

# PFNDAI Bulletin October 2009

## Editorial

It has been noted that consumers want some information about food products especially about the safety and the nutrition information on the labels. Government has made certain regulations regarding what information needs to be given on the label. However, there is hardly any attempt to find out if the information given at present is what consumers want or whether they can adequately use this information to make the right choice of products. There have been some indications that consumers from American and European markets are finding it difficult to use the information especially when they are trying to focus on some substances. Salt and sugar are important examples.

Recently Food Standards Authority in UK conducted a survey to find out whether UK consumers can identify which products need to be controlled in order to restrict the salt intake in the diet. They found that consumers are feel that they should just avoid food products that contain high levels of salt to cut down the salt intake. However, most of them are not consumed frequently so their restriction or avoidance from diet does not markedly affect the salt intake. Food Standards Authority showed that three fourths of salt intake comes from food products like bread, meat products and breakfast cereals which are not the saltiest of products but most regularly consumed ones. The agency has launched the salt reduction programme in 2004 and this has yielded resulted significant reduction in salt intake of consumers.

This is a situation in UK where consumers are more aware and enforcement is more effective. Just imagine the problems in country like India where people have just begun to be aware of problems of lifestyle changes and dietary impact on the health. In India where it has been shown that people have tendency to have hypertension and coronary heart disease, salt intake is quite high (over 8g per day against WHO recommendation of 5g), it is advisable for consumers to know what products contain how much salt in order to reduce it. However, the recent PFA notification on Nutrition labeling has not made salt or sodium declaration mandatory although some companies provide the information.

Similarly, various bodies have recommended that sugar intake needs to be restricted. In the US one can know how much of sugars, whether it is sucrose or glucose or lactose as total sugars need to be declared. PFA has simply asked for declaration of sugar meaning sucrose in common understanding. There is no explanation whether it is total sugar or added sugar, so some manufacturers declare 'Added Sugar' and label it as such. If sugar needs to be avoided by weight watchers or diabetics, then all the sugars and not just sucrose need to be declared as well as those coming from ingredients and that is added separately as ingredients. Due to this fallacy, consumers are getting confused and carry wrong notion about the product.

There are such lacunae in the regulations that need to be corrected. Food Safety & Standards Authority of India (FSSAI) should conduct a survey to find out the effectiveness of regulations that are made otherwise these may merely serve as additional means of harassment and hardship to industry without any benefit for consumers in whose name all these changes have been originally proposed. Wishing you Season's Greetings,

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# Importance of Milk in diet

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Milk is white nutritious secretion, produced by mammary glands of female mammals for feeding their young. It is one of the nature's most complete and nutritious foods on planet. However, since ages, humans have been consuming milk of animals like cow and goats as it is highly nutritious and easily available in large quantity. Since milk is now a food product it has been well defined as per the Prevention of Food Adulteration acts (PFA). As per the PFA acts (A.11.01) it is defined as "Milk is the normal mammary secretion derived from complete milking of healthy milch animal without either addition thereto or extraction therefrom. It shall be free from colostrum."

A cup of milk provides a wealth of nutrients and this we can look from the fact that it is high in proteins, calcium and a range of minerals and vitamins. The nutritional status of milk proves the fact that milk contains all the food constituents required in the human diet and in essentially the proper proportions. Milk supplies proteins of exceedingly high quality and of a nature to supplement, especially well, proteins in the human diet from other sources. Milk also supplies liberal amounts of calcium, which is often otherwise deficient in the human diet. Along with calcium, milk also contains various nutrients that favour calcium absorption (lactose, protein, vitamin D).

Milk of different species, although containing the same constituents in general, varies in composition and properties in minor ways. The difference in the nutrient contents are also man made incorporated due to different processing and this has brought a variety of milk in the market. The original, unprocessed milk which contains fat in its original form is known as whole milk. When fat is removed from the milk and there is less than 0.1% fat, it is called skimmed milk; it has slightly more protein and calcium than whole milk. The fat-soluble vitamins are less than whole milk. Semi-skimmed milk is a low-fat milk with fat content <2% and vitamins are in reduced amounts.

Milk contains approximately 3.5% protein by weight which can be divided into two main groups: caseins and whey proteins. Approximately 80% of the protein in milk is casein based and 20% is whey based. Milk protein is highly digestible and used efficiently, it is found to have high biological value and they contain all essential amino acids that the body cannot synthesis and in the right proportions. These facts have led scientists to conclude that milk proteins are among the most valuable proteins for man.

Other than being a good source of protein it also contains a special carbohydrate known as lactose. It is found only in milk and very few plants and thus it has derived its name which means 'MILK Sugar'. It is a disaccharide comprised of glucose plus galactose. Lactose along with fats is a major source of calories, lactose alone provides 30% of the total milk calories. Skimmed milk contains around 11-14g of lactose per 250ml of milk where as in whole milk and semi-skimmed milk the lactose content is less. Lactose is more preferred over sucrose as it has the lowest sweetness of all natural sugars. Lactose has relatively lower glycemic index as compared to glucose or sucrose and is suitable for diabetics. It is less cariogenic than other sugars, inhibiting tooth decay. Lactose has a beneficial influence on gut flora as it enhances the growth of bifidobacteria in the colon and thereby prevents infection and improves intestinal health. Bifidogenic activity of milk is ascribed to lactalbumin, lactoferrin and glycomacro-peptide derived from the breakdown of casein during digestion. It also

facilitates the absorption of calcium, magnesium and manganese. In infants, it helps in the net retention of phosphorus.

Fats in milk provide a unique characteristic to the flavour, texture, appearance and stability of the dairy products. Whole milk contains around 4 % fat of which 67% comprises of saturated fatty acids and 30% monounsaturated fatty acids, 3% polyunsaturated fatty acid and 3% trans fat. The trans fat content of milk is natural fat and studies have proved that they are not detrimental for heart health as increase of trans fat generated through hydrogenation of vegetable oils. The health oriented essential fatty acids such as omega-3 linoleic acid, eicosapentaenoic acid and docosahexaenoic acid are found in significant level in milk fat. Fatty acids of milk help to lower the pH which in turn facilitates protein digestion.

Milk is rich in mineral salts particularly calcium, which is vital in the development of the growing skeleton of the child. This is not the only reason of including milk in the diet of the child, particularly the infant. Infancy is characterized by rapid growth and development and the digestive system is still immature. Thus milk is provided to the infant as the constituents of milk are highly digestible, palatable and require little preparation. However, human milk is the best food for the child and breast feeding is exclusively recommended in the first six months as it supplies adequate nutrients in the right balance and is safe and rich in protective factors, leading to less gastrointestinal infections.

In preschool children i.e. children between 7–12 years, there is a slow but steady growth with an increase in appetite and food intake. This is an important time for building optimal bone mass and so calcium and other important milk nutrients are needed throughout childhood to maintain existing bone mass and for bone growth. Recent studies indicate that psychomotor development in children may be impaired in riboflavin deficiency and milk and milk products are a good source of riboflavin. Milk also helps in the prevention of pellagra. Although milk is poor in nicotinic acid, the deficiency of which may lead to pellagra, milk is efficient in preventing pellagra because it is rich in tryptophan. Tryptophan is convertible to nicotinic acid in the body.

The importance of milk consumption is felt continuously during all the stages of the life. During adolescence period there is rapid physical growth and maturation thus there is an increased demand for protein and other nutrients.

Adults often do not consume enough dairy foods, missing out on nutrients that are important for good bone health thereby predisposing themselves to the risk of osteoporosis in later stages of life. There is continuous demineralisation and mineralization taking place in bones and teeth, when the body is compromised in such nutrients which help in mineralization of bones and teeth; there is an increased risk of tooth decay and osteoporosis especially among post menopausal women. Adequate nutrient intake as part of a well balanced diet is important during old age too as this is a period of physiological stress associated with decline in bone mass and muscle mass and gain in adipose tissue. Also the rate of mobilisation of calcium is increased from the bones resulting in demineralisation and porosity, leading to osteoporosis.

Milk has large quantity of water as its constituent and thus is considered the best fluid for rehydration. It also maintains healthy skin health and so has found application in a number of cosmetic products. Regular consumption of low fat dairy products can help to reduce the risk of type 2 diabetes. Also people who consume milk and dairy foods are likely to be slimmer than those who do not which implicates its association with reduction of obesity. Consumption of milk and dairy foods as a part of a calorie controlled diet is associated with increased weight loss, particularly from the abdomen. Consuming 2 portions of dairy each day along with

5 portions of fruits and vegetables as part of a low salt diet can reduce high blood pressure in both adults and children. Milk is also found to have a protective effect on the risk of both colorectal and breast cancer. One can notice several health impacts of milk and dairy products.

India is the world's largest milk market with 12% share of global consumption. Indian per capita consumption is high with about 96 L per capita. Daily consumption of milk is found to be 2 - 2.5 liters per affluent Urban Indian household.

Milk should find place in any balanced diet, particularly in a vegetarian diet, to provide good quality protein; sufficient calcium and riboflavin which are difficult to obtain in adequate quantities solely from plant foods. An adult diet should have at least 150ml of milk a day while children, pregnant and lactating women should receive at least 250ml milk a day.

Prepared by **Ms. Ummeayman R.** (Nutritionist, PFNDAI) based on the presentation by at Nutrition Week Activity 2009 at UICT



## **All About Nutrition & Health Claim: GSR 664 VS CODEX Perspective**

By **Prabodh Halde**, Head : Product Integrity, **Marico Ltd.**; Secretary AFSTI (Mumbai Chapter); Member, Regulatory Committee of PFNDAI; Member; Codex Shadow committee at FICCI New Delhi

With GSR 664 being implemented under prevention of "Food Adulteration Act 1954", label claims are approved in India. Thus it is very important to know all about Nutrition and Health claims. There are a number of international regulations and governing bodies that regulate the use of claims on foods. They are FOSHU (Japan), EU guidelines, the Federal Food, Drug and Cosmetics Act (USFDA) and CODEX.

Today Food is governed by prevention of food adulteration act 1954 and PFA rules 1955. Now GSR 664 defined some label claims, it is important to understand the definition of 'Food' under PFA act before touching claim part of the topic.

"**Food**" means any article used as food or drink for human consumption, other than drugs and water. Thus PFA's definition is very vague and open to interpretation.

### **FSSA 2006 has given very detailed definition of food.**

Food means any substance, whether processed, partially processed or unprocessed, which is intended for human consumption and includes primary food to the extent defined in clause (zx), genetically modified or engineered food or food containing such ingredients, infant food, packaged drinking water, alcoholic drink, chewing gum, and any substance, including water used into the food during its manufacture, preparation or treatment but does not include any animal feed, live animals unless they are prepared or processed for placing on the market for human consumption, plants prior to harvesting, drugs and medicinal products, cosmetics, narcotic or psychotropic substances. This definition has bigger and wider scope thus all types of food are covered including functional food, Nutraceutical, & health supplements.

## **Definition of Drug under Drug & Cosmetic act 1946**

“**Drug**” includes all medicines from internal or external use of human beings or animals and all substances intended to be used for or in the diagnosis, treatment, mitigation, or prevention of any disease or disorder in human beings or animals, including preparations applied on human body for the purpose of repelling insects like mosquitoes.

FSSA 2006 has been enacted but rules are not yet formed and thus we are still under PFA regime. Let’s focus what GSR 664 has defined about Health claims.

### **GSR 664 has divided claims in three parts. 1) Nutrition Claim 2) Health Claim 3) Risk reduction claim**

1) Nutrition claim : Nutrition claim” means any representation which states, suggests or implies that a food has particular nutritional properties which is not limited to the energy value but include the protein, fat and carbohydrates, vitamins and minerals e.g. Food A is high in protein.

2) “Health claims” means any representation that states, suggests or implies that a relationship exists between a food or a constituent of that food and health and include the Nutrition claims which describes the physiological role of the nutrient in growth, development and normal functions of the body e.g. Food A is rich in calcium and calcium is good for bone health.

Other functional claims concerning specific beneficial effect of the consumption of food or its constituents, in the context of the total diet on normal function or biological activities of the body and such claims relate to a positive contribution to health or to the improvement of function or to modifying or preserving health, or disease e.g. Food A is low GI food. Low GI food helps in sugar management

3) Risk reduction claim relating to the consumption of a food or food constituents, in the context of the total diet to the reduced risk of developing a disease or health – related condition. “Risk reduction” in the context of health claims means significantly altering a major risk factor for a disease or health-related condition e.g. Food A which is source of soluble fiber when consumed as a part of diet low in saturated fat and cholesterol may reduce risk of heart diseases. (0.75 g of soluble fiber/serving)

One need to be very cautioned before putting this risk reduction claim as it goes towards medicinal benefits. Though GSR 664 has defined all above nutrition and health claims, still there are many questions about its implementation and efficacy proof.

This part of GSR 664 is based on CODEX guideline and thus let’s see in detailed what CODEX has covered under various Nutrition claim and Health claim. The Codex Alimentarius is a collection of internationally recognized standards, codes of practice, guidelines and other recommendations relating to foods, food production and food safety. Its texts are developed and maintained by the Codex Alimentarius Commission, established in 1963 by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO). The implementation of Codex standards is voluntary and there is no obligation on the countries to adopt the same.

There are two texts in the Codex that apply to the use of claims for foods namely the Codex general guidelines on claims and the Codex guidelines for the use of nutrition and health claims. The general guidelines on claims are based on the principle that food should not be described or presented in a false, misleading or deceptive

manner. In the guidelines, claim is defined as any representation which states, suggests or implies that a food has particular characteristics relating to its origin, nutritional properties, nature, production, processing, composition or any other quality.

The guidelines prohibit the use of following types of claims for foods:

- ✓ A claim suggesting that a particular food is an adequate source of essential nutrients except where such claims are permissible as per a Codex standard for well defined product or where the product has been accepted to be an adequate source of nutrients by the appropriate authorities.
- ✓ A claim implying that a balanced diet or ordinary foods cannot be an adequate source of all nutrients
- ✓ A claim that cannot be substantiated
- ✓ A claim suggesting that a food can be used for the prevention, alleviation, treatment or cure of a disease or disorder unless they are in accordance with the Codex standards or guidelines for Foods for Special Dietary Uses or they are permissible under the laws of the country in which they are distributed.
- ✓ A claim that could lead to doubts about the safety of similar foods or arouse fear in the mind of consumer
- ✓ The guidelines also prohibit the use of potentially misleading claims. For the prevention of misleading through claims, the guidelines identify certain conditions/criteria for the use of various types of claims. Such claims are only permitted if the respective conditions attached as listed below are satisfied.

Type of claim / Claim title	Condition / criteria
A food has gained increased or special nutritive value by addition of nutrients	Such claim can be made provided the addition is made based on the nutritional considerations as per the respective Codex guidelines and it is subject to legislation by appropriate authorities
A food has special nutritional qualities by the reduction or omission of a nutrient	Such claim can be made if the reduction of nutrients is based on the nutritional considerations and is subject to legislation by appropriate authorities.
The use of terms such as “natural”, “pure”, “organically grown”, “fresh”, “home made” and “biologically grown”	Such terms can be used only if they are in accordance with the national practices in the country where the food is sold.
A food is a religious or ritual preparation	Such claim can be made provided the food complies with the requirements of the appropriate religious or ritual authorities
Claim that a food has special characteristics when all similar foods have the same characteristics	Such a claim can be made if the fact that all the similar foods also have the characteristics is apparent in the claim
A claim highlighting the non-addition or absence of a nutrient	Such claims must be regarded as nutrition claims and subject to mandatory nutrient declaration as per the Codex Guidelines For Nutrition Labeling

The second text i.e. the guidelines for the use of nutrition and health claims encompass the nutrition and health claims in food labeling and where required, in advertising. These guidelines are applicable to all foods bearing nutrition and health claims. As per these guidelines, unless specifically permitted in Codex standards or national legislation, nutrition and health claims cannot be made on infant foods and foods for young children. In Codex, claims are broadly classified as nutrition claims and health claims.

### **1) Nutrition claim**

It is defined as any representation which states, suggests or implies that a food has particular nutritional properties including but not limited to the energy value and to the content of protein, fat and carbohydrates, as well as the content of vitamins and minerals. The declaration of substances in the ingredients' list, the mention of nutrients as mandatory part of nutrition labeling or the declaration of nutrients or ingredients as per requirements of national legislation does not fall in the ambit of nutrition claims.

A nutrition claim can further be categorized into a nutrient content claim or a nutrient comparative claim.

A nutrient content claim describes the level of a nutrient contained in a food. Claims like “source of calcium”, “no added sugar” and “free of trans fatty acids” are content claims. The guidelines provide for certain nutrient content claims along with specific conditions to be met for the claim to be employed. For a food, which is low in or free of the nutrient on which the claim is made, the term describing the level of the nutrient should not immediately precede the name of the food but should be in the form “a low (naming the nutrient) food” or “a (naming the nutrient)-free food”. Example – a salt with low sodium contents shall bear a claim saying “low sodium salt”.

The other type of nutrition claim is nutrient comparative claim. A nutrient comparative claim is a claim that compares the nutrient levels and/or energy value of two or more foods. Comparison can involve claims like “reduced”; “less than”; “fewer”; “more than”. Example – “This chewable tablet contains X% more chewable calcium than brand y.” Comparative claims should be permitted based on the following criteria and considering further preparations required for consumption depending upon the form in which food is sold.

The basic requirement of comparative claims is that the foods being compared should be different versions of the same food or similar foods and the foods being compared should be clearly identified. The food must bear on the label a statement of the amount of difference in the energy value or the nutrient content. The amount of difference related to the same quantity, expressed as a percentage, fraction or absolute value, the complete details of the comparison and the identity of the food(s) to which the food is being compared must be provided in close proximity to the comparative claim. The comparison between the compared foods should be based on a relative difference of at least 25% in the energy value or nutrient content for macronutrients and at least 10% in case of micronutrients in the NRV and a minimum absolute difference in the energy value or nutrient content equivalent to the values specified for content claims like “low” or “a source” in the guidelines. The food label can bear the word “light” if the criteria for the word “reduced” are met and must indicate the characteristics, which make the food “light”.

### **2) Health claims.**

Health claim is defined as any representation that states, suggests or implies that a relationship exists between a food or a food constituent and health. Health claims must consist of two parts – the information on the

physiological role (function) of nutrient or on an accepted diet-health relationship and that on the composition of the product relevant to the function unless the function is not linked to specific constituents of the food. Detailed principles have been developed in the guidelines to decide on the eligibility of a claim as a health claim. The claims fulfilling the set requirements are only permitted.

The health claims should be based on current relevant scientific substantiation and the proof available should be adequate for substantiating the claim. The claim should be accepted by competent authorities of the nation where the product is sold and the claimed effect should be derived from consuming a reasonable amount of the food/food constituent. In case of a claim attributed to a food constituent having a set Nutrient Reference Value, the concerned food shall be a source of / high in / low in / free of the constituent based on the recommended consumption with the conditions for such terms applicable. There should be a validated method of quantifying the food constituent that the claim is based on. The guidelines emphasize on development of clear regulatory framework for qualifying / disqualifying conditions for the use of specific claims. The label of the foods bearing health claims must incorporate all the relevant information for consumers. The label must indicate the amount of nutrient or constituent of the food on which the claim is based along with the target group, if applicable. The proper directions for consumption to obtain the claimed benefit and caution advice for vulnerable groups, where applicable must be provided. The maximum safe intake of the food/constituent, how the food fits within the context of total diet and a statement on significance of maintaining a healthy diet must be displayed on the label.

Health claims can further be grouped into nutrient function claims, other function claims and reduction of disease risk claims.

Nutrient function claim is a claim that describes the physiological role of the nutrient in growth, development and normal functions of the body. Example: “Contains folic acid which contributes to the normal growth of fetus. Food X is a source of/ high in folic acid.” As per the guidelines, this type of claim can only be made on those essential nutrients with established Nutrient Reference Values in the Codex or the officially recognized dietary guidelines of the concerned national authority.

Other function claims – These claims concern specific beneficial effects of the consumption of foods or their constituents, in the context of the total diet on normal functions or biological activities of the body. Such claims relate to a positive contribution to health or to the improvement of a function or to modifying or preserving health. Examples: “Vitamin C helps to enhance body’s natural defense system. Food Y contains x grams of vitamin C.”

Reduction of disease risk claims are claims relating the consumption of a food or food constituent, in the context of the total diet, to the reduced risk of developing a disease or health-related condition.

Risk reduction means significantly altering a major risk factor(s) for a disease or health-related condition. Diseases have multiple risk factors and altering one of them may or may not have a beneficial effect. The presentation of risk reduction claims must ensure, for example, by use of appropriate language and reference to other risk factors, that consumers do not interpret them as prevention claims. Examples: “Adequate iron intake may reduce the risk of anemia. Food X is enriched with iron.”

The guidelines also identify certain conditions for using claims related to dietary guidelines or healthy diets. The only claims permitted shall be the ones related to the pattern of eating contained in the dietary guidelines officially recognized by appropriate national authority. The words of the claim may be flexible as far as the

pattern of eating outlined in the dietary guidelines is clearly conveyed. The foods described, as part of a healthy diet shall satisfy certain minimum criteria for other major nutrients related to the dietary guidelines and not just the selective considerations of certain aspects of the food. The foods should not be represented in a manner indicating that a food in itself will impart health. Lastly the foods may be described as part of a “healthy diet” provided that a statement connecting the food to the pattern of eating described in the guidelines is provided on the label.

To conclude, GSR 664 has given ‘what’ part of Health claims but need to wait till detailed rules formation to know ‘how’ part of Health claims. There are many questions on claims which includes Claim substantiations, Efficacy data, Nutritional trial ( clinical trials?) & Claim protocol etc which are not clear today. We can expect in FSSAI rule making all above questions will be answered properly and will have very standard system on making Nutrition & Health claims like USFDA and FOSHU. Thus, developing regulations with long-term dietary improvements across populations, as their underlying goal will maximize this potential of nutrition labels and health claims.



## **Multi-micronutrient Approach in Food Fortification**

**By Priyadarshini Muley-Lotankar, Program Manager, DSM Nutritional Products India**

**“Good Nutrition” – It’s everybody’s business and business for everybody**

In spite of the phenomenal increase in food production and all the possible revolutions (green, white and yellow) in place India has not been able to rank itself in a better position when it comes to under nutrition (47%) especially with the prevalence of hidden hunger (deficiency of micronutrients) so rampant. Time has come to understand and redefine the difference between food security and nutrition security. The failure in developing an ideal post harvest technology has still left us hungry among abundance. The reduction in the soil fertility and processing losses has taken its toll on the nutritional quality of the foods. Every nutritionist has a Christmas wish to ask the consumer to obtain his nutrition from the naturally occurring vitamins and minerals but practically it is not possible for reasons of affordability, accessibility, acceptability and availability.

India’s health report card published in the (National Family Health Survey) NFHS-III and the (National Nutritional Monitoring Bureau) NNMB survey is not very encouraging and brings us to a point to rethink on our strategies to improve health and reduce hidden hunger. It’s almost a situation of nutrition emergency and needs to be tackled by food fortification - food base approach and further tag on dietary diversification. The health situation is not only grim in the lower socio economic strata but also in the middle class and the upper middle class too.

The changes in our food choices - high in macronutrients and devoid of micronutrients with a hectic lifestyle to add has brought the middle class and the upper middle class too in the category of population suffering from hidden hunger. Though the micronutrients (vitamins and minerals) are required by our body in small amounts

they play a very vital role in the human body. The multi-micronutrient deficit is leading the Indian population in the vicious cycle of intergenerational transmission of non-communicable disease like non-insulin dependent diabetes, coronary heart diseases and hypertension. Sadly if the baby's life starts with low birth weight it finds its natural entry in the non-communicable diseases. Food fortification is a technological boon to us by which we can enrich the food, food product and nourish the nation in a very systematic and affordable manner.

**Health report card of Indian children:** One sixth of the global population residing in India, one third of about two billion people suffering from vitamin and micronutrient deficit are in India. Micronutrient malnutrition has been a persistent problem in India, and as the recent data suggest, some forms of micronutrient malnutrition are reaching their peak in the present century. The intake of micronutrients in daily diet is far from satisfactory and largely less than 50% RDA is consumed by over 70% of Indian population.

According to the UNICEF's state of the World's Children Report 2008-Every year 4 mio children die within 28 days after birth, a mio of them are born in India. 9.7 mio children worldwide per year die before reaching the age of 5; 2.1 mio of them live in India. 19 mio children weigh less than 2.5 kg at birth; nearly half of them around 8.3 mio are Indian children.. Worldwide 156 mio children are underweight; 55 mio of them reside in India. Even in the least developed country 35% of the children are malnourished but in India the rate is 46 %.

Vitamin A, iron and zinc deficiency when combined constitute the second largest risk factor in the global burden of diseases; 330,000 child deaths are precipitated every year in India due to vitamin A deficiency; 22,000 people, mainly pregnant women, die every year in India from severe anemia; 6.6 million children are born mentally impaired every year in India due to iodine deficiency; intellectual capacity is reduced by 15 per cent across India due to iodine deficiency; and 200,000 babies are born every year with neural tube defects in India due to folic acid deficiency (1).

The loss due to micronutrient deficiency costs India 1 percent of its GDP (1). This amounts to a loss of Rs. 27,720 crore per annum in terms of productivity, illness, increased health care costs and death. Every day, more than 6,000 children below the age of five die in India. More than half of these deaths are caused by malnutrition-mainly the lack of Vitamin A, iron, iodine, zinc and folic acid. About 57% of preschoolers and their mothers have subclinical Vitamin A deficiency. Anemia prevalence among children under five years is 69% and among women it is over 55% in a recently concluded national study (1). With the scientific reality of anemia being a late result of iron deficiency, these data reflect an almost universal iron deficiency in Indian population (3).

We are aware that in the majority of cases the main cause of micronutrient malnutrition is poor dietary intake itself, both in terms of the total quantities of food consumed and the contribution made by micro-nutrient rich foods to the diet. In developing country like India where micronutrient deficiencies predominantly exist a multi-micronutrient approach should be promoted in food fortification rather than a single nutrient approach. Even to handle iron deficiency anemia a multi-micronutrient approach should be promoted with the fact in mind that deficiencies never occur in isolation and are in combination or concurrent. Correction of one may simply mean another emerges as the limiting factor to good nutrition.



The studies done on reproductive women and in infants have shown contradictory effects of multi-micronutrient supplementation. The interplay of both biological and nutrient-nutrient interactions may be responsible for these results. Latest studies have also shown negative effect of iron supplementation in malaria-endemic areas suggest that research is needed to develop and test adequate end economic procedures for large scale iron status determination in the field and reminds us there can be negative consequences of intervention programs. Most import aspect of any fortification intervention is to do the risk profiling of the population. The observations should be carefully estimated and repeatedly updated.

While micronutrients are needed only in minuscule amounts for supporting health and growth, the consequences of their absence are severe. Micronutrient deficiencies increase risk of premature deaths and contribute to a range of disease and disabilities producing a huge burden of human suffering and enormous economic losses. Cutting corners on quality may not result in noticeable problems in the short term – and may even save some marginal expenses. However, lack of a quality focus undermines the potential effectiveness of food fortification programs – and creates some very real risks for consumers and businesses. Effective fortification is affordable, ineffective fortification is expensive. An effective program will deliver micronutrients to populations in need in the most effective and affordable way, maximizing nutrition protection and health impact

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## **FOOD, GLORIOUS FOOD**

**By M.C.Badami, Consultant, Mumbai**

### **The way health claims about food are regulated is changing**

A high intake of Omega-3s has been linked with reduced rates of depression, cardiovascular diseases and homicide. In pregnant women consumption of these wonder molecules has been associated with the uplift of IQ in their offspring. The food industry has responded to this bonanza of evidence by putting omega-3s into everything from baby milk to drinks to margarine in the hope of increasing sales while bringing health benefits to consumers.

Not all omega-3s are created equal. The good ones (long chain fatty acids) come from fish. The far less beneficial ones (short chain fatty acids) come from plant sources such as Flax & Soya as well as from green leafy vegetables.

The problem of dubious nutrition and health claims for foodstuffs is now being addressed on both sides of the Atlantic. America's Food & Drug Administration (FDA) said on October 20th that it would overhaul the regulation of such claims on food labels and issue new standards early next year. In the European Union, meanwhile a legislation process that began in 2006 is grinding toward its conclusion.

The European legislation in question is intended to create a framework for assessing nutrition & health claims. A nutrition claim is one when a product says that it contains calcium or vitamins, say or is "high in fiber". A health claim relates to the alleged consequences of a nutritional claim, such as that the calcium in it "promotes strong bones"

The European Commission asked member states to gather information from across the union so that the range of nutrition & health claims were easy to handle, as they are based on well established science. But the health claims were such a big issue that they were passed to a review panel of the European Food Safety Authority (EFSA) for evaluation before being included in the legislation.

On October 1<sup>st</sup>, the EFSA announced its decision on 523 of a total of 4000 claims. About two thirds of its' decision were negative.

Headlines have also been made by the rejection of 180 claims for so-called probiotic ingredients, which are live microorganisms, such as bacteria that are beneficial to health. In fact, only ten such claims were rejected outright. The other 170 could not be assessed because the panel had insufficient information to characterize the strains of bacteria used.

### **Alpha & Omega**

There is a row over how the European legislation is being applied to Omega-3s. It is not everyday that an international consortium of concerned lipid scientists gets upset, but just such a group, rallied by Jack Winkler of the nutrition policy unit at London Metropolitan University, is on the warpath. The group says that the regulation on Omega-3s that has been adopted so far has no foundation in science, will legalise the deception of consumers and will make public health worse. The problem, in the group's view is that companies are now allowed to claim that a product is rich in omega-3s irrespective of whether these are long chain or short chain molecules.

Albert Flynn, the chairman of the EFSA panel, says this point will be resolved when a claim derived from its omega-3 content, as only those products containing long chain omega-3s are likely to be able to provide any evidence to support such claims. The confederation of Food and Drink Industries, seems to agree with the lipid biologists. It says that the labeling of the omega-3s should be clear about which type is contained in a product. Where this is not already the case among its members, it said it would address the matter.

The lipid biologists complain that a product can now claim to be high in long chain omega-3s yet be of questionable value because it also contains high levels of omega-6 fatty acids. Omega-6s are unsaturated fats found in, for example, in maize and sunflower oils, large quantities of which are used by consumers in western countries.

Another issue is that manufacturers are keen to advertise the health benefits of their products while keeping quiet about the disbenefits. The FDA is expected to address this in its review and thus put an end to cereals being advertised as full of whole-grains, while simultaneously being full of sugar. In Europe the legislation specifies that not all foods may be permitted to carry health claims and the intention is that foods of poor nutritional quality would not be eligible. However, Dr.Flynn says the criteria for determining is controversial and have not yet been agreed.

Yet another problem the lipid biologists have is with the amount of long chain omega-3s that the EFSA has recommended it is desirable to consume. This figure of 250 mg a day, in the opinion of Dr.Winkler's group, is very low. This group says that the dose suggested by averaging the 15 studies on the matter that have been conducted over past two decades is 566 mg a day.

As the ingredients of food become ever more characterized and understood, and their links to human health established, the EFSA has a difficult problem approving a scientifically rigorous approach to the health related claims without assuming the weighty bureaucracy of a pharmaceuticals regulator. Ironically, it is precisely because long chain omega-3s offer such large health benefits that scientists feel that they are obliged to stand up & challenge the authority, for this is a decision that could affect the health of a generation.

Research published in Nature recently reveals more evidence explaining how fish oil works. It turns out that the body converts it into a chemical called Resolvin D2. This reduces the inflammation associated with many diseases, including strokes and arthritis, without suppressing the immune system. Such knowledge helps blur the distinction between nutrient and drug. Unfortunately, for bureaucrats, that blurring makes regulation harder.

#### **Note to Self:**

The best ways to get enough long chain omega-3s oils are either to eat lots of oily fish or take supplements everyday containing 500 mg of Eicosapentanoic acid (EPA) or Docosahexanoic acid (DHA) though some studies have suggested 1100 mg/day. Products that contain short-chain omega-3s such as alpha-linoleic acid from plant oils like Flax-seed oil have not been linked with the strong health benefits shown by fish oils.

Having got enough long-chain omega-3s oils, it is important to reduce consumption of omega-6 oils—those found in Maize, Sunflower, Olive and most other seed oils. The best dietary ratio of omega-6 to omega-3 is reckoned to be less than 4:1. The message is then to eat less fat and get more from fish.

**(Condensed from 'The Economist' Nov.2009)**



# Food & Nutrition News

## Ireland Establishes Food for Health Ireland (FHI)

In a move that recognizes the strategic importance of the dairy industry to the Irish economy, the Irish government, working through Enterprise Ireland, has encouraged and funded the creation of Food for Health Ireland (FHI), a ground-breaking partnership of leading academic and government research organizations and the country's major dairy processing companies. Based on the foundation of a world-class scientific research program, FHI aims to identify bioactive ingredients that can be derived from milk, ensure that any components found satisfy real consumer needs and accelerate their commercialization.

“Although FHI has an Irish focus, we have a distinctly global outlook,” comments Jens Bleiel, FHI's CEO. “We are keen to liaise with organizations from around the world that have similar objectives. Awareness of the value of milk-derived ingredients has grown significantly over recent years. Our ‘back to basics’ approach, molecular analysis and screening of the many different components that are present in milk, what we call ‘Intelligent Milk Mining’, is designed to identify those components in a systematic way that offer the highest potential to address some of the world's most pressing health issues. These include early infant development, obesity, immunity\infection and heart health.”

With its head offices based in Cork, Ireland, FHI brings together the scientific and commercial expertise of Ireland's leading research institutions and dairy processing companies: University College Cork, University College Dublin, University of Limerick, Teagasc's Moorepark Food Research Centre, Carbery, Dairygold, Glanbia and the Kerry Group. FHI has two main research platforms: a mining platform, where milk is deconstructed and screened to generate a pipeline of milk components; these are then funneled into a health platform that tests these components for bioactivity. Additional programs relating to process scale-up, formulation of food with the bioactives, human intervention, consumer and regulatory affairs and training/outreach are also in place to help ensure successful commercialization.

“The expertise of the participants and the close relationships that have been developed mean that FHI represents a unique alliance of industry and academia,” continues Bleiel. “The dairy industry is ideally positioned to meet the food industry's demand for healthy, tasty, scientifically proven and affordable products from a natural source. By inputting our understanding of consumer behavior and needs at an early stage, we aim to ensure that detailed research and clinical trials are initiated only on those components for which there is a real demand.”

## Nutrition Horizon 05 Oct 2009

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## Essential Nutrient Iodine to Be Added to Bread in Australia

The essential nutrient iodine will be added to bread, through the addition of iodised salt, in Australia from 9 October 2009 to help address the re-emergence of iodine deficiency across most of the population. Dr Paul Brent, Chief Scientist for Food Standards Australia New Zealand (FSANZ), said this initiative will address this important public health issue.

‘Iodine is essential for the healthy function of the thyroid gland to help it produce hormones that regulate metabolism, including the regulation of body temperature. Most people need only a small amount a day but we need iodine regularly because we cannot store large amounts in the body ,’ Dr Brent said. ‘Iodine is particularly important for the normal development of a baby's brain and nervous system, especially during pregnancy and in

the first 2-3 years of life . Not having enough iodine during pregnancy and early childhood can cause developmental delay and lead to reductions in mental performance. This damage prior to 2-3 years of age is irreversible.

‘Iodine can be found in many foods, but much of the Australian and New Zealand food supply is low in iodine as our ancient soils lack this important nutrient. In the past some of our iodine came from iodised table salt but now many of us are correctly following healthy eating recommendations not to add salt at the table or when cooking. This has contributed to widespread iodine deficiency throughout the population. The mandatory iodine fortification regulation requires the replacement of the existing salt in bread with iodised salt. This is preferable to people adding extra iodised salt to their food. The only exception is organic bread which is not required to contain iodine because of the rules about organic food.

‘We chose to add iodised salt to bread as it is a commonly eaten food. However, we recognise that some people may not eat bread. Other sources of iodine in the diet, in addition to the fortified bread, include seafood, fish, dairy products, and eggs. If you are concerned about getting enough iodine in your diet, or if you are planning a pregnancy or breastfeeding, we suggest you consult your doctor or health professional for advice as you may need iodine supplements.

‘In developing mandatory iodine fortification, FSANZ set up an Iodine Scientific Advisory Group which included experts in a variety of fields. Mandatory iodine fortification is expected to reduce inadequate iodine intakes from 43% to less than 5% in the Australian population. The increase in iodine intake is about the same as the iodine content of a large glass of milk and safe even for iodine sensitive individuals,’ Dr Brent concluded.

The iodine mandatory fortification standard was developed by FSANZ at the request of the Australia and New Zealand Food Regulation Ministerial Council that consists of health and food ministers from the Australian Federal, State and Territory Governments and the New Zealand Government. The fortification of bread with the B group vitamin folic acid to reduce the risk of spina bifida became mandatory in Australia on 13 September 2009. Mandatory fortification of bread with iodised salt came into force in New Zealand on 27 September 2009.

**Nutrition Horizon 09 Oct 2009**

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## **Pre/Probiotic Market to Expand as Consumers Better Understand Link Between Digestive Health & Immunity**

Once relegated primarily to the domain of yogurt and high-fiber fare, the market for food and beverage products fortified with probiotics and prebiotics has taken off as digestive health emerged as one of the hottest topics in the food and beverage arena. According to “Boosting Immunity Through Digestion: The Relation Among Probiotics, Prebiotics and Digestive Enzymes” by market research publisher Packaged Facts, the global retail market for probiotic/prebiotic foods and beverages was \$15 billion in 2008, a 13% increase over 2007. Driving future growth are two factors: 1) innovations in probiotic and prebiotic formulations that allow an increasing number of products to be enhanced with said ingredients, and 2) increasing consumer awareness of the relation between digestive health and immunity and with overall wellness.

Packaged Facts projects the market will exceed \$22 billion in 2013, representing a compound annual growth rate (CAGR) of 12% between 2004 and 2013. “Consumers in developed countries are becoming increasingly aware of their ability to treat health concerns and problems with diet. Combined with knowledge that allows

consumers to address these concerns without conventional medical involvement is driving interest in nutrition as it relates to digestive health and digestive health as it relates to overall wellness,” says Tatjana Meerman, publisher of Packaged Facts.

Aside from yogurt, leading categories of food and beverage introductions containing probiotics and/or prebiotics through the first six months of 2009 included milk, functional drinks, breakfast cereals, cheese and cookies. And though the probiotics category is more established in the digestive health market, the prebiotics sector is growing faster with a presence in an array of products that range from pudding to frozen chicken dinners.

Working hand-in-hand with probiotics, digestive enzymes can be used in the manufacture of foods to address specific health concerns such as acid reflux, gas and heartburn. They are the new frontier when it comes to digestive health, and evidence suggests beverages, candy, dried goods, fruit juices, margarine, snack bars and other common foods would serve as good delivery vehicles for active digestive enzymes.

### **Nutraceuticals World Breaking News 2009-10-02**

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### **UK: It is too late to shut the door on GM foods**

Ten years ago, when the genetic modification of food was first offered to the British public, it responded with a resounding no, and politicians and the food industry said GM would not be foisted on reluctant consumers. As far as most people are concerned, that is still the situation today; they think their diet remains GM-free. A report from the Royal Society to be published on Wednesday will spark an intense new phase in the GM debate, however, during which the public may be surprised to discover how far GM has already penetrated our food supply.

The report's contents are strictly embargoed but it's a safe bet that its authors, many of whom work in biotechnology research, will argue that we need to put aside any suspicions and embrace GM if there is to be any chance of feeding the world's growing population in the face of climate change and growing scarcity of water and land.

The government has been waiting for the report since a cabinet meeting at the turn of the year. Back then the prime minister, all secretaries of state with responsibilities that touch upon food, the chief scientist Sir John Beddington, and the then chair of the Food Standards Agency Dame Deirdre Hutton, got together to discuss what they saw as an urgent dilemma: they believed that the official line on GM had become untenable, according to a well-placed source.

Of the 2.6m tonnes of soya imported into the UK last year, nearly two-thirds was genetically modified. The vast majority of this came from the Americas and was used as animal feed, although most people remain unaware of it. GM soya oil is also now used in quantity in the catering industry, according to government reports.

"We are living a lie", is how one senior food industry executive put it in discussions with Whitehall officials. "My wake up and worry moments are about high levels of GM being found in the UK feed chain where it's claimed to be GM-free," a leading retail figure has told the Guardian.

Shipping in GM soya is perfectly legal, so long as the varieties imported are ones that have been authorised by the EU. The variety of GM soya that currently dominates global production, Monsanto's Roundup Ready, has been authorised by the EU. However, some newer varieties have not yet been approved here. Importing even

trace levels of unauthorised varieties is illegal, and industry has been pushing hard to have the approval process speeded up. Any GM food sold directly to the consumer also has to be labelled.

## **Bites Safe Food October 16th, 2009**



## **Moms' Eating Habits Have Most Influence on What Children Eat**

Healthy eating is on the minds of many moms, but it's their eating habits and nutritional knowledge that have the most bearing on what their children eat, according to a new report from The NPD Group, a market researcher. Recent NPD research finds that in households with kids, when the adult female has a good Healthy Eating Index (HEI), a measure of diet quality similar to federal dietary guidance, the majority of kids in the household are eating just as well.

Although moms' healthy eating behaviors impact how their children eat, moms' attitudes about nutritional eating often do not necessarily align with actual behavior, according to the NPD report, entitled, "What's on the Minds of Moms and How Are They Coping." Three-fourths of new moms and 65% of experienced moms say they actively seek out foods with nutrition benefits. However, the study finds that moms are less likely to actually eat foods with nutritional benefits.

Moms also give themselves high marks when it comes to nutritional and healthy eating knowledge. The NPD study reports that 67% of moms feel they are extremely or very knowledgeable about nutrition and eating, and 81% of moms feel they are the primary source for nutritional education for their children. Yet when moms are asked to assess their children's level of nutritional knowledge, few ranked their children extremely or very knowledgeable; a little more than half of children 6- to 17-years old were considered somewhat knowledgeable. One-fourth of moms considered their children 6- to 12-years old not very knowledgeable.

"Theirs and their family's healthy eating is clearly top-of-mind with moms, and their follow-through on this attitude has a direct impact on their family's eating behavior," said Dori Hickey, product development manager and author of the report. "It's clear by our findings that moms could use help in expanding their and their children's nutritional knowledge, and the food and beverage industry can help in this regard."

## **Nutraceuticals World Breaking News 2009-10-22**



# Regulatory News

## Shoppers Still Unaware Where Salt is Hidden – FSA

Over three quarters of people (77%) are not aware that bread and breakfast cereals are among the top salt-contributing foods in our diet, reveals a new UK Food Standards Agency survey. About 75% of the salt we eat comes from everyday foods. Foods that contribute the most salt to our diets are not necessarily the saltiest, but the ones we eat most often. The top three salt-contributing foods are bread, followed by meat products, then breakfast cereals.

When asked to pick the top three from a list of the 10 foods that contribute the most salt to our diets, only 13% of people mentioned bread, and 12% said breakfast cereals. The Food Standards Agency's new advertising campaign on TV, radio and in print, is urging people to pay closer attention to the salt levels in the foods they are buying. The campaign features foods that make significant contributions to the salt intakes of UK adults and children. The salt levels of these foods vary across brands, so a simple way to reduce the amount of salt we eat is to choose the ones that are lower in salt.

The survey also found that many people (40%) believe that supermarket value ranges are higher in salt than other ranges. However, this isn't necessarily the case and sometimes the cheapest are among the lowest in salt. In addition, supermarket own-label versions of some foods, including bread, are often lower in salt than the branded versions. The only way of knowing for sure is by checking the labels.

Other highlights from the survey include:

- When asked to pick the top three contributors, from a list of the 10 foods that contribute the most salt to our diets, the foods most commonly mentioned were crisps and snacks (73%), ready meals (65%) and meat products (36%).
- About 85% of people tend to stick to the same brands of foods they buy regularly, such as bread, ketchup and breakfast cereals. However, a quarter of these people (26%) said they would change from their usual brand if they knew that a lower salt option was available.
- 37% of respondents were either 'very concerned' or 'quite concerned' about the amount of salt they eat.

In the UK, we are eating 8.6g salt a day on average, which, although much higher than the recommended 6g, is almost a gram less than we were eating before the Agency launched its salt reduction programme in 2004. With the majority of the salt we eat coming from everyday foods, people need to be more aware of where the salt in their diet comes from, and that it's possible to reduce this amount simply by checking labels for salt, comparing products and choosing the ones with less salt.

Rosemary Hignett, Head of Nutrition at the Food Standards Agency, said: 'Salt intakes are coming down, but if we are to get closer to meeting our target of reducing intakes to 6g a day, people need to become more aware of the foods which contribute to intakes, as it isn't just the obvious things we need to watch out for as far as salt is concerned. 'We're not suggesting people stop eating or even cut down on bread or breakfast cereals, because they are important part of a healthy diet. But we are saying take a look at the labels to find one that is lower in salt. This could be a supermarket own-label product, and maybe one from the 'value' range. If so, any cost saving is an added bonus.

'We've been working closely with food manufacturers and retailers to encourage them to use less salt in their foods, and are pleased with the progress that is being made. But there is still a wide variation of salt levels in different brands, which is why it is so important that people check the labels.'



## **Fruit Juices Contain More vitamin C than their Labels Indicate**

A team of pharmacists from the University of Santiago de Compostela (USC) has established that the levels of vitamin C in many fruit juices and soft drinks are far higher than those indicated on their labels by the manufacturers. This finding has been possible owing to a new technique developed by the researchers to determine the content of vitamin C in these kinds of drinks.

Ascorbic acid or vitamin C is a natural antioxidant in fruits and vegetables, but the European Commission permits its use as an additive in juices, jams, dairy products and other foods. The involvement of this substance in the immune response and other biochemical processes such as the formation of collagen and the absorption of iron is well-known. However, high levels of ascorbic acid can cause diarrhoea and gastrointestinal problems, as a result of which scientists are attempting to determine the content of vitamin C in foods with greater and greater accuracy.

Now, a group of researchers from the Faculty of Pharmacy of the USC has developed a new chromatographic technique (these are used to separate and identify chemical elements) aimed at accurately measuring the ascorbic acid in fruit juices and soft drinks. By applying this method, they have found that the amounts of vitamin C stipulated on the labels of many drinks are not real. In a sample of 17 fruit juices, soft drinks and isotonic drinks, only two correspond to what is indicated on the bottle.

Ana Rodríguez Bernaldo de Quirós is a member of the team which has developed the new technique, whose details have recently been published in the Food Chemistry magazine. "The other drinks contain much higher levels than those specified by the manufacturer because, as has already been indicated in a previous study, the label probably only shows the amount of added ascorbic acid, without taking into account the fruit's natural vitamin C content", she explained to SINC.

Bernaldo de Quirós highlights the greater resolution and sensitivity of the method, by means of which it is possible to detect up to 0.01 milligrams of vitamin C per litre, "thanks to the use of new column chromatography, based on spherical particles of ultra pure silica 3 microns in size".

"Another advantage of the method is its simplicity and speed, as the total time taken to carry out the analyses is no more than six minutes", the researcher remarked.

With the new technique, the valuation of the ascorbic acid in the drinks has revealed some curious data. Of the 17 samples analyzed, the one with the highest vitamin C content was an apple juice (840 mg/l), more than the orange juices (352-739 mg/l). The results for the pineapple and grape juices were 702 mg/l and between 30.2 and 261 mg/l for the soft drinks (orange, lemon and apple).

The researchers also evaluated how the vitamin C content of the orange juices and tea drinks varies while they are on the shelves in the temperature conditions specified by the manufacturer. After six days, the former barely

lose 8% of their ascorbic acid while, in the tea drinks, this substance falls by 54% at 4°C and practically disappears at room temperature.

## **Nutrition Horizon 06 Oct 2009**

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### **Australia Bans Some Energy Drinks**

More than three-quarters of energy drinks on sale in New South Wales may contain illegal levels of caffeine, and some of the drinks exceed the legal limit by more than 30 percent, according to a preliminary NSW Food Authority investigation. The NSW Food Authority completed initial testing of 85 energy drinks, 70 of which are subject to current food laws, which limit the caffeine levels.

Five of the eight products that exceed the standard by more than 30 percent have been taken out of distribution in NSW, including "Fuel Cell" and "Cintron" products. Suppliers of the remaining three drinks that exceed the standard by more than 30 percent will be asked to justify their product being on the market. If they are unable to do so, further action may be taken including seizure of the product or they may be prosecuted. Manufacturers of the other 46 products that exceed the standard by less than 30 percent will be required to inform the NSW Food Authority of the corrective action they intend to take to ensure their product meets legal requirements.

"Our investigations so far have revealed that 77 percent of energy drinks on sale exceed the legal caffeine content limit," Primary Industries Minister Ian Macdonald said. "I am concerned by the anecdotal reports of young people being adversely affected by these products, even though the available science suggests that they do not pose a serious health risk. The government is taking immediate action on this matter."

## **Food Product Design Oct 6, 09**

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### **FDA issues Draft Guidance on ingredients declared as 'evaporated cane juice'**

The Food and Drug Administration (FDA) has issued a draft guidance entitled "Draft Guidance for Industry: Ingredients Declared as Evaporated Cane Juice." While comments on guidance documents may be submitted at any time, to ensure agency consideration in development of a final guidance, comments must be submitted to FDA by Dec. 7, 2009.

The draft guidance states that the practice in recent years of declaring certain sweeteners as "evaporated cane juice" on food labels is unlawful because the name is false and misleading. The term "evaporated cane juice" is not an appropriate common or usual name for any type of sweetener, including dried cane syrup. In addition, the guidance states that sweeteners derived from sugar cane syrup are not "juice" and should not be included in the percentage juice declaration on beverage labels.

The FDA notes that sugar cane is used to produce a variety of food products. Some sugar cane products have common or usual names defined by regulation. For example, "sugar" is the common or usual name for sucrose derived from sugar cane or sugar beets. "Cane syrup" (or, if in solid or dried form, "dried cane syrup") is the common or usual name for sugar cane syrup that complies with the relevant FDA standard of identity regulation. However, it is not appropriate to use the term "juice" in the name of any sweetener derived from sugar cane.

The term “evaporated cane juice” falsely suggests that the ingredient is a juice, although it does not meet the definition of “juice” in FDA regulations. FDA’s juice HACCP (Hazard Analysis and Critical Control Points) regulation defines “juice” as “the aqueous liquid expressed or extracted from one or more fruits or vegetables, purees of the edible portions of one or more fruits or vegetables, or any concentrates of such liquid or puree.” According to the FDA, although sugar cane is a member of the vegetable kingdom, it is used as a source of sugar and not as a vegetable. Therefore, juices and extracts of the sugar cane are neither “vegetable juice” nor “fruit juice,” and cannot be “juices.” Other plant juices that are neither “vegetable juice” nor “fruit juice” include maple syrup and sorghum syrup.

Because sweeteners derived from sugar cane are not “juice,” they may not be listed in the ingredients declaration using a name that suggests they are juices, such as “evaporated cane juice.” In addition, they may not be included when calculating the percent juice declaration for a beverage that is represented as containing juice. The ingredient likely should be declared instead as “dried cane syrup.”

## IFT Newsletter Oct 14, 09



### **FDA seeks better nutrition labelling: Pursuit of standards comes as foodmakers set up own systems**

The federal government is wading into the supermarket aisle, making its first effort to provide better nutritional information on food products since it developed the black-and-white Nutrition Facts label 15 years ago. Margaret A. Hamburg, the commissioner of the Food and Drug Administration, said Tuesday that shoppers are bombarded by slogans ("Heart Healthy," "Good for You," "A Better Choice") on products and that the government needs to set standards and knock down spurious claims.

"As a mother of two who frequently finds herself racing down the grocery aisle hoping to grab foods that are healthy for my family, I would welcome the day that I can look on the front of packages and see nutrition information I can trust and use," she said. "As the commissioner of FDA, I see it as my responsibility, and the responsibility of this administration, to help make that happen."

Hamburg said consumers often do not have time to scan the Nutrition Facts label, which is required on the back of products. And in recent years, foodmakers have increasingly been putting their own symbols and labels on the front of packages, providing nutrition cheat sheets that are not always accurate, she said. The FDA grew particularly concerned in late August, when a consortium of major foodmakers rolled out their Smart Choices Program. The system, "designed to help shoppers easily identify smarter food and beverage choices," raised eyebrows when the green check-mark label appeared on foods that are not typically noted for their nutritional value.

"There are products that have gotten the check marks that are almost 50 percent sugar," said Hamburg, who sent a letter to industry Tuesday outlining the FDA's intentions. "Products with symbols stating they provide a high percentage of daily vegetable requirements and other nutrients but neglect to mention they represent 80 percent of your daily fat allowance. There are those with zero percent trans fats on the front [label] but don't indicate that they contain very high percentages of saturated fats."

Some retailers have created their own ranking systems. The result is a "completely chaotic system" in which "food companies have set up their own nutritional criteria for evaluating products and then apply it and then --

guess what? -- lots of their products qualify," said Marion Nestle, a professor of nutrition at New York University.

Industry labels can mislead shoppers, she said. "Consumers think 'I like the way this product tastes' and 'Oh, good, it's got Vitamin D in it. It's got antioxidants in it. It must be terrific for me. I don't need to give another thought to all the sugar it has.' It gives them an excuse to buy the product. And marketers know this."

Hamburg said one of the reasons the FDA wants to improve nutrition labeling is because the nation is fighting an obesity epidemic. "Two out of every three adults is overweight or obese," she said. "We know people want information that will help them quickly and easily make healthy choices."

She said that the FDA intends to crack down on food companies that are making assertions on the front of their products that suggest they are healthier than they really are and that the agency will create a uniform labeling system by the end of next year. Within three months, the FDA will propose new standards that manufacturers must meet to make a nutritional claim on the front of a product, agency officials said.

Mike Hughes, chairman of the Smart Choices Program, said in a statement that the labeling system was based on federal dietary guidelines and sound nutrition. "We believe in the science behind the Smart Choices Program," he wrote. "We also look forward to the opportunity to participate in FDA's initiatives on front-of-package labeling. And we note that the Smart Choices Program complies with all U.S. laws and regulations."

**From: Washington Post By Lyndsey Layton, October 21, 2009**

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## **UK's food regulator endorses folic-acid fortification**

The UK looks set to follow the lead of the US, Canada and Australia by introducing mandatory fortification of bread or flour with folic acid in a bid to reduce incidences of birth defects such as spina bifida. The UK's industry regulator, the Food Standards Agency (FSA), wrote to the British Government on 9 October recommending mandatory fortification after a panel of experts said evidence linking folic acid with bowel cancer was not strong enough to prevent introducing such a measure. The UK Department of Health will now consider the recommendation before deciding whether to give fortification the green light. The FSA's decision represents, in effect, a double u-turn. In June 2007, the agency announced it would be backing mandatory fortification having been advised to do so by the UK's Scientific Advisory Committee on Nutrition (SACN) in December, 2006.

However, the FSA subsequently changed its mind when two new studies linking excessive intakes of folic acid with bowel cancer came to light, and it referred the matter back to the SACN for review. But the FSA said last week that the SACN had ruled the new evidence "does not provide a substantial basis to change its previous recommendation for the introduction of mandatory fortification with folic acid. However, SACN's recommendation has been amended to clarify the advice on supplement use for particular population groups."

This new advice from the SACN states: "There are no specific recommendations on folic acid supplementation for other population groups (ie children, women above childbearing age, and men) except on medical advice. For people who choose to take supplements, as a precaution, it would be advisable for those aged over 50 years not to consume supplements containing folic acid above the recommended nutrient intake for folate of 200µg/day since the risk of developing colorectal adenomas/colorectal cancer increases after this age.

"For people with a previous history of colorectal adenomas, folic-acid supplementation should also not exceed 200µg/day without medical guidance. This recommendation is relevant to current consumption patterns and those which would prevail if mandatory fortification were introduced."

In a letter to the government's chief medical officer, Sir Liam Donaldson, FSA chief executive Tim Smith wrote: "Since SACN's advice regarding mandatory fortification has not significantly changed, the FSA's advice of June 2007 remains unchanged. I shall be writing to the FSA Board to inform them of the outcome of SACN's review of the recommendation for mandatory fortification with folic acid, and to advise them that no further discussion by the Board on this matter is required at this time."

Fortification of bread and flour with folic acid is a hot topic globally. In Ireland, regulators decided in March 2009 not to introduce mandatory fortification, principally because it believed women already had enough folic acid in their diets through the voluntary fortification of food and drink. Mandatory fortification was due to begin in New Zealand in September, but in July the government agreed to delay any such move until 2012 while more research was conducted into its potential impact on human health. New Zealand had been due to introduce mandatory fortification alongside Australia, with which it shares a food regulator in the form of Food Standards Australia and New Zealand. But Australia has now introduced the measure independently. The US, Canada and Chile, meanwhile, have all had mandatory fortification of flour for ten years.

### **Functional Ingredients by Richard Clarke October 26, 2009**

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### **Article 13 health claims: the EFSA evaluations**

The results of the European Food Safety Authority's (EFSA) first series of article 13 health claims evaluations have been received with mixed feelings across the sector. Of the 94 EFSA scientific assessments summarising 523 health claims:

Less than one-third received a positive evaluation from EFSA, and these are limited to claims relating to basic functions of vitamins/minerals, dietary fibres and fatty acids for the maintenance of cholesterol levels, lactase contributing to the break down of lactose, and sugar-free chewing gum for maintenance of dental health.

More than two-thirds of the article 13 claims data analysed received a negative EFSA evaluation.

This included data on a wide range of probiotics, herbal extracts, other ingredients and some vitamins and minerals, many of which have an important role in the present marketing of food supplements in the EU. For example, all joint maintenance claims for glucosamine, chondroitin sulphate, MSM, hyaluronic acid, EPA/DHA/DPA, shark cartilage and green lipped mussel extract were rejected. And not one of the probiotic or herbal extract claims submissions analysed in these first series was deemed sufficient by EFSA to provide a positive evaluation.

This raises the question of why there have been so many negative evaluations on similar categories of substances or types of claims all in one go. Indications from EFSA are that its NDA Panel chose this first series based on ease of decision: those for which a positive evaluation was easier to adopt (e.g. vitamins and minerals), and those for which EFSA realised lacked the sufficient characterisation (or other) data for it to perform a detailed claims assessment.

Almost half of the negative evaluations owed to a lack of characterising information on the substance on which the claim is based, rather than the evidence presented to support the claim itself. In many of these cases EFSA concluded that "a cause effect relationship has not been established," even though EFSA was only unable to characterise the substance, and therefore did not go further to evaluate the evidence.

Some Member States have questioned why EFSA had not requested further information from them or the European Commission at an earlier stage to clarify key elements of submissions, as it had done for other claims. The significant negative outcome of this first series of assessments should not, however, be seen as fully indicative for the next series expected in February 2010. This second batch will include further evaluations on vitamins, minerals, certain plant substances and probiotics. However, it demonstrates clearly that few claims are now expected to make it through the process unscathed.

## **Functional Ingredients by Stefanie Geiser October 26, 2009**

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### **Nutrition Labelling & Label Claims**

The existing consumer research suggests that consumers like FOP labeling, finding it to be a time-saver. Consumers do not fully trust it, however, and find the plethora of FOP labels confusing. Most importantly, research suggests that FOP labels can give consumers an overrated view of a food's healthiness, and make it less likely that consumers will read the complete Nutrition Facts information on the back.

The FDA intends to conduct further research in the coming months that will compare several FOP types, with the goal of determining which best help consumers make informed choices.

The FDA is developing a proposed regulation that would define the nutritional criteria that would have to be met by manufacturers making broad FOP or shelf-label claims concerning the nutritional quality of a food, whether the claim is made in text or in symbols. The FDA's intent is to provide standardized, science-based criteria on which FOP nutrition labeling must be based.

The nutrition community will be able to weigh in more formally through an Institute of Medicine study of FOP labeling directed by the 2009 Labor/HHS appropriations bill.

The nutrition labeling statute gives FDA authority to ensure that consumers get nutrition information and that it be provided in an effective way. The agency focused initially on the Nutrition Facts label, which has proven to be successful. Now, however, with manufacturers desiring to use the front of the package for nutrition information, the logical next step may be to ensure that such labeling is done in the best way possible. That could mean setting criteria governing how voluntary FOP systems are done or establishing a single, uniform, government-mandated symbol. The planned consumer research will be critical to making that decision so that the desire for a simpler format on the front of pack is consistent with how consumers make judgments about the nutritional or healthful attributes of products, and is not misleading for consumers, but assures they make informed choices.

First, the agency is working closely with USDA officials, as it will be important that USDA's oversight of labeling of meat and poultry be consistent with FDA decisions on the rest of the food supply. The agency is also assisting the IOM in the development of its study, in consultation also with USDA and the Centers for Disease Control and Prevention. And FDA and USDA will be working with retailers, private design experts, food manufacturers, nutrition experts, and health officials from other countries, to ensure that a comprehensive research agenda is conceived and carried out.

Consumers can currently use the Nutrition Facts label to make judgments for themselves about the food products. The % Daily Value is a useful tool for comparing various products whether looking at nutrients to limit such as sodium or saturated fat or nutrients to get enough of such as fiber or vitamins and minerals. Keep in mind that 5% of the Daily Value (DV) is low and 20% of the DV is high. The Nutrition Facts label provides information based on a single serving of the product and the serving size is indicated in Nutrition Facts.

## **Functional Ingredients October 2009**

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### **Stearidonic acid omega-3 soybean oil receives GRAS status**

Monsanto Company and Solae, LLC have reached an important regulatory milestone that advances the development of foods containing the world's first stearidonic acid (SDA) omega-3 soybean oil product. The U.S. Food and Drug Administration (FDA) issued a Generally Recognized as Safe (GRAS) notice confirming that the SDA omega-3 soybean oil could be used under the intended conditions of use. The confirmation of GRAS status enables food companies to develop and test foods containing the new omega-3 oil, which are important steps towards consumers being able to benefit from this omega-3 product in a variety of food products with an acceptable taste experience.

“Consumers are increasingly looking for ways to improve health through better nutrition,” said Al Gallegos, Marketing and Sales Director for omega-3, Solae. “One approach food companies are taking is incorporating omega-3s into food and beverage products. The development of this new, plant-based omega-3 soybean oil can play an important role in helping food companies achieve this objective.”

Monsanto developed the soybean product that produces oil containing SDA, an omega-3 fatty acid. Earlier this year, the company completed U.S. regulatory submissions to the U.S. Department of Agriculture (USDA) and the FDA for the product that produces a sustainable, land-based source of SDA omega-3 soybean oil. Upon completion of the regulatory process, food companies will be able to purchase this new food oil and deliver its benefits to consumers.

Currently, the only significant source of long-chain, omega-3 fatty acids are fish and algal oils, which are expensive and difficult to incorporate into food products. The new omega-3 soybean oil would enable food manufacturers to enhance the nutritional benefits of a broad range of food products because of its preferred sensory qualities and functional performance in familiar food and beverage applications. Monsanto and Solae are actively seeking food application partnerships with companies interested in delivering food products to consumers with this improved oil.

## **IFT Newsletter Oct 28, 09**

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### **Senomyx receives GRAS status for sucrose enhancer**

Senomyx Inc., a company focused on using proprietary technologies to discover and develop novel flavor ingredients for the food, beverage, and ingredient supply industries, announced Oct. 23 that its sucrose enhancer, S6973, has been determined to be Generally Recognized As Safe (GRAS) under the provisions of the Federal Food, Drug, and Cosmetic Act, administered by the U.S. Food and Drug Administration (FDA). Sucrose (common table sugar) is widely used in many food and beverage products. Taste tests have

demonstrated that S6973, which was discovered and developed by Senomyx, enables the reduction of up to 50% of the sucrose present in product prototypes while maintaining the sweet taste of natural sugar. This GRAS determination allows S6973 to be incorporated into specified products in the U.S. and in numerous other countries.

“Receiving GRAS determination for our S6973 sucrose enhancer is one of Senomyx’s most important achievements and represents a significant commercial opportunity for the company,” said Kent Snyder, CEO of Senomyx. “By enabling a meaningful reduction in sugar content without altering the sweet taste, S6973 could allow manufacturers to offer appealing products with lower calories and improved nutritional profiles.”

The GRAS designation allows usage of S6973 in baked goods, cereals, gum, condiments and relishes, confectioneries and frostings, frozen dairy offerings, fruit ices, gelatins and puddings, hard and soft candy, jams and jellies, milk products, and sauces. Numerous individual product types are included in each of these broad categories. In addition, the company is evaluating the opportunity to pursue a GRAS designation for S6973 in additional product categories in the future.

**IFT Newsletter Oct 28, 09**



## **Research in Health & Nutrition**

### **Research Shows Fish Oil May Protect Against Stroke from Ruptured Carotid Artery Plaques**

Research led by Hernan A. Bazan, MD, Assistant Professor of Surgery, Section of Vascular Surgery, at LSU Health Sciences Center New Orleans School of Medicine, has found that unstable carotid artery plaques - those in danger of rupturing and leading to a stroke - contain more inflammation and significantly less omega-3 fatty acids than asymptomatic plaques. This suggests that increasing the levels of omega-3 fatty acids in carotid artery plaques could either prevent strokes or improve the safety of treatment. This may be accomplished by increasing dietary intake of foods rich in omega-3 fatty acids. The study is an Article in Press in the journal, *Vascular Pharmacology*, currently online.

Our bodies produce only a small amount of omega-3 fatty acids, so most of what we need has to come from eating omega-3 fatty acid-rich foods like fish (salmon, tuna, trout, herring, etc.) or from supplements. Omega-3 fatty acids have been shown to protect against cardiovascular disease, particularly heart attack and sudden cardiac death. Dr. Bazan's team wanted to determine what the association might be with plaques in the carotid arteries, a common cause of strokes. Vulnerable plaques which can rupture in the carotid arteries may lead to transient ischemic attacks (TIAs), strokes, or vision loss by affecting the artery to the retina. The mechanisms leading to plaque rupture are still not fully understood but inflammation within the plaque is beginning to be recognized as an important cause of plaque rupture.

Dr. Bazan, an LSUHSC vascular/endovascular surgeon, in collaboration with researchers at Yale University and others at LSUHSC, analyzed plaques from 41 patients who underwent carotid endarterectomy (CEA) to remove plaque buildup in their arteries. Twenty-four patients were asymptomatic and 17 were symptomatic, having had neurological symptoms. All of the fats in the plaques were assessed with mass spectrometry, in collaboration with Dr. Song Hong at LSUHSC. The team was measuring the amounts of docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) - the components of long-chain omega-3 polyunsaturated fatty acids. The plaques of asymptomatic patients contained more than twice as much DHA as the symptomatic patients, and about one

and a half times as much EPA. Significantly less inflammation was also seen in the carotid atherosclerotic plaques from asymptomatic patients.

"In the future, a study to address whether supplementation with dietary omega-3 polyunsaturated fatty acids prevents carotid-related events in patients with moderate or high-grade carotid stenosis will help answer whether this is a formidable therapeutic target for the prevention of stroke," says Dr. Bazan.

According to the Centers for Disease Control and Prevention, stroke is the third leading cause of death in the United States, as well as a leading cause of serious long-term disability. About 795,000 strokes occur in the US each year and about 610,000 of these are first, or new, strokes. About 185,000 occur in people who have already had a stroke. Nearly 25% of strokes occur in people under the age of 65. Of all ischemic strokes occurring, carotid artery atherosclerotic plaques account for over a third of them. It has been noted for several decades that the southeastern United States has the highest stroke mortality in the country. It is not completely clear what factors might contribute to the higher incidence and mortality from stroke in this region.

The research was supported by the National Institutes of Health-National Center for Research Resources, an LSUHSC Cardiovascular Center Grant ("Mentoring in Cardiovascular Biology"), and the American Vascular Association.

### **Nutrition Horizon 05 Oct 2009**

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### **Higher Folates Can Reduced Hearing Loss Risk in Men**

Increased intakes of antioxidant vitamins have no bearing on whether or not a man will develop hearing loss, but higher folate intake can decrease his risk by 20 percent, according to new research presented at the 2009 American Academy of Otolaryngology-Head and Neck Surgery Foundation (AAO-HNSF) Annual Meeting & OTO EXPO, in San Diego, CA.

The study, which identified 3,559 cases of men with hearing loss, found that there was no beneficial association with increased intakes of antioxidant vitamins such as C, E, and beta carotene. However, the authors found that men over the age of 60 who have a high intake of foods and supplement high in folates have a 20 percent decrease in risk of developing hearing loss.

Hearing loss is the most common sensory disorder in the United States, affecting more than 36 million people. High folate foods include leafy vegetables such as spinach, asparagus, turnip greens, lettuces, dried or fresh beans and peas, fortified cereal products, sunflower seeds and certain other fruits and vegetables are rich sources of folate. Baker's yeast, liver and liver products also contain high amounts of folate.

The authors believe this is the largest study to delve prospectively into the relation between dietary intake and hearing loss. They used the most recent figures from the Health Professionals Follow-up Study cohort from years 1986 to 2004, a group consisting of 51,529 male health professionals. They were first enrolled into this study in 1986 and filled out detailed health and diet questionnaires every other year. The authors believe their findings can allow greater education, prevention, and screening efforts.

### **Nutrition Horizon 07 Oct 2009**

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## How Soy Lower Diabetes Risk

Nutrition scientists led by Young-Cheul Kim at the University of Massachusetts Amherst have identified the molecular pathway that allows foods rich in soy bioactive compounds called isoflavones to lower diabetes and heart disease risk. Eating soy foods has been shown to lower cholesterol, decrease blood glucose levels and improve glucose tolerance in people with diabetes. According to Kim, the study shows that “what we eat can have tremendous impact on health outcomes by interacting with certain genes. Recent research also suggests that diet can even change the copy number of a certain gene, leading to biological changes.”

Soy is the most common source of isoflavones in food. In experiments with mouse cells, Kim, a molecular nutrition researcher who studies how fat cells develop in the body, and colleagues, focused on daidzein, one of the two main isoflavones found in soy. Many epidemiological observations and human clinical studies have shown that adding soy to one’s diet is associated with lower diabetes risk and improved insulin sensitivity, as well as lower cardiovascular disease risk, Kim notes. However, until now the direct target tissue and molecular pathways by which soy exerts its anti-diabetic effects was not clearly understood.

Kim and colleagues at Southern Illinois University, with others at the universities of Tennessee and Florida, had earlier found that dietary isoflavones reduced the severity of diabetes in an animal model of the disease by increasing the activity of certain transcription regulators in the fat tissue. For the current study, they hypothesized that daidzein and its metabolite, equol, are part of this activation process.

They found that daidzein and equol enhanced adipocyte differentiation, or the formation of fat cells, through activation of a key transcription regulator, the same receptor that mediates the insulin-sensitizing effects of anti-diabetes drugs. Thus, daidzein and equol seem to work in a similar manner as anti-diabetic drugs currently in the market. Their findings are reported in a September online version of the *Journal of Nutritional Biochemistry*.

“Our results suggest that soy isoflavones exert anti-diabetic effects by targeting fat cell-specific transcription factors and the downstream signaling molecules that are important for glucose uptake and thus insulin sensitivity,” Kim notes. “The new findings help us to understand the cellular mechanisms.” That is, how these biologically active compounds in soy interact to regulate and initiate metabolic and biological functions. Results demonstrate that daidzein and equol enhance adipocyte differentiation by activating a specific receptor. The downstream responses include increased expression of three proteins, resulting in enhanced glucose uptake and insulin sensitivity.

“Although some details remain to be worked out, our data provide an additional molecular basis for the mechanism of insulin-sensitizing action by soy isoflavones,” says Kim. “These new findings help fill a critical gap between epidemiological observations and clinical studies on the anti-diabetic benefits of dietary soy.”

Future studies will extend the work to primary cultures of human cells through collaboration with researchers at Pioneer Valley Life Science Institute and Baystate Medical Center in Springfield. If replicated, studies can move on to further work in whole body systems.

**Nutrition Horizon 08 Oct 2009**

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## Scientists Explain Cellular Effects of Vitamin A Overdose and Deficiency

If a little vitamin A is good, more must be better, right? Wrong! New research published online in the FASEB Journal (<http://www.fasebj.org>) shows that vitamin A plays a crucial role in energy production within cells, explaining why too much or too little has a complex negative effect on our bodies. This is particularly important as combinations of foods, drinks, creams, and nutritional supplements containing added vitamin A make an overdose more possible than ever before.

"Our work illuminates the value and potential harm of vitamin A use in cosmetic creams and nutritional supplements," said Ulrich Hammerling, co-author of the study, from the Sloan-Kettering Institute for Cancer Research in New York. "Although vitamin A deficiency is not very common in our society, over-use of this vitamin could cause significant dysregulation of energy production impacting cell growth and cell death."

Although the importance of vitamin A to human nutrition and fetal development is well-known, it has been unclear why vitamin A deficiencies and overdoses cause such widespread and profound harm to our organs, until now. The discovery by Hammerling and colleagues explains why these effects occur, while also providing insight into vitamin A's anti-cancer effects. The scientists used cultures from both human and mice cells containing specific genetic modifications of the chemical pathways involved in mitochondrial energy production. The cells were then grown with and without vitamin A, and scientists examined the impact on the various steps of energy production. Results showed that retinol, the key component of vitamin A, is essential for the metabolic fitness of mitochondria and acts as a nutritional sensor for the creation of energy in cells. When there is too much or too little vitamin A, mitochondria do not function properly, wreaking havoc on our organs.

"Beauty might be only skin deep, but vitamin A isn't. It goes to the nucleus of our cells and can affect our health for better or worse," said Gerald Weissmann, M.D., Editor-in-Chief of the FASEB Journal. "Using too many products enriched with vitamin A could lead to negative, even fatal, consequences."

**Nutrition Horizon 09 Oct 2009**

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## Healthy Neighborhoods May be Associated with Lower Diabetes Risk

Individuals living in neighborhoods conducive to physical activity and providing access to healthy foods may have a lower risk of developing type 2 diabetes in a five-year period, according to a report in the October 12 issue of Archives of Internal Medicine, one of the JAMA/Archives journals. "The worldwide epidemic of type 2 diabetes mellitus is largely driven by the combined rise in obesity, intake of energy-dense or nutrient-poor foods and physical inactivity," the authors write as background information in the article. Interventions to reduce risk on the individual level—including surgery, medication and behavior change—have had mixed results. Large-scale behavior change may be necessary to reverse the diabetes epidemic, but such a change is difficult to achieve and may be unsustainable if the surrounding environment is not supportive.

Amy H. Auchincloss, Ph.D., M.P.H., of Drexel University School of Public Health, Philadelphia, and colleagues studied 2,285 adults age 45 to 84 who were initially examined between 2000 and 2002. Study participants were from three of the sites in the Multi-Ethnic Study of Atherosclerosis (MESA) for which neighborhood level data were obtained: Baltimore; Forsyth County, N.C.; and New York City/Bronx. Blood glucose levels were obtained from study participants at baseline and at three follow-up examinations, during which other individual characteristics also were assessed (including diet, body mass index [BMI] and physical activity levels).

Measures of neighborhood resources were obtained from a separate assessment, the Community Survey, in which other residents of the same neighborhoods (defined as the area within a 20-minute walk or a mile from their homes) rated the suitability of their environment for physical activity and access to healthy foods. For instance, they were asked if it was pleasant or easy to walk in their neighborhood, and whether a large, high-quality selection of fruits, vegetables and other low-fat foods was available. Scores for physical activity and healthy foods were calculated for each neighborhood on scales of one to five (with five representing the healthiest areas).

Over a median (midpoint) of five years of follow-up, 233 of the 2,285 participants (10.2 percent) developed diabetes. Average neighborhood scores were 3.68 for physical activity and 3.36 for healthy foods. "Better neighborhood resources, determined by a combined score for physical activity and healthy foods, were associated with a 38 percent lower incidence of type 2 diabetes," the authors write. This was similar to the reduction in risk observed among individuals whose BMI was five points lower. "The association remained statistically significant after further adjustment for individual dietary factors, physical activity level and body mass index."

The increasing prevalence of type 2 diabetes in the past 30 years makes it urgent to identify environmental features that may mitigate risk, the authors conclude. "Current efforts to foster health-promoting environments include designing and modifying physical environments, such as zoning residential neighborhoods to require safe sidewalks, creating parks and attractive public green spaces and improving public transportation so that residents rely less on their cars; supporting fresh-food farmers' markets in low-income, urban neighborhoods; and assisting stores in those neighborhoods in improving their selection of healthy foods," they write.

"There is unlikely to be a panacea for the obesity epidemic and rising epidemic of type 2 diabetes. However, altering our environments so that healthier behaviors and lifestyles can be easily chosen may be one of the key steps in arresting and reversing these epidemics."

**Nutrition Horizon 13 Oct 2009**

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## **UT Southwestern Study Shows How Substance in Grapes May Squeeze Out Diabetes**

A naturally produced molecule called resveratrol, found in the skin of red grapes, has been shown to lower insulin levels in mice when injected directly into the brain, even when the animals ate a high-fat diet. The findings from a new UT Southwestern Medical Center study suggest that when acting directly on certain proteins in the brain, resveratrol may offer some protection against diabetes. Prior research has shown that the compound exerts anti-diabetic actions when given orally to animals with type 2 diabetes (non-insulin dependent diabetes mellitus), but it has been unclear which tissues in the body mediated these effects.

"Our study shows that the brain plays an important role in mediating resveratrol's anti-diabetic actions, and it does so independent of changes in food intake and body weight," said Dr. Roberto Coppari, assistant professor of internal medicine at UT Southwestern and senior author of the study appearing online and in the December issue of *Endocrinology*.

"These animals were overrun with fat and many of their organs were inflamed. But when we delivered resveratrol in the brain, it alleviated inflammation in the brain," added Dr. Coppari.

Dr. Coppari emphasized that his study does not support the conclusion that consuming products made from red

grapes, such as red wine, could alleviate diabetes. "The main reason is that resveratrol does not cross the blood brain barrier efficiently," he said. "In order for the brain to accumulate the same dose of resveratrol delivered in our study, the amounts of red wine needed daily would surely cause deleterious effects, especially in the liver. Rather, our study suggests that resveratrol's analogs that selectively target the brain may help in the fight against diet-induced diabetes."

For the study, the researchers investigated what happens when resveratrol acts only in the brain. Specifically, they wanted to know whether resveratrol injected in the brain activated a group of proteins called sirtuins, which are found throughout the body and thought to underlie many of the beneficial effects of calorie restriction. Previous animal research has shown that when these proteins are activated by resveratrol, diabetes is improved. In addition, drugs activating sirtuins currently are being tested as anti-diabetic medications in human trials, Dr. Coppari said.

In one group of animals, researchers injected resveratrol directly into the brain; another group received a saline-based placebo. All the surgically treated animals consumed a high-fat diet before and after the surgery. Dr. Coppari said the insulin levels of the animals treated with the placebo solution rose increasingly higher post-surgery. "That's a normal outcome because insulin sensitivity decreases the longer you keep an animal on a high-fat diet."

Insulin levels in the mice given resveratrol, however, actually started to drop and were halfway to normal by the end of the five-week study period, even though the animals remained on a high-fat diet. In addition, the researchers found that resveratrol did indeed activate sirtuin proteins in the brain.

Dr. Coppari said the findings support his team's theory that the brain plays a vital role in mediating the beneficial effects of resveratrol and that manipulation of brain sirtuins also may have other beneficial outcomes. "By knowing that the central nervous system is involved, pharmaceutical companies can begin to focus on developing drugs that selectively target sirtuins in the brain," he said. The next step, Dr. Coppari said, is to determine precisely which neurons in the brain are mediating the effects of the resveratrol.

### **Nutrition Horizon 15 Oct 2009**

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### **Link Between Dietary Balance and Alzheimer's Disease**

Prof Gandy and colleagues compared the effect of four diets on brains in mice that are genetically altered to develop changes in their brain like Alzheimer's disease in people. Surprisingly, a combination of high protein, low carbohydrate, standard fat diet resulted in smaller brain sizes. However, as there were no normal control mice included in the study, it is difficult to interpret these results as the same might or might not happen in normal mice. A high fat diet seemed to change the amount of an intermediary compound in the process that leads to amyloid plaques.

'This study is very interesting but without a control group it is hard to tell if these changes would not have occurred anyway. Further investigation is now needed to better understand whether the way we balance our diet can increase or reduce our vulnerability to Alzheimer's disease. It is important to eat a diet rich in fruit, vegetables and fish. People who want to reduce their risk of dementia should also take regular exercise, refrain from smoking and get their blood pressure and cholesterol checked.'

### **Nutrition Horizon 23 Oct 2009**

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## Moderate Amounts of Protein per Meal Found Best for Building Muscle

For thousands of years, people have believed that eating large amounts of protein made it easier to build bigger, stronger muscles. Take Milo of Croton, the winner of five consecutive Olympic wrestling championships in the sixth century BC: If ancient writers are to be believed, he built his crushing strength in part by consuming 20 pounds of meat every day.

No modern athlete would go to such extremes, but Milo's legacy survives in the high-protein diets of bodybuilders and the meat-heavy training tables of today's college football teams. A recent study by University of Texas Medical Branch at Galveston metabolism researchers, however, provides evidence that strongly contradicts this ancient tradition. It also suggests practical ways to both improve normal American eating patterns and reduce muscle loss in the elderly. The study's results, obtained by measuring muscle synthesis rates in volunteers who consumed different amounts of lean beef, show that only about the first 30 grams (just over one ounce) of dietary protein consumed in a meal actually produce muscle.

"We knew from previous work that consuming 30 grams of protein — or the equivalent of approximately 4 ounces of chicken, fish, dairy, soy, or, in this case, lean beef — increased the rate of muscle protein synthesis by 50 percent in young and older adults," said associate professor Douglas Paddon-Jones, senior author of a paper on the study published in the September issue of the *Journal of the American Dietetic Association*. "We asked if 4 ounces of beef gives you a 50 percent increase, would 12 ounces, containing 90 grams of protein, give you a further increase?"

The UTMB researchers tested this possibility by feeding 17 young and 17 elderly volunteers identical 4- or 12-ounce portions of lean beef. Using blood samples and thigh muscle biopsies, they then determined the subjects' muscle protein synthesis rates following each of the meals. "In young and old adults, we saw that 12 ounces gave exactly the same increase in muscle protein synthesis as 4 ounces," Paddon-Jones says. "This suggests that at around 30 grams of protein per meal, maybe a little less, muscle protein synthesis hits an upper ceiling. I think this has a lot of application for how we design meals and make menu recommendations for both young and older adults."

The results of the study, Paddon-Jones points out, seem to show that a more effective pattern of protein consumption is likely to differ dramatically from most Americans' daily eating habits. "Usually, we eat very little protein at breakfast, eat a bit more at lunch and then consume a large amount at night. When was the last time you had just 4 ounces of anything during dinner at a restaurant?" Paddon-Jones said. "So we're not taking enough protein on board for efficient muscle-building during the day, and at night we're taking in more than we can use. Most of the excess is oxidized and could end up as glucose or fat."

A more efficient eating strategy for making muscle and controlling total caloric intake would be to shift some of extra protein consumed at dinner to lunch and breakfast.

"You don't have to eat massive amounts of protein to maximize muscle synthesis, you just have to be a little more clever with how you apportion it," Paddon-Jones said. "For breakfast consider including additional high quality proteins. Throw in an egg, a glass of milk, yogurt or add a handful of nuts to get to 30 grams of protein, do something similar to get to 30 for lunch, and then eat a smaller amount of protein for dinner. Do this, and over the course of the day you likely spend much more time synthesizing muscle protein."

**Nutrition Horizon 27 Oct 2009**



## Red Grape Skin Extract Can Treat Patient with Sickle Cell Disease

An extract in red grape skin may be a new treatment for sickle cell disease, Medical College of Georgia researchers say. The extract, resveratrol, a natural chemical typically found in red wine and various plants and fruits, has been found to induce production of fetal hemoglobin, which decreases the sickling of red blood cells and reduces the painful vascular episodes associated with the disease.

Most fetal hemoglobin production ceases after birth, but in patients where it remains the predominant form, it can result in fewer complications, says Davies Agyekum, a second-year Ph.D. student in the MCG School of Graduate Studies. In sickle cell disease, abnormal hemoglobin causes red blood cells to sickle. The abnormal shape impedes blood's passage through vessels and can cause excruciating pain and other complications because of the blood's oxygen deficiency.

Davies is working with Dr. Steffen E. Meiler, vice chair of research for the Department of Anesthesiology and Perioperative Medicine, on an eight-week animal study to determine if the combined anti-inflammatory and fetal hemoglobin-producing properties of resveratrol, a dietary polyphenol, can reduce the severity of sickle cell disease. Hydroxyurea, an anti-cancer agent and the only Food and Drug Administration-approved therapeutic drug for sickle cell disease, increases fetal hemoglobin. Davies says resveratrol-based therapy might be easier on patients.

The Ghana native recently received a three- to five-year \$15,000 scholarship from the Southern Regional Education Board State Doctoral Scholars Program, a program aimed at increasing the number of minority students who earn doctoral degrees and become college and university professors. He is attending the organization's annual Institute on Teaching and Mentoring in Arlington, Va., to learn success skills and prepare for a university-level teaching position. "My ultimate career goal is to be in position where I can inspire future generation through teaching and mentoring, so I am ecstatic about the opportunity this scholarship presents," Davies says.

### Nutrition Horizon 27 Oct 2009

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## Flaxseed May Lower Cholesterol

Researchers in China, who conducted a review of research studies, say a diet that includes flaxseed may help lower cholesterol levels. The review of 28 studies, which involved more than 1,500 people, found cholesterol reduction linked with eating whole flaxseed was stronger in women than men.

Study leader Dr. Xu Lin of the Chinese Academy of Sciences in Shanghai says one tablespoon daily of whole flaxseed or flaxseed oil is usually associated with reductions in total cholesterol and low-density lipoprotein, or LDL, the "bad" cholesterol -- particularly post-menopausal women, more than men, and in people with higher cholesterol concentrations at the outset. However, the whole flaxseed did not appear to significantly alter triglyceride levels or affect the amount of high-density lipoprotein, or HDL, the "good" cholesterol. Flaxseed is considered healthy for the heart because it contains high amounts of omega-3 fatty acids, fiber and alpha linolenic acid. The review was published in the American Journal of Clinical Nutrition.

### Soya Tech e-News October 19, 2009

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