processing, an criterion where application needs piece identity.

Drum dried fruits in powder form, provide flavour, colour and sweetness to applications where piece identity or particulate concentration is not important. There are other applications too. In apples, soluble and insoluble fibre (20%) contributes water-absorbing and binding capabilities, tenderisation and nutritional enhancement. Sorbitol provides humectancy, dough and batter stability. Acids, mostly malic, contribute to flavour enhancement and microbial inhibition. Vitamins and minerals add nutritional appeal.

Brownies, muffins and cookies wherein fat was replaced with fruit powders had 30% longer shelf life, due to ability of fruit powders due to inhibition of microbes by binding water, reducing pH, and inhibition by sorbitol and reducing sugars. About 2 to 5% flake powders in dry bakery mixes and in-plant doughs are recommended for producing low-fat cookies, tender snack cake, flat bread with rich brown colour, coffee cake with enhanced flavour and moisture retention and pizza dough that stays moist and tender under infrared lights. Other bakery applications include: bagels, scones, muffins and brownie mixes, English muffins and crumb-cake topping.

Infusion replaces water in the fruit with sugar or juice solids. This results in 5% to 22% moisture fruit pieces that retain a soft, pliable texture, even under dry, shelf-stable conditions.

Slices and dices

Wide choice of dried and infused fruit pieces, cut and diced into pie pieces, rings, chips, flakes, granules and other shapes are available adding visual appeal to garnishes, salads and baked goods as well as functional capabilities. Correct size is important to achieve optimum utility. Larger heavier pieces may sink to the bottom of batters while smaller, lighter pieces remain suspended throughout leading to better dispersion and more attractive products.

Many applications use dried fruit ingredients. These are hot and ready-to-eat (RTE) cereals, sweets, cookies, cakes, pies, pastries and muffins. Freeze-dried berries like strawberries, are added to RTE cereals for colour, texture and attracting health conscious consumers. Low moisture apples are also used in cereals, bakery and snack foods. Apple products like granules, powders, flakes and dices in RTE, cooked or instant-type breakfast cereals. Apples may also be coloured and flavoured with other fruit flavours like strawberry, peach, blueberry etc. to increase their versatility in cereal products.

Slices and dices of apple have been infused with sugar, colour and flavour, juice solids, high fructose syrup etc. to prepare shelf-stable soft textured products. Low-cost, bland fruits can be infused with flavours and enhancers to simulate more expensive fruit pieces. Dried fruit products are also used in meat dishes, stuffing, sauces, glazes etc. for many applications like fat replacers, thickeners, humectants etc.

Consumers have been demanding healthier foods with reduced calories, low-fat or fat free products. Consumers don't want sacrifice taste and texture appeal in such products, so dried fruits become key ingredients to create tasty, more-healthful food products. In such products apples, plums and figs are used wherein high fibre and pectin act as thickeners and water binders, while malic acid enhances flavour. Addition of sugar in fat-reduced baked goods gives a short sweet flavour spike while chewing. Malic acid coats the mouth like fat potentiating flavours giving a more satisfying eating experience. Even fruit powders have been used to replace butter blends and eggs to make reduced fat, crisp, chocolate-chip cookie. Scones maintain rich butter taste even after reducing butter and eggs.

Canned fruit

Shelf stability and low cost makes canned fruit and fillings ideal for certain applications. Thermal processing degrades fruit texture, making it soft and mushy. Adding syrup before heating minimises texture loss. Canned fruits like peaches, pineapples, Mandarin oranges, pears, cherries and blueberries and canned fruit filling of cherries, figs, prunes, blueberries and strawberries can be used in toppings and fillings in bakery goods like Danishes and cakes. Foodservice can use fillings as delicious and appealing toppings over cake, ice cream, French toast, waffles or pancakes. Thickened syrup helps suspend fruit and coats the food products without making them too moist. Even hot-fill (non-retorted) fillings are used in bakery industry. Bakeries use custom-made fillings formulated using evaporated apples for flavour,

texture, piece-identity and extending other higher-cost fruit. Apple fillings are deposited on pastries and strudels, or in soft cookies and fruit bars. Fried apple pies, popular in fast-food restaurants utilise evaporated apples.

Cornucopia of choices

Fruits, whether fresh or processed, are versatile and are used in various beverages, confections, sweet dishes, savoury products, salads, soups and breads. They add festive touch to any meal formal and informal. Manufacturers of processed foods using fruits and processed fruits need to adhere to standards of identity, which require specific levels of fruit in particular products. They cannot add a couple of pieces of fruit to a batch and call it "raisin bread" or "blueberry muffins". Fruit standards in some processed foods are based on certain amount of fruit content. Fruit preserve, jams and jellies, juices and canned fruits fall under these regulations. Even newer innovations could be thought of. Experimenting by flavouring fruits with spices and herbs or combining two or more fruits together could be refreshing change. Tart and sweet flavours of fruits complement savoury flavours as well. The results would be "fruitful".

(Condensed from: Food Product Design October 2003: Karen Banasiak)

In The News

FDA approves qualified health claim for barley

The US Food and Drug Administration has approved a health claim for whole-grain and barley-containing products, linking their consumption to a reduced risk of coronary heart disease. To qualify, barley-containing foods must provide at least 0.75g of soluble fibre per serving. Sources eligible for the health claim include: whole grain barley, barley bran, barley flakes, barley grits, barley flour, barley meal, sieved barley meal and pearl barley.

"The scientific evidence on barley beta-glucan soluble fibre and its ability to reduce cholesterol is significant," said Mary Sullivan, executive administrator of the National Barley Foods Council. "Barley has a distinct advantage over some other grains in that beta-glucan soluble fibre is found throughout the entire barley kernel. In some other grains, the fibre is only found in the outer bran layer. So if these grains are processed, the fibre can be easily lost. This is not the case with barley."

The FDA estimates a quarter of hot breakfast cereals, and five per cent of all cold cereals sold in the US will start boasting their health benefits. The cereal market is worth $7.1 billion a year. According to the National Barley Growers Association, barley production in the US averages 319 million bushels per year, with an estimated value of $759 million. Of the barley consumed, most is used for animal food and beer production. About 2 per cent is used in human foods.

Minnesota Grain Inc, a 50-year-old speciality-grains supplier and one of the largest barley suppliers in the US, welcomed the news. "We have been pushing for this for a long time, and it opens the possibility that people are now going to figure out that barley is really healthy," said CEO and owner Tom Mensing. "We're quite pleased that barley is finally getting the accolades it deserves, and are expecting a substantial increase in sales."

The company, which provides barley to such cereal companies as Kellogg's and General Mills, has also worked with international food aid programs, where barley plays a particularly important role. "Barley is not only nutritional, it uses less water when you're cooking it up, which in places like Africa is a pretty important deal."

Kris Nelson, director of marketing for Grain Millers Inc, a supplier of grain ingredients for commercial food production in Minnesota, said barley is an easy grain to work with because it's very bland, so it doesn't have an overwhelming flavour. "Barley could be used in more applications than it is currently, and maybe with this health claim there will be more interest," she said. "Generally it's less expensive to buy a barley flake than an oats flake."

The health claims petition was filed by the National Barley Foods Council. A unit of Cargill Inc helped underwrite the cost of the petition.

(Joysa Winter: Functional Foods & Nutraceuticals: March 2006)

Pomegranate becoming hot flavour of the year

Coca-Cola has embraced the super fruit of the moment, pomegranate, by launching a line of pomegranate-based juices under its Odwalla brand in the US.

Pomegranate has been getting spectacular press for the best part of a year, due to its good taste and antioxidant-laden health benefits, and the move by Coke indicates just how far this previously obscure fruit has come.

Odwalla's entry joins other pomegranate offerings from the likes of R.W. Knudsen, Lakewood Organic, Avomex and Naked, most selling at a substantial premium. RJA Foods' PomeGreat has been notching robust sales growth in the UK and is the only juice that carries the logo of heart-health charity, Heart UK, on its packaging. It sells for $2 for a 330ml bottle. Ramping up the premium even further is retailer Marks & Spencer — it has an own-label pomegranate drink retailing for about $2.65.

The Odwalla range, PomaGrand, consists of a straight pomegranate juice as well as two blends – one with mango, one with berries. In comparison, Pomegranate pioneer Pom Wonderful's range comprises pure pomegranate, as well as cherry, mango, blueberry or tangerine juice blends. PomaGrand is being marketed on its antioxidant properties and sweet taste.

"The blend in Odwalla PomaGrand is less tannic than other pomegranate juices on the market, which allows for a more enjoyable drinking experience," said Barr Hogen, an Odwalla creative chef. Another major beverage player, Cadbury-Schweppes, recently launched Pomegranate Pear under its Nantucket Nectars division in the US. It has already become one of the brand's better sellers.

It is clear pomegranate is moving beyond the juice category. Germany's Bitburger Brauerei has developed a 60 per cent beer/40 per cent pomegranate blend called Bit Passion, aimed at the youth market, with the slogan "Do you have the desire?" A pomegranate-flavoured vodka has been launched in the US by Pearl Vodka.

Lotte Confectionery has introduced a chewing gum in South Korea fortified with 2.8 per cent pomegranate juice. Other offerings include an organic vinaigrette (US), a soft drink (Israel) and an ice cream (US). Pomegranate pastes and powders are also being used in Indian ready meals in the US and UK.

From: Functional Food & Nutraceuticals March 2006

Whole-grain message winning consumers

Functional Foods & Nutraceuticals *April 2006*

Whole-grain breads continue to buck the downward trend for all bread categories in the US by winning favour with consumers who are responding to clearer, more sophisticated and more prominent whole-grains labelling.

According to ACNielsen, whole-grain bread sales jumped 17 per cent in the 52-week period ending March 25, with pastas and breads, rice and cereals, cookies, cakes, snacks and even matzo meals being snapped up by consumers eager to reap the health benefits of whole grains consumption.

Food technology advancements have delivered whole-grain products consumers are more likely to try and stick with: whole-wheat breads with the characteristics of white bread, fast-cook brown rice, whole-grain hot dog and hamburger rolls and bagels.

In 2005, 303 whole-grain products were introduced in the US, compared with 143 in 2004. However, labels needed to be further improved to give consumers more detailed information. Very few products give the actual number of whole grain grams per serving content; instead, many use descriptors like "good" or "excellent." However, such terminology may soon be outlawed, as the Food & Drug Administration recently issued draft guidelines for whole-grains labelling that highlighted its opposition to such ambiguous terminology.

Currently, products that meet certain requirements can carry one of two marks provided by the Whole Grains Council. A stamp that says "good source of whole grains" means the item contains at least 8 grams of whole grains. The "excellent source of whole grains" stamps are on products with 16 grams or more. These are based on government dietary guidelines, which recommend at least three servings, or 48 grams, of whole grains a day. (A typical slice of 100 per cent whole wheat bread has 16 grams).

From May 1, the council's stamps will start to provide the actual grams of whole grains per serving and the total daily recommendation.

http://www.ffnmag.com/ASP/articleDisplay.asp?strArticleId=969&strSite=FFNSite&Screen=HOME

Gatorade Sports Science Institute Issues Hydration Recommendations for Boston Marathon Runners

Apr 11,2006-***Guidelines to Help Participants Prevent Both Dehydration and Hyponatremia in This Year's Race.***

To help runners have a safe and successful performance at the 110th Boston Marathon, the Gatorade Sports Science Institute (GSSI) has developed hydration recommendations to aid runners in managing the risk for both dehydration (the loss of body fluid) and hyponatremia (low blood sodium levels due to excessive drinking and inadequate sodium intake). These recommendations have been distributed to all Boston Marathon participants in preparation for this year's race.

"The health and safety of all participants in the Boston Marathon has always been our priority," said Chris Troyanos, ATC, medical coordinator for the Boston Marathon. "Dehydration and hyponatremia are both serious concerns, and we believe that these hydration recommendations will provide important guidance to runners to help them reduce the risk of these conditions on race day. It's essential that runners keep hydration top of mind, and make sure to drink enough to prevent dehydration, but avoid overdrinking."

The recommendations developed by GSSI focus on the importance for runners to gauge their own fluid needs, rather than drinking according to thirst or following a specific rule of thumb for fluid intake. An effective hydration strategy combines adequate fluid and electrolyte intake — not too much, not too little. According to the hydration recommendations, runners can gauge their individual needs by weighing before and after training runs to understand if they typically lose or gain weight. Based on this information, they can adapt their fluid intake accordingly to minimize their losses or gains.

For the vast majority of runners, dehydration, not hyponatremia, will be the key challenge. However, runners should be cautioned that hyponatremia during marathons is the result of aggressive over-drinking of any beverage — actually drinking so much that substantial weight is gained before, during, or after the event — and under those circumstances, runners should cease drinking immediately.

The GSSI hydration recommendations also highlight the importance of ingesting sodium during a marathon, especially for heavy sweaters and salty sweaters. Research shows that consuming sports drinks during a marathon helps runners replace some of the sodium lost in sweat and that will help assure proper hydration — reducing the risk of both dehydration and hyponatremia. Also, newly published research in the British Journal of Sports Medicine (40:98-105, 2006) concludes that sodium-containing sports drinks will delay the development of hyponatremia compared to consuming just plain water (for those who do not over-drink any type of fluid).

"The two most important things runners can do to protect themselves from hydration-related problems is to drink according to their individual fluid needs and make sure to consume adequate sodium," said Dr. Bob Murray, director of the Gatorade Sports Science Institute.

Research conducted by GSSI with endurance athletes has shown that during long-distance training and competitions, such as preparing for or competing in a marathon, sweat and sodium losses can be substantial. To help offset these losses, athletes should increase their sodium intake throughout the day and during training and racing. The GSSI research led to the development of the specialized Gatorade Endurance Formula which was introduced last year. Gatorade Endurance Formula contains approximately twice the amount of sodium (200 mg/per 8 oz) of Gatorade Thirst Quencher to help meet the needs of athletes during prolonged exercise. For the first time ever, the Boston Marathon will be providing Gatorade Endurance Formula on course at this year's race. An estimated 30,336 gallons — or over 647,000 servings — of Gatorade Endurance Formula will be served at the race.

http://www.prnewswire.com/cgi-bin/stories.pl?ACCT=109&STORY=/www/story/04-11-2006/0004338389&EDATE

Grains Help you Feel Better

Apr 3,2006- ***Nutrition studies show that grain-based foods such as cereals, bread, crispbreads, rice, oats and pasta are one of the most important parts of our diet.***

Carbohydrates are essential for the body's normal functioning, and health experts are concerned that skipping out on foods like bread and breakfast cereals could affect more than just the quality of our daily diet.

Coinciding with the launch of National Grains Week (April 3-7), researchers warn that Australians who drop grain foods from their regular diet may be doing more harm than good.

Nutrition studies show that grain-based foods such as cereals, bread, crispbreads, rice, oats and pasta are one of the most important parts of our diet.

Not only are they a source of essential vitamins and minerals, they provide the body with carbohydrates which are the main source of energy for physical activity, normal metabolic function, healthy growth and good brain function.

The Good Mood Food

However, high carbohydrate foods like grains have another little-known effect – the ability to positively influence mood and help control appetite. And these calming effects may even improve the likelihood of sticking with a weight management program.

Dr Philippa Lyons-Wall, lecturer in nutrition and dietetics at Queensland University of Technology, said carbohydrate can affect a chemical messenger in the brain called serotonin that elevates mood and suppresses appetite.

"High carbohydrate consumption naturally stimulates the production of serotonin – which has a natural calming effect – but protein and fat counteracts the effect," Dr Lyons-Wall said.

"Because grain-based foods are generally high in carbohydrate, and low in fat and protein, they tend to have this subtle, calming effect. High protein foods, on the other hand, tend to do the opposite," she said

This remarkable finding dates back to the 1970s when scientists Richard Wurtman and John Fernstrom first discovered that eating carbohydrates increases the production of serotonin in the brain.

"This early work was conducted in rats, but there's been further research with humans since then, and Wertman and Fernstrom's model has stood the test of time," Dr Lyons-Wall said.

Whilst most nutrition research is about preventing or curing diseases such as cancers, heart disease and type 2 diabetes, there is mounting evidence that our daily mood states and thinking capacities are influenced by the foods we eat.

Recent studies have found the types of breakfast people eat can affect the state of their mood in the middle of the day. Other research shows dieters tend to become depressed about two weeks into a diet, which may be linked to a drop in serotonin levels due to decreased carbohydrate intake.

But despite the fact that carbohydrate's effect on mood has been suspected for around 30 years, most people aren't aware of the mood enhancing effect grain-based foods can provide.

Ms Trish Griffiths, Accredited Practicing Dietitian and Executive Manager of Go Grains Health and Nutrition, said carbohydrates have had a lot of bad press in recent times and Australians may not realise their many benefits.

"Carbs have been demonised on a number of fronts - accused of causing weight gain and blamed as the reason people can't lose weight - but the opposite is actually true," Ms Griffiths said.

"It seems clear that people would benefit from understanding how foods like carbohydrates can affect their mood and appetite. Further research in this area might help us control food intake more effectively to maintain a healthier and happier lifestyle. Living longer is about wellness, not feeling miserable," she said.

Disease prevention

Regardless of the effect of carbohydrates on mood, it's clear that people are increasingly confused by conflicting messages about diet and good nutrition, and they may be affecting their health by cutting out grain-based carbohydrate foods.

"People should be more concerned about balancing the total calories in their diet with regular exercise, rather than trying to exclude carbohydrates," Ms Griffiths said.

"The evidence shows wholegrain foods can significantly reduce the risk of heart disease, diabetes and some cancers so, as a nation, we risk developing unhealthy long-term dieting habits if we cut out grain-based foods," she said.

http://www.nutritionhorizon.com/newsmaker_article.asp?id NewsMaker=10606&fSite=AO545&category=26&page=2

Granola maker stays ahead of health trend

Producing GrandyOats granola is truly an international affair, with chocolate chips from Italy, oats from Saskatchewan and honey from Brazil. It took company principals Aaron Anker and Nat Peirce about four years to find organic sources for all their ingredients, enabling them to meet the U.S. Department of Agriculture's standards for organic labeling in the summer of 2004.

They had to scour the globe to find the organic foodstuffs; honey was the toughest - you can't tell bees to avoid flowers sprayed with pesticides, so the honey has to come from isolated areas. Some of the ingredients are from Maine, like the $1,500-a-barrel organic maple syrup they buy from Arnold Farm on the Quebec border. The effort was worth it, said Anker and Peirce.

The move to 100 percent organic was and is a competitive advantage, setting GrandyOats apart, even in the ultra-healthy granola category. And that distinction has resonated with consumers. In 2005, revenue grew 60 percent over 2004, said Peirce. The company broke $1 million in sales for the first time last year, and Anker and Peirce believe they'll hit $1.5 million this year. The company is profitable, they said, though they declined to say how profitable.

Over the last year, the company expanded into the west, selling its products in the mountain and desert states and on the coast, too. GrandyOats products are sold in the biggest independent natural food store in the country, Rainbow Grocery in San Francisco, as well as the Whole Foods chain. This July, the company will go international, with distribution in Ontario.

All that growth and distribution reach has taken place at a company where the employees still make and mix granola by hand in a 90-plus-year-old restored dairy barn tucked away in the foothills south of Fryeburg.

With 13 employees in Brownfield, GrandyOats is the tiny town's biggest private employer, said Peirce. The company also has six subcontractors around the country who serve as sales representatives.

According to a recent report by Information Resources Inc., consumers increasingly are paying attention to nutrition, a trend that Anker and Peirce said has helped their organic granola sales.

Roughly half of consumers approach food and beverage purchases with a "healthy eating strategy" in mind, according to IRI. Baby boomers, in particular, try to eat whole grains, a meal component that received additional attention with the USDA's release of new dietary guidelines last year.

About 46 percent of consumers ages 21 to 49 said they try to eat whole grains, according to IRI, but 64 percent of consumers age 65 or older try to include them in their diets.

Many food companies have been reformulating their recipes to use whole grains or to exclude dietary no-nos, like trans fats. For instance, Kraft Foods Inc. has tweaked 650 products, leaving only 2.5 percent of their goods with trans fats, according to IRI. GrandyOats was able to ride the health trend without reformulating, said Peirce.

"We don't have to do anything," he said. "That's what we are."

As their company grows, Anker and Peirce want to help Maine's organic agriculture sector grow with it. After two years of work, it appears GrandyOats may be able to source some of its organic oats from Maine rather than Canada and the Midwest.

Matt Williams grew 25 acres of organic oats at his farm in the Aroostook County town of Linneus a few years ago but didn't have the equipment to process the hulled oats. Williams and his wife, Linda, own Aurora Mills, which processes organic wheat for companies such as Borealis Breads.

Williams recently located and bought an oat huller and milling equipment that will allow him to process not only organic oats but other grains as well. He plans to process the oats that have been stored for GrandyOats in the next few weeks and possibly plant a new crop this year.

Having a company like GrandyOats looking to source organics from Maine farms helps build that sector of the agriculture economy, Williams said.

"I wouldn't have taken on the project if I didn't feel I had a good enough market to cover the investment," Williams said. "I'll do more than GrandyOats - oat flour, for instance. It rounds us out."

And while Aurora mostly processes grains it grows, it does take in organic grains from other farmers, too. Having the ability to process them will allow other farmers to expand.

"I believe regionally produced food is better economically and better nutritionally because of the freshness," Williams said. "I'm interested in creating a food community in the state and participating in that. This helps me do it."

Peirce and Anker said they want to perfect their nationwide distribution system and continue to focus on the products they now offer before eyeing other markets.

In addition to granola, they also produce roasted nuts. While they've mostly been a bulk products company, they've recently re-released a line of individual packages of their products.

The company faces challenges as a small business that's gone beyond the cottage industry stage but still is growing. Cash flow remains a ongoing concern, said Peirce.

There's also growing competition in the market. Granola is relatively easy to make, and new companies are entering the business.

Some big companies are pushing in as well, said Anker. That's not necessarily bad, he said. It draws attention to the food category of granola, he said. For example, in Florida, the Whole Foods chain plans to dedicate eight feet of aisle space solely to granola, Anker said.

"Ultimately, there's enough room for everybody in the marketplace," he said.

Matt Wickenheiser, Portland Press Herald Writer, April 7, 2006

Fortitech Asia Pacific Targets Overall Health and Wellness

From bone to immunity to heart health, consumers worldwide are searching for newer, more innovative functional foods and beverages. Fortitech Asia Pacific met the demand by showcasing the latest trends and food fortification initiatives at Food Ingredients China (FIC) 2006.

FIC is the largest food industry trade show in Asia and has been for the past 15 years. During the show, Fortitech Asia Pacific demonstrated how custom nutrient premixes can be successfully incorporated into food applications, increasing nutrient value to consumers and product value for manufacturers. Fortitech Asia Pacific showcased many different applications including three complete healthy beverage concepts, a fortified snack seasoning, vitamin/mineral supplements and a fortified confection.

A person can't achieve top mental, physical or spiritual awareness when aches, pains and fatigue are present. This specially formulated wellness beverage contains lycopene and beta carotene, which may offer important health benefits with regard to prostate, lung and skin cancer. In addition, a complete antioxidant profile containing vitamins A, C and E helps with the re-growth and repair of tissues, boosts immunity, maintains healthy skin and strengthens blood vessels. Added calcium and magnesium allows the body to make new cells and assist in blood clotting. These nutrients also regulate heart beat, muscle action and nerve function.

The immune system is the body's first line of defense toward maintaining good health. This refreshing immunity beverage is formulated with a complete antioxidant profile containing vitamins A, C and E, plus it contains vitamins B2 and B6 to help process amino acids and convert nutrients to energy. Magnesium, selenium and calcium relax muscles and protect the body. Added folic acid reduces the risk of breast cancer in older women.

Second only to cancer, heart disease is a major worldwide killer. Keeping active and eating a healthy, well balanced diet containing antioxidants, is crucial in maintaining a healthy heart. This heart-healthy beverage has it all – effective antioxidants beta carotene and lycopene, vitamin E to help neutralize LDLs (bad cholesterol), magnesium to stabilize heart rhythm and folic acid to protect your heart from amino acids linked to heart disease.

To make certain foods more appealing and healthy for kids, Fortitech has developed a specialized premix for snack seasoning that can be used in noodles, corn or rice-based snacks. This fortified seasoning makes for a more nutritious alternative and acceptable snack for parents to give their children. This fortified seasoning contains calcium and phosphorus. Zinc is also added to help boost mental capacity.

Two vitamin-mineral health supplements incorporating a diverse blend of essential nutrients were showcased. These supplements each include antioxidants, B vitamins, calcium, magnesium, iron and zinc. Additional nutrients offering health benefits to consumers include chromium, copper, manganese, choline, boron and pantothenic acid.

Fortitech Asia Pacific showcased an innovative multi-vitamin gummy bear that offers a complete all-in-one formula containing the precise amount of nutrients. Fortified gummy bears are a perfect health option that parents can feel good about giving their kids. This concept includes Vitamins A, C, E and folic acid which are all important for your children's growth and development. This chewy application also contains vitamins B12 and B6, plus every bear delivers biotin and niacinamide which each play a vital role in the production of energy from the metabolism of carbohydrates and fats.

http://www.pr.com/press-release/7852

EFSA assesses new aspartame study and reconfirms its safety

The AFC Panel1 of the European Food Safety Authority (EFSA) has evaluated the new long-term study on the carcinogenicity of aspartame conducted by the European Ramazzini Foundation2 in Bologna, Italy. In its opinion published today, the Panel concluded, on the basis of all the evidence currently available, that there is no need to further review the safety of aspartame nor to revise the previously established Acceptable Daily In take (ADI) for aspartame (40 mg/kg body weight). The Panel also noted that inta kes of aspartame in Europe, with levels up to 10 mg/kg body weight per day, are well below the ADI.

The full text of the opinion is available at:

http://www.efsa.eu.int/science/afc/afc_opinions/1471_en.html

PRESS RELEASE European Food Safety Authority Parma, 5 May 2006

Q & A: Bird flu

What is bird flu?

Like humans and other species, birds are susceptible to flu. There are 15 types of bird, or avian, flu.The most contagious strains, which are usually fatal in birds, are H5 and H7. There are nine different types of H5. The nine all take different forms - some are highly pathogenic, while some are pretty harmless. The type currently causing concern is the deadly strain H5N1, which can prove fatal to humans. Migratory wildfowl, notably wild ducks, are natural carriers of the viruses, but are unlikely to actually develop an infection. The risk is that they pass it on to domestic birds, who are much more susceptible to the virus.

How do humans catch bird flu?

Bird flu was thought only to infect birds until the first human cases were seen in Hong Kong in 1997. Humans catch the disease through close contact with live infected birds. Birds excrete the virus in their faeces, which dry and become pulverised, and are then inhaled. Symptoms are similar to other types of flu - fever, malaise, sore throats and coughs. People can also develop conjunctivitis. Researchers are now concerned because scientists studying a case in Vietnam found the virus can affect all parts of the body, not just the lungs. This could mean that many illnesses, and even deaths, thought to have been caused by something else, may have been due to the bird flu virus.

Is it possible to stop bird flu coming into a country?

Because it is carried by birds, there is no way of preventing its spread. But that does not mean it will be passed to domestic flocks. Experts say proper poultry controls - such as preventing wild birds getting in to poultry houses - which are present in the UK, should prevent that happening. In addition, they say monitoring of the migratory patterns of wild birds should provide early alerts of the arrival of infected flocks - meaning they could be targeted on arrival.

How many people have been affected?

As of 27 April 2006, the World Health Organization (WHO) had confirmed 204 cases of H5N1 in humans in Azerbaijan, Cambodia, China, Egypt, Indonesia, Iraq, Thailand, Turkey and Vietnam, leading to 113 deaths. For the latest WHO information on the numbers of humans infected and killed by avian flu, see related internet links section on right of page.

How quickly is the disease spreading?

After bird flu claimed its first human victim - a three-year-old boy in Hong Kong in May 1997 - the disease was not detected again until February 2003, when a father and son were diagnosed with H5N1, again in Hong Kong. Since then it has spread westwards through Asia, the Middle East, Europe and Africa. Despite mass culls, exclusion zones and other measures put in place to prevent its spread, the H5N1 virus has continued to travel. In one week in February 2006, Italy, Greece, Bulgaria, Germany, Austria, France, Slovenia, India, Iran and Egypt confirmed their first cases of H5N1 in wild birds. In April 2005, a dead swan in Scotland was found to have the strain.

But it can't yet be passed from person to person?

For the most part, humans have contracted the virus following very close contact with sick birds.
There may have been examples of human-to-human transmission, but so far not in the form which could fuel a pandemic. A case in Thailand indicated the probable transmission of the virus from a girl who had the disease to her mother, who also died. The girl's aunt, who was also infected, survived the virus. UK virology expert Professor John Oxford said these cases indicated the basic virus could be passed between humans, and predicted similar small clusters of cases would be seen again. It is not the only instance where it has been thought bird flu has been passed between humans. In 2004, two sisters died in Vietnam after possibly contracting bird flu from their brother who had died from an unidentified respiratory illness. In a similar case in Hong Kong in 1997, a doctor possibly caught the disease from a patient with the H5N1 virus - but it was never conclusively proved.

What would the consequences of a mass outbreak be?

Once the virus gained the ability to pass easily between humans the results could be catastrophic. Worldwide, experts predict anything between two million and 50 million deaths. However the mortality rate - which presently stands at around 50% of confirmed cases - could decline as it mutates, they say.

Is there a vaccine?

There is not yet a definitive vaccine, but prototypes which offer protection against the H5N1 strain are being produced. But antiviral drugs, such as Tamiflu which are already available and being stockpiled by countries such as the UK, may help limit symptoms and reduce the chances the disease will spread. Concerns have been prompted by news that patients in Vietnam have become partially resistant to the Tamiflu, the drug that doctors plan to use to tackle a human bird flu outbreak. Scientists say it may be helpful to have stocks of other drugs from the same family such as Relenza (zanamivir).

Can I continue to eat chicken?

Yes. Experts say avian flu is not a food-borne virus, so eating chicken is safe. The only people thought to be at risk are those involved in the slaughter and preparation of meat that may be infected. However, the Who recommends, to be absolutely safe all meat should be cooked to a temperature of at least 70C. Eggs should also be thoroughly cooked. Professor Hugh Pennington of Aberdeen University underlined the negligible risk to consumers: "The virus is carried in the chicken's gut. "A person would have to dry out the chicken meat and would have to sniff the carcass to be at any risk. But even then, it would be very hard to become infected." **What is being done to contain the virus in the countries affected?** Steps have been taken to try to stop the disease spreading among birds. Millions of farmyard birds have been culled, while millions more have been vaccinated and confined indoors. Areas where the disease has been found have been isolated and some countries have banned imports of live birds and poultry products. In January 2006 international donors pledged $1.9bn (£1.1bn) in the fight against bird flu, while the World Health Organization has devised a rapid-response plan to detect and contain a global flu pandemic. There are also measures recommended when a wild infected bird is found, including protection and surveillance zones.

From: http://news.bbc.co.uk/2/hi/health/3422839.stm

The opportunity in green

Neha Kaushik & Dharini Nagarajan

A host of corporates are getting into agri-business as it will ease their foray into food retail. The priority accorded to the food-processing sector in the Union Budget this year will also fuel the interest.

The Indian farmer seems to be fast developing corporate linkages, what with India Inc discovering that there is big money to be made in growing and selling fruits and vegetables. Companies which have drawn up big plans in the agri-foods segment are Reliance, Pantaloon, Godrej, Field Fresh (Bharti Enterprises CMD Sunil Mittal's joint venture with Rothschild), Ballarpur Industries, DSCL, Tata Group and Mahindra & Mahindra.

Market analysts are already terming this opportunity in agriculture as the next big growth driver, with demand coming not only from the domestic market but also from overseas. In fact, the opportunity for growth is immense with less than 1.5 per cent of the food undergoing processing in the country. This is minuscule compared to Thailand, Malaysia and Brazil where it is as much as 65-75 per cent.

The segment, with immense potential, is projected to grow at a high double-digit rate. A study conducted by McKinsey and the Confederation of Indian Industry (CII) pegs the turnover of the total food market at approximately 2.5 lakh crore. Meanwhile, the move to agriculture makes sense for companies which are all set to jump on to the food retailing bandwagon.

"Retailing in general and food retailing in particular is one of the high-growth sectors. Food retailing is to grow 10-fold in five years. For a lot of Indian companies, this may pose a good business opportunity. There are also few companies where food farming/ retailing might appeal in sense of backward or forward integration (Godrej Group, for instance)," points out Amit Adarkar, Director at market research company Synovate.

Analysts add that for corporates planning a foray into food retail, getting directly involved with agri-business helps to keep costs under check by eliminating the role of intermediaries. Reliance Industries, for instance, is charting out a massive foray into the retailing sector and is reported to have plans to invest over Rs 4,000 crore, mostly in Punjab and Haryana, for its foray into agri-business. The company is believed to have tied up more than 900 acres of land in Punjab already. In fact, both Reliance and retailing giant Pantaloon are learnt to be in the process of partnering with farmers to source food grains, fresh vegetables, fruits and processed foods directly.

Similarly, Bharti, which is in talks with several foreign retailers, including Tesco, to foray into food retailing, can derive synergies from its subsidiary Field Fresh Foods, a 50:50 joint venture with the Rothschild Group. Field Fresh, which started off with an investment of Rs 250 crore, could become the supply line for Bharti's proposed retailing business. The company has been working with farmers in Punjab, Jammu & Kashmir, Himachal Pradesh and Uttaranchal to source apples, kinnos, litchis, cherries and tomatoes among other products. This portfolio may soon increase to include grapes, mangoes and bananas.

From: Hindu Business Line April 27, 2006

EFSA approves two nutrients for European use

The European Commission has presented two nutrient proposals to the 25 European Union member states for addition to the Food Supplements Directive's (FSD) 'positive list' of vitamins and minerals, following favourable

opinions from the European Food Safety Authority (EFSA). These are the first nutrients to gain EFSA approval under the FSD nutrient dossier process. EFSA has hundreds of similar dossiers to process by the end of 2009. The two nutrients forwarded by EFSA were boron (and its sources, boric acid and sodium borate), and calcium L-methyl folate and ferrous bis-glycinate. Although the addition of the indicated sources of calcium and iron were approved, the EC declined to permit the addition of boron and its sources to the positive list following objections from some member states.

Entering the Japanese marketplace

A new four-part guide is available for companies looking to export their products to the Japanese marketplace: Entry to the Japanese Nutrition Market. Edited by industry expert Loren Israelsen, parts 1 and 2, available now, explain the Japanese regulatory system in depth, and regulations related to marketing, product labelling and health claims. The next two parts, available in May and August, respectively, will highlight successful case studies of international companies entering the Japanese nutrition market, and offer a guide to finding local partners and/or customers in Japan.
From: Functional Foods & Nutraceuticals: April 2006

Functionality driving European dairy expansion

Reduced European subsidies, increasing competition and declining profitability are driving dairies into the value-added milk market for growth opportunities, according to new findings by UK-based organic and natural products business research consultancy, Organic Monitor. Dairy groups such as Denmark's Arla and the Dutch Campina have started an added-value milk drive partly as a result of the reduction in EU subsidies, while Finnish dairy Valio and Germany's biggest dairy, Nordmilch, have formed an alliance to develop 'special products' such as functional milks and probiotics.

In Britain, functional and flavoured milks are the fastest-growing segment in the dairy industry, and have been a major factor in boosting all milk sales for the first time in about 30 years. Organic Monitor noted sales of value-added milk expanded by 39 per cent in 2005, and this sector now comprises more than six per cent of drinking-milk sales in the UK. High growth rates are projected to raise the market share to more than 10 per cent in coming years, with British dairies investing in value-added milk products as they shift away from commodity offerings. Food giants such as Nestlé and Unilever are being enticed into the market by growth potential and low barriers to market entry. "Major multinationals are moving into the sector as well. You only have to look at the way Unilever has expanded their cholesterol-lowering offerings with Flora pro.activ so they now offer it in a one-litre carton you buy as you would regular milk for the fridge," Organic Monitor director Amarjit Sahota told FF&N.

"Functional milk is somewhat of an unknown quantity but dairies and other food companies see it as a platform for functional experimentation that could take off and yield significant profits. The R&D investment in functional dairy is vast right now and the fruit of that is beginning to appear on the market."

Organic milk and functional milk segments are growing the fastest, with products such as Dairy Crest's St Ivel Advance recording buoyant sales. Fortified with marine-sourced omega-3 fatty acids, Advance is marketed as 'clever milk' and promotes its ability to assist learning and concentration. Similar product launches are expected to drive growth in the functional milk market. "Flora pro.activ in the one-litre format and St Ivel Advance is taking up the middle ground between traditional and functional milk," Sahota observed.

The organic milk market is showing even stronger growth, with many retailers reporting 50 per cent sales increases in 2005. The market has been boosted by studies highlighting organic milk's nutritional superiority over regular milk, including higher levels of vitamin E, omega acids and conjugated linoleic acid. The surge in demand has led to local organic milk supply shortages after years of oversupply with imports increasingly meeting the shortfall. Sahota noted countries such as Germany, Portugal, Denmark, France and Sweden mirrored the UK organic dairy situation where demand surges have led to undersupply, except in Denmark "whose organic milk supply is vast." "Between 1999 and 2006, the market has gone full circle," he said.

From: Shane Starling, Functional Foods & Nutraceuticals April 2006

Sterol cookie launched in US

New Jersey start-up Right Direction Foods has debuted the world's first sterol-fortified cookie in the US. The chocolate chip cookies are marketed with the strap line, 'Right Food, Right Choice, Right Direction,' and flag the presence of '5g dietary fibre, 1.3g plant sterols in each cookie,' although the FDA-approved, sterol food cholesterol-lowering health claim is not employed on the product packaging due to trans-fat and sugar levels.

Initially, the cookies, which retail at about $1 each, are available online. However, the company aims to have retail distribution by year's end. While offering a cholesterol-lowering alternative, the company notes the cookies should not replace cholesterol-lowering, prescription drug treatments, and are only effective in

easing mild-to-moderate cholesterol problems. “These cookies can be part of a cholesterol-lowering treatment regimen that includes prescription medication, diet and exercise,” said Wendy Miller, MS, RD, and co-creator of Right Direction Cookies.

Clinical research found subjects who ate two chocolate chip Right Direction Cookies each day for 30 days showed a significant drop in total cholesterol from 217mg/dL to 203 mg/dL and in LDL cholesterol from 133mg/dL to 120 mg/dL with Right Direction Cookies vs a placebo. educating the public about the cookies' efficacy via A Right Direction spokesperson said the company wasconsumer and trade press as well as Internet and trade-show exposure, but no advertising campaign was planned. She said the cookies had been well received in taste tests, while not being as sweet as conventionalcookies. The two nutritionists behind Right Direction Cookies, Miller and Norman Null, decided to commercially develop the cookies after positive results from dispensing homemade sterol-fortified cookies to clients. According to AC Nielsen, the US sterol foods market is estimated at $75 million, compared to $600 million in Europe and $130 million in Japan.

From: Functional Foods & Nutraceuticals, Shane Starling, April 2006

Coming Events

May 12-14,2006- Interbake China 2006, at Guangzhou International Convention and Exhibition Centre Organised by: Canton Universal Fair Group Ltd.It focuses on bakery machinery, raw material, ingredients included, flavour, yeast, other related additives and packaging; E-mail: interbake@faircanton.com; Web: www.faircanton.com

May 25-27,2006- African Dairy Conference & Exhibition, at Munyonyo, Kampala, Uganda, The Speke Resort Munyonyo, Organiser: Eastern and Southern African Dairy Association (ESADA);
E-mail:info@dairyafrica.com;
Web: www.dairyafrica.com/index.asp

June 24- 28,2006 –IFT Annual Meeting + Food Expo, IFT (Institute of Food Technologists), at Orange County Convention Center, Orlando, FL USA Organised by Institute of Food Technologists, 525 W. Van Buren, Suite 1000, Chicago, IL 60607
Phone: 312-782-8424 or 800-438-3663, Fax: 312-782-0045 E-Mail: info@ift.org , Website: www.ift.org

July 23-25,2006 – Agri-Food 2006, Manufacturers and producers Expo, at Johannesburg, South Africa E-mail: cruz@eth.net, cruzconstaltants@rediffmail.com, admin@exhibitionsafrica.com
Web: www.intexexpo.com, www.exhibitionsafrica.com

August-25-27,2006 -Pro Foods pack 2006, National processed and packaging exhibition in Sri Lanka, at Sirimavo Bandaranaike Memorial Exhibition Centre, Colombo-Sri Lanka,
E-mail: hiranya@saexhibitions.com , cruz@eth.net;
Web: www.saexhibitions.com/profoods

August 27-29,2006 -International Livestock and Dairy Expo India orILDEX-2006, international trade exhibition on animal production at Hall 8-11, Pragati Maidan, New Delhi. Organiser: NCC Exhibition Organizer Co (NEO), Bangkok; E-mail: ashish.kala@pixiepublication.com;
Web: www.ILDEX.com

September 1-4,2006-India Packaging Show 2006,at Pragati Maidan Complex, New Delhi
E-mail: info@indiapackagingshow.com;
Web: www.indiapackagingshow.com

September 3-9,2006 – IBA 2006,Munich, Germany, Int'l bakery industry show,
E-mail: vdma@giascl01.vanl.net.in

October26-28,2006 – Propaca India 2006,the international exhibition on processing and packaging, at Bombay Exhibition Centre, Mumbai; E-mail: falconmail@vsnl.net

November1-3,2006 – World of Food India 2006,Mumbai, India
E-mail info@cidex-tradefair.com;
Web: www.cidex-tradefair.com

November 9-11,2006-Food & Bev Tech 2006, International Exhibition & Conference for the food & beverage processing industry, Mumbai;
E-mail: anil.padwal@ciionline.org;
Web: www.foodbevtech.com; www.ciionline.org

November 23-25,2006 – Int'l Food Tec India 2006,Mumbai, India, Details from Ya Trade fair, Hyderabad; **E-mail: info@yatradefair.com**

PFNDAI Library

FOOD TECHNOLOGY (Feb, 2006)

- Biosensors and food defence-The potential threat of bioterriorism and emerging diseases
- Fiber's new image
- High pressure processing
- Aseptic and Extended-shelf-life packaging
- Proteins power up
- Software aids product development
- Keeping Botulism out of canned foods
- Micro pollutants in milk and their control
- Pomegranate: Recent Developments in

Nutrition Bulletin (March, 2006)

- Time to reconsider a folic acid fortification policy in the UK
- Rye – the overlooked cereal
- Measure for measure
- The nutritional properties of flours derived from Orkney grown bare barley
- The history of food composition databases
- Dietary cholesterol, eggs, and coronary heart disease risk in perspective
- Nutrition in pregnancy
- Breaking down barriers – examining health promoting behaviour in the family
- Diet-gene interactions and current EU research
- Euro FIR update

Nutraceutical World (March, 2006)

- Antioxidants: Finding the Right Balance
- The Omega 3 Explosion
- GLA: The 'Good' Omega 6
- Web Exclusive: Contract Manufacturing Tips
- Interview with Dr. Andrew Shao

Food Tech (March, 2006)

- Reducing Sodium – a European Perspective
- Nanotechnology in Nutraceuticals and Functional Foods
- Testing for Mad Cows and Sick Chickens
- Women's Health – Fat Chance?
- Processing Breakfast Cereals to Deliver Nutrition
- Prime Time for Meats and Poultry
- Nano and Food Packaging Technologies Converge
- Synergising Sweetness
- Functional Fats
- Do Food Standards Stifle Innovation?

The World Of Food Ingredients (Feb, 2006)

- Ingredient Branding-Does co-branding mean value creation or is it merely contemporary wishful thinking?
- New Confectionary Opportunities-The best growth for confectionary is likely to be in sugar- free and functional lines.
- Confectionary Design Trends-A major recent trend has been for consumers to spoil themselves with something truly indulgent. Starch Innovation –The starch industry is moving from a commodity basis to one driven by value-added product development
- Hydrocolloid Ideas- The food and beverage industry continues to be the biggest consumer of gums and starches.
- Natural sweeteners- Do natural high –potency sweeteners hold the way ahead for diet products.
- Healthy Oils- Top of the list of functional fats are the omega –3 fatty acids, most commonly derived from oily fish, algae and linseed.
- Flavour Challenges-A numbers of technical challenges currently dominate demands in terms of the aroma, taste and perception of food and beverage products.
- Targeting Obesity-While more consumers want to control their weight better, few manage it successfully.
- Functional Confectionery-Confectionery remains a great opportunity for health ingredients, but the sector is all about impulse and indulgence.
- Fortifying Products –While it is important to consider quantity of vitamins and minerals, safety, flavour attributes, ingredient stability to light, ph and heat and the overall consumer acceptance.

Functional Foods & Nutraceuticals (March, 2006)

- The science of Immunity compelling new research on seven bioactive
- Canberries –Emerging research points to a rich range of therapeutic applications for this potent fruit
- Lessons of low-carb bust-Three suppliers share what they learned
- Sweetners –the time has never been sweeter for sugar alternatives.
- Colour's added value-Natural shades also impart health benefits
- The Gold Standard-FF&N highlights four leaders in research and development

Indian Food Industry (March-April, 2006)

- Network marketing of milk and milk products: A Convenient method to reach rural consumers
- Papaya –"Fruit of the angel"
- Resistant Starch- A Functional Dietary Fibre
- Guidelines for developing good manufacturing practices in meat plants