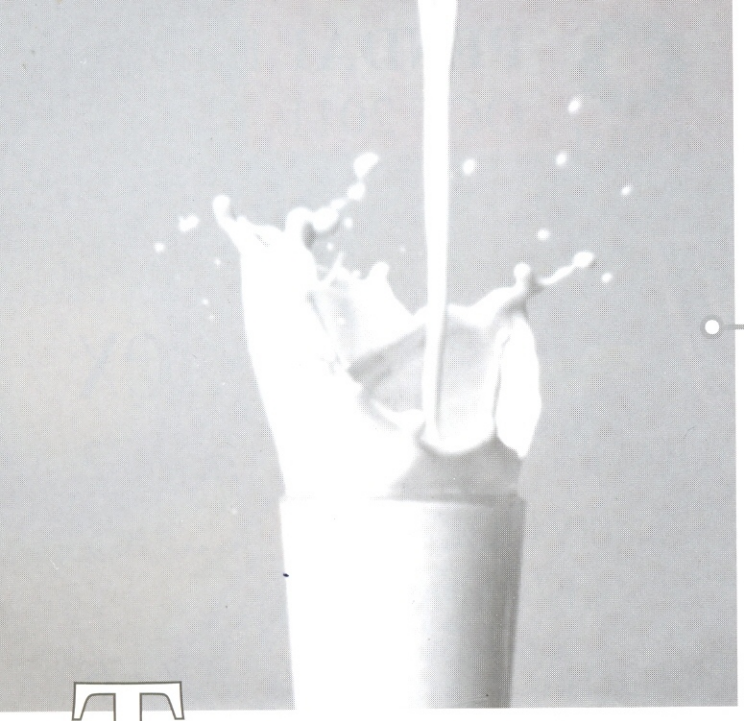

Editorial

There have been newspaper reports about milk adulteration in India. We have heard a lot about the milk adulteration with dangerous chemicals like melamine in China. It became even worse when such milk was used for preparing baby foods which was exported to countries including the US. It created a lot of adverse publicity for Chinese food industry and every country started issuing warnings about Chinese food products.

Chinese government started taking action not only against those involved and responsible for adulteration and took action to improve the safety system. They have installed these systems in the industry and already there seems to be an improvement and restoring of confidence in Chinese products globally.

We should learn from this. Right now it seems that except for giving a big sensational news item in media nothing much is being done about the problem. We are more interested in exact number whether 75% is adulterated or something else; whether it is in one state or the other. Our officers are happy to know that this is not happening in our state but somewhere else.

People are also happy telling others what are the adulterants being used and how much cheating is going on. There are some companies happy to tell the consumers that their product is difficult or impossible to adulterate. However, whether at central level or state, no efforts are being made to remove this malaise of adulteration.

There is no plan of action to curb it. None of the enforcing authorities are getting agitated about this problem. With this attitude the day may not be far when our goods are looked on suspiciously by other countries. We do not want our goods to be branded like Chinese food products.

We are looking not only to improve our exports but also we want in domestic markets more processed foods which are value added and which would last longer and avoid losses due to spoilage. If we do not worry too much about this warning sign of milk adulteration we may start having consumers losing faith in food products including pasteurised milk. They may start asking the milkman to bring his cow to the door and then have him milk the cow in front of them.

This used to happen about half a century ago even in Mumbai. We have driven the dairy barns out of the heart of the city to suburbs so it will be difficult to do so. Alternatively we may have to go to "tabela" in Jogeshwari or Goregaon and get fresh milk.

Let us hope that the government gets serious about this problem and starts action to not only monitor but also curb this problem. The adulteration may not happen in processing plant but once the milk is packed in bags these may be tampered.

We need to effectively police the distribution and also try to find out ways to make this pack pilfer-proof without making milk two or three times more expensive. We are not just trying to make milk safe for upper class but for masses.

Same attitude must be there when it comes to other products as well. Let us hope that we get better enforcement and so safer food products in future.

With season's greetings,

Prof. Jagadish S. Pai
Executive Director
executivedirector@pfndai.org

PFNDAI Bulletin October 2011

Regulatory Challenges: Accessing Markets:

Dr. J.I. Lewis, Chairman, Regulatory Affairs Committee, PFNDAI

The global market for foods under the self care health segment comprising food supplements and functional foods is placed at USD 117 billion, while the Indian market is pegged at about Rs. 44 billion - except that where global market growth is pegged at 7% the Indian market in the last 3 years is growing at 18% CAGR.

A major factor that will fuel growth is that for the first time under Section 22 of the Food Safety & Standards Act 2006, several food categories previously placed under Proprietary Foods will now be defined for regulatory purposes. Food regulations will now recognize novel foods, GM foods, organic foods, foods for special dietary uses, food supplements, functional foods and nutraceuticals. Many food products currently burrowed under the ubiquitous regulatory provision of proprietary foods will be identified under the emerging categories defined in the Act.

The key concern that grips industry is lack of an enabling mechanism to distinguish products classified under these food categories. A draft placed for consultation falls short of the defining features of products under each category and in fact brings in further ambiguity. When stakeholder consultations are not in consensus about these distinguishing features that separate one group from another a situation arises where field officers commence enforcement from interpretation rather that direction. Regulatory drafts are increasingly being composed of precariously arranging downloaded texts without an understanding of the regulatory precepts underpinning them. A stark example of this is borne out from a comparison of the abbreviated texts of foods for special dietary uses shown in Fig. 1. Infant foods are conspicuous by their absence in the draft regulations put out and continue to be placed under dairy foods and analogues.

It may be conceded that in certain cases regulatory boundaries for determining whether a food belongs to one category or another is not so forthright nevertheless the fuzziness existing between these categories needs to be narrowed down to enable compliance prior to placing foods on the market. More importantly product developers need to determine regulatory gates they need to cross, markets in which the product is placed and what claims they may legitimately make. Industry is uncomfortable with legal uncertainty as hence a closer scrutiny of the various regulatory categories emerging under section 22 of the Act needs to be done. Some cases in point may help directions in revising the consultation note.

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Food Supplements and Functional Foods:

Plant sterols and stanol esters, were approved under the novel foods/food ingredients regulation in the EU for their cholesterol lowering properties. This substance is approved for addition to various food categories such as dietary supplements or functional food, (Figure 1). What emerges from this example is the regulatory context that connects three legal entities viz a novel food ingredient, a dietary supplement and functional foods. Novel foods or ingredients are not necessarily a new food category but may be a regulatory gate for safety evaluation of foods not hitherto used to a significant degree (as foods) in the country.

Although most regulatory agencies do not have a legal provision for functional foods or nutraceuticals, consensus is emerging among the scientific community on what the term means if

a regulatory option were to arise. On the other hand FSSA, 2006 recognizes such a category and how it intends to regulate needs understanding.

Fig. 1: Foods for Special Dietary Uses

FOODS FOR SPECIAL DIETARY USES
Codex 146 – 1985
- **Specially processed or formulated**
- **Particular dietary requirements (due to)**
- **Physical or physiological condition ...**
- **Differ significantly ordinary foods**
- **Includes infant foods**

FOODS FOR PARTICULAR NUTRITIONAL USES
EU 2009/39
- **Specially processed or formulated**
- **Digestive or metabolism disturbed or**
- **Person in a special physiological condition**
- **Differ significantly ordinary foodstuffs ...**
- **Includes infant foods**

SPECIAL PURPOSE FOODS
FSANZ 2.9
- **Specially processed or formulated**
- **Dietary support physical /physiological needs**
- **Differ significantly ordinary foods**
- **Includes infant foods**

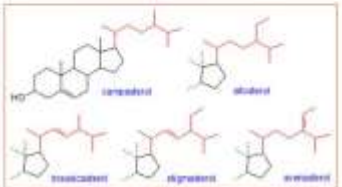
FOODS FOR SPECIAL DIETARY USES
FSSAI draft
- **Comprises 3 types of foods**
- **Foods for Special Nutritional Purposes**
- **Foods for Medical Purposes (Infants/others)**
- **Person in a special physiological condition ...**
- **Does not include infant foods**

To take one of the many definitions available, the Bureau of Nutritional Sciences, of the Food Directorate of Health Canada, has proposed the following definitions:

> A *nutraceutica*l is a product isolated or purified from foods that is generally sold in medicinal forms not usually associated with food. A nutraceutical is demonstrated to have a physiological benefit or provide protection against chronic disease. Instead of being perplexed at what this term (a marketing concoction) actually means regulators should dismiss it as incapable of fitting into the foods regulatory agenda until consensus emerges.
>
> A *functional food* is similar in appearance to, or may be a conventional food, is consumed as part of a usual diet, and is demonstrated to have physiological benefits and/or reduce the risk of chronic disease beyond basic nutritional functions.

Fig. 2: Food Categories

2. Dietary Supplements



1. Phytosterols Approved as 'novel food' (EU)

3. Functional Foods

Dietary or food supplements on the other hand are clearly distinguishable from conventional foods from their distinctive 'discreet dosage' formats of pills, capsules, and powders etc which resemble the 'therapeutic dosage' feature of medicines.

The example illustrated (Figure 2) amply demonstrates the difference arising from putting an ingredient such as phytosterols into a pill or capsule format to the same being incorporated in margarine or yoghurt. The latter is eaten as a food and a part of the usual diet with a physiological benefit (of lowering cholesterol) far beyond the nutritional functions being provided through these foods. Product developers must therefore determine the food form or format containing the health ingredient - one of the factors of distinction. Marketing decisions will also enter selection of such formats as marketing channels may be different.

Food Supplements and Medicines:

Many countries have separate regulatory provisions (Act) for food supplements where only food claims may be made from herbal medicinal products which are considered therapeutic in nature. However while these are fine in print, several issues arise where the same substance is used in both categories, e.g. vitamins or minerals. While the Act places RDA as an upper regulatory limit for vitamins and minerals used in supplements the scientific basis of which is unclear debate is currently on at the EU on levels of use and a consensus yet to emerge. Clearly no vitamin or mineral is expected to assume 'medicinal' properties if it were used at say 10% above the RDA. This is a dilemma the product developer will face where dosage may lead to cross border transgressions and enforcement hassles, particularly where RDA directions are not available. The distinctions between food supplements and herbal medicines begin to blur even further where multiple botanical ingredients are used, many of which are found in herbal medicines, a duality that brings with it legal interpretations. Since the probability of category blur exist, a decision making mechanism needs to be evolved based on several factors e.g. dosage, presentation, scientific literature among other factors.

Way Forward:

Some countries provide a positive list of ingredients that may be used in food supplements e.g. list of vitamin and mineral substances that are permitted for use. The more daunting task is providing a positive list of safe botanicals.

More importantly the regulation needs to provide details what information companies need to provide to get their ingredients on the positive list. The process of acceptance or rejection should be transparent and collaborative for a quick approval system.

In a discussion note published by the Food Safety & Standards Authority of India, the Authority most appreciatively recognized, that 'regulated industry rightfully expects enablement to meet regulatory compliance. While preparing new regulations, the Authority will take into account all compliance pre-requisites and publish the same before the enforcement date which may include among other things, analytical procedures, tolerances, guidance notes in a simple Frequently Asked Questions style explaining what current products will or will not fall under the proposed rule/regulation". This is a welcome step towards enabling compliance which is the true objective of a modern regulatory regime.

While the Act puts an obligation on the Food Business Operator to place safe foods on the market – the regulation needs to provide guidance on how safety of these products will be assessed.

Measuring Encapsulation Efficacy

Many ingredients from flavours to probiotics and other bioactive ingredients have been encapsulated. Numerous techniques and materials have been used to encapsulate them and many methods have been used to evaluate efficacy in delivering them in human body. About two dozen microencapsulation techniques are used for encapsulation of above including leavening agents and nutrients.

Encapsulation began with flavours which are oils and for mixing them in bakery mix they could be made into powder form by encapsulation. Powdered flavours used in products ranging from snack chips to dry mixes are mostly spray dried with starches or other carriers.

Encapsulation Techniques & Challenges

Many techniques are used including coacervation-phase separation, fluidised bed and pan coating, interfacial poly-condensation, in-situ polymerisation, micelles, liposomes, cyclodextrins, extrusion, atomisation (spinning disk, spray drying, spray chilling/congealing), precipitation, nanoencapsulation, micro-emulsion techniques, and sol-gel encapsulation (condensation of siloxanes to form a silica shell or particle).

Spray drying accounts for 90% of encapsulated flavours. Spray chilling (prilling) involves atomisation of molten wax or fat into a chilled chamber. Fluidised-bed coating is used for solid particles that are suspended in air and coating solution is sprayed on. Coextrusion is the encapsulation of liquid droplets using nozzle system forming annular jet that breaks into core-shell droplets. The outer droplet dries, gels or cools forming a shell. Coacervation, interfacial polymerisation, sol-gel and in-situ polymerisation all form shell around oil droplets dispersed in aqueous solution. Micelles, liposomes and microemulstions (nano-encapsulation) encapsulate active ingredients by stabilising oil-in-water emulsions using surfactants and stabilisers. Molecular complex is formed with hydrophobic active ingredients when cyclodextrins are used.
Using proper shell material and particle size, capsules with different properties like release mechanism like mechanical rupture, thermal release, permeation, shell dissolution, biodegradation etc. could be achieved. Shells are commonly made of Synthetic polymers, gums, waxes, hydrocolloids and resins.

Capsule protects contents (payload) against oxygen and water. Encapsulated fish oil used in baked goods, dry mixes and beverages protects it from oxidation with no change in flavour and odour. In some cases water-soluble ingredients are put into an aqueous system. Here it is not possible to prevent water from diffusing in or out. Capsule may also protect against heat which accelerates diffusion of oxygen and water. Pasteurisation or retorting often destroys the capsule.

Capsule must retain clarity of beverages which can be achieved by choosing proper particle size and refractive index. Encapsulation is also useful to separate reactive substances, mask taste and improve bioavailability. There is no single encapsulation that works in all applications.

Measuring Efficacy

There are two types of tests for efficacy of encapsulation namely the efficacy of process itself and the performance of encapsulated product. Testing will depend on type and purpose of encapsulation.

Efficacy of flavour encapsulation would involve consumer taste panel and product analysis before and after production and after storage. For fish oils both consumer taste or odour tests and product analysis may be done but true test would measure absorption of omega-3 into the body after consumption. Thus all tests are important. Similarly encapsulated vitamin can be tested for consumer taste, product analysis and absorption into body.

Different methods are used for measuring efficacy. How much ingredient a capsule contains can be estimated by extraction and analysis by HPLC, GC-MS and thermal analysis. There are also standard physical and chemical techniques.

Morphology of capsules is also measured – whether they are core-shell particles or solid particles with even distribution of active ingredient, particle size and size distribution, shell thickness, and content (payload) distribution. Optical microscopy, electron, scanning and transmission electron microscopy provide various morphological parameters including particle size, distribution and composition, shell or matrix porosity, uniformity, and crystallinity. Laser diffraction and dynamic light scattering are other methods used.

X-ray diffraction measures porosity while zeta-potential analysers measure surface charge that affects the stability of suspended particle. Thermo-gravimetric method analyses thermal stability whereas differential scanning calorimetry measures phase changes.

US Pharmacopeia methods use HPLC, GC-MS and spectroscopy for controlled release test to establish release profile.

Structural Design Approach

Encapsulation has become more important for nutraceuticals and functional foods. Bioactive ingredients chemically degrade due to exposure to light, water and oxygen and their breakdown is accelerated when they are incorporated into foods. Hence, there is a need for encapsulation particularly for beverages and water-based foods.

Some compounds are not very bioavailable. Encapsulation can increase their bioavailability and make them more effective. However, the capsule structure must be stable till it is consumed without changing its performance in the body.

The matrix consisting of protein, sugars and/or other carbohydrates can protect against oxygen and other breakdown causes in encapsulated powders but once they are incorporated into aqueous product they lose the encapsulation matrix. Water and light then lead to breakdown. Thus traditional powder technology of encapsulation has many challenges in wet systems.

Many bioactive lipophilic compounds like omega-3 fatty acids, conjugated linoleic acid, vitamins, antioxidants, carotenoids, phyterols etc. have health benefits and can be used in functional foods designed to combat coronary heart disease, diabetes, hypertension, and cancer. Incorporating bioactive lipophilic ingredients into aqueous foods is a challenge and designing a system must consider chemical stability, physical state, solvent solubility, rheology, optical properties, and bioavailability. Thus different delivery systems are usually needed for each type of bioactive lipid component.

An edible delivery system for lipophilic bioactive component needs to have a high loading capacity and retention efficiency. It must protect the bioactive from degradation. It must not adversely affect product's appearance, flavour, texture or shelf life. It must be resistant to

environmental stresses on the product during production, storage and transport. Finally it must be released and absorbed in the GI tract at proper place.

Many delivery systems are available for encapsulation of lipophilic bioactives in simple solutions, powders, colloids, biopolymer matrices, conventional emulsions, micro-emulsions, nano-emulsions, multiple emulsions and multilayer emulsions. Some are difficult and very expensive. If they are sophisticated they break down in common production process and require more sophisticated production system.

Researchers have been working on using layer-by-layer electrostatic deposition to prepare nano-laminated coatings. They first prepare oil-in-water emulsion in presence of ionised water-soluble emulsifier. They then add oppositely charged biopolymer so that it adsorbs on the droplets, forming a two-layer coating. More biopolymer layers are formed by successive addition of charged materials of opposite charges.

Performance of emulsion-based delivery system depends on composition of particles, type of structure, size, shape and thickness of components used, ratio of solid to liquid within the structure, physical integrity of the particle, permeability and the digestibility of particle. Ability of structured particle to deliver the payload at desired site in GI tract depends on susceptibility to digestive enzymes. Since proteins are mainly digested in stomach and small intestine, fibres and resistant starches in colon and starches in mouth, stomach and small intestine, the relative positioning of these components within the structured particle is important for controlling digestibility.

Effect of multilayered nano-emulsion coatings have been studied on digestibility of encapsulated lipids and they are found suitable for controlling bioavailability of lipids within GI tract. Key in efficacy of encapsulation and delivery are the size and charge of particles. Also important are loading capacity, stability and optical property. Product having very small particles tends to be transparent while those with larger particles opaque.

Active substance should be protected by capsule which itself should be stable but should not overprotect it that it is not absorbed by the body.

Condensed from article by Neil H. Mermelstein in Food Technology January 2011

Fresh Opportunities in Functional Foods

Success in today's functional foods market can be found at the crossroads of price, taste, awareness and efficacy.

As an aging society struggles with vexing health issues like obesity, stress and lack of energy, more consumers have turned to functional foods and beverages to satisfy their thirst for wellness.

Awareness of functional foods is at an all-time high, as 90% of U.S. consumers agree that certain foods have benefits that extend beyond general nutrition, according to the International Foods Information Council (IFIC). Innovation in terms of new product formats, enhanced portability, efficacy improvements and expansion into new categories like confectionery and snacks has helped generate broad interest in the market overall.

Additionally, compared to five years ago, 65% of consumers are more concerned today about the foods they eat, and 56% of consumers are paying a "high" or "very high" amount of attention to food and drink ingredients, according to Datamonitor.

Offering insights on market drivers, Tom Vierhile, director of Datamonitor's Product Launch Analytics, recently gave a presentation titled "Capitalizing on Evolving Consumer, Product and Ingredient Trends in Functional Foods and Drinks" at the SupplySide East tradeshow in Secaucus, NJ.

Citing the 2010 IFIC "Food & Health Survey," Mr. Vierhile noted that 73% of consumers said they are looking to add more whole grains to their diet; 72% are looking to add more fiber; and 49% said they are looking to include more protein.

"Taste and price is where the rubber meets the road," said Mr. Vierhile, acknowledging the lingering effect of the economic downturn and the higher price point for many functional foods. At the same time, however, more people are recognizing the value of prevention, compared to disease treatment, and the need to reign in healthcare costs.

Driving continued purchases in the functional arena, health and good taste are no longer mutually exclusive, Mr. Vierhile added. "Consumers are warming up to the fact that health and indulgence can go together."

He also noted products aimed at improving general well-being are more popular than those designed to combat specific conditions. Meanwhile, consumers are more interested in hearing what they should be eating, as opposed to what they shouldn't. "That's likely because the research regarding what not to eat changes so often," he offered.

In terms of marketing language, "rich in" has proved more successful than "added," which has connotations of processed additives. "Consumers are skeptical about the health credentials of processed foods," he noted.

Major Markets

Reviewing key functional areas, Mr. Vierhile said cardiovascular health has broad appeal, especially in the U.S., where the purchase rate for heart healthy products is significantly higher than the global average. According to Datamonitor figures, U.S. sales of heart healthy foods and beverages reached $5.6 billion in 2009 and are expected to reach nearly $7.1 billion by 2014,

representing a compound annual growth rate of 4.8%.

Omega 3s stand out in terms of heart health ingredients, but polyphenols and flavonoids are "rising stars," as both are found in many types of food, from tea and vegetables to chocolate. Additionally, the number of food and beverage products with resveratrol has tripled, Mr. Vierhile noted.

Representing the second largest functional product category, behind energy products, digestive and immune health products reached $9.7 billion in U.S. sales for 2009. Datamonitor predicts the market will grow 7.7% to $14.1 billion by 2014. "The increasing palatability of products containing probiotics and fiber is driving sales growth in various world markets," said Mr. Vierhile, also noting growing popularity and mainstream acceptance of kombucha.

Interestingly, U.S. consumers are more interested in immune products (50%), compared to digestive products (32%). Meanwhile, however, nearly 20% of consumers say they have avoided work or social situations due to digestive issues.

As the most mature market, energy products in the U.S. brought in $14.8 billion in 2009, and are expected to grow 6.6% to $20.3 billion by 2014. Consumers simply aren't satisfied with their energy levels, as 80% say they don't have enough energy to do all the things they want to.

Growth potential for bone and joint health products is lower than most other functional health categories due to a lack of product innovation, according to Datamonitor. However, joint health is a widespread problem, as 46 million Americans—20% of the population—have arthritis or other rheumatic conditions. In the U.S., product sales reached $3.3 billion in 2009 and are expected to grow 4.4%, to $4.1 billion by 2014.

Cognitive health could be the greatest opportunity in the functional foods and beverages market. While 57% of consumers expressed an interest in cognitive health products, only 19% are actually buying them right now, according to a 2009 Datamonitor consumer survey. U.S. sales could double by 2014, from $1.2 billion in 2009 to $2.1 billion (11.8% growth). "The lion's share of cognitive product growth is expected to be in the beverage sector, growing at twice the rate of foods in many markets," said Mr. Vierhile.

Lastly, the beauty foods and beverages category is poised for growth despite a lack of understanding among consumers for terms like "nutricosmetics," Mr. Vierhile said. U.S. sales reached $76.7 million in 2009, and are expected to reach $133.9 million by 2014 (11.8% growth). Beverages dominate the category, with antioxidants topping ingredient lists and collagen growing in popularity. Datamonitor notes major crossover with the natural/organic market, as 72% of women who buy natural or organic personal care products believe in the "beauty from within" concept, compared to 49% of mainstream product buyers.

Overall, skepticism dampens sales of functional products and companies should look to simplify nutrition labeling in an effort to build trust with consumers. "Make sure front-of-pack marketing is consistent with nutritional details on the back of the pack," Mr. Vierhile said. Consumers already see fruits/vegetables, fish/seafood and dairy as "functional," so manufacturers should look to build on what consumers already believe.
From an article by Sean Moloughney in Nutraceuticals World July 18, 2011

Research in Health & Nutrition

9 things that can undermine your vitamin D level

According to 2011 National Center for Health Data statistics, almost one in three Americans has vitamin D blood levels below 20 nanograms per milliliter (ng/ml), the threshold that the Institute of Medicine (IOM) says is needed for good bone health. Some experts say even higher levels are needed. Figuring out all the factors that can affect a person's vitamin D levels is complicated. You can get the vitamin from food (mainly because it's been added; few foods are natural sources of vitamin D) and by taking supplements (many doctors recommend taking 800 IU of vitamin D_3 a day).
But vitamin D is also produced by the body in a complex process that starts when rays in the invisible ultraviolet B (UVB) part of the light spectrum are absorbed by the skin. The liver, and then the kidneys, are involved in the steps that eventually result in a bioavailable form of the vitamin that the body can use. A review paper about the many factors influencing a person's vitamin D levels appeared in 2011 in *Acta Dermato-Venerologica*, a Swedish medical journal. Here are nine interesting factors identified in the paper:

1. The latitude where you live. At higher latitudes, the amount of vitamin D–producing UVB light reaching the earth's surface goes down in the winter because of the low angle of the sun. In Boston, for example, little if any of the vitamin is produced in people's skin tissue from November through February. Short days and clothing that covers legs and arms also limit UVB exposure.

2. The air pollution where you live. Carbon particulates in the air from the burning of fossil fuels, wood, and other materials scatter and absorb UVB rays. Ozone absorbs UVB radiation, so holes in the ozone layer could be a pollution problem that winds up enhancing vitamin D levels.

3. Your use of sunscreen — in theory. Sunscreen prevents sunburn by blocking UVB light, so theoretically, sunscreen use lowers vitamin D levels. But as a practical matter, very few people put on enough sunscreen to block all UVB light, or they use sunscreen irregularly, so sunscreen's effects on our vitamin D levels might not be that important. An Australian study that's often cited showed no difference in vitamin D between adults randomly assigned to use sunscreen one summer and those assigned a placebo cream.

4. The color of your skin. Melanin is the substance in skin that makes it dark. It "competes" for UVB with the substance in the skin that kick-starts the body's vitamin D production. As a result, dark-skinned people tend to require more UVB exposure than light-skinned people to generate the same amount of vitamin D.

5. The temperature of your skin. Warm skin is a more efficient producer of vitamin D than cool skin. So, on a sunny, hot summer day, you'll make more vitamin D than on a cool one.

6. Your weight. Fat tissue sops up vitamin D, so it's been proposed that it might be a vitamin D rainy-day fund: a source of the vitamin when intake is low or production is reduced. But studies have also shown that being obese is correlated with low vitamin D levels and that being overweight may affect the bioavailability of vitamin D.

7. Your age. Compared with younger people, older people have lower levels of the substance in the skin that UVB light converts into the vitamin D precursor, and there's experimental evidence

that older people are less efficient vitamin D producers than younger people. Yet the National Center for Health Statistics data on vitamin D levels fly in the face of the conventional wisdom that vitamin D inadequacy is a big problem among older people. They don't show a major drop-off in levels between middle-aged people and older folks.

8. The health of your gut. The vitamin D that is consumed in food or as a supplement is absorbed in the part of the small intestine immediately downstream from the stomach. Stomach juices, pancreatic secretions, bile from the liver, the integrity of the wall of the intestine — they all have some influence on how much of the vitamin is absorbed. Therefore, conditions that affect the gut and digestion, like celiac disease, chronic pancreatitis, Crohn's disease, and cystic fibrosis, can reduce vitamin D absorption.

9. The health of your liver and kidneys. Some types of liver disease can reduce absorption of vitamin D because the ailing liver isn't producing normal amounts of bile. With other types, steps essential to vitamin D metabolism can't occur — or occur incompletely. Levels of the bioactive form of vitamin D tend to track with the health of the kidneys, so in someone with kidney disease, bioactive vitamin D levels decrease as the disease gets worse, and in end-stage kidney disease, the level is undetectable.

Harvard Medical School Healthbeat August 2011

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How low you should go with blood pressure and cholesterol?

For years, experts have been dancing the limbo with blood pressure and cholesterol, routinely lowering the bar in the quest to prevent heart attacks, strokes, heart failure, and other cardiovascular conditions. Two articles in the August 2011 *Harvard Heart Letter* explore healthy targets for blood pressure and harmful low-density lipoprotein (LDL) cholesterol.

High blood pressure (also known as hypertension) slowly damages arteries. It is a key contributor to heart attack and stroke. Low blood pressure is harmful in more immediate ways. It can cause blurry vision, confusion, dizziness, fainting, and falls. Among healthy people, a good blood pressure is under 120/80. For people with hypertension, lowering blood pressure to 120/80 may be a good goal, but is usually more trouble than it's worth. That's why most people with hypertension aim for a target under 140/90.

Cholesterol is a different story. The average American has an LDL of around 120 milligrams per deciliter of blood (mg/dL). That's substantially above the 50 to 75 mg/dL that our hunter-gatherer ancestors probably had. Findings from clinical trials support the idea that lowering LDL to the neighborhood of 70 mg/dL can halt or even reverse the steady spread of artery-clogging atherosclerosis.

Two expert panels commissioned by the National Heart, Lung, and Blood Institute are in the process of updating the guidelines that doctors use to diagnose and treat high blood pressure and high cholesterol. The reports are due next year. It will be interesting to see if they continue to lower the bar for cholesterol.
Harvard Heart Letter August 2011

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The protein-dairy diet that helps lose fat and increase muscle

New research suggests a higher-protein, lower-carbohydrate diet has a positive impact on body composition, trimming belly fat and increasing lean muscle, particularly when the proteins come from dairy products. The study published in this month's issue of *The Journal of Nutrition* compared three groups of overweight and obese, but otherwise healthy, premenopausal women. Each consumed either low, medium or high amounts of dairy foods coupled with higher or lower amounts of protein and carbohydrates.

The women exercised seven days per week for four months, a routine that included five days of aerobic exercise and two days of circuit weightlifting. According to the researchers, there were identical total weight losses among the groups, but the higher-protein, high-dairy group experienced greater whole-body fat and abdomen fat losses, greater lean mass gains and greater increases in strength. All the tissue the women lost was fat which has profound implications for longer-term health, say the researchers.

“One hundred per cent of the weight lost in the higher-protein, high-dairy group was fat. And the participants gained muscle mass, which is a major change in body composition,” said Andrea Josse, lead author of the study. “The preservation or even gain of muscle is very important for maintaining metabolic rate and preventing weight regain, which can be a major problem for many seeking to lose weight.”

Researchers found the lower-protein, low-dairy group lost about a pound and half of muscle, while the lower-protein, medium dairy group lost almost no muscle. In marked contrast, the higher-protein, high-dairy group actually gained a pound and half of muscle, representing a three-pound difference between the low- and high-dairy groups.

Ingredients Network 01 September 2011

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Researchers Call for Framework to Assess Totality of Evidence for Health Claims

Evidence based medicine is not suitable for the evaluation of the Article 13.1 claims under the of European Union’s (EU) Nutrition and Health Regulation, the 26th Hohenheim Consensus Conference has agreed. In a document published this month in the academic journal Nutrition, the 13 academic experts who attended the conference last year and who authored the paper said that evidence based medicine is designed to evaluate the effects of drugs and not the unique properties of nutrients and the bioactive substances subject to Article 13.1 of the EU’s Nutrition and Health Claims Regulation.

They called for a process to define evidence-based nutrition that embraces state-of-the-art nutrition science, and stimulates future academic research. At the conference the experts spent a day presenting and discussing their views and arrived at several consensus statements, which they hope will serve as guidance for bodies performing or taking decisions on the claims assessments, such as the European Commission.

"The scientific knowledge available to date cannot be ignored and should be a starting point for the assessment of the totality of the available data and the strength, consistency and biological plausibility of the evidence," said Professor Hans Biesalski, who heads the University of

Hohenheim (Stuttgart, Germany) Department of Biological Chemistry and Nutrition and organises the renowned Hohenheim conferences.

"Evidence based medicine is clearly not appropriate for the evaluation of claims made on foods and what is needed in the process of evaluating Article 13.1 claims is to define evidence-based nutrition, which embraces state-of-the-art nutrition science, and stimulates future academic research. This approach does not mean to have a lower scientific level. Indeed, specific designs should be developed to estimate the effect of 'non-xenobiotics' on human health".

Article 13.1 of the EU's Nutrition and Health Claims Regulation aims to ensure that health claims on foods and food constituents can be properly justified and scientifically substantiated. The European Food Safety Authority, the body entrusted with the evaluations of the claims, has adopted an evaluation process that has been subject to considerable debate amongst leading scientists in the field of human nutrition. It is thought that this process has led to negative opinions on health effects for many food components, which, according to some, could have been recognised had a more holistic approach to the evaluation of the claims been adopted.

The Univeristy of Hohenheim organised the 26th Hohenheim Consensus Conference to gather the views of many academic experts in the field of nutritional research on various aspects of the claims substantiation process and the possibilities and limitations of the different approaches given the debates in this area.

At the conference case studies were addressed, focusing on carotenoids and Vitamin A in relation to age related macular degeneration (AMD); the quality of carbohydrates (as expressed by the glycemic index) in relation to health and wellbeing; probiotics in relation to intestinal and immune functions; micronutrient intake and maintenance of normal body functions; food components with anti-oxidative properties and health benefits, and the nature of evidence supporting the impact of deficient, adequate, and optimal intakes of micronutrients on physiological function.

"We chose these case studies in order to address the extent to which an evidence-based benefit is a reliable endpoint, and the extent to which data from clinical studies of disease states can be used as supportive evidence for health effects," said Prof Biesalski. "They also enabled us to consider how to assess other factors, such as the different effects of the various dietary nutritional components on systemic parameters, for example, the individual effects of the various types of fatty acids in the diet on blood lipids."

The university will continue its exploration into issues presented by the EU's claims regulation and has already touched upon this in two further case-study consensus workshops this summer, which focused on the health relationships of individual substances subject to evaluation under Article 13.1.
Nutrition Horizon Sep 28 2011 ---
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New studies reveal faster-working supps for joint relief

With Baby Boomers staying more active as they age, the demand for joint-supporting supplements continues to grow. But as osteoarthritis rates rise due to obesity and a growing aging population, consumers, and now suppliers, are looking beyond the old G&C combo.
Creaky knees, arthritic hips and frozen shoulders used to be a sign of retirement—either from a pro sports career or a lifetime at a desk job. But two social phenomena—baby boomers' refusal to

slow their exercise regimes and the global obesity epidemic—are causing joint pain in people who have no plans to collect their pensions any time soon.

While glucosamine-chondroitin combos are still the Kobe Bryants of the joint health category, these ingredients, like the Los Angeles Lakers superstar, are losing market value as they age. Not only are some newer joint-health formulations quicker acting, but Dean Mosca, president of Proprietary Nutritionals, predicts future ingredients may go even further, targeting specific joints or structural components such as synovial fluid and cartilage.

"A cursory search on planned [joint-health ingredient] clinical trials shows an amazing number that are focusing on the knee," Mosca says. That makes sense, considering that the number of knee replacements in Americans age 45 to 64 more than tripled between 1997 and 2009, according to the U.S. Agency for Healthcare Research and Quality.

Check out these promising rookie ingredients in the joint-health arena.

Promising ingredients for joint health

Natural eggshell membrane (NEM) combines glucosamine and chondroitin sulfate with hyaluronic acid, collagen and calcium. The result, says Chris Haynes, director of sales for ESM Technologies, which developed NEM, is a faster delivery mechanism than a simple glucosamine-chondroitin product.
Two human clinical trials show that a daily dose of one 500 mg NEM pill can reduce the pain and stiffness associated with osteoarthritis in as few as seven to 10 days. ESM Technologies President Micah Osborne says preliminary results from a soon-to-be-published in vitro study show that NEM appears to do this by inhibiting a number of pro-inflammatory cytokines in human immune cells.

Phat fat

Working with the premise that worn joints can be linked to insufficient lubrication and cell membrane fluidity, Proprietary Nutritionals developed Celadrin topical cream by esterifying fatty acids to ensure stability and prevent oxygen reactions. There is also a plant-source Celadrin, Vege-Celadrin, for vegans and vegetarians.

Mosca says research has shown that Celadrin's fatty acids inhibit inflammation in endothelial cells—the thin cells that line the inside of various body cavities—and decrease the pro-inflammatory effects of arachidonic and other fatty acids. Celadrin has also been shown to control the immune factors responsible for inflammation, he says.

There are 10 published human and animal studies on the effects of Celadrin on the pain and swelling of osteoarthritis. In a double-blind study, 100 percent of the osteoarthritic subjects showed significant improvement in range of motion, pain levels, timed up and go, timed stair climbing and muscular endurance tests within 30 minutes of applying Celadrin, and cumulative benefits throughout the remaining 30 days of the study.

Rosy results from rosehips

DSM Nutritional Products brought its i-flex joint relief finished product to U.S. shores starting in May of last year, and, according to the company, quickly became the No.1 selling non-

glucosamine product in the category. I-flex is based on a powder made from the fruits (the rosehips) and seeds of a subtype of *Rosa canina*, commonly known as the Dog Rose. The ingredient has seven scientific studies to its credit, four of which were clinical trials. One ding against the brand—in January the National Advertising Division advised DSM to back off on some of its claims related to the product.

Ayurvedic remedy goes mainstream

For centuries, Ayurvedic practitioners in India have used resin from the boswellia tree for treatment of inflammatory conditions, including joint protection. Today, P. L. Thomas' 5-Loxin, made from high-content acetyl-keto beta boswellic acid (AKBA), is used in the No. 1 joint-health product on the market, Osteo Bi-Flex.

The new generation of 5-Loxin, 5-Loxin Advanced, provides 50 percent more AKBA bioavailability than the original formulation, says Vladimir Badmaev, director of medical and scientific affairs for P.L. Thomas. Clinical studies show daily doses of both 100 mg and 250 mg of 5-Loxin Advanced helps relieve osteoarthritis symptoms in five days, compared to seven days for 5-Loxin. Other studies show that 5-Loxin products improve biological markers associated with joint health and inhibit enzymes that break down cartilage, collagen and connective tissues around the joints.

2011-09-06 Functional Ingredients Vicky Uhland

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Vitamin D loses its place in the sun

While no one disputes vitamin D's importance as a nutrient, research finds that lesser-known vitamins work just as well, if not better, in affecting calcium absorption, bone formation and resorption. Who are the new heroes of bone health? Vitamin K2 is climbing high and natural eggshell membrane is cracking the glass ceiling in the bone health category.

The next time the letter D sponsors Sesame Street, it might want to focus on the events of 2011—deficit in the U.S., deluge in Japan, democracy in Egypt. Even in the supplements world, D has hogged the spotlight following the release of new U.S. dietary guidelines for the vitamin late last year.

But no matter how compelling each D event has been, the public has moved on. That even seems to be the case for vitamin D and bone health. In the last year, organizations as diverse as the USDA and General Mills have made it clear that D and its cohort calcium are not the only solutions for an aging population's weakening bones.

"Despite many years of research on the roles of calcium and vitamin D in bone health, we still haven't been able to prevent osteoporosis," wrote research nutritionist Jay Cao, PhD, on the USDA's Agricultural Research Service website last summer. "Now, we know many other dietary factors may have equal or more important roles affecting calcium absorption, bone formation and bone resorption as calcium and vitamin D." And this summer, General Mills announced it was looking for innovations in dairy products that "enhance the bone formation process beyond the known impact of calcium and vitamin D."

That sets the stage for D's less famous cousin, vitamin K, and other ingredients for bone health. "The category is heading in the direction of more ingredients that help deliver nutrients like calcium, magnesium, phosphorus and sulfur to bone matrix and cartilage," says Vladimir Badmaev, MD, PhD, director of medical and scientific affairs for P.L. Thomas. These ingredients include not only vitamin D3, but vitamin K2, essential fatty acids and carotenoids, he says.
Here's a look at innovations in branded and nonbranded ingredients for bone health.

K2: the summit of bone health?

Research shows like vitamin D, vitamin K helps move calcium into the bones; K also transports calcium out of the arteries, helping prevent plaque buildup. In addition, K helps activate the protein osteocalcin, which binds calcium to bone surfaces.

Vitamin K is available in two forms: K1, which comes from plants such as algae and leafy greens; and K2, which is derived mainly from meat, dairy and soy. Studies show that K2, which debuted in functional ingredients only a few years ago, is the more bioavailable form. "Bone health benefits from introduction of vitamin K2 to the marketplace, broadening interest in safe and effective prevention of osteoporosis," Badmaev says.

There are two main forms of K2: menaquinone 4, aka MK-4, which is sourced mainly from meat, and MK-7, which is usually derived from natto, or fermented soybeans. There is some debate over which form is the most effective.

"Basically, MK-4 has been widely researched in human studies, while little human research exists for the MK-7 forms. All human MK-7 studies were association studies with natto intake," says Kathy Lund, director of business development for AIDP, which makes KoACT MK-4. "MK-7 converts to MK-4 in the body anyway, and MK-7 is much more expensive than MK-4."
P.L. Thomas' argument in favor of MK-7 is that studies show it reduces the risk of age-related decline in bone tensile strength, and potentially prevents bone resorption. In addition, MK-7 is thought to remain in the body much longer than MK-4.

Beyond the alphabet

Calcium from eggshells, like ESM Technologies' NEM (natural eggshell membrane), has been shown in human and animal research to have an effect on osteoporosis. Clinical studies involving postmenopausal women and women with osteoporosis show that eggshell powder increases mobility and bone density.

A higher ratio of omega-3 to omega-6 fatty acids in the body has been shown in several studies to have beneficial effects on bone health, Badmaev says. An epidemiological study of 78 young men found that those with higher serum levels of the omega-3 DHA had greater bone mineral density; a study of rats produced the same results. The theory is that omega-3s effect calcium balance in the body and the physiology of bone cells. They also decrease inflammation, which may harm bone building and regeneration.

A recent interventional study of nearly 1,000 men and women with a mean age of 75 found that those with the highest carotenoid intake had a significantly lower risk of hip fracture, while those who ingested the most lycopene had not only a lower risk of hip fracture, but all non-vertebral fractures.
2011-09-08 Functional Ingredients Vicky Uhland
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Women embrace natural solutions for health

When it comes to the ladies cranberry's king, but don't count out krill. Old stand-bys and fresh faces are energizing the women's health category as research and health care professionals begin to catch up to the natural health movement.

Menopause, premenstrual syndrome, urinary tract infections (UTIs) and even childbirth used to be the "don't ask, don't tell" aspect of women's health. But the sexual revolution not only lured cramps, hot flashes and C-sections out of the closet, they spurred major clinical trials into natural—and not so natural—ingredients for these conditions.

We all know that many menopausal women gave hormone-replacement therapy (HRT) its marching orders when the National Institutes of Health stopped its study of HRT in 2002 after synthetic estrogen and progesterone were linked to elevated risk of heart disease, stroke and breast cancer. HRT has continued its steady downswing—the North American Menopause Society reports that estrogen-progesterone prescriptions dipped from 7.5 million in 2006 to 5.3 million in 2010.

Meanwhile, sales of top natural menopause ingredients like soy isoflavones and black cohosh have increased.The numbers are even more compelling for pregnancy support, with omega-3 products and vitamins showing healthy growth. Here's a look at some of the newest and best-selling ingredients for other common women's health conditions.

A cranberry a day

Women have long known that swigging cranberry juice can quell UTIs. Now, science backs up this folk wisdom. Decas Botanical Synergies' PACran, which is standardized to 1.5 cranberry proanthocyanidins (PACs), has been the subject of two human clinical trials. One, published in the *British Journal of Nutrition*, analyzed women age 18 to 60 who took 500 mg of PACran daily for six months, or a placebo. The UTI recurrence rate for the PACran group was 15 percent, compared to 30 percent for the placebo group.
Previous research found that the PACs in cranberries fight UTIs by preventing bacteria from adhering to uroepithelial (urinary tract) cells.This scientific evidence has translated into solid sales for PACran, which is in the number-one pharmacy-recommended brand AZO Cranberry, says Decas' Senior Director of Sales and Marketing Dan Souza.

Krill trumps fish oil

A couple of studies have found that fish oil (2 grams of EPA and DHA daily for two months) can reduce PMS-related moodiness and pain. But a Swedish study of 70 women found that 2 grams of krill oil daily for three months significantly reduced physical and mental symptoms associated with PMS, whereas fish oil only lowered some of the symptoms.

Krill—tiny shrimp-like creatures that thrive near Antarctica—continue to make a splash in the omega-3 pool thanks to the unique structure of the active ingredient. The omega-3 in krill oil is mainly in phospholipid form, compared to the triglyceride form found in fish oil. A recent randomized, double-blind study analyzed the effect of fish oil, krill oil and olive oil on 76 overweight and obese men and women. Researchers found that subjects who took 2 grams a day of Aker BioMarine's Superba krill oil for four weeks had a 24 percent greater amount of EPA and DHA in their blood than those who took a similar dose of fish oil. The conclusion: Krill oil has more bioavailability than fish oil.

To allay concerns over the sustainability of krill harvesting, Aker BioMarine has developed a patented Eco-Harvesting system of nets and trawls that capture krill without ensnaring fish, birds and marine animals. Aker is also a founding member of the Association of Responsible Krill Harvesting Companies. Add to that the difficulty of catching krill in such inhospitable environs and the expense of the specialized handling equipment necessary (krill spoil quickly when taken from the water) and the krill haul is set to be sustainable for years to come, says Aker Vice President of Sales and Marketing Eric Anderson.
011-09-09 Functional Ingredients Vicky Uhland
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Probiotic Bacteria May Lessen Anxiety and Depression

Probiotic bacteria have the potential to alter brain neurochemistry and treat anxiety and depression-related disorders according to research published today in the prestigious international journal Proceedings of the National Academy of Sciences USA.

The research, carried out by Dr Javier Bravo, and Professor John Cryan at the Alimentary Pharmabiotic Centre in University College Cork, along with collaborators from the Brain-Body Institute at McMaster University in Canada, demonstrated that mice fed with Lactobacillus rhamnosus JB-1 showed significantly fewer stress, anxiety and depression-related behaviours than those fed with just broth. Moreover, ingestion of the bacteria resulted in significantly lower levels of the stress-induced hormone, corticosterone.

"This study identifies potential brain targets and a pathway through which certain gut organisms can alter mouse brain chemistry and behaviour. These findings highlight the important role that gut bacteria play in the bidirectional communication between the gut and the brain, the gut–brain axis, and opens up the intriguing opportunity of developing unique microbial-based strategies for treatment for stress-related psychiatric disorders such as anxiety and depression", said John F. Cryan, senior author on the publication and Professor of Anatomy and Principal Investigator at the Science Foundation Ireland funded Alimentary Pharmabiotic Centre, at UCC. The APC researchers included Dr Hélène Savignac and Professor Ted Dinan.

The researchers also showed that regular feeding with the Lactobacillus strain caused changes in the expression of receptors for the neurotransmitter GABA in the mouse brain, which is the first time that it has been demonstrated that potential probiotics have a direct effect on brain chemistry in normal situations. The authors also established that the vagus nerve is the main relay between the microbiome (bacteria in the gut) and the brain. This three way communication system is known as the microbiome-gut-brain axis and these findings highlight the important role of bacteria in the communication between the gut and the brain, and suggest that certain probiotic organisms may prove to be useful adjunct therapies in stress-related psychiatric disorders.
Nutrition Horizon Aug 30 2011 ---
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Micronutrient Powders Reduce Anemia and Iron Deficiency in Infants in Low-Income Countries, Review Finds

Adding a powder that contains several vitamins and minerals, including iron, zinc and vitamin A, to the semi-solid foods taken by infants and children between six months and two years of age, can reduce their risk of anemia and iron deficiency. This is the conclusion of a new Cochrane Systematic Review.

Vitamin and mineral deficiencies, particularly those of iron, vitamin A and zinc, affect more than two billion people worldwide. Infants and young children are highly vulnerable because they grow rapidly and often have diets low in these nutrients. Micronutrient powders are single-dose packets containing multiple vitamins and minerals in powder form that can be sprinkled onto any semi-solid food immediately before eating at home or at any other place. Thus, this intervention is known as home or point of use fortification.

Led by Luz Maria De-Regil, a team of researchers set out to see whether using micronutrient powders could improve the health of young children. They found eight relevant trials that together involved 3748 children living in Asia, Africa and the Caribbean, where anemia is a public health problem. The studies lasted between two and 12 months and the powder formulations contained between five and 15 nutrients.

Overall, home fortification with the micronutrient powders reduced the risk of having anemia by 31% and iron deficiency by 51% when compared with no intervention or placebo. The team found, however, that there was little or no evidence that this intervention has an effect on growth, survival or overall developmental outcomes. "We still need to know more about possible positive and adverse side effects as only a few trials reported on this," says De-Regil, who is an Epidemiologist at the Department of Nutrition for Health and Development of the World Health Organization in Geneva, Switzerland.

The researchers also found that these powders had a very similar effect to daily iron supplements. However, as they report, "We need to treat this result with caution, however, because there was much less data for this comparison."

"It seems that micronutrient powders can be helpful for infants and young children aged six to 23 months and living in places that have different amounts of anemia and malaria, regardless of whether the intervention lasts two, six or 12 months or whether recipients are girls or boys.." Nonetheless, the authors add a word of caution: "This intervention involves mixing the powders with homemade food as a vehicle, so it is important to assure that basic sanitation is available and food hygiene and handling is done properly with safe water."

The team believes that we now need more information about the best combination of vitamins and minerals to include in the mix, whether to give it daily or intermittently and for how long to give it to ensure that children receive the maximum benefits.
Science Daily (Sep. 6, 2011)
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Mother's Diet Influences Baby's Allergies, Research Suggests

A possible link between what a mother eats during pregnancy and the risk of her child developing allergies has been identified in new research published in this month's *The Journal of Physiology*. The research found that if a mother's diet contains a certain group of polyunsaturated fatty acids (PUFAs) -- such as those found in fish, walnut oil or flaxseed -- the baby's gut develops differently. The PUFAs are thought to improve how gut immune cells respond to bacteria and foreign substances, making the baby less likely to suffer from allergies.

Until now, several clinical trials have shown that fish and walnut oil supplementation in pregnant women reduces the risk of allergy in their children, but the mechanism was unknown.
"There is intense research interest in maternal diet during pregnancy. In the western diet, the group of polyunsaturated fatty acids that we have shown to help gut function are actually

disappearing -- our dietary intake of fish and nut oils is being replaced by corn oils which contain a different kind of fatty acid." Said Dr Gaëlle Boudry, of the INRA research institute in Rennes, France.

"Our study identifies that a certain group of polyunsaturated fatty acids -- known as n-3PUFAs -- causes a change in how a baby's gut develops, which in turn might change how the gut immune system develops. These changes are likely to reduce the risk of developing allergies in later life."
The team found that supplementing a mother's diet with n-3PUFA caused the newborn's gut to become more permeable. A more permeable gut enables bacteria and new substances to pass through the lining of the gut into the bloodstream more easily. These new substances then trigger the baby's immune response and the production of antibodies.

"The end result is that the baby's immune system may develop and mature faster -- leading to better immune function and less likelihood of suffering allergies," added Dr Boudry.
This research adds to previous studies which have shown that an intake of n-3 PUFAs during pregnancy increases gestational length and maturation of the central nervous system of a baby and that their performance on mental tasks also seemed to be improved in childhood.
"Other studies have found that a diet containing fish or walnut oil during pregnancy may make your baby smarter -- our research adds to this, suggesting such supplements also accelerate the development of a healthy immune system to ward off food allergies."

In terms of next steps, the team's findings were based on piglets so research will continue to see if they translate to humans. The porcine intestine is an excellent model of the human gut however, so they are hopeful that the findings can be extrapolated. The team also plans to investigate whether the apparent gut function-boosting effects of n-3PUFA that they have identified in newborns extends into later life.
Science Daily (Sep. 8, 2011)
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Food Science & Industry News

Stevia market set for rapid growth

A new report on sugar and sweetener trends in the US estimates that the use of stevia is set to rise exponentially. According to Packaged Facts, the stevia market is now worth as much as $2 billion – up from $20 million in 2008.

Much of the growth in the stevia market is due to the increasing use of stevia by manufacturers to replace artificial sweeteners, high-fructose corn syrup and sugar, says the report. The strength of the stevia market in the US also reflects its GRAS (generally recognised as safe) status and its support from major corporations such as Coca-Cola and PepsiCo.

Between 2004 and 2008 more than 2,000 stevia-sweetened products were introduced worldwide. In 2010 76 stevia-sweetened product lines were introduced to the U.S. market alone. Most of the new products introduced combine stevia with one or more other bulk sweeteners.

It is likely that high-purity stevia will be approved for used as in ingredient in the EU by November 2011. Following approval in Europe, Packaged Facts says that it expects sales of products containing stevia to skyrocket, fuelled by approval around the world by the end of 2012.
Ingredients Network 06 September 2011
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Convenient Meals Ready-Made for Diabetics

Freezer case meals are big on flavor, low in sodium and a healthy option for a variety of diet-specific conditions.

Grocery store freezer cases are full of ready-made microwave meals but for a big segment of the consumer population afflicted with food allergies and certain health conditions, those meals are strictly off limits. In 2008, Dallas, TX-based businessman Cole Egger was moved by a diabetic family friend who expressed having difficulty finding a good tasting, healthy packaged meal. The need intrigued Mr. Egger and he partnered with friend Aaron Murski to research the market. What they found was an abundance of weight loss products and foods but none suitable for the diabetic community.

As part of a comprehensive analysis of the market, Mr. Egger visited with diabetes support groups, endocrinologists, diabetes educators, dietitians and consumers. It was clear that people with diabetes and other specific dietary needs had to fend for themselves when it came to meal planning. The few frozen entrees that were available were described by consumers tasting like cardboard and exhausting a day's worth of sodium in one serving.

Mr. Eggers put together a team of food specialists to assess the already at-market products. What they found was disturbing. Products being touted as "healthy" weren't truly healthy at all. While the products were formulated with reduced fat and calories, the flavor profile was boosted by unhealthy added sodium. They also found that the handful of frozen entrees that did live up to their health claims tasted bland and were unpalatable, echoing the feedback they received from consumers they'd spoken to.

Satisfied by their research, Mr. Eggers and his team accepted the challenge to create products that

would make a difference. The result of their work was Meals to Live, a line of tasty, healthy, convenient and affordably priced foods formulated with "only nutritionally beneficial ingredients" especially for consumers with special dietary requirements. The recipes were a developed by Mr. Eggers and Jeremy Womble, chef to the Dallas Cowboys football team, who has type 2 diabetes himself.

The product lineup spans eight frozen entrees—Sliced Turkey, White Chicken Fajita, Chicken Chili Relleno, Spinach Omelet, White Chicken Burrito, Grilled White Chicken, Shrimp Jambalaya, and Turkey Meatballs. Each of the entrees provide between 10-19% of the daily fiber value (25 grams per day for women and 38 grams per day for men), which can help regulate blood glucose.

The low fat and low sodium entrees contain between 18 to 58 grams of carbohydrates, much of which comes from whole grains. Each meal costs between $3.99 and $4.99. Five of the eight meals are also gluten free. The meal packaging features easy-to-read calorie, fat, sodium, sugar, fiber and protein nutrition data on the front panel, eliminating the guess work for consumers.

According to company marketing representative, Christy Lizarraga, Meals to Live is in the process of adding at least three more frozen entrees, plus a breakfast line and a tertiary line formulated just for kids. The company is also working to take its product development endeavors "beyond the frozen food section" of the grocery store.

As a complement to the frozen entrees, the company also markets Meals to Live brand Glucose Quick Sticks for diabetics in need of a quick blood glucose boost. Available in two tasty, kid-friendly flavors (Watermelon and Green Apple), the products are billed to be portable, quick-dissolving powder alternatives to pills, drinks and messy gel tubes that deliver five grams of glucose per stick. The product also delivers 100% of the RDI for vitamin C. A package containing four Quick Sticks retails for about $24.

Meals to Live products are currently sold in about 2000 nationwide U.S. retail venues in select locations of Brookshire's, Walgreens, Randalls, Ralphs, Tom Thumb, Raley's, Sprouts, Meijer and Publix stores. In addition to its at-retail products, Meal to Live offers a free monthly newsletter that features tips and recipes for healthy eating. The company is also a sponsor of the Diabetes Friendly Foundation (DFF), a nonprofit organization created by Egger that promotes education in an effort to prevent the onset and severity of diabetes.

By Joanna Cosgrove Nutraceuticals World September 8, 2011

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Additives Meant to Protect Vitamin C Actually Cause More Harm

Anti-caking agents in powdered products may hasten degradation of vitamin C instead of doing what they are supposed to do: protect the nutrient from moisture. Lisa Mauer, a Purdue University professor of food science; Lynne Taylor, a professor of industrial and physical pharmacy; and graduate student Rebecca Lipasek study deliquescence, a reaction in which humidity causes a crystalline solid to dissolve. They wanted to understand how anti-caking agents protect substances such as vitamin C from humidity.

In Mauer's laboratory, different anti-caking agents were blended with powdered sodium ascorbate, a common form of vitamin C, and were exposed to different relative humidities. Normally, sodium ascorbate deliquesces, or dissolves, at 86 percent relative humidity and is stable below that level. Some anti-caking agents, however, caused the degradation to begin at

lower humidity levels. "The additives that the food industry puts in to make these powders more stable didn't help the vitamin C, and in some cases actually made things worse," Lipasek said. Once vitamin C changes chemically, it no longer holds its nutritional value.

The findings suggest that foods made with powdered vitamin C may lose the vitamin's nutrients at a lower humidity than once thought. The team's findings were published in the current issue of the Journal of Food Science. A variety of anti-caking agents were studied. "Some of the agents act like little raincoats, covering the particles and protecting them from moisture. Others will absorb the water themselves, keeping it away from the vitamin C particles," Mauer said. "I really thought some of those anti-caking agents would help, but they didn't."

The problem, according to the research, is the chemical properties of the anti-caking agents themselves. The water-repellent agents, which act like raincoats, are mobile, Lipasek said. When they move around, they clump together and leave some of the vitamin C uncovered. When that happens, moisture is able to reach and degrade the exposed vitamin C.

The moisture-absorbing agents, which absorb the water at a lower humidity than vitamin C, may be absorbing so much moisture that they become saturated. When that occurs, Mauer said, the pH level around the vitamin C can change, or water can move and interact with the vitamin C. Both of these scenarios could lead to further reactions that lower the humidity at which vitamin C deliquesces and changes from solid to liquid. Once the vitamin C dissolves, it is unstable.

Next, Mauer and Lipasek plan to test more complex blends that contain more ingredients along with vitamin C. They also plan to determine how much water is necessary to destabilize vitamin C and how temperature affects the destabilization of vitamin C with anti-caking agents.

Food Ingredients First Sep 29 2011 ---
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Innovation—is it part of your business?

Innovation comes in many forms—a new botanical from the rainforest, a new extraction method, a new peptide or fraction, new research validating an old ingredient, a combination of ingredients that signal a more efficacious formulation, a new solution to a nagging health condition.
How would you describe benchmarks for successfully integrating innovative practices—especially in today's global regulatory environment that appears desirous of squeezing innovation out of the health and wellness sector? How do you possibly count on process innovations when a lot of the work is no longer done in your U.S. facility but has been off-shored to countries that don't have such easy familiarity with the consumer bellwethers? Do you outsource innovation by simply looking to acquire smaller, more nimble companies that seem to have a tighter turning radius?

We know that you finished goods manufacturers are more open to innovation today—you're looking for new ideas that resonate with consumers, products you can bring to market and change your company's growth metric.

What does it take to bring innovation to your business?
Have we got a solution for you. And it's in a—dare I say?—innovative format. It's our first foray into the so-called virtual trade show medium. We call it Engredea365. On Thursday, Sept. 29, you can fill your head with provocative notions that just might take your business in new

directions. It comes straight to your desktop. Whether you play in the food/beverage, supplement or nutricosmetic sandbox, I know you will find great value here. Did I mention it's free?
Oh, it's got some of the trappings of the virtual trade show model. In one "hall" are exhibiting companies with "booths"—they staff their booths with real live people who can engage in a conversation or a chat about their capabilities and ingredients that can give you a fresh perspective on your product lineup.

In another hall are the education sessions. But here we break from the norm in a few significant ways. One is the lineup—the entire education track focuses like a laser beam on innovation. Literally.

Our keynote is the strategy and innovation expert Dr. Vijay Govindarajan, author of the best-seller, "The Other Side of Innovation: Solving the Execution Challenge." Unlike Webinar-style virtual trade shows that have the perfunctory PowerPoint presentation with audio of a speaker, Engredea365 has live video panel discussions on topics like creating benchmarks for innovation in a post-NDI world and top industry innovations and innovators. Market watchers reveal the ingredients, technologies and companies that are leading the next generation of healthy solutions. Just like on TV! Only it's better, because we'll answer your questions at the end.
Better than TV. Interactive TV.

So, what does it take to bring innovation to your business? Check out www.engredea.com and click on "virtual."
2011-09-19 Functional Ingredients Todd Runestad

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Taking a Formulation Global? Do Your Homework…

When you're a global company servicing the food, beverage and pharmaceutical industries, it pays to do your homework and be prepared when it comes to developing product formulations, which will eventually be adopted in many countries worldwide. For instance, an ingredient or nutrient that is GRAS (Generally Recognized As Safe), within a nutrient premix, in a country like the U.S., may not necessarily be approved for food or beverage fortification in another country.

The regulations set forth by FDA are not necessarily in line with the European Food Safety Authority (EFSA) within the European Union, CODEX Alimentarius (CODEX) or the Agência Nacional de Vigilância Sanitária (ANVISA) in South America. In light of this and other challenges, we feel we can offer some guidance for manufacturers hoping to capitalize on some of the trends that are resonating with consumers today.

A newcomer to the functional drink category is the antithesis to an energy drink—relaxation drinks. These are becoming more prominent in the U.S., and GABA (Gamma Amino Butyric Acid) seems to be the ingredient of choice. There is mounting data suggesting it has functional properties to calm the brain.

But GABA's application, while long popular with beverage manufacturers, has expanded outside that arena. So when preparing chocolate bar samples that addressed relaxation in Brazil, we needed to consider that under ANVISA, GABA could be consumed as a supplement, but not as a food additive. According to the technical team in our Campinas facility, the alternatives were either L-theanine or L-tryptophan.

Another area of concern relates to a manufacturer making the same product in two different locations, using two different technologies. Nutrient market forms and overages may need to be different to ensure the finished product at both locations is in spec—i.e., has the right color etc.—and adheres to the guidelines set forth by the regulatory authority in that country.

In addition to the regulations set forth by the various governing bodies in the many regions of the world, religious considerations may also apply. Having your facility certified as Kosher and/or Halal is an additional step that must be taken in order to operate in the global marketplace.
By Patrick Morris, Fortitech Nutraceuticals World September 15, 2011
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Energy drink formulators favor sustained energy ingredients

Typically energy drinks have evoked an image of testosterone-riddled twenty-somethings careening down mountains on bikes. But the evolution away from caffeinated energy bursts to more sustained, work-focused energy supplements started with the vitamin B boom of 5-hour Energy. Now even more ingredients are cropping up with promises of endless energy.
The immortal question: "Dude, wanna pound a Red Bull?" tends to have less resonance the further away you get from a frat house. For people who are past the party-all-night stage of life, energy support tends to focus on cellular-level ingredients like D-ribose, L-carnitine and B vitamins, along with carbohydrate formulations that digest slowly.

"There are two distinct energy markets: stimulants and sustained," says Dan Murray, vice president of business development at Xsto Solutions. Traditionally, he says, younger people tend to go for caffeine- and herbal stimulant-based quick boosts, while older people are looking for all-day energy that gets them through a planning session at the office or a training run for a 10K.
But in the wake of the FDA's recent crackdown on caffeine and alcohol-spiked beverages, even young people are questioning the safety of purely stimulant drinks, says Chase Hagerman, business development and marketing manager with Chemi Nutra. Hence the rise in multigenerational beverage blends like Coca-Cola's Full Throttle energy drink, which contains the stimulant caffeine and the sustained energy ingredients ribose and niacin.

Young or old, the energy category is booming, Hagerman says. "Not everyone needs to address the health of their heart, joints, bones, skin or body composition, but most people welcome having more energy," he points out. Here's a look at some of the sustained-energy ingredients that are propelling sales.

3 new ingredients to boost energy drink formulations

Rev with ribose
Bioenergy Life Science's Ribose, a five-carbon monosaccharide, is a precursor to ATP, which the body's cells use to produce energy. More than 100 studies show that ribose helps produce energy in muscles, including the most important muscle of all—the heart—which not only improves athletic performance, but also pumps more oxygen throughout the body, helping people feel less tired.

The sweet spot
Humanetics' Inzitol provides sustained energy courtesy of pinitol, a sugar alcohol found in legumes. Pinitol's ability to mimic insulin is a natural aid to glucose metabolism, says Scott Steil, Humanetics' vice president of sales and marketing. Muscles are a major site for glucose

metabolism, and a St. John's University study shows that pinitol stimulates glucose uptake in muscle cells by 25 percent to 80 percent.

Pinitol also boosts athletes' creatine levels, which helps produce ATP. One study of 20 men who supplemented with creatine and 1 to 2 grams of pinitol daily found the combo was 23 percent more effective than dextrose at delivering creatine to muscle.

Beneo's Palatinose also uses sugar—in this case isomaltulose, a form of glucose—for sustained energy. According to the company, isomaltulose molecules are more stable than sucrose so they're metabolized four to five times slower, providing sustained, low-glycemic energy. Palatinose is backed by more than 180 human and animal studies.

B energetic
B vitamins have long been known for their ability to provide energy by breaking down carbohydrates into glucose. Several ingredients companies have debuted products that use Bs or related nutrients.

Chemi Nutra's AlphaSize Alpha-Glyceryl Phosphoryl Choline (A-GPC) powers muscles and provides mind and body energy, Hagerman says. A-GPC turns into phosphorylcholine, an active form of the B vitamin choline, and synthesizes and releases acetylcholine, which is an important neurotransmitter in brain and muscle tissue. A-GPC helps improve cell-to-cell communication, activating muscle fiber and muscle contractions for sustained energy, Hagerman says.

AlphaSize is available in a powder formulation and received self-affirmed GRAS status in April following a regulatory review by Life Sciences Research Organization. A 2008 study showed that supplementing with 600 mg of AlphaSize 90 minutes prior to resistance exercise increased subjects' peak bench press power. Hagerman says Chemi Nutra is planning another study on the ingredient within the year.

National Enzyme Co.'s Zip Ex2 provides a three-pronged energy punch through B complex vitamins, digestive enzymes and stimulant herbs like guarana and Siberian ginseng. The herbs offer quick energy, B vitamins provide sustained energy, and lipase and proteolytic enzymes reduce digestive energy drain by helping the body break down macronutrients in proteins and fats and absorb them easily, says Danielle Harrison, National Enzyme's science and regulatory affairs manager.

L-carnitine, once known as vitamin Bt, is another sustained-energy favorite. It helps transport fatty acids into the cells for energy generation. Lonza uses a fermentation process to produce its L-carnitine ingredient Carnipure tartrate. A new randomized, double-blind, placebo-controlled study showed that Carnipure coupled with carbohydrates increases muscular L-carnitine in recreational athletes, producing more vigorous workouts with lower perceived exertion.
2011-09-01 Functional Ingredients Vicky Uhland
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'Plastic Bottle' Solution for Arsenic-Contaminated Water Threatening 100 Million People

With almost 100 million people in developing countries exposed to dangerously high levels of arsenic in their drinking water, and unable to afford complex purification technology, scientists have now described a simple, inexpensive method for removing arsenic based on chopped up pieces of ordinary plastic beverage bottles coated with a nutrient found in many foods and dietary supplements.

The report was part of the 242nd National Meeting & Exposition of the American Chemical Society (ACS), a major scientific meeting with 7,500 technical papers, being held in Denver Colorado the week of August 29.

"Dealing with arsenic contamination of drinking water in the developing world requires simple technology based on locally available materials," said study leader Tsanangurayi Tongesayi, Ph.D., professor of analytical and environmental chemistry at Monmouth University, West Long Branch, N.J. "Our process uses pieces of plastic water, soda pop and other beverage bottles. Coat the pieces with cysteine -- that's an amino acid found in dietary supplements and foods -- and stir the plastic in arsenic-contaminated water. This works like a magnet. The cysteine binds up the arsenic. Remove the plastic and you have drinkable water."

Tongesayi described laboratory tests of the plastic bottle arsenic removal method on water containing 20 parts per billion (ppb) of arsenic, which is two times the safe standard set by the U.S. Environmental Protection Agency for drinking water. It produced drinkable water with 0.2 ppb of arsenic that more than meets the federal standard.

The technology is so straight-forward that people without technical skills can use it, Tongesayi said, citing that as one of its advantages over some of the existing arsenic-removal technologies. It can use discarded plastic bottles available locally, and the application of cysteine does not require complicated technology. Tongesayi is seeking funding or a commercial partner, which he said is the key to moving the arsenic-removing process into use in a relatively short time. The technology also has the potential for removing other potentially toxic heavy metals from drinking water.

Odorless, tasteless and colorless, arsenic enters drinking water supplies from natural deposits in soil and rock that occur in some parts of the world, including parts of the United States, and from agricultural and industrial sources. Symptoms of arsenic poisoning include thickening and discoloration of the skin; stomach pain, nausea, vomiting and diarrhea; vision loss; and numbness in hands and feet. Arsenic also has been linked to cancer of the bladder, lungs, skin, kidney, nasal passages, liver and prostate.
Science Daily (Aug. 31, 2011)
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Safety & Regulatory News

Cereal's Confusing Claims

Yale researchers call for greater government regulation on misleading health claims in the cereal aisle.

The front panels of most breakfast cereal boxes are veritable billboards for a variety of health claims. Researchers at the New Haven, CT-based Rudd Centre for Food Policy and Obesity at Yale University took a closer look into how the nutrition messages on the front of the box related to the data in the products' Nutrition Facts panel. After polling parents on their perceptions (and misconceptions) of those messages, they determined more supervision is needed to protect consumers.

In a study published in the journal Public Health Nutrition, the Yale researchers determined that nutrition-related health claims on children's cereals are often misinterpreted by parents, causing them to infer that products with health claims are more nutritious overall despite actual nutrient quality.

Via an online survey, the researchers asked 306 parents with children between the ages of 2 and 11 to view images of actual box fronts of children's cereals. While the cereals were of below-average nutritional quality, the boxes featured various nutrition-related health claims including "whole grain," "fibre," "calcium and vitamin D," "organic" and "supports your child's immunity." Participants were provided with possible meanings for these claims and indicated how these might affect their willingness to buy the product.

Parents inferred that cereals containing claims were more nutritious overall and might provide specific health-related benefits for their children, which predicted a greater willingness to buy the cereals. For example, approximately one-quarter of parents believed that the "whole grain" claim on Lucky Charms and "calcium and vitamin D" claim on Cinnamon Toast Crunch meant these cereals were healthier than other children's cereals.

With the exception of the "organic" claim, approximately half of parents stated that the claims would make them more likely to buy these cereals. Three-quarters of parents believed the "immunity" claim on Cocoa Krispies meant that eating this cereal would keep their child from getting sick.

The researchers said their study served to demonstrate that front-of-package labelling needs additional government regulation in the interest of protecting consumers.

"Promoting specific positive nutrients in products with other, less beneficial, ingredients (e.g. high-sugar cereals) appears to be a highly effective and low-risk marketing strategy for food companies," said Jennifer Harris, lead author of the study and the Rudd Center's Director of Marketing Initiatives. "These claims provide an opportunity to enhance product image and increase sales with limited potential for consumer skepticism or other negative reactions."

The tactic, they wrote, seems commonplace especially between competing brands. "If companies profit from this practice, it is unlikely they will discontinue its use in the absence of government intervention," they said.

The researchers offered two potential regulatory solutions. The first was modeled after an

approach adopted by Australia, which requires all products with nutrition-related claims to meet minimum overall nutrition criteria to ensure claims do not lead consumers to incorrectly infer that products are nutritious.

The second option entailed FDA pre-approval of all types of claims, not just health claims, before companies are allowed to use them. "This approach would ensure that claims are supported by scientific evidence and are not misleading, and is currently in place in the EU and Canada for structure/function types of claims," they wrote.

The researchers made it clear that although the nutrition-related claims examined in the study were "technically accurate," with most meeting the criteria for such claims set by FDA, their issue was that the majority of consumers misunderstood the meanings of the health claims.

"When these claims are used to promote products that also contain high levels of sugar and/or sodium, they incorrectly imply that the products are nutritious overall; and they can even convey similar health-related benefits as stringently regulated health claims," they wrote. "Therefore, the common use of nutrition-related claims on otherwise nutritionally poor products raises significant public health concerns… [and] affirming the need for increased regulation in the USA to protect consumers from the potentially misleading information conveyed by nutrition-related claims."
By Joanna Cosgrove
Nutraceuticals World August 25, 2011
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Heavy Lobbying Leads to Clearer EU Food Labeling Regulation

Food labelling will be clearer, simpler and more honest following heavy lobbying in Europe by the UK, DEFRA claims. The victory means it will be far easier for consumers to know what's in the food they're buying.

Following a key vote yesterday, the EU agreed to make it compulsory for manufacturers and retailers to clearly state:

- The country of origin of fresh and frozen meat;
- If any of the main ingredients in foods claiming British origin are actually imported;
- If there is more than five per cent water content in cuts of meat such as bacon;
- Nutritional labelling on the back of packs;
- The types of vegetable oils used – such as palm oil;
- Information in an agreed minimum sized font;
- Allergen information for unpackaged food, including in restaurants; and
- High caffeine drinks will require additional labelling.

The EU has also agreed:

- To make it easier for alcohol companies to voluntarily include calorie information;
- To set out voluntarily criteria for front of pack nutrition labelling on pre-packed food and drink; and
- To enable voluntary provision of calorie information in out of home settings.

Britain has also protected its traditional practice of selling by numbers – such as a dozen bread rolls or eggs – and imperial measures, from EU plans to require metric weights on all products, thanks to strong lobbying, DEFRA claims.

UK Environment Secretary Caroline Spelman said: "We've fought long and hard for more honest

labelling so that consumers can make up their own minds about what they eat. Shoppers will now be absolutely sure that if meat claims to be British, it will be British – reared to the high standards they'd expect.

"We've also protected what we already hold dear. Selling eggs or bread rolls by the dozen, and using imperial measures like pints, are great British traditions that we all know and love, and there was no way I was going to let them be put at risk."

Health Secretary Andrew Lansley said, "We have led the way in nutritional labelling, pioneering voluntary labelling in the UK. This regulation will now ensure that everyone will have the information they need to make an informed choice about what they eat and help them make healthier choices."

The probably most important innovative element of the new food labelling rules is the mandatory nutrition information on prepacked foods. Under the new rules, the energy value and the amounts of fat, saturates, carbohydrates, protein, sugars and salt (which together form the "mandatory nutrition declaration") must be indicated in the same field of vision per 100g or per 100ml and may, additionally, also be expressed per portion. The intention is to enable consumers to make healthier dietary choices. Another important element of the draft regulation is the introduction of a minimum font size of 1.2 mm (for the x-height) for all mandatory information which is aimed to improve legibility of food labels. A third important element is the extension of compulsory country of origin labelling to fresh meat of swine, sheep and goats, and poultry (in addition to beef, for which a separate piece of legislation was introduced during the BSE crisis, and to fruits and vegetables, honey, olive oils, and cases where the failure to do so misleads the consumer). Further improvements of the EU food labelling rules concern allergens (which in the future must be highlighted in the list of ingredients), vegetable oils (whose specific vegetable origin must be indicated) and imitation foods (which consumers will be able to recognise more easily).
Food Ingredients First Sep 30 3011 ---
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New GM ruling plunges EU market for honey ingredients into crisis

European beekeepers may find themselves in the position of learning to herd their bees to pollinate only non-genetically modified crops or they will be forced to label their honey as containing GM ingredients. The European Union market for honey is in turmoil after the European Court of Justice ruled that any pollen in honey derived from genetically modified plants constitutes a GM ingredient and must be authorized for sale in the EU and, if permitted, labeled. The decision places a huge question mark over the future marketing in the EU of food and beverage products, and dietary supplements, containing honey-based ingredients that may contain GM pollen—wherever in the world the honey has been produced.

In theory, it means that if a product contains a honey-based ingredient that contains GM pollen, the GM plant from which the pollen came must now be authorized in the EU for the product to be permitted for sale on the EU market. If it is not, then the product will be banned. However, even if it is authorized, the GM pollen will have to be declared on the label. This is likely to be a real blow to the food industry since, unlike many consumers in the US market, the majority of EU shoppers are vehemently opposed to buying products containing GM ingredients.

The ruling came as a result of a dispute between the State of Bavaria, in Germany, which grows GM maize on several plots, and a local beekeeper. In its judgment, the court said: "The Court

observes that pollen is not a foreign substance or an impurity, but rather a normal component of honey, with the result that it must indeed be classified as an 'ingredient'.

"The pollen in question consequently comes within the scope of the regulation [on GM foods] and must be subject to the authorization scheme provided for thereunder before being placed on the market."

Irene Wohlfahrt, scientific consultant at Germany-based regulatory consultancy Analyze & Realize, said: "According to our understanding, this ruling means that all honeys that are produced within the range of GMOs can potentially contain GM pollen. If that is the case, and GM pollen is found in a honey above a certain amount, the honey in question needs to contain a reference to GMOs on the label, and it needs to obtain a marketing permission. Theoretically, this applies to all honeys produced outside of the EU. Also, we understand from this ruling that all dietary supplements made from honeys containing GM pollen are subject to the same ruling."
2011-09-27 Functional Ingredients Richard Clarke
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World's 5 Biggest Killers to Cost $47 Trillion

The global economic impact of the five leading non-communicable diseases (NCDs)—cardiovascular disease (CVD), chronic respiratory disease, cancer, diabetes and mental ill-health—could total $47 trillion over the next 20 years, according to a study released by the World Economic Forum.

"The Global Economic Burden of Non-communicable Diseases" report analyzes the overall costs of NCDs to the global economy. Findings show the estimated cumulative output loss over the next 20 years represents approximately 4% of annual global GDP. While mental ill-health is typically left off the list of top NCDs, it alone accounts for more than $16 trillion, or one-third, of the overall $47 trillion anticipated spend on NCDs.

"Think of what could be achieved if these resources were productively invested in an area like education," said Professor Klaus Schwab, Founder and Executive Chairman of the World Economic Forum. "The need for immediate action is critical to the future of the global economy."

More than 60% of deaths worldwide are due to NCDs, killing 36 million people each year. Low- and middle-income countries are disproportionately affected. In 2010, 80% of NCD deaths occurred in those countries, many of them prematurely, at working age. Developing countries are confronted with an ever-increasing share of this financial burden, as their economies and populations grow. The global population beyond the age of 60 is expected to double between now and 2050. This development, coupled with increasing urbanization, means a sharp increase in NCD rates. The study concludes that the cumulative costs of CVD, chronic respiratory disease, cancer and diabetes in low- and middle-income countries are estimated to surpass $7 trillion in 2011-2025, an average of nearly $500 billion per year.

"Until now, we've been unable to put a figure on what the World Health Organization (WHO) calls the 'world's biggest killers.' This study shows that families, countries and economies are losing people in their most productive years," said Olivier Raynaud, Senior Director of Health at the World Economic Forum. "The numbers indicate that non-communicable diseases have the potential to not only bankrupt health systems but to also put a brake on the global economy. Tackling this issue calls for joint action by all actors of the public and private sectors."

Mental health concerns and CVD alone account for almost 70% of lost output. In 2010, the global direct and indirect cost of CVD was approximately $863 billion and is estimated to rise 22% to $1,044 billion by 2030. Overall, the cost for CVD alone could be as high as $20 trillion over the 20 year period. For mental health conditions, the 2010 global costs were approximately $2.5 trillion, with the cost projected to surge to $6 trillion by 2030.

Cumulative NCD losses will rise steadily over the next 20 years, but the rate of increase will pick up sharply by 2030. The value of life lost, including lost income, out-of-pocket spending related to medical care and pain and suffering due to NCDs will double between 2010 and 2030.

The report uses three different methods to calculate the economic burden of NCDs: the World Health Organization's EPIC model, the Value of Statistical Life (VSL) approach and the Cost-Of-Illness (COI) approach. These methods enabled study authors to analyze data from both a private and societal perspective.

"The challenge of non-communicable diseases goes beyond health ministries. Policy-makers must understand that these diseases pose a significant threat to personal as well as to economic well-being and progress. Non-communicable diseases undermine productivity and result in the loss of capital and labor," said study author David Bloom, member of the World Economic Forum Global Health Advisory Board and professor at the Harvard School of Public Health. "These costs are unbearable and clearly call for innovative solutions and an all-of-society approach, with strong partnerships between government, the private sector and civil society."

To a substantial degree, NCDs are caused by tobacco use, harmful use of alcohol, physical inactivity and poor diet. Strategies for targeting these risk factors are considered in a companion study released by the WHO, which analyzes the means and costs of implementing these measures in low- and middle-income countries.

This assessment of the developmental and financial impact of these diseases comes as the United Nations convenes the High-Level Meeting on NCDs in New York on September 19-20. Heads of State and Government will assemble to address the prevention and control of NCDs worldwide. The report released by the World Economic Forum serves as a companion piece to another WHO report that assesses the cost benefits of different solutions to the NCD crisis. A joint executive summary for the two reports, highlighting the complementary findings, is available here.
Nutraceuticals World September 19, 2011
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UK FSA Launches Guidance on Removing Food Colours

The Food Standards Agency has published guidance to help food businesses remove from their products certain food colours associated with possible hyperactivity in young children.

Research commissioned by the Agency has shown that combinations of certain permitted food colours, and the preservative sodium benzoate, could be linked to increased hyperactivity in some children. The food colours are: sunset yellow (E110), quinoline yellow (E104), carmoisine (E122), allura red (E129), tartrazine (E102) and ponceau 4R (E124).

Some manufacturers and retailers have already taken action to remove these colours. The Agency is encouraging others to work towards finding alternatives, and to voluntarily withdraw these colours as requested by UK Ministers and the Food Standards Agency in 2008.

The guidance includes technical details to provide businesses with more information about alternative colours that may be appropriate for their products. The guidance was commissioned by the Food Standards Agency in Scotland and produced by Campden BRI.

Food Ingredients First Sep 16 2011 ---
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Dietary Supplements Could Make Athletes Unwitting Drugs Cheats

Minute levels of banned substances in some dietary supplements are leaving athletes susceptible to failed drugs tests according to Loughborough University Professor of Sport and Exercise Nutrition Ron Maughan, who chairs the Sports Nutrition Group of the International Olympic Committee Medical Commission. He has warned of the dangers of commercially available supplements which could turn athletes into unwitting drugs cheats.

He said: "It is now well established that many dietary supplements contain compounds that can cause an athlete to fail a doping test. In some cases the presence of these compounds is not declared on the product label. For some prohibited substances, the amount that will trigger a positive test is vanishingly small and may not be detected by routine analysis of the supplement."
Professor Maughan has raised particular concerns about the presence of the steroid nandrolone (and its metabolic precursors) which are banned by the World Anti-Doping Agency (WADA). Maughan and his team investigated athlete responses to trace amounts of a nandrolone precursor (19-norandrostenedione) where subjects ingested either water or a commercial sports bar contaminated with minute levels of the banned substance. Despite contamination levels 1,000 times lower than concentrations typically scanned for during supplement manufacture, volunteers' samples still registered a positive doping result for nandrolone.

Professor Maughan added "The potential for such low levels of contamination in a sports supplement to result in adverse test results raises significant concerns for the manufacture of dietary supplements intended for consumption by athletes liable to regular doping tests. It presents a serious dilemma for sports supplement manufacturers, athletes, and those responsible for the welfare of athletes."
Science Daily (Sep. 19, 2011) —
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