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Protein Foods & Nutrition Development Association of India

Editorial

Although everyone talks about how education is important, it still remains neglected. Even the government talks about strengthening education but does very little. Even in the latest budget it has allocated less than one percent of total spending earmarked for education. It talks about Right To Education (RTE) and ICDS programme and many other things but the real efforts to support education are lacking. The higher education is lacking in funds and support even more severely.

The government is starting national institutions spending a lot of money in order to meet the challenges of modern day needs. This is necessary and should be encouraged but government should not starve the already existing ones of funds or encouragement. Most of the programmes especially having food and nutrition emphasis have shortages of funds. The facilities provided to students in terms of laboratory and library are pathetic. These institutions should get adequate funding and should be encouraged to excel along with the top ones in the field.

There is shortage of teachers in all levels of education has been acknowledged but very little efforts are carried out. There should be special programmes to train the teachers. Teaching material should also be made available to them. Books and journals are lacking not only in quantity but most books are old editions. Both books are journals have become very expensive so colleges tend to avoid buying foreign publications.

There was a story about one professor from a western university visited some Chinese universities and discussing with one of the professors in a remote university he assumed that their library would not have good expensive journals. He was shocked to learn that they had copies of them. He was told that the government provides them copies of all important journals. We may not expect this kind of encouragement from the government but at least a much



better support could be extended. Just declaring some planned expenditure in budget is not enough.

Industry also must encourage not only by holding campus interviews and picking the best students but they should also help during the semester. There could be research support, scholarships and awards, funding for buying equipment, access to industry library and laboratory facilities for students to use are some of the things in which they could help. Their scientists could also spend some time giving talks on some specialised topics. There are also instances where industry has funded teaching positions by instituting chair in the college.

Many past students do go to their alma mater and teach and help in many other ways but there should be industry efforts as part of CSR that would have the management support. Many food departments in the US universities have started programmes with the help of food industry. This may be either from purely altruistic angle or also in mutually beneficial way. Some of the centres for advanced research and development have been established so they would take up projects sponsored by the industry. This helps industry as well as university. There have been similar thoughts expressed earlier in this place but this subject is so important it cannot be overemphasised.

With season's greetings,

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

5th International Congress FSFB 2012

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Coming Events

REPORT ON THE WORKSHOP ON MATERNAL & YOUNG CHILD NUTRITION

(Report prepared by Dr. G.M. Tewari, Rapporteur & Mr. Kiran Desai, Mead Johnson)

No moments in life are more precious and have more specific nutritional needs as pregnancy and young child age. Assuring the nutritional requirements, providing adequate dietary management and ensuring appropriate regulations are put in place are indispensable to provide the best start in life for both mother and child. Against this background a workshop was organized between scientific experts focusing on both the Indian and global perspective. This highly successful workshop was organized on April 23, 2012 at Hotel Lalit Ashok, Bangalore.

In this manuscript the different angles as presented by the scientific speakers at a workshop recently organized in Bangalore will be reviewed.

Welcome address

Dr. Sanjog Surve in his welcome note discussed the importance of nutrition. He pointed out the poor knowledge transfer between the scientific community and common man in India, He said that despite our scientific capability we do not embrace science in the walk of life, especially nutrition. He also added that the industry has a major role to play in driving consumer trend towards judicious nutrition.

He suggested following points of action:

- 1. The government need to encourage and support new ideas;
- 2. Scientific community should enable the government with decisive end to end recommendations;
- 3. Industry should consider local taste and food habits while delivering nutritious food.

Dr. Peter van Dael in his welcome note, highlighted three key elements – importance of infant and young child nutrition, rapidly changing regulatory environment around the world in order to catch up with the new science, and the globalization challenges in terms of products availability and media coverage. He also stressed the importance of effective interaction among various stakeholders including government, scientific community and industry in shaping regulatory framework, and suggested that such discussions must always be led by facts rather than by emotions.

Dr. Prakash highlighted the role of doctors in bringing about the trend of positive and healthy lifestyle in the society. He discussed the importance of incorporating health and wellness agenda in government policies, and cited example of representation to the government for including nutrition security alongside food security in India. He also highlighted the importance of self regulation and urged on the industry engagement while developing regulations.

Energy and Protein Requirements During Early Life

Prof. K. Tontisirin (Mahidole University, Bangkok, Thailand)

Energy and protein intake during early life is critical for adequate growth and development. The energy and protein requirements for pregnant and lactating women, healthy infants and young children, as recently reviewed by FAO/WHO, were discussed. Principles for energy and protein requirements as well as the specific needs were highlighted. Similarly the energy and protein requirements were detailed for both breast- and formula-fed infants. The scientific rationales for the 1985 and the 2004 FAO/WHO reports were discussed and the importance of applying the lower protein and energy needs to infant nutrition were highlighted. Child malnutrition and approaches towards tackling child malnutrition were being reviewed. Finally key aspects to improve food, nutrition and health were detailed: food security is critical and requires food and nutrition education with a food culture approach. This involves interaction between all critical stakeholders, namely the scientific community, regulatory authorities and industry.

Developmental Requirements for Protein during Pregnancy

Prof. A. Kurpad (St John's Medical College, Bangalore, India)

Energy and protein requirements are particularly important as protein is the key building block for fetal growth. The scientific principles and conclusions of the 2004 FAO/WHO report were documented and reviewed against the actual data, with particular focus on India. Applying the 2004 FAO/WHO protein and energy recommendations is important to ensure adequate fetal growth. Finally,

reflections were shared on how to best reduce low-birth-weight incidence, which was concluded as not manageable with single nutrients, such as increased protein intake, only.

Answering a question from participant on nutrition during pregnancy, Dr. Kurpad stressed that the balanced diet with adequate protein supply, rather than amino acid profile must drive dietary choices among pregnant women. He indicated that the exact protein requirement in pregnant women in order to ensure that the babies are neither underweight nor overweight is still not clear and may require a generation for that to get sorted out.

Maternal and Young Child Nutrition- Perspectives in Reference to RDA for Indians

Dr. B. Sesikeran (National Institute of Nutrition, Hyderabad, India)

The burden of malnutrition in India was documented. Specific data for micronutrient deficiencies (i.e., iron, zinc, vitamin A, vitamin D, vitamin B_{12}) as well as their management through community based programs were reviewed. The role of lipids, and in particular long-chain polyunsaturated fatty acids, for development during infancy was discussed. Finally specific data for human milk lipid composition as well as lipid intake in India were being reviewed, indicating the levels vary largely and can be optimized.

From 2010 RDA recommendations it is noted that requirements of iron are lower than what was recommended in the RDA in 1989. This is based on the studies in last few years indicating that the extent of bioavailability of iron in the diet is more that what was presumed. Also it is observed that in presence of vitamin C the iron requirement is slightly lower.

Further he discussed 3 studies which show that as the child's age advances there is progressive depletion of zinc. Zinc status from birth up to 9 months of full term, pre term and formula fed babies is almost similar. At 9 months of age formula fed babies get lower zinc than those who are breast fed both who are full term and pre term. Hence there is need to address the zinc levels in the formula.

He also highlighted that Zinc intake in children of age group 15 to 18 months are much lower than RDA. Zinc deficiency is an issue and need to be addressed in the regulations. He pointed out that in the regulations zinc is considered as contaminant rather than a nutrient.

NNMB data show that there is no significant improvement in macronutrient deficiency since 1970. Likelihood of replacing the micronutrient deficiency through natural sources is less. The foods need to be fortified to address this issue.

Also adequate nutrients are required to be provided to adolescent girls to address the concern of low birth weight babies.

He also discussed the importance of DHA and ARA for infants and young children.

Answering a question whether nutrient requirements in Indian standards must be expressed per 100 kcal rather than per 100 g, Dr. Sesikeran mentioned that for easy understanding of manufacturers and regulators the requirements are expressed per 100g; and that labelling may carry nutrient contents expressed as both per 100 g as well as per 100 kcal. Addressing another question from audience regarding the use of Iron EDTA, which has higher bioavailability, as the source of iron in infant nutrition products, he said that it may require submission of more data on safety for review by the scientific panel.

Indian Regulatory Standards for Infant Formulas in View of Evolving Science

Dr. V. Sattigeri (Central Food Technological Research Institute, Mysore, India)

Dr. Sattigeri gave an overview of regulatory standards governing infant nutrition products in India. He discussed that the regulations under Food safety & Standards Act, 2006 give definitions of infant nutrition products and lay down compositional, microbiological and quality requirements.

He compared Codex standard for infant formula (Codex STAN 72-1981) with the Indian standards under Food Safety and Standards Regulations (FSSR) and pointed out some major differences. He pointed that the FSSR requires min 12% milk fat in infant formula, where as such a limit is not set in codex; that Codex specifies a range for linoleic to alpha linolenic acid ratio where as FSSR does not. Precooked and gelatinized starches are allowed to an extent of 30% of total carbohydrates in codex. He then highlighted the differences in compositional requirements set out by both Codex and FSSR. He pointed that along with minimum requirements, Codex also specifies maximum (or GUL) limits for vitamins and minerals. Minimum iron requirement specified in FSSR is more than double than that given in Codex. Minimum requirements for Copper and Manganese specified in FSSR are much higher than those specified in the Codex. Iodine requirement as per FSSR is much lower than that of Codex requirements. Based on these observations, Dr. Sattigeri suggested that the minimum requirements of these minerals must be revised to ensure adequate nutrition in Infants. He also suggested that the Chromium and Molybdenum levels and sources may be specified in the revised standard on Infant formula.

Dr. Sattigeri emphasized on the differences in the absorption of milk fat and vegetable fats in infants, and pointed that vegetable oils with predominantly unsaturated fatty acids are absorbed more completely than milk fat. He pointed that it is not only the fatty acid composition but the arrangement of fatty acids on glycerol molecule that is important in digestion and absorption.

He suggested that nutrient declaration per 100 kcal is more apt from physiological point of view. He recommended that the long chain polyunsaturated fatty acids such as DHA and ARA must be allowed at the levels specified in Codex. He recommended that the list of

Food additives and sources of micronutrients may be adapted from codex. He also pointed that the revised standard must contain a provision for the addition of precooked/ gelatinized starch at level not exceeding 30% of total carbohydrates.

Answering a question from participant, Dr. Sattigeri repeated his suggestion that the Iron requirement in Indian standard for infant formula must be revised in line with the revised codex standard. He explained that the codex had revised Iron requirement from 1 mg to 0.45 mg per 100 kcal based on 2005 recommendations of ESPGHAN who had analyzed infant's actual requirement of iron before 6 months age. He also mentioned that folic acid content must be increased from current 20 mcg to 50 mcg per 100 g to match requirements as per codex standard. In totality he suggested that the iron requirement must be reduced and folic acid requirement increased to match codex specifications which are based on risk assessment studies. He concluded suggesting that the regulations must be dynamic to keep pace with the latest developments in nutrition science.

Addressing a question on Zinc contents in Infant formula, Mr. Nair said that the zinc requirement must be revised based on Indian RDA values, and that the current requirements are indicated from the 'contaminant' point of view.

Mr. Shrinivas Bhat suggested that the Ca:P ratio given in FSSR for preterm formula must be revised, and suggested to provide a range from 1.2 to 2 instead of just one ratio as given in current standard.

Dietary Management of Medical Conditions in Infancy-Indian Scenario

Dr. B. Raju (Chennai):

Infants with specific nutritional needs such as preterm infants, infants with allergic manifestations, infants with inborn errors of metabolism or malabsorption syndromes, have special dietary needs, different from those of normal healthy infants, in order to support normal growth and development.

Each of the specific medical conditions, dietary specificity of the medical conditions as well as ways for their dietary management was reviewed. These formulas for special medical purposes are critical and indispensable for the dietary management of infants with specific disorders. An overview of specially designed formulas for the dietary management of these disorders was been presented. At present these formulas are not available in India as there is not specific regulation that enables these special formulas to be registered and commercialized in India. A clear request for making these formulas available to the health-care community and the infants that are at need in India was launched.

Dr. B. Raju started his discussion highlighting that the children in India currently are not getting adequate food and nutrition. He pointed that cow milk protein allergy (CMPA), mal-absorption and metabolic disorders are specific conditions in infants and young children, where adequate diet and right nutrition can make a huge difference. He pointed that protein allergy which was considered uncommon in India has become a common occurrence in recent years. He brought out the differences between cow and human milk protein and pointed that β -lactoglobulin is the worst offender in infant nutrition. He indicated that the incidence of cow milk protein allergy (CMPA) in India is 0.5 – 1%, and that most of the affected young children tend to overcome the associated GI symptoms by the age of 4 years. He stressed that early introduction of cow milk to infants is one of the major risk factors for developing allergy. Inadequate breastfeeding and early introduction to solid foods are other major factors.

He discussed the commonly used feeding alternatives for infants with CMPA in India that include legume based foods, yoghurt and soy based formulas; and suggested that ideally hypoallergenic foods must be given. He pointed that the enzymatic hydrolysis is the most efficient way to produce hypoallergenic formula for infants with CMPA.

He discussed AAP recommendations on dietary management on CMPA which includes avoidance of soy formula; and preference to extensively hydrolyzed formula over partially hydrolyzed formula.

He pointed that the formulas developed specifically for dietary management of infants with CMPA, which includes some of the brands of global reputation are unfortunately not available in India, and that the pediatricians have to rely on soy based formulas as there are no alternatives. He said this is a wrong approach, as infants with CMPA are generally allergic to soy protein as well.

He discussed additional nutrient requirements in preterm infants to achieve 'catch up' growth and pointed that mothers milk of preterm infant can provide adequate 'extra' nutrients only for first 10 days, but later it reverts to composition similar to mother's milk of term infants. Hence supplementation becomes necessary to ensure adequate catch up growth. He mentioned that the exclusive preterm formula feeding can not be recommended as mother's milk carries many other advantages. He pointed that the formulas and human milk fortifiers available in Indian market are fairly primitive.

In conclusion he urged that the regulations must make provisions to bring life saving high quality formulas to India.

Answering a question on unavailability of FSMP in India, he said that he can't find a justifiable answer for that and said that it is very difficult to meet the needs of such infants with disorders. Dr. Sesikeran clarified that so far these products were caught in between drug regulations and food regulations and assured that a category would be formed under new regulations to regulate distribution and sale of such products.

Mr. Srinivas Bhat commented on the issue highlighting two major hurdles - that the Indian standards for infant nutrition products are not aligned to the global standards; and second, that the mandatory BIS certification required for infant nutrition products, which

specifies the use of certain outdated testing methods that may not be practically possible. He opined that the affordability is certainly not an issue.

Meeting Dietary Needs of Infants: Scientific and Regulatory Insights

Prof. Dr. B. Koletzko (Munich, Germany):

Infants during the first month of life are solely dependent on a single food source, ideally breastfeeding as defined by WHO. WHO recommends exclusive breastfeeding for at least 6 months, but if breastfeeding is not possible supports a nutritionally adequate breast milk substitute as alternative. Provisions for breast milk substitutes or infant formula have been defined by regulatory authorities as well as by Codex Alimentarius, the UN FAO/WHO body established to elaborate global standards for safe and nutritious foods as well as to promote/ensure free trade. Regulatory standards, in general, and for infant nutrition in particular, are to be aligned with the latest scientific findings in order to assure the highest nutritional and safety standards for infants and young children. Against this background an international expert group assisted the elaboration of the revised Codex infant formula standard (Codex STAN 72-1981).

The compositional criteria of infant formula meet the nutritional needs of healthy infants. However, some infants suffering from specific metabolic or functional disorders require special nutritional needs in order to comply with their medical conditions. For these infants, the infant formulas have to be specifically adapted to meet their special dietary requirements. These formulas are called formulas for medical purposes and generally are different in composition from normal infant formulas for some specific nutrients.

Examples of special medical conditions, such as phenylketonuria, galactosemia or severe cow milk protein allergy, and the simple, efficient way how infants with these medical disorders can be effectively managed through dietary intervention have been reviewed. Adequate management enables these infants to develop normally, whereas inadequate management, using normal infant formulas, can lead to irreversible damage or even in some case to death. The availability of a regulatory framework such as established by Codex Alimentarius or European Commission is indispensable to provide these dietary management options to all infants and assure that all infants, even those with medical disorders, have access to normal development and growth.

Prof. Koletzko started his discussion stressing that feeding in Infancy is more important than at any other stage of life. He pointed that there is evidence to support that early nutrition modifies the risk of later development of non-communicable diseases such as obesity, diabetes etc. He mentioned, though breast milk is the best possible source of nutrition for infants, it is very important to have high quality infant formula, as the volumes of infant formula consumed are significantly high because there are instances when infants cannot be or should not be breast fed, wherein the use of unmodified animal milk must be discouraged.

He pointed that providing cow milk in first year of life must be avoided as it leads to inadequate nutrition and may aggravate iron deficiency, hence should be avoided. He suggested high protein intakes in infancy may lead not only to increased weight gain but also long term obesity. He reiterated WHO statement that those infants who are not fully breast fed must receive high quality breast milk substitutes.

He discussed the evolution of infant formula through 19th and 20th century and pointed that pediatric nutrition science has evolved from 'more is better' notion to 'balanced intakes' strategies.

He discussed how ω -6 and ω -3 fatty acids compete for same enzyme system in their metabolism and pointed that too much Linoleic acid may adversely impact DHA incorporation in infants, which have untoward effects in eye and brain development.

He cited a randomized study that indicated iron supplementation in iron sufficient infants resulted in significantly lower length gain in them. He also pointed that feeding infants protein at levels found in human milk helped to maintain low BMI, whereas higher protein consumption in the first year of life resulted in significantly high BMI even at the age of 6. He stressed that 'more is not better' and that adequate and balanced nutrition should be the focus. He cited the example of Codex adapting ESPGHAN recommendations for revising infant formula standard, where maximum limits were laid down on many nutrients, not present in older recommendations.

He discussed the codex standard on infant formula which has two sections: one for regular infant formula and the other for formulas for special medical purposes (FSMP). He reiterated that FSMP are required for the dietary management of specific disorders such as inborn errors of metabolism, abnormal GI function and allergies.

Prof. Koletzko highlighted the importance of FSMP in dietary management on infants with disorders through some examples: he discussed a couple of examples of children with phenylketonuria (PKU), a metabolic disorder; and described the dietary management of such children that involves severe restriction on Phenylalanine (Phe) intakes together with monitoring its plasma levels. Such infants could be partially breastfed and given a FSMP that provides all essential amino acids, generous amounts of Tyrosine and absolutely no Phenylalanine. The result was completely healthy and normal children. He mentioned that early diagnosis and proper dietary management of phynylketonuria that would enable an individual to grow as a healthy child and be a productive member of society is the most worthwhile investment in healthcare.

He also discussed an example of an infant with galactosemia, who was treated to a normal healthy infant by using lactose free infant formula, excluding breastfeeding and regular infant formula from the diet. In another example he showed how an infant with persistant diarrhea was cured by giving low lactose formula.

He stressed the effect of malnutrition on IQ of children, and hence their productivity and wealth creation ability later in life and suggested that investment in adequate nutrition is critical for any society. He discussed the importance of using a nutrient dense special formulation for malnourished infants. He stressed the importance of using specific formulations to different age groups, especially in infancy. He also discussed the importance of hypoallegenic FSMP in treating CMPA by giving example of an infant allergic to external proteins in her mother's diet which transferred in small amounts into her breastmilk. The baby was cured by exclusive feeding of a hypoallergenic formula based on extensively hydrolysed protein. He suggested that the soy formula intake as an alternative in infants with CMPA must be avoided at least during early infancy.

In the end, he discussed the features of FSMP and stressed on their proper usage.

He concluded saying that breastfeeding must be actively promoted, that high quality infant formula based latest scientific developments must be made available to infants which are not fully beastfed, that infants with certain disorders who don't do well with breastfeeding/ regular infant formula must be made available FSMPs which are specifically designed for such disorders.

Overview of Global Regulations for Formulas for Special Medical Purposes (FSMP)

Dr. Peter Van Dael (Mead Johnson Nutrition, Evansville, Indiana, USA)

Infant nutrition regulations are put in place to assure safe and nutritious infant foods that meet the nutritional needs during early life as sole source of nutrition or as complementary food. Regulations are to be updated as needed to ensure new scientific findings are taking into consideration so that state of art nutrition and safety is provided to all infants. Infant formulas for special medical purposes are indispensable for the dietary management of infants with special medical disorders and require appropriate regulatory provisions. The revised Codex Alimentarius standard for infant formulas (Codex STAN 72-1981) laid down a specific section for these special formulas. The key principles of this standard are that the composition of these formulas should be based on scientific principles that support the needs of infants with special medical disorders. Additionally these formulas require special labeling conditions as well as to be used under medical supervision.

The regulatory provisions laid down by Codex Alimentarius, are similar to those defined in the USA, the European Union as well as Australia and New Zealand. The availability of regulatory provisions has been a key driver for the availability and the development of formulas for special medical purposes in both USA and European Union Member States. These regulations can be used as a reference to implement locally a regulatory standard for FSMP.

Absence of a regulatory framework has also been an obstacle to make these formulas available in India. It is was recognized and agreed that a regulatory provision for FSMP is required urgently in India, that it is desirable to use the Codex Alimentarius standard as a reference for India and that the learning from US or European Union can guide the implementation of FSMP in India.

Peter van Dael pointed that the regulations can generate trust only when science is adapted and adopted in them. It's a 360 degree effort – regulatory authorities, scientific bodies and manufacturers must work together to generate trust among consumers. He stressed that the risk assessment and risk management are two key elements of regulations, and it is very important to generate consensus among stakeholders.

He highlighted that the infants with specific medical conditions need formulas for special medical purposes (FSMP) addressing those specific disorders. For example, infants with inborn errors of metabolism must be given certain specific formulas containing protein equivalents.

He suggested that the regulatory framework must be evolved to cover these FSMP. He pointed that globally, regulations provide compositional flexibility to address the specific disorders and meet the specific nutritional requirements in infants with certain disorders, with a condition that the nutritional adequacy and safety must be scientifically demonstrated. He mentioned that the Codex standard has a separate section that deals with FSMP; US have a separate section on 'exempt formulas' in the Infant Formula Act that covers FSMP; and In the EU, FSMP directive regulates these products.

Discussing the procedures followed to place a FSMP in the market, he described that the US have a system wherein a petition is submitted by the manufacturer citing the rationale along with the supporting studies for assessment, the US FDA website maintains a list of such approved exempt formulas in the market; in EU, the manufacturer is required to notify the competent authority of the member state that gives the scientific opinion on the product. He said a similar system is in place in Australia - New Zealand as well.

In conclusion, he stressed the need to have compositional flexibility and specific labelling requirements incorporated into the FSMP regulations.

Answering a question on non-availability of FSMP in India, he pointed that marketing of such life saving products is rewarding for any infant nutrition company, and said that the regulations must allow room for development of such products and that enforcing authority must clearly understand the rationale behind such products.

Answering a question on the requirement of milk fat in infant formula, he pointed that there is no nutritional basis for adding milk fat in infant formula and that there should not be any regulatory requirement on min content of milk fat in infant formula.

Panel Discussion:

Dr. Shenaz Vazir emphasized the practice of exclusive breastfeeding, its advantages on cognitive and socio-emotional developments and suggested that the healthcare system and family must educate and support new mothers on breastfeeding. She discussed the importance of adequate complementary feeding on growth and development and stressed on holistic approach to nutrition.

Dr. Jamuna Prakash highlighted the importance of hygiene and sanitation along with adequate nutrition, and discussed the importance of awareness, education and making available the nutritional advice to every section of the society.

Dr. Appu Rao discussed the importance of having regulatory aspects in place so that India may not lag behind in providing adequate nutrition. He called for effective and focused delivery systems in ICDS for micronutrient supplementation for mothers and young children. He stressed the importance regulatory provisions allowing FSMP into India and being used effectively. He pointed that the micronutrient supplementation must be based on food based approach.

Dr. Peter van Dael stressed the importance of research in nutrition science conducted in different parts of the world, especially the backward countries. He discussed the importance of creating nutritional education and awareness among children. He suggested that regulations may be evolved effectively through interactions among individuals who may have different opinions. He discussed the importance of having implementable regulations in place, and the necessity to put emerging conclusive science into regulations. He stressed the importance of de-connecting relevant from non-relevant and minor discussions in shaping regulations. He also discussed the need to focus and un-focus on the research areas.

Dr. Anura Krupad highlighted the lack of clarity on feeding requirements during pregnancy in terms of protein and other micronutrient requirements. He agreed with the comment from Prof. Koletzko that the protein requirements in current Indian regulations are higher than the recommended P/E ratio for that age group. He discussed that some economic assistance may be planned for people who cannot afford life saving FSMP products. He pointed the importance of targeted entitlements for social welfare.

Dr. Anuja Agarwala said that the life saving FSMP products must be made available in India. She stressed the need of education and awareness to promote child health.

Dr. Sasidhar Rao recommended that the FSSAI must look into the legislation to make FSMP products available in India to address the pediatrician's concerns. He suggested that the industry and institutions in India must come up with products necessary for the country, which are based on the materials available in the country.

Dr. Vongsvat pointed the missing link between translating research into practice at the grassroots level. She reiterated the importance of public awareness of maternal and young child nutrition and brought out its impact on national economy and human well being.

Dr. Pai stressed the importance of encouraging nutrition awareness programs through media.

Dr. RBN Prasad highlighted the importance of speedy clearance of industry submissions and urged for the quicker conversion of recommendations into regulations by the FSSAI.

Dr. Prakash suggested that Codex must take into consideration local knowledge and practices especially from East, while formulating guidelines and standards. While answering a question on Public Private Partnerships he stressed the importance of collaborating with the NGOs, academic and R&D bodies, and most importantly industry; and pointed that authorities are working with the industry like never before.

Research in Nutrition & Health

Keep Your Fruit Close and Your Vegetables Closer

Science Daily (Apr. 30, 2012) — College students wishing to eat healthier may want to invest in a clear fruit bowl says a recent article published in the *Environment and Behavior*. The new study found that when fruits and vegetables are within arm's reach, students are more likely to eat them. Furthermore, making fruit and vegetables more visible increases the intake of fruit, but the same does not hold true for vegetables.

Researchers Gregory J. Privitera and Heather E. Creary tested a total of 96 college students by placing apple slices and carrot cuts in either clear or opaque bowls at a table close to the participants or at a table two meters away. Participants watched as the food was taken out of its packaging and were told that they were welcome to eat it.

After leaving the students alone with the food for ten minutes, the researchers found that when apples and carrots were left close to the participants, those healthy foods were more likely to be eaten. Interestingly, making the food more visible to participants by placing them in clear bowls increased the intake of the apples but not the carrots. The researchers explained that this might be due to the fact that fruit is sweeter and may induce more motivation to eat than bitter-tasting vegetables.

"Apples, but not carrots, have sugar, which is known to stimulate brain reward regions that induce a 'wanting' for foods that contain sugar," the authors wrote. "Hence, apple slices may be more visually appealing than carrots."

Privitera and Creary also offered suggestions for the structure of dining and café settings on college campuses.

"Many dining facilities on college campuses are structured in a buffet," the researchers wrote. "Placing foods in locations that are more proximate (closest to seating area or entrance) and visible (in open containers at the front or easiest to reach locations in the buffet) could increase intake of these foods among college students."

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Regular Chocolate Eaters Have Thinner Waistlines

March 27, 2012 Food Product Design

SAN DIEGO—Chocolate lovers rejoice. Adults who eat chocolate on a regular basis are actually thinner compared to those who don't indulge in the tasty treat, according to a new study published in the *Archives of Internal Medicine*. The latest findings add to the growing body of research touting chocolate's positive effect on the heart, brain, digestion, eyes and more.

Researchers at the University of California, San Diego conducted a study to examine whether the metabolic benefits of eating modest amounts of chocolate might lead to reduced fat deposition per calorie and offset the added calories. They examined data from 1,018 men and woman without known cardiovascular disease, diabetes or extremes of low-density lipoprotein cholesterol (LDL-C) levels who were screened for participation in a clinical study examining non-cardiac effects of statins.

They found that adults who ate chocolate on more days a week had a lower body mass index than those who ate chocolate less often. The size of the effect was modest but the effect was "significant." This was despite the fact that those who ate chocolate more often did not eat fewer calories (they ate more), nor did they exercise more. No differences in behaviors were identified that might explain the finding as a difference in calories taken in versus calories expended.

"Our findings appear to add to a body of information suggesting that the composition of calories, not just the number of them, matters for determining their ultimate impact on weight," the researcher said. "In the case of chocolate, this is good news—both for those who have a regular chocolate habit, and those who may wish to start one."

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Nutrient-Rich Mangos May Fight Off Breast Cancer April 24, 2012 Food Product Design

SAN DIEGO—Individuals who regularly eat mangos have a better overall diet rich in fiber, vitamins and minerals compared to nonmango consumers, according to new research presented at the Experimental Biology 2012 annual meeting. The findings also suggest the phytochemicals found in mangos may have an effect on breast cancer cell proliferation.

In the first study, researchers compared the diets of more than 13,000 individuals participating in the National Health and Nutrition Examination Survey (NHANES) between 2001 and 2008 to the Healthy Eating Index (HEI), a quantitative measure of diet quality relative to federal dietary guidance. They found that those that regularly ate mangos scored higher on the HEI than those that did not. Compared to non-mango consumers, mango consumers had, on average, significantly increased intake of vitamin C, magnesium, potassium and dietary fiber, while having lower intake of sodium and total fat. Adults who added mangos to their diets also had lower average body weight and lower levels of C-reactive protein levels.

Results of a second study revealed a polyphenolic compound found in Keitt mangos may be toxic to breast cancer cells. The study, done in vitro and in mice, found decreased proliferation of breast cancer cells treated with the polyphenolic extract, and reduced tumor size and weight in mice.

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Foods Fortified With Fiber Boost Bone, Digestive Health

April 23, 2012 Food Product Design

SAN DIEGO—Fiber intake among the global population is approximately half the daily recommended amount, which can adversely impact heart health, digestion and calcium absorption in the bones. However, adding fibers to foods is a realistic and simple way to address a growing health concern, according to three new studies presented at the Experimental Biology 2012 annual meeting.

The studies on PROMITOR™ Soluble Corn Fiber and STA-LITE® Polydextrose were supported by Tate & Lyle.

The first study evaluated the effect of soluble corn fiber on dietary calcium absorption and retention in adolescents. In a double-blind, randomized-controlled, cross-over study, female and male subjects consumed a daily diet including 600mg of calcium with either 0g or 12g of soluble corn fiber. They found when the subjects consumed soluble corn fiber, calcium absorption increased by 12% compared to the control, but there was no overall effect on calcium balance.

Results of the second study found soluble corn fiber and polydextrose provided gut health benefits. A randomized control trial of 36 adults looked at gut fermentation of two types of fiber: polydextrose and soluble corn fiber, and found that both fiber types increased fermentation in the gut and were well-tolerated by the subjects.

Results of the third study found soluble corn fiber is well-tolerated at and above recommended daily intake levels. A randomized controlled crossover study of 20 healthy adults examined gut tolerance of soluble corn fiber at daily doses equivalent to and greater than daily recommendations. Current recommended daily intake is 25g to 38g a day; in this study multiple doses of soluble corn fiber were administered as a single bolus dose and spread out in multiple doses throughout the day. Up to a 40g single dose of soluble corn fiber and a 65g daily total were well-tolerated among subjects.

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Mom Was Right: Chewing Food Longer Increases Satiety

April 18, 2012 Food Product Design

AMES, Iowa—New research conducted at Iowa State University validates mom's age-old advice to chew your food slowly—chewing may play a more complex role in the digestion process, impacting nutrient absorption, and feelings of satiety or fullness.

The researchers studied 20 Iowa State students who were given a metronome and told to chew every time it ticked, with half chewing 15 times and the other half 40 times. Researchers monitored the subjects' appetite and took blood samples to study plasma glucose levels and hormones. Those who chewed more ate less.

"When people chewed the pizza 40 times before swallowing, there was a reduction in hunger, preoccupation with food and a desire to eat," they said. "There was an increase in CCK, which is a hormone related to fullness and satiety. And there was a reduction in ghrelin, another hormone that stimulates the brain to increase appetite."

The researchers also found plasma glucose and insulin levels were higher among the subjects who chewed the pizza 40 times.

"And the reason, I think, is that the increased mastication breaks down the food more thoroughly in the mouth, and this really facilitates nutrient absorption," they said. "That means you're getting more glucose and carbohydrates into the blood stream, which requires a larger insulin response to maintain plasma glucose levels."

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Leafy Greens Help Prevent Damage Caused by a Workout, Study Suggests

Science Daily (Apr. 25, 2012) — Researchers have found that antioxidant-rich watercress can alleviate the natural stress put on our body by a workout. And they found that participants with no watercress in their system who ate the leafy vegetable just two hours before high level exercise still experienced the same level of protection.

Though regular moderate exercise is known to be good for us, the increased demand on our bodies can cause damage to our DNA.

According to a new study from scientists at Edinburgh Napier University and the University of Ulster, eating watercress can prevent some of the damage caused by high intensity exercise and help maximise the benefits of a tough workout.

The study findings have now been published in the British Journal of Nutrition.

Study leader Dr Mark Fogarty, from Edinburgh Napier's School of Life, Sport and Social Sciences, said: "Although we are all aware of how good exercise can be for our bodies, pounding the treadmill, lifting weights, or doing high-levels of training can take its toll. The increased demand on the body for energy can create a build-up of free radicals which can damage our DNA.

"What we've found is that consuming a relatively small amount of watercress each day can help raise the levels of important antioxidant vitamins which may help protect our bodies, and allow us to enjoy the rewards of keeping fit. It's an interesting step forward in sports nutrition development and research."

Ten healthy men, aged on average of 23 years, participated in the study. For eight weeks they were given 85 grams of watercress -- a small bag -- and asked to participate in high-level exercise on the treadmill. An eight week study with no watercress consumption was carried out to act as a control.

The scientists also tested whether the protection properties of watercress were affected by the regularity of consumption.

Dr Fogarty said: "We put participants through short bursts of intense exercise and found that those who had not eaten watercress were found to have more DNA damage than those that did not. What was also fascinating is that the effect of eating watercress was not reliant on an accumulative build-up in our bodies. Those that ate the vegetable just two hours before exercise experienced the same benefits as those who had consumed the vegetable for eight weeks."

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Dietary Changes Help Some Children With ADHD

Science Daily (Apr. 24, 2012) — Together with child and adolescent psychiatrists, researchers from the University of Copenhagen have just completed an extensive report which reviews the studies which have been done so far on the significance of diet for children and young people with ADHD. The report shows that there are potential benefits in changing the diets of children with ADHD, but that key knowledge in the area is still lacking.

The comprehensive report covers the scientific literature on the significance of diet for children with ADHD: "Our conclusion is that more research is required in the area. There is a lot to suggest that by changing their diet, it is possible to improve the condition for some ADHD children," says professor in paediatric nutrition Kim Fleischer Michaelsen from the Department of Human Nutrition at the Faculty of Life Sciences, University of Copenhagen, who is heading the study.

Professor Kim Fleischer stresses that more research is needed: "Several of the studies show, for example, that fatty acids from fatty fish moderate the symptoms. Other studies detect no effect. Elimination diets are also promising. These look at whether there is anything in the diet which the children cannot consume without adverse side effects. However, we still lack knowledge about which children with ADHD benefit from dietary changes, how positive the effect is in the long term and what the changes mean for children's health."

The report shows that not all ADHD children benefit from changes to their diet, and that there are still many unknown factors. Tine Houmann, a consultant at the Centre for Child & Adolescent Psychiatry, says:

"There are different types of ADHD, and the disturbance is probably due to both genetic and environmental factors. We know that children with ADHD react very differently to both medication and dietary changes. We therefore need to study which children benefit from dietary changes, and whether we can identify genetic or environmental factors that can predict this."

Bigger studies needed

The experts hope that, by acquiring more knowledge on the subject, it is possible to reduce the use of medication and instead develop special dietary advice for the children: "It is promising that many research results indicate that dietary changes can help some ADHD children. However, it is crucial that bigger studies on dietary changes are conducted on children with ADHD to see how effective this is and how long the benefits last," says Kim Fleischer Michaelsen, while stressing that parents should always seek professional advice before changing their children's diet.

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Vitamin E in Diet Protects Against Many Cancers, Study Suggests

Science Daily (Apr. 23, 2012) — Next time you need to choose between vegetable oil and margarine in that favorite recipe, think about your health and reach for the oil.

While the question of whether vitamin E prevents or promotes cancer has been widely debated in scientific journals and in the news media, scientists at the Center for Cancer Prevention Research, at Rutgers Ernest Mario School of Pharmacy, and the Cancer Institute of New Jersey, believe that two forms of vitamin E -- gamma and delta-tocopherols -- found in soybean, canola and corn oils as well as nuts do prevent colon, lung, breast and prostate cancers.

"There are studies suggesting that vitamin E actually increases the risk of cancer and decreases bone density," says Chung S. Yang, director of the center. "Our message is that the vitamin E form of gamma-tocopherols, the most abundant form of vitamin E in the American diet, and delta-tocopherols, also found in vegetable oils, are beneficial in preventing cancers while the form of vitamin E, alpha- tocopherol, the most commonly used in vitamin E supplements, has no such benefit."

Yang and colleagues, Nanjoo Suh and Ah-Ng Tony Kong, summarized their findings recently in *Cancer Prevention Research*, a journal of the American Association for Cancer Research. In a Commentary, "Does Vitamin E Prevent or Promote Cancer?"

the Rutgers scientists discuss animal studies done at Rutgers as well as human epidemiological studies that have examined the connection between vitamin E and cancer.

Yang says Rutgers scientists conducting animal studies for colon, lung, breast and prostate cancer found that the forms of vitamin E in vegetable oils, gamma and delta-tocopherols, prevent cancer formation and growth in animal models.

"When animals are exposed to cancer-causing substances, the group that was fed these tocopherols in their diet had fewer and smaller tumors," Yang says. "When cancer cells were injected into mice these tocopherols also slowed down the development of tumors."

In researching colon cancer, Yang pointed to another recently published paper in *Cancer Prevention Research* indicating that the delta-tocopherol form of vitamin E was more effective than other forms of vitamin E in suppressing the development of colon cancer in rats.

This is good news for cancer research. Recently, in one of the largest prostate cancer clinical trials in the United States and Canada, scientists found that the most commonly used form of vitamin E supplements, alpha-tocopherol, not only did not prevent prostate cancer, but its use significantly increased the risk of this disease among healthy men.

This is why, Yang says, it is important to distinguish between the different forms of vitamin E and conduct more research on its cancer preventive and other biological effects.

"For people who think that they need to take vitamin E supplements," Yang says, "taking a mixture of vitamin E that resembles what is in our diet would be the most prudent supplement to take."

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Big Doses of Vitamin C May Lower Blood Pressure

Science Daily (Apr. 18, 2012) — Taking large doses of vitamin C may moderately reduce blood pressure, according to an analysis of years of research by Johns Hopkins scientists. But the researchers stopped short of suggesting people load up on supplements.

"Our research suggests a modest blood pressure lowering effect with vitamin C supplementation, but before we can recommend supplements as a treatment for high blood pressure, we really need more research to understand the implications of taking them," says Edgar "Pete" R. Miller III, M.D., Ph.D., an associate professor in the division of general internal medicine at the Johns Hopkins University School of Medicine and leader of the study published in the *American Journal of Clinical Nutrition*.

Roughly 30 percent of adults in the United States have high blood pressure, or hypertension, an important risk factor for heart disease and stroke. Successful treatment may include drugs, exercise, weight loss, and dietary changes such as reducing salt intake. Some experts believe that large amounts of vitamin C, an essential micronutrient found primarily in fruits and vegetables, could lower pressure as well, but randomized, controlled dietary intervention studies -- the gold standard of nutrition research -- have produced mixed results.

Miller and his colleagues reviewed and analyzed data from 29 randomized, controlled, previously published clinical trials that reported systolic and/or diastolic blood pressure values and also compared vitamin C intake to a placebo. What they found is that taking an average of 500 milligrams of vitamin C daily -- about five times the recommended daily requirement -- reduced blood pressure by 3.84 millimeters of mercury in the short term. Among those diagnosed with hypertension, the drop was nearly 5 millimeters of mercury.

By comparison, Miller says, patients who take blood pressure medication such as ACE inhibitors or diuretics (so-called "water pills") can expect a roughly 10 millimeter of mercury reduction in blood pressure.

Five hundred milligrams of vitamin C is the amount in about six cups of orange juice. The recommended daily intake of vitamin C for adults is 90 milligrams.

"Although our review found only a moderate impact on blood pressure, if the entire U.S. population lowered blood pressure by 3 milliliters of mercury, there would be a lot fewer strokes," Miller says. Miller cautions, however, that none of the studies his team reviewed show that vitamin C *directly* prevents or reduces rates of cardiovascular disease, including stroke.

Scientists have focused on vitamin C's potential role in blood pressure reduction because of the nutrient's biological and physiological effects. For example, vitamin C may act as a diuretic, causing the kidneys to remove more sodium and water from the body, which helps to relax the blood vessel walls, thereby lowering blood pressure.

Nutritional supplements are a \$28 billion-a-year industry, and marketing claims, newspaper stories and testimonials often make them hard to resist, Miller says. People often view supplements as a "natural alternative" and preferable to drugs for high blood pressure or other ailments, he adds, despite mounting evidence that many supplements don't work and in some cases may cause harm.

"People love to take vitamins regardless of the evidence or lack of it," Miller says. "We're trying to raise the bar and provide evidencebased guidance about whether supplements help or actually do harm." With respect to vitamin C, he says, the jury is still out.

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Fibre Protects Against Cardiovascular Disease, Especially in Women

Science Daily (Apr. 16, 2012) — Foods high in fibre provide good protection against cardiovascular disease, and the effect is particularly marked in women. The new study, which was recently published in the scientific journal *PLoS One*, involved the study of the eating habits of over 20,000 residents of the Swedish city of Malmö, with a focus on the risk of cardiovascular disease. The importance of 13 different nutrient variables (aspects of fibre, fats, proteins and carbohydrates) was analysed.

"Women who ate a diet high in fibre had an almost 25 per cent lower risk of suffering from cardiovascular disease compared with women who ate a low-fibre diet. In men the effect was less pronounced. However, the results confirmed that a high-fibre diet does at least protect men from stroke," says Peter Wallström, a researcher at Lund University and the primary author of the article.

The exact reason for the difference between the sexes is unclear. However, a probable explanation is that women consume fibre from healthier food sources than men do. Women ate a lot of fibre in the form of fruit and vegetables, whereas the most important source of fibre for men was bread.

"The difference in the results for men and women shows that we need to pay more attention to gender when we conduct research on diet," says Peter Wallström.

However, the researchers did not identify any definite links between the other nutrients in the study and cardiovascular disease, for example the proportion of saturated fat or sugar in the diet.

"These results should be interpreted with a certain amount of caution. Almost everyone eats more saturated fat than recommended, including the participants in many other population studies. It is therefore difficult to compare recommended and high fat intake. Other types of study that have been carried out have shown that those who limit their fat and sugar intake are at lower risk of cardiovascular disease," says Peter Wallström.

Peter Wallström is skeptical of 'extreme' diets and says that the dietary recommendations from the National Food Administration are good, despite having received criticism:

"The National Food Administration's dietary advice, which is based on extensive research, is well balanced. In the short term, most weight-loss diets achieve their aim as long as you follow them. However, we know too little about the long-term effects to be able to recommend more drastic changes to one's diet," says Peter Wallström.

Data for the study has been taken from the Malmö Diet and Cancer population study, which has involved 30,000 Malmö residents since the start of the 1990s. The participants have given blood samples and detailed information about their diet.

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Eating Flavonoids Protects Men Against Parkinson's Disease, Study Finds

Science Daily (Apr. 4, 2012) — Men who eat flavonoid-rich foods such as berries, tea, apples and red wine significantly reduce their risk of developing Parkinson's disease, according to new research by Harvard University and the University of East Anglia.

Published April 4 in the journal *Neurology*®, the findings add to the growing body of evidence that regular consumption of some flavonoids can have a marked effect on human health. Recent studies have shown that these compounds can offer protection against a wide range of diseases including heart disease, hypertension, some cancers and dementia.

This latest study is the first study in humans to show that flavonoids can protect neurons against diseases of the brain such as Parkinson's.

Around 130,000 men and women took part in the research. More than 800 had developed Parkinson's disease within 20 years of follow-up. After a detailed analysis of their diets and adjusting for age and lifestyle, male participants who ate the most flavonoids were shown to be 40 per cent less likely to develop the disease than those who ate the least. No similar link was found for total flavonoid intake in women.

The research was led by Dr Xiang Gao of Harvard School of Public Health in collaboration with Prof Aedin Cassidy of the Department of Nutrition, Norwich Medical School at UEA.

"These exciting findings provide further confirmation that regular consumption of flavonoids can have potential health benefits," said Prof Cassidy.

"This is the first study in humans to look at the associations between the range of flavonoids in the diet and the risk of developing Parkinson's disease and our findings suggest that a sub-class of flavonoids called anthocyanins may have neuroprotective effects."

Prof Gao said: "Interestingly, anthocyanins and berry fruits, which are rich in anthocyanins, seem to be associated with a lower risk of Parkinson's disease in pooled analyses. Participants who consumed one or more portions of berry fruits each week were around 25 per cent less likely to develop Parkinson's disease, relative to those who did not eat berry fruits. Given the other potential health effects of berry fruits, such as lowering risk of hypertension as reported in our previous studies, it is good to regularly add these fruits to your diet."

Flavonoids are a group of naturally occurring, bioactive compunds found in many plant-based foods and drinks. In this study the main protective effect was from higher intake of anthocyanins, which are present in berries and other fruits and vegetables including aubergines, blackcurrants and blackberries. Those who consumed the most anthocyanins had a 24 per cent reduction in risk of developing Parkinson's disease and strawberries and blueberries were the top two sources in the US diet.

The findings must now be confirmed by other large epidemiological studies and clinical trials.

Parkinson's disease is a progressive neurological condition affecting one in 500 people, which equates to 127,000 people in the UK. There are few effective drug therapies available.

Dr Kieran Breen, director of research at Parkinson's UK said: "This study raises lots of interesting questions about how diet may influence our risk of Parkinson's and we welcome any new research that could potentially lead to prevention.

"While these new results look interesting there are still a lot of questions to answer and much more research to do before we really know how important diet might be for people with Parkinson's."

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Racial Differences In Breast Cancer Risk Influenced By Vitamin D

09	Apr	2012	Medical	News	Today
American wom	en of African ancestry are mo	ore likely than Eur	onean America	ns to have estrogen recentor (FR) negative	e breast cancer

American women of African ancestry are more likely than European Americans to have estrogen receptor (ER) negative breast cancer. There continues to be discussion about the role of low levels of vitamin D in the development of breast cancer for these women. New research published in BioMed Central's open access journal *Breast Cancer Research* has shown that specific genetic variations in the vitamin D receptor (VDR) and in CYP24A1 (responsible for deactivating vitamin D) are associated with an increase in breast cancer risk, particularly for ER negative breast cancer, for African American women.

When a team of researchers led by Dr Song Yao and Dr Christine Ambrosone, from Roswell Park Cancer Institute, compared levels of vitamin D in the blood of women with or without breast cancer they found that severe vitamin D deficiency in African American women was almost six times more common than in European American women. However, because low levels of vitamin D can also be caused by disease, or by treatment, the researchers decided to focus their studies on genetic variations in VDR and the enzymes responsible for breaking down vitamin D in the body.

The results showed that African American women with the highest levels of vitamin D also had a specific variation in VDR. Although this variation was present in European Americans, it was not associated with alteration in their levels of vitamin D. African American women with the specific variation associated with the higher levels of vitamin D, had half the risk of breast cancer than the women without it.

When the researchers looked in detail at the patterns of genetic variation for women with ER negative breast cancer, they found that seven SNPs, in the gene coding for CYP24A1, were associated with ER negative breast cancer risk, and that two of these seemed to account for the higher risk of ER negative breast cancer in African American women.

Dr Song Yao explained, "While it is difficult to determine the exact effect of low levels of vitamin D on the risk of developing breast cancer, our results show that these genetic variations, which contribute to the function of vitamin D, are strongly associated with ER negative breast cancer and may contribute to the more aggressive breast cancer features seen in African American women." $\oplus \oplus \oplus$

At Breakfast, Eating Low Glycemic Index Foods Can Control Blood Sugar Throughout The Day

10 Apr 2012 Medical News	Today
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Eating foods at breakfast that have a low glycemic index may help prevent a spike in blood sugar throughout the morning and after the next meal of the day, researchers said at the Institute of Food Technologists' Wellness 12 meeting.

These breakfast foods also can increase feelings of satiety and fullness and may make people less likely to overeat throughout the day, acdcording to presentations Wednesday by Kantha Shelke, Ph.D., principal, Corvus Blue LLC, and Richard Mattes, M.P.H., R.D., distinguished professor of foods and nutrition at Purdue University.

The glycemic index ranks foods on the extent to which they raise blood sugar levels after eating. Foods with a high index are rapidly digested and result in high fluctuations in blood sugar levels. Foods with a low glycemic index produce gradual rises in blood sugar and insulin levels and are considered healthier, especially for people with diabetes.

Mattes' research specifically focused on the advantages of having almonds, a low glycemic index food, with the morning meal. In his study, published last year in the *Journal of Nutrition and Metabolism*, participants who ate a breakfast containing whole almonds experienced longer feelings of fullness and had lower blood glucose concentrations after breakfast and lunch, compared to those who did not have a low-glycemic breakfast.

When a low glycemic food is added to the diet, people spontaneously choose to eat less at other times throughout the day. Mattes added that while the calories need to be taken into consideration as part of a person's overall diet, almonds can be incorporated in moderate amounts without an effect on body weight.

Both Mattes and Shelke stressed the importance of eating a healthy, low-glycemic breakfast in maintaining a healthy weight and blood sugar levels. A 2009 study found that about 30 percent of people skip breakfast one to three times per week. Among those who eat breakfast, cold cereal is the most popular (83 percent), followed by eggs (71 percent). In addition to low glycemic index, Dr. Shelke said the ideal breakfast for consumers has these attributes:

- Savory
- Portable
- Pleasing texture
- Fills you up for extended periods of time
- Satiates quickly so less is consumed
- Affordable for the whole family to eat every day
- Non-fried
- Delicious without making you feeling guilty

"This is a very tall order for food product manufacturers," Shelke said. "It takes a lot of skill and understanding."

While it may present challenges for food manufacturers, it is well worth it to develop these products because of the prevalence of
diabetes and pre-diabetes in the United States and beyond. It is estimated that by 2030, more than 16 percent of the global population
will have a blood sugar problem.

"Most of the risk factors are things that can be managed and modified," Shelke said. "We can reverse pre-diabetes and prevent it from becoming diabetes. Food has become the reason for what's ailing us, but it can actually be a solution in a number of different ways."

Low- and Non-Glycemic Foods that Promote Satiety

- Rolled oats and groats (hulled and crushed grain, usually oats)
- Pulses
- Whole grains
- Nuts and seeds
- Sweet potato
- Barley B-glucan
- Yam flour
- Glucomannan
- Durum pasta
- Vegetable flours
- Chia / flax seed
- Resistant starch

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Simple, Concise Messages About The Benefits Of Phytonutrients Would Help Consumers

10	Apr	2012 Medical	News	Today

An expert	panel	at the	Institute of Food	Techno	logists'	Wellness	12 meeting	urged	the food	indust	ry to	find simp	ole yet powerful
language	to	tell	consumers	about	the	many	benefits	of	а	diet	rich	in	phytonutrients.

Phytonutrients	are plant-l	based comp	onents that are thought to	promote health,	such as beta	carotene and lycopene.	They	are typically
found	in	fruits,	vegetables,	grains,	legumes,	nuts	and	teas.

During the discussion, the panelists noted that phytonutrients are very complex, and care must be taken when promoting their benefits to avoid the image of a "magic bullet." At the same time, consumers can grow weary of constantly changing nutritional recommendations, causing them to feel overwhelmed and possibly decide to forgo healthy eating altogether.

The solution is for the scientific community to agree on appropriate messages and then present those simply and consistently to consumers, said panelist Connie Diekman, M.Ed., RD, LD, FADA, director of university nutrition at Washington University in St. Louis.

"It has to be easy for consumers to make this part of what they do in their diet," Diekman said. "When we question each other, the consumer really gets confused and thinks, 'If scientists can't agree, where does that leave me?""

For example, Diekman noted that dark chocolate contains phytonutrients that can be very beneficial for health. However, the message to consumers must stress that these benefits are limited to dark chocolate - not milk chocolate- and that eating too much of any kind of chocolate can lead to serious health conditions such as obesity.

Diekman suggested promoting "strongly flavored, darkly colored" foods, and taking care to highlight the importance of phytonutrients as part of the whole food. Consumers should be encouraged to choose healthy plant-based foods because of how all the ingredients combine to produce health benefits.

•	Key			Nutrient:			Allicin
	Sources:			Garlic,			Onions
	Benefits: Heart he	ealth; Cancer pre	vention, helps prev	ent increased choleste	erol		
٠	Key	_		Nutrient:			Limonin
	Sources:	Grap	efruits,	Lemons,	Lim	es,	Oranges
	Benefits: Cancer	prevention, helps	prevent increased	cholesterol, lung heal	lth		
٠	Key			Nutrient:			Lutein
	Sources:	Broce	coli,	Spinach,	Kiwifr	uit,	Lettuce
	Benefits: Eye hea	lth					
٠	Key			Nutrient:			Quercetins
	Sources:	Apples,	Broccoli,	Garlic,	Onions,	Pears,	Lettuce
	Benefits: Allergy	inflammation red	luction, lung health	n, cancer prevention			
٠	Key			Nutrient:			Sulforaphane
	Sources:		Broccoli,		Cabbage,		Turnips
	Benefits: Colon ca	ancer prevention					
٠	Key			Nutrient:			Zeaxanthin
	Sources:			Corn,			Spinach
	Benefits: Eye hea	lth					

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An Important Role In Nutrition Played By Beans, Pulses And Legumes

10 Apr 2012 Medical News Today

Beans, pulses and legumes can be classified as either vegetables or proteins under the new USDA dietary guidelines, giving them an important role in a person's daily diet, an expert panel said at the Institute of Food Technologists' Wellness 12 meeting.

The 2010 Dietary Guidelines for Americans, which highlights the messages behind the MyPlate food icon, recommend half a person's plate be vegetables and fruit, the other half grains and protein, and a serving of dairy be included with the meal. In the guidelines, beans, pulses and legumes are permitted to go on either side of the plate, although not both, at each meal. This does not include green beans, which are grouped with other vegetables.

During the panel, Joanne Slavin, PhD., RD, professor at the University of Minnesota and a member of the committee that wrote the guidelines, said beans, pulses and legumes are a good source of protein, fiber and nutrients such as potassium and folate. However, most Americans do not get nearly enough of them in their diets, and when they do report eating beans, the most common form is refried.

"It's an exciting time, with the huge emphasis on plant products as a healthier way to eat," Slavin said. "There are lots of opportunities to increase consumption."

Brian Larson, Ph.D., vice president of research and development for JG Consulting Services, LLC, gave examples of how specialty grain legumes, such as sweet white lupin, pigeon peas and heirloom/heritage beans, could add nutritional value to bakery products and frozen waffles and pancakes, as well as act as a meat substitute, a soup thickening and fortification agent and act as a potato substitute or side dish in frozen entrees.

These specialty grains add protein, resistant carbohydrates and healthy fiber without adding gluten, he said. $\oplus \oplus \oplus$

Compound Found In Red Wine, Fruit Could Help Block Fat Cell Formation

10 Apr 2012 Medical News Today

A compound found in red wine, grapes and other fruits, and similar in structure to resveratrol, is able to block cellular processes that allow fat cells to develop, opening a door to a potential method to control obesity, according to a Purdue University study.

Kee-Hong Kim, an assistant professor of food science, and Jung Yeon Kwon, a graduate student in Kim's laboratory, reported in the *Journal of Biological Chemistry* that the compound piceatannol blocks an immature fat cell's ability to develop and grow.

While similar in structure to resveratrol - the compound found in red wine, grapes and peanuts that is thought to combat cancer, heart disease and neurodegenerative diseases - piceatannol might be an important weapon against obesity. Resveratrol is converted to piceatannol in humans after consumption.

"Piceatannol actually alters the timing of gene expressions, gene functions and insulin action during adipogenesis, the process in which early stage fat cells become mature fat cells," Kim said. "In the presence of piceatannol, you can see delay or complete inhibition of adipogenesis."

Over a period of 10 days or more, immature fat cells, called preadipocytes, go through several stages to become mature fat cells, or adipocytes.

"These precursor cells, even though they have not accumulated lipids, have the potential to become fat cells," Kim said. "We consider that adipogenesis is an important molecular target to delay or prevent fat cell accumulation and, hopefully, body fat mass gain."

Kim found that piceatannol binds to insulin receptors of immature fat cells in the first stage of adipogenesis, blocking insulin's ability to control cell cycles and activate genes that carry out further stages of fat cell formation. Piceatannol essentially blocks the pathways necessary for immature fat cells to mature and grow.

Piceatannol is one of several compounds being studied in Kim's laboratory for its health benefits, and it is also present in different amounts in red grape seeds and skin, blueberries, passion fruit, and other fruits.

Kim would like to confirm his current finding, which is based on a cell culture system, using an animal model of obesity. His future work would also include determining methods for protecting piceatannol from degrading so that concentrations large enough would be available in the bloodstream to stop adipogenesis or body fat gain.

"We need to work on improving the stability and solubility of piceatannol to create a biological effect," Kim said. 參參參

Encouraging Healthy Eating To Avoid Childhood Obesity

20		Apr		20	12 Me	dical			News		Today
Obesity am childhood	ong children eating	has long habits,	been a rising according	problem to	in large new	e parts of the research	world. from	Parents the	play a crucial University	role in of	shaping good Stavanger.
Providing y key	oungsters wit elements	h fruit and for	vegetables, in creating	volving th he	em in b althy	uying and coo eating	oking he ł	ealthy foo abits,	od, and encoura this	ging the study	m to eat it are finds.
But nutritio	nist Elisabeth	Lind Me	lbye at the Un	iversity of	f Stavan	ger, who did	the wor	k, warns	against strict r	ules on	what children
can			or				cani	not			eat.

That can actually make them less healthy, she discovered on looking at what works - and does not work - when parents seek to teach

their offspring	how	to	eat	healthy.
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Increasing

Accordingly to health statistics, the number of young children who are overweight or obese has been rising steadily over the past 30 years.

The proportion in the USA, the UK and southern Europe is almost twice as high as in northern Europe. Nevertheless, roughly one in
eight-year-oldsisoverweightorobese.

At the same time, daily consumption of fruit and vegetables by children in Norway is far below the recommended level - and Melbye views these developments with concern.

She now wants to mobilise parents in the fight against obesity, and her PhD thesis has taken a closer look at the vital part they play in encouraging a positive diet.

Some 800 Norwegian children aged 10-12 and their parents took part in this study, which also tested a broader measurement tool than has been used in earlier work on the issue.

Moreover, Melbye has focused on relatively older children compared with previous research in the USA and France, which looked at youngsters aged from two to eight.

Myths

Her study tackles some of the myths about good strategies for encouraging healthy eating by children, and she sums up the recipe for establishing a good diet as follows.

"The most important thing parents can do is to have healthy food on hand for their child, who should be allowed to help itself to this whenever it wants."

Melbye also maintains that the value of the physical act of preparing food in the home has long been undervalued.

Similarly, parents must ensure that unhealthy food is not available except at parties. In with the fruit bowl, out with the sweet packet, she emphasises.

"In addition to exposing children to healthy food, they ought also to participate in its preparation and in planning meals. Let them cut up vegetables and help in the kitchen".

"And take them with you to the shops. If they're old enough, you can also discuss healthy eating with them and explain why it's good for the body".

Relationship

Inculcating a good relationship with food from an early age is an important lesson Melbye wants to convey. But parents must not be too strict.

While earlier international studies have devoted most attention to parental control of child eating, she has also looked at the way youngsters make their own choices.

"If parents are unreasonably strict and restrictive over diet, their offspring might develop a yearning for unhealthy food. They then eat less of the healthy options.

"That's the paradox - forbidden fruit is tempting. So even when parents encourage a good diet, the child itself must also feel that it has both the opportunity and desire to eat properly".

"As a result, the goal should be to create a sound home environment, where a healthy and varied diet and good experiences with food are the main ingredients".

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Lactic-acid-bacteria Enriched Bread Enhances Health Effects - Study

By Oliver Nieburg, 20-Mar-2012 Food Navigator

Adding lactic acid bacteria to sourdough can improve the nutritional value of white bread without hampering product appeal, according to a study.

The study 'Quality of White Bread Made From Lactic Acid Bacteria-Enriched Dough' Jeng-Leun Mau et al was published in the Journal of Food Processing and Preservation. Researchers added two forms of lactic-acid-bacteria (LAB) during formulation, Lactobacillus delbrueckii subsp. Delbrueckii (LDD) and Pediococcus acidilactici (PA), and observed the effects.

Nutritional profile

The researchers said "LAB can be added to dough to improve flavour and shelf-life, and to increase its variety, nutritional value and product appeal. The present work showed that LAB could be incorporated into bread to provide its beneficial health effects." LAB is commonly used as a probiotic in foods and has been widely documented to boost the immune system in studies such as Perdigón et. al (2001). Researchers in the present study said that the LDD strain was particularly effective in boosting the beneficial health effects of bread.

Impact on characteristics

The study said that the LAB breads were less moist and the LDD bread gave more aroma. Both LAB-enriched doughs produced similar bread volumes to a non-enriched formulation. Flavour was also said to be enhanced. "Although LAB may not survive after baking, the addition of LAB would produce organic acids and flavor compounds, which contribute greatly to flavour," said the study. It continued that LAB could increase shelf life by preventing spoilage moulds and rope forming bacteria.

The downside

The researchers said: "All sensory results exhibited that LAB enriched breads showed better acceptability than white bread except for the appearance and colour." Both LAB enriched breads exhibited different lightness and whiteness to traditional white bread, which could impact customer appeal. The study said that further research was needed to improve appearance and colour attributes to appeal to consumer preferences.

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Smelly foods may help industry fight obesity, say researchers

By Nathan Gray, 21-Mar-2012 Food Navigator

Manipulating foods so that they smell stronger could be a way of helping industry fight obesity by encouraging consumers to take smaller bit sizes, suggests new research.

The study – published in the new peer-reviewed journal Flavour – suggests that altering the aroma of food products can help to control portion sizes. Led by Dr Rene de Wijk of the Top Institute Food and Nutrition, the Netherlands the research team evaluated the effect of food aroma on bite size using a vanilla custard dessert model that was designed to be consumed while different strength cream aromas were delivered to participants' noses. The study results suggest that manipulating the smells of food could result in a 5% to 10% decrease in intake per bite. "Bite size was associated with the aroma presented for that bite and also for subsequent bites," explained de Wijk, noting that there is an unconscious feedback loop which regulates bite size in correlation to the amount of flavour experienced.

The authors said that combining aroma control with portion control could fool the body into thinking it was full with a smaller amount of food – thus aiding weight loss. "These results suggest that bite size control during eating is a highly dynamic process affected by the sensations experienced during the current and previous bites," said the researchers. In addition to helping industry better understand how aroma can affect portion control, the researchers said the results may also explain why we take smaller bites of unfamiliar or disliked foods.

Study details

The research team assessed the effect of aroma on consumption rates by repeatedly delivering different intensities of aroma into the nose of 10 participants. At the same time a pump fed the participants the custard desert. "Our human test subjects were able to control how much dessert was fed to them by pushing a button," said de Wijk.

Over the course of 30 trials the custard was presented randomly either without an aroma, or with aromas presented below or near the detection threshold. de Wijk and his team found that the intensity of aroma affected the size of the corresponding bite – as well as that

of subsequent bites – with higher aroma intensities resulting in significantly smaller 'bite sizes'. "Increasing the aroma intensity reduces the bite size," said the authors, adding that the result fit "into a growing body of literature that suggests that bite size control plays an important role in the self-regulation of food sensations."

Red wine compound can battle obesity: Study

By Nathan Gray, 05-Apr-2012 Nutra Ingredients

A resveratrol-like compound found in red wine and fruits could have potential for fighting obesity by blocking fat uptake, according to new research.

The study reports that piceatannol – a compound that is structurally similar to resveratrol – has been found to block cellular processes that allow fat cells to develop. The researchers, from Purdue University, USA, say that the study could open a new door to potential methods of controlling obesity. Writing in the Journal of Biological Chemistry, Kee-Hong Kim and his colleagues reported that the compound, which is produced as a metabolite of resveratrol – blocks an immature fat cell's ability to develop and grow, in laboratory tests. "Piceatannol actually alters the timing of gene expressions, gene functions and insulin action during adipogenesis, the process in which early stage fat cells become mature fat cells," said Kim. "In the presence of piceatannol, you can see delay or complete inhibition of adipogenesis."

Resveratrol's little brother?

While similar in structure to resveratrol, which is also found in red wine, grapes and peanuts, the two related compounds do seem to have different functions and possible health benefits, noted the authors. They noted that whilst resveratrol is thought to have potential in combating cancer, heart disease and neurodegenerative diseases, piceatannol could play an important role in fighting fat. However, it should be noted that the current study was performed on laboratory cell cultures. A 2006 study showed that when injected into rats, the compound had poor bioavailability and was rapidly broken down.

Study details

The researchers noted that despite the 'well documented' health benefit of resveratrol in intervention of the development of obesity – the role of piceatannol in the development of fat tissue and related diseases "is unknown." The team monitored the development of immature fat cells, called preadipocytes –finding that piceatannol binds to insulin receptors of immature fat cells in the first stage of adipogenesis, blocking insulin's ability to control cell cycles and activate genes that carry out further stages of fat cell formation. "These precursor cells, even though they have not accumulated lipids, have the potential to become fat cells," said Kim.

"We consider that adipogenesis is an important molecular target to delay or prevent fat cell accumulation and, hopefully, body fat mass gain." Kim added that he would like to confirm the current finding, which is based on a cell culture system, using an animal model of obesity, and noted that future work would also include determining ways to protect piceatannol from breaking down in the body. We need to work on improving the stability and solubility of piceatannol to create a biological effect," Kim said.

Sunshine vitamin supplements could boost critically ill survival rates

By Nathan Gray, 04-Apr-2012 Nutra Ingredients

Vitamin D supplementation could help to boost survival rates of critically ill patients in hospital intensive care units, suggest researchers.

The study – published in QJM: An International Journal of Medicine – demonstrates that low vitamin D levels are common among patients admitted to intensive care units. The study found that patients who had a vitamin D deficiency lived an average of 8.9 days less than those who were sufficient in the vitamin – whilst levels of the sunshine vitamin were also found to correlate with levels of disease-fighting white blood cells. As a result, the authors of the new study have now called for further research to assess whether the sunshine vitamin could help improve survival in critically ill hospital patients.

"The rationale behind the current investigation was to see if the higher morbidity and mortality rates attributed to vitamin D deficiency in the general population, and in the elderly population also affected extremely ill patients, with high mortality rates," explained the researchers -who were led by Professor Howard Amital of Tel Aviv University, Israel. "We observed longer survival times among vitamin D sufficient patients," they added. Amital said the results of his study suggest a need for further research into giving patients vitamin D, which could confirm that the vitamin will improve their survival outcomes. "The rationale behind the current investigation was to see if the higher morbidity and mortality rates attributed to vitamin D deficiency in the general population, and in the elderly population also affected extremely ill patients, with high mortality rates," explained the researchers.

Critical vitamin?

To measure the impact of vitamin D levels on the survival of critically ill patients, the researchers designed an observational study. Over the course of six months, 130 patients over the age of 18 admitted to an intensive care unit of a Tel Aviv University-affiliated hospital and requiring mechanical ventilation were admitted to the study. Patients who had taken vitamin D supplements prior to admittance were excluded from the study population. Upon admittance, patients were divided into two groups based on vitamin D concentration: those who had 20 nanograms or more of the vitamin — the amount defined as the National Institute of Health as sufficient — and those who were vitamin D deficient based on the same criteria. In total, 107 patients suffered from vitamin D deficiency.

Survival curves indicate that while patients with sufficient vitamin D survived an average of 24.2 days, those who were deemed to be deficient in vitamin D survived an average of only 15.3 days — meaning patients with sufficient vitamin D levels survived an average of 8.9 days longer. Patients with sufficient vitamin D levels were also found to have a higher white blood cell counts. Amital said the findings 'merit further investigation', adding that the effects of vitamin D supplementation in critically ill patients should be further assessed. "Our results provide important background information to perform larger scale, intervention-based trials of adjunctive vitamin D therapy," said the researchers.

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Soy isoflavones again linked to blood pressure benefits

By Nathan Gray, 30-Mar-2012

Daily consumption products containing soy isoflavones could help to significantly reduce blood pressure across the general population, according to a new study.

The research reports that consumption of the soy compound could lead to as much as a 10 mmHg drop in systolic blood pressure for people with slightly raised blood pressures – known as pre-hypertension. In addition, the study finds for the first time that there is a particular benefit for African American populations – who are known to have a higher risk of raised blood pressure.

The research, presented at the American College of Cardiology's 61st Annual Scientific Session, compared blood pressure levels of people consuming various levels of the soy compound, finding that those who received less than 0.33 mg of isoflavones per day had significantly higher blood pressure levels than those with the highest isoflavone intake (of more than 2.5 mg per day).

"What's unique about this study is that the results are very applicable to the general population. Our results strongly suggest a blood pressure benefit for moderate amounts of dietary isoflavone intake in young black and white adults," said Safiya Richardson, of Columbia University's College of Physicians and Surgeons, USA, who lead the study. "Our study is [also] the first to show a benefit in African Americans, who have a higher incidence of high blood pressure, with an earlier onset and more severe end-organ damage."

"This could mean that consuming soy protein ... could lead to as much as a 10 mmHg drop in systolic blood pressure for prehypertensives, greatly improving their chances of not progressing to hypertension," said Richardson. She added that any dietary or lifestyle modification people can easily make, which does not require daily medication is 'exciting'.

Study details

Richardson and her team analysed data from the Coronary Artery Risk Development in Young Adults (CARDIA) study – an NIHfunded study created to examine the development and determinants of cardiovascular disease. The study began in 1985 with 5,115 African American and white Americans aged 18-30 years old who have been followed and re-examined at various intervals. Year-20 was the first year that participants completed an extensive dietary survey. They used multivariable linear regression models to evaluate the relationship between daily isoflavone intake and systolic blood pressure after dividing patients across quartiles according to selfreported isoflavone intake.

Richardson noted that even after controlling for age, sex, BMI, smoking, alcohol, physical activity and total caloric intake, the relationship between daily isoflavones and lower systolic blood pressure remained. She explained that as a result, the study helps to lay groundwork for future randomised controlled trials, in order to help better understand the association between isoflavones and blood pressure.

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Have your cake and eat it: Chocolate consumption linked to lower BMI

By Stephen Daniells, 28-Mar-2012 Food Navigator

People who consume chocolate frequently may have lower body mass index (BMI) values, suggests 'intriguing' data from the University of California, San Diego.

A research letter published in the Archives of Internal Medicine indicated that, in a study with over 970 men and women, frequent chocolate consumption was linked to lower BMI. "Our findings – that more frequent chocolate intake is linked to lower BMI – are intriguing. They accord with other findings suggesting that diet composition, as well as calorie number, may influence BMI. They comport with reported benefits of chocolate to other elements of MetS," wrote lead author Beatrice Golomb, MD, PhD, and her co-workers. "Compatible experimental findings in rats given epicatechin from cocoa suggest the association could be causal."

Cocoa's benefits

The health benefits of polyphenols from cocoa have been gathering increasing column inches in the national media. To date studies have reported potential benefits for cardiovascular health, skin health, and even brain health. The majority of science into the potential benefits of cocoa have revolved around cardiovascular benefits of the flavanols (also known as flavan-3-ols or catechins), and particularly the monomeric flavanol (-)epicatechin. This is not the first time that cocoa and the compounds it contains has been reported to have potential for weight management. Scientists from the Hershey Center for Health and Nutrition and the Pennsylvania State University reported in the Journal of Agricultural and Food Chemistry (2011, Vol. 59, pp 5305–5311) that polyphenols from cocoa inhibited various digestive enzymes in a dose-dependent manner, meaning the more consumed, the greater the effect.

New data

The San Diego-based scientists report preliminary data from an analysis of almost 1,000 men and women aged between 20 and 85, and free of heart disease, diabetes, and abnormal cholesterol levels. Chocolate consumption habits were assessed using a questionnaire, while intakes of fruit, vegetables, and saturated fat were factored into the calculations. Results showed that, although chocolate consumption was linked to higher calories and increased intakes of saturated fat, more frequent chocolate consumption was linked to lower BMI.

Commenting on the potential active ingredients in chocolate, the researchers not that catechins in chocolate possess antioxidant properties and they may influence metabolism. "Cocoa-derived epicatechin, specifically, is reported to increase mitochondrial biogenesis and capillarity, muscular performance, and lean muscle mass and to reduce weight without changing calories or exercise in rodent studies," they said. "Parallel processes in humans, if present, could underlie our findings."

The researchers did not measure the types of chocolate consumed nor did they provide information on the quantities consumed by the study participants. "A randomized trial of chocolate for metabolic benefits in humans may be merited," they concluded. $\oplus \oplus \oplus$

Food Science & Industry News

Demand for Healthy Snacks Driving Global Market

March 28, 2012 Food Product Design

DUIVEN, The Netherlands—The global snack foods sector is experiencing steady growth with the number of new product launches showing double-digit growth in 2011, according to new market data from Innova Market Insights.

Consumer demand for healthy snacks, including gluten-free, organic, clean labels, whole grains, reduced calories and omega-3 and vitamin- and mineral-fortified products also was reflected in new product launches in 2011. Savory and salty snacks accounted for just under two-thirds of the total number of product launches, while snack nuts and seeds rounded out the numbers.

Launches in Asia accounted for nearly 40% of total snacks introductions, ahead of Europe with just under 30%. Within Europe, the United Kingdom, Germany and the Netherlands had some of the highest levels of product activity, reflecting relatively high per capita consumption levels in these countries.

Lu Ann Williams, research manager at Innova Market Insights, said despite the increasing competition from other snacks, savory snacks and nuts are more than holding their own, largely via growing emphasis on authenticity, originality, strong and exotic flavors and more convenient packaging concepts, often supported by a healthy or natural angle and strong branding.

Data also revealed nearly 40% of global launches in 2011 had some type of health positioning, including whole grain, organic, glutenfree, low-calorie, vitamin and mineral fortification, omega-3 fatty acids or bone health. In the United States, that number rose to 60%. Interestingly, the rise of gluten-free products has also been fairly dramatic, with nearly 10% of global snacks launches using that platform in 2011, rising to more than 20% in the United States.

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Specialty Food, Beverage Sales Soar to \$75 Billion

April 2, 2012 Food Product Design

NEW YORK—Consumer willingness try new foods and flavours helped propel U.S. retail and foodservice sales of specialty food and beverages to \$75 billion in 2011, a 6.9% increase over 2010 sales, according to a new report from the National Association for the Specialty Trade (NASFT). Surging demand for yogurt, energy bars, nut and seed butters and coffee drinks helped drive sales to new highs for the second year in a row.

The report, "The State of the Specialty Food Industry 2012" tracks sales of specialty food through supermarkets, natural food stores and specialty food retailers, and includes research from interviews with food retailers, distributors, brokers and others involved in the supply chain.

"Consumers are making better food a part of their lifestyle," said Ron Tanner, vice president, communications and education, for the NASFT. "They are embracing new foods and flavours and are willing to choose top-quality even while they economize elsewhere."

Cheese continues to dominate specialty foods, pulling in \$3.44 billion in retail sales in 2011. The next largest retail sales categories are meats, poultry and seafood; chips, pretzels and snacks; coffee, coffee substitutes and cocoa; and bread and baked goods. Functional beverages are the fastest-growing segment, followed by yogurt and kefir.

While 2011 product introductions declined 6.2% a manufacturers focused on existing lines, there is positive momentum for the industry as the average transaction size for specialty food stores jumped 11.4% to \$41.49.

Key takeaways from the report include:

Specialty foods represent 13.7% of all food sales at retail.

- Kosher is the leading claim for new specialty food products, followed by All Natural.
- Natural food stores are the fastest growing retail channel, with a sales increase of 19.8% from 2009-2011.
- In 2011, 41% of specialty food manufacturers reported a sales increase of more than 20%.
- Local is the most influential product claim today, according to 75% of retailers surveyed.
- Latin is the fastest-emerging cuisine, retailers said. Importers report growth in cuisines from Eastern Europe and India.

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Mustard seed waste may offer natural preservative promise

By Nathan Gray, 28-Mar-2012 Food Navigator

A new method to extract compounds from 'low value' mustard seed waste could provide industry with a new source for natural food preservatives, according to a team of Canadian researchers.

The researchers characterised the antimicrobial activity of several compounds isolated from the mustard seed meal – a waste product of very low value to industry, finding that the waste product contained elements that could be used as natural food preservatives. Writing in the journal European Food Research & Technology, the Canadian team reported that treatment of the mustard seed meal enabled the isolation of the antimicrobial sinapic acid. The team, led by Christina Engels from the University of Alberta, said the natural compound shows antibacterial effects against strains including Staphylococcus aureus, E. coli and Listeria monocytogenes, and could be used to protect against food spoilage.

Engels said the isolation of sinapic acid lends a useful function to mustard seed meal – which is the product left over after the seed is pressed for its oil. While the oil can be used for production of biodiesel and is used for cooking oils in some markets, she explained that "the defatted seed meal left over is currently of little economic value. That means the mustard seed meal can be used as a source for natural food preservatives," said Engels, who added that the use of sinapic acid from mustard waste could mean greater consumer choice when it comes to choosing foods containing preservatives.

Study details

Engels and her colleagues extracted phenolic compounds from defatted Oriental mustard (Brassica juncea L.) seed meal. They revealed that sinapic acid, along with several sinapoyl conjugates, were identified. "The crude extract and a purified phenolic fraction exhibited selective antibacterial effects against Gram-negative and Gram-positive spoilage bacteria," said the research team. However, after alkaline hydrolysis, only sinapic acid could be detected in the extract – which allowed the Canadian team to quantify it with an authentic reference substance. "The release of sinapic acid after alkaline hydrolysis not only allows for the quantification using the reference substances but also facilitates the standardization of the antibacterial activity of plant extracts for use as food preservative," they said.

They team revealed that alkaline hydrolysis released 2.66 mg of sinapic acid per gram of dry defatted mustard seed meal. Engels and her colleagues added that the minimum concentration of the hydrolyzed extract needed for inhibition of microbes such as Bacillus subtilis, Escherichia coli, L. monocytogenes, Pseudomonas fluorescens, and S. aureus was 0.1 grams per litre. \Rightarrow \Rightarrow

New encapsulation system may allow consumers to sprinkle supplements on foods

By Nathan Gray, 29-Mar-2012

A new way to encapsulate bioactive nutritional supplements into food-based products could provide industry with the right ingredients to create supplements that consumers can sprinkle on foods, say researchers.

The encapsulation method uses crystalline-like fibres to embed and protect the nutraceuticals from external influences, thus preventing degradation. The research team, led by Dr Srinivas Janaswamy of Purdue University, USA, says that the new method to encapsulate such ingredients could be used to provide solutions within food-based products, but could also lead to products that allow consumers to be able to sprinkle vitamins, antioxidants and other beneficial compounds directly onto their meals.

Writing in the journal Food & Function, the research team "propose an elegant and novel approach for the delivery of nutraceuticals in their active form, using hydrocolloid matrices that are inexpensive and non-toxic with generally recognized as safe (GRAS) status." The team said that nutraceuticals such as beta-carotene, lycopene, resveratrol and vitamins – which are thought to play significant roles in treating or preventing disease – could be encased using the new methods. "Once the nutraceutical is enveloped, it is thermally protected," explained Janaswamy. "Anything of interest can be used, even drug molecules, vitamins or hormones."

Janaswamy envisions that the encapsulated bioactives could be 'chopped' into small particles, which could then be used in the formulation of processed foods or might even be used at the dinner table where consumers could reach for the resveratrol or curcumin in the same as they might sprinkle some salt or pepper.

Delayed release

However the Purdue research team still has a few challenges overcome before the nutraceutical fibre delivery system is suitable for use in foods or on consumers' dinner tables. Janaswamy explained that the current release time for the compounds from the fibre matrix is around 30 minutes. He and his team are working on delaying the release of the embedded compounds once consumed. He

said the time would need to be extended to about three hours to ensure that the bioactives reach the gut, where they can be properly absorbed.

Study details

In the research, Janaswamy and his team used iota-carrageenan, a long-chain carbohydrate, to encapsulate

curcumin. Curcumin is the principle compound found in the spice turmeric and is considered to be effective against inflammation, cancer and obesity. Iota-carrageenan was reported to form a 'well-orientated' fibre network that maintained a stable double-helical structure with small pockets between the helices that contain water molecules. Janaswamy replaced these water pockets with curcumin, which was then protected by the iota-carrageenan network.

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Line between cereal bars and energy/nutrition bars is blurring, says report

By Elaine Watson, 04-Apr-2012 Food Navigator

While the food bar market has traditionally been split into two distinct categories: cereal/granola bars and energy/nutrition bars; the boundaries between them are becoming increasingly blurred, according to a new report.

Cereal bar manufacturers are now targeting consumers that want to move away from treats and get a workout energy boost, a nutritious snack or even a meal replacement, says Packaged Facts. Meanwhile, energy/nutrition bar makers are "incorporating ever more creative and decadent formulations" to make their bars more appealing to a mainstream audience, according to its new report, 'Food Bars in the US'.

Cereal bars: Shift from low fat, sugar, calories towards high protein, high fiber

Although the cereal bar segment has seen little growth beyond that achieved through price increases, the focus has shifted from a food-minus approach to a food-plus approach, notes the market researcher. "Over the past few years, cereal bars with reduced calories, fat or sugar have performed quite well, although the number of product introductions with these claims has fallen sharply in the last five years. Manufacturers are [now] addressing more sophisticated concerns, such as creating products to supplement perceived nutritional deficits that might be incurred in a weight-loss program. High-protein, low-carbohydrate or balanced-gastrointestinal formulations have seen good growth."

Energy bars: CoQ10, L-carnitine, omega-3, resveratrol, and vitamin K2

In the energy/nutrition bar category, meanwhile, "new flavor and ingredient introductions along with improvements in taste and mouth feel have made the future of these products look very bright", it adds. And the functional ingredients to watch? "CoQ10, L-carnitine, omega-3, resveratrol, and vitamin K2."

Lifestyle trends bode well for food bar category

While the market is becoming more crowded, successful players in this space are still posting double-digit growth in the mass market and the natural products channel, says Packaged Facts publisher David Sprinkle. "Food trends such as the blurring of meals and snacks, an emphasis on portion control, and increasingly informal, spur-of-the-moment, and customized eating all favor the food bar market." US retail sales of cereal/granola bars and energy/nutrition bars were worth \$5.7bn in 2011, says the report. \clubsuit

Food Processing needs to be championed by industry

By Sarah Hills, 12-Apr-2012 Food Navigator

Industry needs to boast about achievements in food processing as it provides a key role in sustainability and nutrition, according to Food Science and Technology Professor, Tiny van Boekel.

In contrast to common belief, food processing is good for nutrition value and sustainability issues, Boekel told FoodNavigator.com. However he added: "The downside is people don't really know anymore what is happening. They get alienated from their food. The food industry seems to ignore the benefits of their processing. People should know that what the food industry is doing is also in their own benefit, saves them time and is more environmentally friendly if you do it on such a large scale."

Industry should 'be proud'

Boekel made a plea to the food industry to be "much more proud of what they achieve and tell consumers what they are doing" at the recent 2012 Annual Symposium of the International Life Sciences Institute Europe. The symposium called 'The 21st Century Food

Chain', took place in Brussels at the end of March with topics including primary production and sourcing, processing technologies, food intake physiology and societal impact of food.

Boekel told this publication that adverts and marketing of processed foods tend to hide the industrial side of production and focus more on an artisanal impression. But he argues that food processing "is necessary to reach sustainability" and from a food technology point of view, this is about using skills, resources and raw material as much as possible. This means avoiding waste, using as little water as possible and reducing the use of fossil energy. "If you want to do that in a way that makes a difference you can do that only industrially," Boekel said. He contrasted this to the organic production of food, without processing, which he argued was likely to result in more wastage or product spoilage.

Optimising nutrition

Similarly the professor said: "Most people tend to think that processed foods have lost a lot of nutritional quality. This is not true... The processes in the food industry are optimised to retain as many nutrients as possible. Some even become better digestible, such as starch and proteins. By processing you are making nutrients more available in general than eating unprocessed foods".

He gave the example of canned tomatoes or tomato paste, where he said the antioxidants present are "better" than in a fresh tomato where they are "locked in". However, Boekel argues that epidemiological studies tend not to take processed foods into account and instead focus on the nutritional value of foods in their unprocessed state. He suggested that information on processed foods needs to be considered in epidemiological work and databases should be built to estimate the intake of compounds from processed foods.

The Market for Nutraceutical Gums

Though mature, the gum market continues to transition into the role of a value-added product. By Joanna Cosgrove Nutraceuticals World April 2012

Usually an inexpensive impulse buy found at the grocery or convenience store checkout, chewing gum has evolved to be more than just a sweet, breath-freshening treat. According to a recent gum market report from Global Industry Analysts, Inc. (GIA), gum is an aggressive market, projected to reach an estimated worth of \$23 billion by 2017. Nutraceutical and/or functional gums—worth \$5.5 billion in 2010—promise and array of health and dental benefits, and have made the value-added gum segment is one of the most promising sectors in the gum industry and is positioned to be a driving growth force in the overall global gum market.

GIA researchers said gums offer many benefits to consumers beyond the simple pleasure of chewingand are gaining recognition as an innovative platform for nutritional dosage delivery system, on par with pills and capsules."Usage of gum, as an inexpensive and effective medium to deliver medicinal properties to the human body, is the budding opportunity," they stated. "Owing to the effective incorporation of pharmaceutical ingredients in the gum base, gum acts as an efficient means for dispersing nutraceutical properties into the human body."

Furthermore, the mechanism of chewing gum enables molecules to infuse into the bloodstream, and gum as a delivery vehicle can disperse minerals drugs, antioxidants and vitamins. "Chewing gum is by far pleasurable and simple when compared to taking injections or tablets," the researchers said. "With growing awareness, gum is emerging as a substitute to regular pills, hence widening the scope of the gum industry."

The GIA report found the proportion of new gums with high content of a specific nutrient was estimated at 11.5% in 2010 in the U.S., a significant rise compared to less than 5% share in the previous year. In fact, several gum manufacturers have ventured into the budding nutraceutical sector to capitalize on its potential growth opportunities. "To develop gum products with nutraceutical properties, numerous gum companies are forging various agreements and partnerships with pharma companies," the company said. "Gum companies are poised to carry out similar endeavors for exploiting the potentiality of nutraceutical sector, thereby developing the gum industry."

According to the researchers, specific opportunities on the horizon for functional chewing gum-based technology include oral-care probiotics, chlorhexidine, and antacids. Nutraceutical chewing gums are also expected to play a role in the treatment of health conditions such as weight management, immune defense, heart health, joint health and energy. "In response to the growing health concerns worldwide particularly among the adult population, novel gum products are emerging to offer various dental and health benefits such as curing ear infections, soothing ulcers, fighting cavities, in addition to whitening and strengthening teeth," GIA said via press release. "As consumers are becoming more health and calorie conscious, surge in sugarless and medicated gums are expected to continue in future."

The United States has traditionally represented the largest regional market worldwide and the best performing segment within the candy market. The Asia-Pacific market was determined to have the greatest potential, as the majority of young population, increasing urbanization and spending power, and vast potential in developing markets of India, China and Taiwan among others is primed to exhibit the fastest CAGR of 5.7% through 2017.

Historically speaking, the gum industry witnessed a low phase until the emergence of sugarless gum products, which played a major role in the resurgence of the chewing gum market. Over the years, the gum industry, traditionally inclined towards the children and youth population, witnessed a demographic shift in favor of adult consumers. The aging population, higher buying propensity and sluggish growth in kids' category has prompted the development of more adult-specific products – a trend evident in the ongoing development of functional and medicated gums. Looking ahead, GIA said future market growth should come from the continued development of value-added gum varieties such as nutraceutical gum and biodegradable gum with health and environmental benefits expand traditional market frontiers, enabling sound growth.

Bread contributes most sodium to US diets, finds CDC

By Caroline Scott-Thomas, 09-Feb-2012 Food Navigator - USA

Nine out of ten Americans eat too much sodium, and bread and rolls are the biggest problem, rather than salty snacks, according to the latest Vital Signs report from the Centers for Disease Control and Prevention (CDC).

The CDC found that 44% of US sodium consumption comes from ten types of food, with bread and rolls at the top of the list, contributing more than twice the sodium (7.4% of average dietary sodium intake) of snacks like pretzels and chips, which rounded out the list in tenth place, contributing 3.1%. Cold cuts and cured meats were in second place behind bread, with a 5.1% contribution to average sodium intake, followed by pizza (4.9%), fresh and processed poultry (4.5%), soups (4.3%), sandwiches like cheeseburgers (4%), cheese (3.8%), pasta mixed dishes like spaghetti with meat sauce (3.3%), meat mixed dishes like meat loaf with tomato sauce (3.2%), and savory snacks (3.1%).

The Grocery Manufacturers Association (GMA) said that for years food companies have been introducing low and no-sodium products, and incrementally reducing sodium in foods, while trying to maintain consumer taste preferences. "While progress is being made, reducing sodium in products without affecting the taste or consumer acceptance of products is no easy task," the trade association said in a statement.

"Research is needed to understand the unique sensory reception properties of sodium and salt and then apply that understanding to finding acceptable substitutes. In addition, salt and sodium play a vital role in food preservation; therefore, great care must be taken to ensure that changes do not compromise food safety."

Based on self-reported data, the CDC said in this latest report that average intake is around 3,300mg each day, while the USDA's dietary guidelines recommend no more than 2,300mg – and less than 1,500mg for people with hypertension, or those considered at risk of developing hypertension. It said that reducing the average daily population sodium consumption by about one third could reduce blood pressure and decrease the incidence of heart attack and stroke, and save about \$20bn in annual healthcare costs.

Multiple emulsions may unlock sodium reduction options

By Stephen Daniells, 27-Apr-2012 Food Navigator

Formulating foods using multiple emulsions may provide a way to produce reduced sodium foods and beverages without impacting on the perception of 'saltiness', says a new study.

Scientists from the University of Guelph and Ryerson University report that by formulating less stable emulsions alongside more stable emulsions could provide 'pockets' of saltiness in the mouth, while the overall sodium chloride levels of the emulsion is reduced. "Our hypothesis was that 'less stable' emulsions would be perceived as saltier than 'more stable' emulsions, given that 'less stable' droplets would rupture and release their saline cargo upon oral processing when compared to 'more stable' droplets," explained the researchers. "As a result, more NaCl would be released near the oral mucosa, where the taste receptors and oral shear are most prevalent."

According to findings published in the Journal of Agricultural and Food Chemistry, tests of their hypothesis showed that emulsions more prone to destabilization had a greater salt perception irrespective of their initial salt load. "The knowledge gained from this study provides a powerful tool for the development of novel sodium-reduced liquid-processed foods," wrote Matthew Rietberg, Dérick Rousseau, and Lisa Duizer.

Salt

Salt is of course vital and is necessary for the body to function, but the average daily salt consumption in the western world, between 10 and 12g, vastly exceeds recommendations from WHO/FAO of 5 grams per day to control blood pressure levels and reduce

hypertension prevalence and related health risks in populations. And with 80 per cent of salt intake coming from processed foods, many countries have initiated salt reduction program, with many holding up the UK's Food Standards Agency as the torch bearer for national initiatives.

The benefits of a salt global salt reduction strategy were given blinding clarity by a meta-analysis published in The Lancet Chronic Diseases Series in 2007, which concluded that reducing salt intake around the world by 15% could prevent almost nine million deaths between 2006 and 2015.

The topic remains controversial, however, with a prestigious Cochrane review concluding that salt reduction did not impact cardiovascular disease risk. However, this was subsequently slammed in a re-analysis of the same data in The Lancet, with the authors of this paper stating that salt reduction does provide a significant reduction in cardiovascular events. Regardless of this ongoing debate, public health policy in many continues to advocate salt reduction, and the food industry continues to explore ways of reducing the salt content of its products without detrimentally affecting consumer liking.

Formulation

The new study fits into that category. Rietberg, Rousseau, and Duizer prepared water-in-oil emulsions containing a saline-dispersed aqueous phase. By varying the mass fraction aqueous phase (MFAP), salt level, and the concentration of surfactant concentration (polyglycerol polyricinoleate, PgPr of the emulsions they could influence the saltiness perception. The most important factor to correlate with saltiness was the emulsion MFAP, said the researchers. "These findings have clear implications for the development of salt-reduced foods and highlight the delicate balance between ensuring adequate emulsion stability during the lifetime of a processed food and the requisite oral destabilization to ensure appropriate saltiness perception," they said. Multiple emulsions may unlock sodium reduction options. "If this balance is not found in a formulation, poor shelf stability and/or suboptimal salt taste perception will be the result."

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Microscopic hollow salty balls are gaining momentum in the US

By Elaine Watson, 16-Apr-2012 Food Navigator

The microscopic salt crystals at the center of a sodium reduction

Soda-Lo, which is engineered using a patented process that re-crystallizes salt to create free-flowing, microscopic hollow balls just 5-10 microns in size, offers formulators a distinct advantage over other sodium reduction strategies as it can still be listed as 'salt' on food labels.

Salted peanuts, bread... and tomato soup

Logically, for example, the micro-crystals should be best-suited to topical applications such as potato chips, he said, as once dissolved, salt is salt. However, Soda-Lo has also helped firms achieve significant sodium reductions in a wide variety of products from tomato soup to cheese and bread, he said. "We find it works surprisingly well in bread and starchy foods, but also tomato soups and other tomato-based products, although we're not sure exactly why this is." He added: "It makes a real difference when you add it during the manufacturing process. Adding it with the fat phase can help coat the sphere and protect it, for example. "There is interest from a wide range of manufacturers but probably the most in bread and topical applications like salty snacks. You can get a 50% reduction in salt and deliver the same salty taste on salted peanuts, for example."

Why small is beautiful

It is well-known that the smaller the crystals, the higher the salt perception. However, simply grinding salt to make the particles smaller does not deliver as the tiny particles quickly lose their free-flowing properties and stick together. By contrast, Soda-Lo has been engineered using a patented process by its creator Dr Stephen Minter that re-crystallizes salt to create free-flowing, microscopic hollow balls that at 5-10 microns are a fraction of the size of standard salt (c.200-500 microns), deliver an intense, salty hit on the taste buds, and can still be listed as 'salt' on labels.

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Regulatory News

New Food Labeling Regs Take Effect in South Africa

March 30, 2012 Food Product Design

JOHANNESBURG, South Africa—Delayed for one year to allow the industry extra time to revise product labels in preparation, South Africa's new mandatory food labelling regulation (R146) became effective from March 1, 2012. The new rule was enacted to prevent the use of misleading or ambiguous food labels and applies to domestic and international food manufacturers.

Mandatory information now is required on food labels include the name and address of the manufacturer, importer or distributor, instructions for use, net content, country of origin, batch identification, use by date, nutrient analysis per 100 g (or per 100 ml of liquids), a list of ingredients and a list of any common allergens.

Regulation R146 mandates labels must contain the contents of foodstuffs (e.g. colorants, preservatives, herbs and spices, etc.) Ingredients must be listed in order of descending mass (not volume). The ingredient weighing the most will be listed first and the ingredient weighing the least will be listed last. Common allergens include gluten, milk, eggs, soy, peanuts, tree nuts, shellfish or crustaceans, and major cereals (wheat, rye, barley, and oats).

Misleading descriptions are prohibited on packaging and labels, including words or images, marks, logo or descriptions that create the impression foods are endorsed by health practitioners, organizations, institutes or foundations. Exceptions to the rule include religious certification organizations, Fauna & Flora certifications, and organizations accredited under the South African National Accreditation System (SANAS). No individual endorsement or testimony implying a nutritional claim, an endorsement of the manufacturer or seller (by a logo, mark, symbol, written or verbal statement) are allowed on the labels.

Specific words and phrases forbidden for nutrient claims are "rich in", "excellent source", "good source", "enriched with X", "with added X", "X free" or similar wording, "nutritious", " healthy", "wholesome", "complete nutrition" or "balanced nutrition" or other words or symbols that imply health giving properties, the word "cure" or any other medicinal claim. Other misleading descriptions, e.g. "grain fed", "Karoo lamb", "natural lamb", "country reared", "free range", "pure," and "organic" are also banned.

Statements to the effect of being fresh, natural, pure, traditional, original, authentic, real, genuine, homemade, farm house, handmade, selected, premium, finest, quality, best or any other words or pictures that convey similar concepts are also prohibited unless the products are compliant with Food Standards Agency (FSA) criteria.

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Gold Nanoparticles Offer Quick & Easy Salmonella Detection – Developer

By Mark Astley, 30-Mar-2012 Food Quality News

US researchers have developed the 'El Dorado' of foodborne Salmonella detection and outbreak prevention - using antibody-coated gold nanoparticles.

Researchers at Jackson State University have been working to develop the technology which uses antibody-covered gold nanoparticles to detect the presence of Salmonella microbes on the surface of food. The same technology can then be used to kill the pathogen. The Mississippi-based researchers were able to attach Salmonella antibody molecules to the gold nanoparticles, which attach to the outer surface of Salmonella microbes when they encounter the pathogen. Several of the modified nanoparticles can attach to one microbe, allowing the easy detection of the gold nanoparticle-antibody-Salmonella structures. The method, which is suitable for field-based analysis, has already been modified to identify the presence of other pathogens including E.coli.

"Very little gold"

Head researcher Paresh C. Ray told FoodQualityNews.com, that once commercialised, the patent-pending development will offer the industry a quick and surprisingly cheap Salmonella detection option. "Using this technique we can detect pathogens such as Salmonella very fast," he said. According to Ray, some traditional testing methods can take up to 72 to complete, whereas the gold-nanoparticle test can identify Salmonella microbes within five minutes – fulfilling the urgent need for faster detection. "As well as that, anybody can use this method, it doesn't take a trained technician or require specialist training to use it. This could make it ideal for field-based detection."

Despite its status as a precious metal, only small amounts of gold are actually needed for each individual test, Ray added. "From about \$90 or \$100 worth of gold we can make gallons of the gold nanoparticle solution. Very little gold is actually needed in each test." Only a few drops of the solution are then needed to detect the pathogen in question.

Detect and kill

"We are making gold nanoparticles that are modified with anti-bodies of bacteria. By doing this we can use the gold nanoparticles to detect harmful bacteria and kill them," he said. When a specific wavelength of light is shone at the nanoparticles, they gold absorbs the heat, which in turn burns through the outer membrane of the Salmonella bacteria – killing it. "The process has a double use. It can detect and then kill them by heating the gold nanoparticles which in turn kills the bacteria. We are working with different companies to secure a grant, from there we will look to commercialise the product and bring the device to the market," concluded Ray.

Pathogen-combatting Ultrasound Wash system Could Provide Organic Alternative - Developer

By Mark Astley, 29-Mar-2012 Food Production Daily.com

'Organic' processors could be set for a "significant improvement" in the protection of produce against pathogens through the development of new wash system practices using ultrasound.

California-based Earthbound Farms, which produces organic salad products including spinach, is working alongside researchers from the Chicago-based Institute of Food Safety and Health (IFSH) to develop an organic-friendly wash system to combat the presence of foodborne pathogens. The IFSH, a department at the Illinois Institute of Technology, is currently conducting pilot tests using treatments including high powered ultrasound (HPU) and peracetic acid-based and citrus-based sanitisers – which are approved for use in organic processes. HPU works to combat pathogens such as E.coli O157:H7 by creating tiny bubbles. When these bubbles burst on the leaf's surface, they help dislodge and blast away any pathogens – boosting the effectiveness of the sanitiser in use. The use of HPU is yet to be implemented at Earthbound Farms, although they hope to adapt the practice as part of its "multi-hurdle" food safety approach.

Organic alternative

"We're hoping to see a significant improvement in the effectiveness of the wash system with the sanitizer plus HPU over simply the sanitizer. We're testing the HPU in the wash system along with peracetic acid-based and citrus-based sanitizers, both approved for use in organic production," said Earthbound Farms senior vice president of operation and organic integrity Will Daniels. The company was forced to take steps to find an alternative to the industry-standard use of chlorine-based washes. The pathogen-killing additive is not an ideal organic option for processors as regulations demand that residual chlorine remains low. "There are a few other wash additives out there, but we haven't seen any data around how effective they are and some aren't approved for use in organic [processing]. We are still using chlorine, within the organic regulation where residual chlorine is at below 4 parts per million."

"The HPU is used in the wash together with the sanitizer. We are exploring various sanitizers to see which, if any, performs best. The sanitizers we're testing are citrus-based and peracetic acid-based, both of which are approved for use in organic production," Daniels added.

"Multi-hurdle" approach

Despite their excitement over the potential implementation of the HPU method, Daniels its implementation would be just one step in ensuring the safety of salad products entering the market. "But whether organic or conventional, there's no proven kill step available for fresh-cut salads and other fresh items that are eaten raw," he said. The company's "multi-hurdle" food safety approach begins in the field and runs through to its processing facility, followed by two rounds of pathogen testing. "Even if this HPU is incredibly effective, it won't be a kill step and we'll still need to have our multi-hurdle approach in place and the HPU will simply be another, we hope higher, hurdle," Daniels concluded.

Ripeness-varying Salmonella behavior could lead to product food safety boost

By Mark Astley, 02-Apr-2012 Food Quality News

The changing behaviour of Salmonella on ripe and unripe tomatoes could lead to the improvement of measures against the attachment and survival of the pathogen on tomatoes, UK researchers have claimed.

Researchers at Imperial College London have discovered that Salmonella microbes attached to ripe tomatoes produce an extensive network of filaments - behaviour not witnessed when the bacterium to present on the surface of unripe tomatoes. Head of the study,

professor of molecular pathogenesis Gad Frankel told FoodQualityNews.com that this behaviour could determine how successfully foodborne pathogens such as Salmonella attach and survive on raw produce such as tomatoes. Frankel added that understanding how Salmonella behaves on the surface of ripe and unripe tomatoes could lead to new strategies to improve food safety.

Prevent Salmonella survival

"The fact that Salmonella bacterium is responding differently at different stages of ripeness is very interesting," said Frankel. "We are interested to know how Salmonella microbes firstly attach to tomatoes and how they manage to survive. Through this research, we are looking to establish whether we can prevent the attachment and survival of Salmonella on tomatoes. We want to make sure we are using the most effective composition for washing tomatoes," he said.

According to Frankel, when attached to green un-ripened tomatoes, Salmonella microbes appear smooth under a microscope. However, when present on red ripened samples the bacterium appeared to produce filament. "It appears that Salmonella microbes have a sense of whether or not they are attached to red or green tomatoes. We need to check whether filaments make a difference and if they have a stronger attachment – it is one possibility, but it's not proven yet," Frankel added. However, he added that translating this research into new decontamination practices is a challenge for future studies.

Tainted tomatoes

In recent years, tomatoes and similar products such as jalapeno and Serrano peppers have been implicated in several foodborne disease outbreaks. In December 2011, US and Canadian food safety authorities issued separate warnings on a brand of jalapeno and Serrano peppers that were potentially contaminated with Salmonella. The peppers became the subject of a recall in the US and a product warning in Canada after a random US Department of Agriculture (USDA) sample of the product was found to be contamination with potentially deadly Salmonella. Tomatoes were falsely implicated in an outbreak of Salmonella in the US in 2008. The contamination, which went on to infect around 1,500 people and kill two people in the country, was later attributed to tainted Mexican peppers.

National Consumer League urges FDA crackdown on US lemon juice swindle

By Ben Bouckley, 26-Mar-2012 Food Navigator

The National Consumers League (NCL) has urged the US Food and Drug Administration (FDA) to come down hard on some lemon juice producers for alleged 'adulteration and misbranding' of '100%' lemon juice diluted with water.

In a letter to FDA commissioner Dr. Margaret Hamburg, the NCL executive director Sally Greenberg said that such producers were violating the federal Food, Drug and Cosmetic Act (FDC act) and were "cheating consumers [within a \$100m bottled lemon juice market] plain and simple". Greenberg said that tests by third-party provider Eurofins showed that certain brands of lemon juice from concentrate – all labelled as containing '100%' juice – were (in the Greenberg's words)"heavily diluted with water beyond what is necessary and appropriate to reconstitute the product. Citric acid, and in some cases sugars, are added to compensate for taste," she added.

Brands included 'NautraLemon 100% Lemon Juice from concentrate – Natural Strength' (distributed by Sirob imports), which Eurofins said contained only about 35% lemon juice. 'Lira 100% Lemon Juice from Concentrate' – distributed by Castella – was only contained about 25% lemon juice, Eurofins' lab tests showed, while 'Lemon Time Lemon Juice from Concentrate' (distributed by the Gourmet Factory) contained only 15% lemon juice.

Finally, 'Pampa Lemon Juice from Concentrate' (distributor Transnational Foods) contained only around 10% lemon juice, and stated (on a Nutrition Facts panel on the bottle that requires juice content to be stated under federal law) 'Made with 100% Juice'.

The FDC act (cited above) states that producers violate the law when (1) any valuable constituent has been in whole or part omitted (2) if any substance has been substituted either wholly or in part (3) damage or inferiority is concealed. Finally, (4) the law states that there is a violation, "if any substance has been added thereto, or mixed or packed therewith so as to…make it appear better or of greater value than it is".

Greenberg said: "While any one of these actions violates the law, here all four criteria are met. The products tested omit requisite amounts of real orange juice and substitute water citric acid and in some case sugar." She added: "The cheating is concealed by labelling products as 100% lemon juice or simply 'lemon juice from concentrate', and the producers make it appear that the products are of greater value than they really are." The FDA's regulation 21 CFR § 146.114 (b) specifically limited water content in lemon juice to that necessary to reconstitute the products, Greenberg said, adding that the products named in this complaint clearly violated that regulation.

She quoted a legal treatise to the extent that fruit juice-derived products are the "paradigm examples of economic adulteration, because there is a direct economic correlation between lower production costs of undisclosed, cheapened product mixing and the seller's higher profit margin".

To illustrate the alleged fraud in this case, Greenberg took the example of the NaturalLemon product that states on its label: 'Two tablespoons of NaturalLemon Juice equals the juice of an average-size lemon'. Accepting that the bottle contained around 31 two tablespoon servings, she said that – if the firm's claim was accurate – it would take around 30 lemons to make the juice contained in one quart bottle. However, given tests results showing that NaturalLemon was only about 35% lemon juice, this meant (according to Greenberg) that the producer was instead only using around 10 lemons.

Given fluctuations in the availability of fresh lemons (especially from Arizona and California) the NCL said that producers had a clear "motivation to cheat", and told Dr.Hamburg that the FDA must take enforcement action.

National Consumer League urges FDA crackdown on US lemon juice swindle. Greenberg said the administration had an obligation to ensure that a "basic consumer staple that plays so many roles in the American diet is what it purports to be. "Without that assurance, unscrupulous companies will continue to bilk consumers for millions, and the public will lose faith in the integrity of the food supply," she added.

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Improper nutrient content claims cited in new wave of class action suits

By Elaine Watson, 19-Apr-2012 Food Navigator

With class action lawsuits alleging labeling violations now "filed almost daily in California", food manufacturers are spending "hundreds of thousands of dollars in legal fees and settlement amounts" to resolve cases that are entirely avoidable, according to one leading food law attorney.

Colorado-based attorney Justin Prochnow from law firm Greenberg Traurig was speaking to FoodNavigator-USA after Bumble Bee Foods became the latest in a string of manufacturers to be targeted in a lawsuit citing "false and deceptive nutrient content claims".

The very real threat of civil litigation

The suit alleges that Bumble Bee made unlawful omega-3 nutrient content claims. The actions should serve as a warning to firms to get labels checked by an expert before products go to market, said Prochnow. "With the very real threat of civil litigation over labeling violations now hanging over companies, the ability to just fix it when the Food and Drug Administration (FDA) notifies a company of problems, is no longer the worst thing that can happen.

Now, an improper labeling claim could mean hundreds of thousands of dollars in legal fees and settlement amounts to resolve the situation that could have been resolved by having an experienced person spend just an hour or two to review the labels or labeling."

'Cases for alleged labeling violations continue to be filed almost daily in California'

He added: "Cases for alleged labeling violations continue to be filed almost daily in California. And nutrient content claims appear to be an area that plaintiffs' lawyers, or at least the group filing such cases, have latched onto. I believe that they feel nutrient content claims are relatively easy cases to bring, compared to other subjective claims like 'natural'. For nutrient content claims, there are specific regulations that set forth the parameters and it is usually pretty easy to see whether a company is in compliance or not."

How easy is it to prove damages in these cases?

Having said that, there is still no guarantee of success, he added: "I still think a big roadblock to plaintiffs' lawyers down the road in these cases is going to be the ability to prove actual damages for these cases. Are people really buying products because they know that 'great source of' means there is 20% of the RDI or DV of a particular ingredient? Unlikely. So, were these consumers really deceived and damaged as a result of a potential labeling violation? I think if these cases ever make it to completion, plaintiffs may be hard pressed to prove any significant damage." But he added: "However, the cost of defending such litigation is such that most cases don't make it to the court phase, much less the damage phase."

What's the worst that could happen?

Some companies do not realize they are violating labeling legislation, he said, while others "believe they can just copy the labels of other companies with products already on the market. That works fine if you copy the A student. But if you copy the D student, you are just copying the wrong information." Others don't consider the threat of civil litigation, he said. "I also think there is a small segment that has Improper nutrient content claims cited in new wave of class action suits operated under the assumption that the worst thing that would happen from an improper labeling claim is that they would receive a warning letter and then they would fix it and move on."

FDA warning letters: A 'road map' for enterprising plaintiffs' attorneys?

While several class actions refer to FDA warning letters sent to defendants - and opportunistic attorneys often trawl through such letters seeking ammunition – the letters are not conclusive proof of violations, he stressed. "While warning letters probably do provide a 'road map' to plaintiffs' lawyers, many of them are incorrectly citing to them as proof of violations, when they are really nothing more than the FDA's opinion that violations have taken place. Warning letters are not final agency action or law."