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PFNDAI Bulletin

DEC 2015

IMPORTANCE OF HYDRATION

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Innovation and Importance

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PFNDAI Bulletin
DECEMBER 2015

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Cover Design & Bulletin Layout by Ms. Leena Shanbhag

Editorial

In a recent study by researchers from Cornell University published in the journal, Evolutionary Psychological Science found that men eat significantly more food in company of women than they will eat with other men. They found that this was because the men wanted to impress women by eating much more food.

The researchers also asked men coming out of restaurants, how much they ate and whether they were full after eating and their comfort while eating. On an average they ate over 90% more pizza and over 85% more salad while eating in company of at least one woman compared to those eating with other men. Women did not have such difference whether eating in company of men or just women.

Of course there are instances of men competing against other men eating all kinds of foods like boiled eggs, biscuits, cakes etc. or drinking beer etc. Women hardly ever get into such mindless competitions.

Competitions are there in school or college canteens in India, again mostly among men. There used be roti eating competitions or laddu and jalebi eating competitions. There have been instances of men competing in wedding dinners also. Now we know that it is mostly to impress the women.

Are women really impressed with such performances? We hear women getting impressed by men fighting over them, killing wild animals and performing super human physical efforts like swimming or running or throwing objects or even shooting. However, it is surprising to know that men feel women might be impressed by seeing their men eat twice the amount of food normally consumed.

Whatever the reason for eating more, it certainly is harmful for health and also for finances as one needed to buy bigger sizes of clothes every few months. No wonder men are having more problems or obesity and related diseases like hypertension and heart disease.

There was a movie Ram Aur Shyam in which actor Dilip Kumar ate a lot of food and it was one of the memorable scene which was hilarious and shows how he ate the amount of food enough for at least half a dozen people.

We never have competitions where men eat fruits and vegetables. May be it is time to start such healthy competitions but then the prices of these are sky-rocketing. Probably men feel that women may not get impressed by fruit eating men.

We sincerely hope that you all had a wonderful year and wishing everyone a very Happy & Healthy New Year.

Prof. Jagadish S. Pai,
Executive Director
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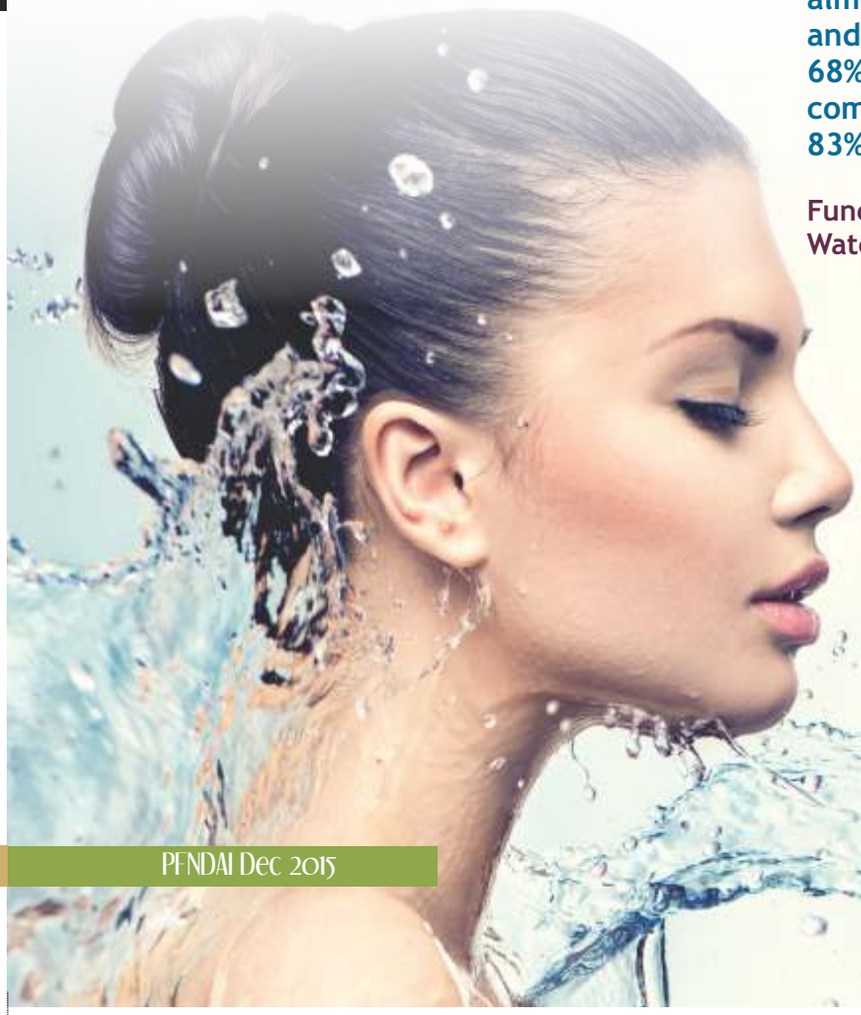
IMPORTANCE OF HYDRATION

By **Prof. Jagadish Pai,**
Executive Director, PFNDAI

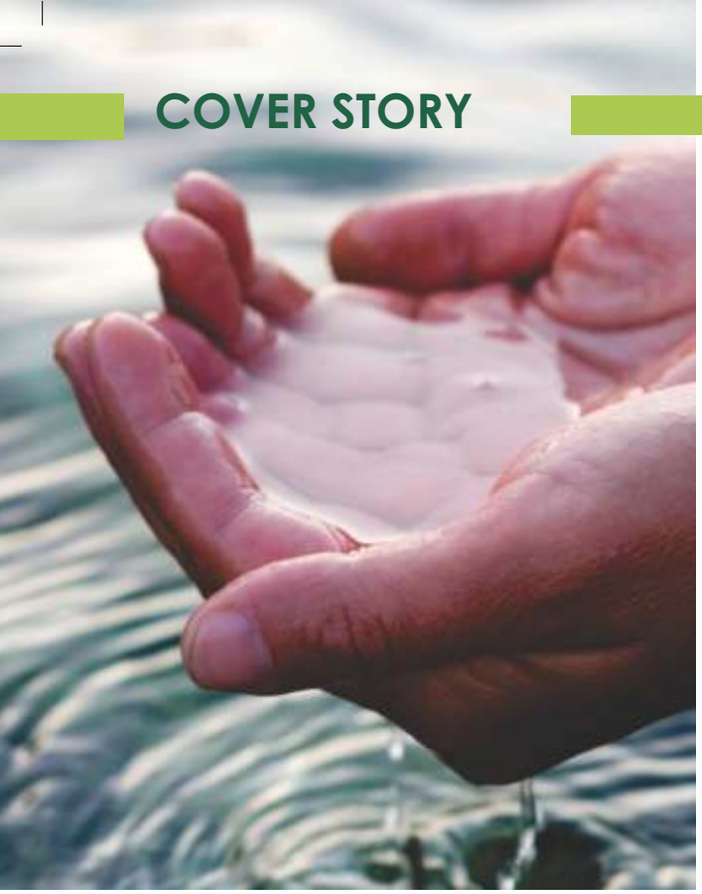
Water has many functions in our body. It is more than a nutrient for us. Water is the single largest component of our body. In fact at birth about 75 to 85% of weight is water and it slowly decreases and as adults about 60% in male and 50-55% in female body weight is composed of water. Many parts of our body have large proportion of water. Our organs have a very high proportion of water e.g. kidney has over 82%, brain 80%, heart almost 80% and liver over 68%. Blood is composed of 83% water.



Functions of Water

Water has many important functions in our body. Of course it prevents dehydration which can have a lot physiological problems as most tissues and cells operate optimally when hydrated fully. Most components of the tissues especially protein have a particular shape, size and orientation so they have certain properties when hydrated. Because of the amino acids in the chain having positive and negative charges and some of the groups have affinity or repulsion for certain groups. This makes them extremely useful in many functions. If they do not have adequate moisture then they will not be able to perform these functions adequately.

One important example is enzymes, the bio-catalysts, which can catalyse many different biochemical reactions so essential for the living beings to survive. They are able to catalyse these reactions even at ambient conditions at quite rapid rates so we are able to function efficiently. If these enzymes are not hydrated adequately then they would lose their efficiency in



catalysing these reactions.

An important function of water in body is that it regulates temperature. When body heats up, we perspire so moisture accumulates on skin in the form of sweat which evaporates. When water evaporates from body, the heat of vaporisation is taken from body so it cools in the process. This loss of water depends on several factors such as how intense is physical activity, whether temperature outside is warm or cool and whether humidity is high or low. Even when a person is resting, there is loss of water from body through skin and through breathing.

Cooling of body also depends on environmental conditions as well as clothing. In very humid weather cooling or also if heavy, impermeable clothing is worn the sweat formed does not evaporate easily so cooling is not very effective.

Water also gives the feeling of fullness when consumed with meal as the solid food is hydrated and fills the stomach.
Water also functions as carrier of nutrients and oxygen to different tissues within body. Food that is eaten is carried from stomach through GI tract by water as it is digested. After digestion water carries the nutrients to blood during absorption and then carries to different organs and tissues for further metabolic processes. Blood is about 83% water. It also helps transport oxygen from lungs to different cells as part of blood.

Besides carrying nutrients through body, it also helps disposal of waste as urine and fecal matter and through sweat. Inadequate consumption of water increases the possibility of kidney stones as waste does not get removed quickly. As skin constantly is losing moisture, if not kept hydrated it becomes dry and scaly. Inadequate fluid consumption also raises the possibility of constipation as water helps bowel movement. Among other functions, it helps cushion the joints and helps strengthen the muscles.

Loss of Water from Body and Gain

As was mentioned above water is lost from the body performing several functions. Largest loss is through urine, about 1.5 to 2 litres. Thereafter the next is through perspiration and respiration loss of about 0.75 litre. The perspiration takes place not for keeping the body cool but as a normal loss through skin to atmosphere. In dry and hot weather the loss if more. Next is loss due to sweating to keep body cool. This may be any amount from negligible to several litres depending on the extent and intensity of activity as well as environmental conditions. There is also small fecal loss of about 200 ml. Thus the total loss per day may be about 2 to 3 litres or more. This much amount needs to be replenished through drinking water and food and beverages.

Hydration can be done by drinking water but a fairly large portion also occurs through consuming foods and beverages. Most fruits and vegetables are high in water from 70 to 85%, cooked cereals like rice and pasta like noodle more than 65 to 75%, bread over 30 to 45%, fish over 70%, meat over 45 to 55%. Beverages may contain over 80% water content.

Commonly about 20% hydration occurs from food intake whereas remaining 80% from fluids including beverages such as milk, juices, hot and cold beverages etc. This is highly variable dependent on the diet. There are people who consume good amounts of fruits and vegetables which contain large amounts of water. Children may drink a lot of milk and juices so much of their intake will be through fluids.

However, whichever way hydration occurs it must be constantly balanced so dehydration does not occur as it can lead to many problems and diseases. When water consumed is more than body's needs, excess water is excreted through urine and feces.

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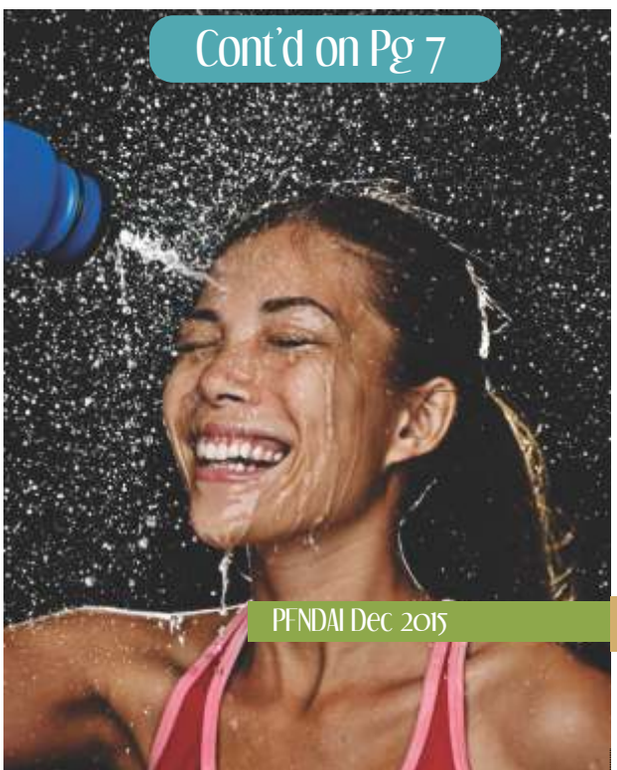

New Technologies - Innovation and Importance

By
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Recent innovations in food technologies have led to the use of fermentation, extraction, encapsulation, fat replacement, and enzymes technology, to produce new health food ingredients, reduce or remove undesirable food components, add specific nutrient or functional ingredients, modify food composition, mask undesirable flavors or stabilize ingredients. Modern biotechnology has even revolutionized the way foods are created.

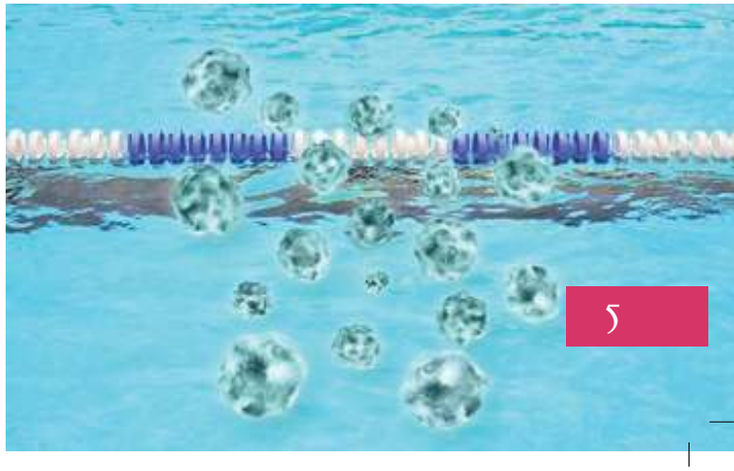
In combination with biofermentation, desirable natural compounds can now be produced in large amounts at a low cost and with little environmental impact. Nanotechnology is also beginning to find potential applications in the area of food and agriculture. In addition to this, the development of novel food packaging methods and techniques has not only increased the shelf life of foods, but also improved their safety and quality. Packaging preserves food throughout the supply chain of distribution, storage, sale, and use and carries information about nutrition and storage on its label. Without it, goods can become exposed and contaminated. There is no doubt that scientific advances depend not only on new ideas, conceptual leaps and paradigm shifts, but also to a large extent on technological advances that make these steps possible.

Because of the importance of technical advances in the food sector, this article has brought out new technologies with sufficient technical details to allow a deeper understanding of the technique described which will give insight into current and possible future applications.

Can bacteria in water be detected with a sniff?

Scientists have developed a simple biosensor based on the human nose to sniff out the smelly molecules which can applied to detecting contaminated drinking water, according to a study published recently in the journal Biosensors and Bioelectronics1. A human olfactory receptor (hOR)-based bioelectronic nose mimics the human smell sensing system and can quickly identify odours, easily assess quality of water with high sensitivity and selectivity by detecting geosmin (GSM) and 2-methylisoborneol (MIB) mainly produced by bacteria, which are representative odor compounds and also indicators of contamination in the water supply system.

The biosensor is coated with special proteins called human olfactory receptors that bind to the compounds when they are present. Human olfactory receptors (hOR) react to GSM and MIB, and bind them in single-walled carbon nanotubes field –effect transistor and this was functionalized with olfactory nanovesicles (nanovesciles express the hORs on surface, are



produced from Human embryonic kidney, HEK-293 cell) for a conversion of biological signals to electric signals i.e. when the compounds are present, the carbon nanotubes light up.

The sensor was designed to detect two different odorants at the same time for more accurate assessment of water contamination. In tests, the researchers found that their device can detect GSM and MIB at concentrations as low as 10 nanograms per litre of water, or 10,000 parts per trillion i.e. limit of detection (LOD) is10ng/L, which is sufficiently low level for water quality monitoring. Furthermore, detection of these compounds from the real samples such as tap water, bottled water and river water was available without any pre-treatment processes.

Importance of the device:

i. This device would help water quality technicians detect contaminants quickly in real time and even on the spot, preventing the delay caused by lab testing, by directly detecting water contaminants without any pre-treatment process.

ii. It could be used in different applications in the perfume or cosmetic industry, wine and coffee industry.

iii. There is also a role for security, for example in drug searches or to spot explosives at airports.

Electronic noses have been used in a variety of commercial agricultural-related industries, including the agricultural sectors of agronomy, biochemical processing, botany, cell culture, plant cultivar selections, environmental monitoring, horticulture, pesticide detection, plant physiology and pathology.

Beans and Nuts without allergen

Food allergy caused by eating legumes is not rare, and is increasing. Easily the most famous of these legume allergies is peanut allergy. Peanut allergy can be very dangerous, deadly and in the U.S., approximately three million people report allergies to peanuts and tree nuts. Soy allergy is also a common allergy among children. Approximately 0.4% of American children have a soy allergy. Most children outgrow their soy allergy by the age of 10. Thus, food allergies are a growing food safety and public health concern that affect an estimated 4%–6% of children in the United States. This potentially deadly disease affects 1 in every 13 children (under 18 years of age) in the U.S. That's roughly two in every classroom.

Such food allergies are triggered when the immune system recognizes specific proteins in the food and releases the antibody immunoglobulin E (IgE) to latch on to the allergen, thereby causing reactions from mild itching to life-threatening anaphylaxis.

Anaphylaxis symptoms can include difficulty breathing, low blood pressure, swelling of the tongue, eyes or face, stomach pain, nausea and vomiting, skin rashes, blisters, itching, inflammation, pain, and, in some cases, even death. Allergy free nuts are coming to supermarket shelves within a few years after scientists discovered how to modify the dangerous proteins which can trigger deadly reactions.

Soybean seed proteins are immunologically bioactive as food allergens resulting in it being classified as one of the eight major food allergens, regulated under Food Allergen Labeling and Consumer Protection Act (FALCPA) which is an amendment to the Federal Food, Drug, and Cosmetic Act and requires that the label of a food that contains an ingredient that is or contains protein from a "major food allergen " declare the presence of the allergen in the manner described by the law.

As soybean allergy is one of the allergies predominant in the USA, a new type of soybean, with significantly reduced levels of three key proteins viz. Kunitz trypsin inhibitor, soybean agglutinin and P34 responsible for both of its allergenic and anti-nutritional effects, has been conventionally bred by the Scientists (Schmidt et al., 2015)2 from the Universities of Arizona and Illinois. The new variety, dubbed Triple Null has same properties as normal soy in terms of texture and potential uses such as livestock and agriculture. This soybean can be directly employed in any currently used food processing mode such as conventional feed/food source without modification. It has also potential use in immunotherapy to mitigate soybean allergenic response.

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However, as body has finite rate or ability to excrete water, excess water may cause undesirable effects swelling, headache, nausea, muscle twitching etc. Although extremely rare hyperhydration due to drinking too much water without electrolytes in a very short time may upset electrolyte balance in various organs.

Problems of Dehydration

As water is essential for body for many functions if the water balance is disturbed, consequences could be mild problems to drastic effects. Even a small loss of 1 to 2% body water can cause mild to strong thirst and discomfort. At 3% loss impairs physical performance while 4% loss makes physical work difficult and causes nausea. At 5% loss there is difficulty in concentration while 6% loss causes failure to regulate excess temperature. Higher losses cause dizziness, weakness, muscle spasms, delirium, inability for proper blood circulation and failing renal function etc. Thus for an individual of 70kg, even a loss of about 700 ml (1% bw) can show symptoms.

Kidneys have the ability to adapt to the quantity of excreted water while maintaining stable solute excretion. Thus depending on hydration state of body and fluid intake, metabolic waste is excreted in more or less concentrated urine. Excretion of water by kidney is regulated to maintain a constant composition of extracellular fluid and in particular a constant plasma osmolality. Thus in case of inadequate water intake, output of urine is less and its colour is darker. In fact dark urine is a sign of dehydration.

Water should be regularly consumed separately or through foods and beverages. The thirst is felt only after 1 or 2% loss of water so one is already dehydrated showing adverse effects when one feels thirsty.

Keeping Hydrated

As water comes from a variety of sources, plain water, foods, beverages of different types and at different times, total amount should be enough to replenish whatever is lost by way of urine, perspiration and sweat, feces etc. For a sedentary person as the total loss per day is about 2 to 3 litres, that much should be recovered. In simple terms it works out to be about 8 to 12 glasses. However, you do not need all this water to be consumed separately as each food and beverage you consume has water. So if there is not much of physical activity i.e. sedentary one can drink say about 4 glasses of water assuming that rest comes through foods and beverages. However, if one consumes very little fluids, fruits and vegetables then more is needed.

In hot weather one perspires more so there is a greater need. In case of person having to work physically this also increases needs. Sports or activities like walk, gardening, and working out also needs more water. Dry climate causes loss of water through perspiration much more without person realising so this also will add to the requirement. Higher altitudes make people breathe faster so water lost in breathing is more.

Certain medical conditions or treatments also cause increase in water requirements. Certain medications are diuretic so they increase urination so more water should be consumed as compensation. Fever, illness, diarrhea and vomiting increases water losses so more water is needed.

It must be remembered that for small amounts of water replenishment plain water could be consumed. However, when needs are greater for example in an intense or endurance sports one must consume with electrolytes besides some carbs needed for energy. Plain water consumed quickly in large amounts can cause imbalance in electrolytes in plasma causing adverse problems. In hot weather in a dry place, one must keep hydrating even when not thirsty because dehydration occurs more rapidly than one feels thirsty.

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Another new process which has lead to the development of allergen free peanuts has been developed by Dr. Jianmei Yu, a food & nutrition researcher in the NC A&T School of Agriculture and Environmental Sciences in Greensboro, U.S. state of North Carolina with two faculty members Dr. Mohamed Ahmedna and Dr. Ipek Goktepe. The process includes treating roasted peanuts, removed from the shell and skin, by soaking them in food-grade enzymatic solution.

Studies show that this treatment reduces key peanut allergens Ara h 1 to undetectable levels and Ara h 2 by up to 98 percent. The resulting peanuts look and taste like roasted peanuts. Treated peanuts can be used as whole peanuts, in pieces or as flour to make foods containing peanuts safer for many people who are allergic. Treated peanuts also can be used in immunotherapy.

In addition to above, allergen-free cashew nuts have also been developed by reshaping proteins so they are no longer recognised by the immune system. The process includes treating proteins from cashew extract with a potent combination of heat and sodium sulfite, "generally regarded as safe," or GRAS, by the U.S. Food and Drug Administration. The treatment essentially cuts the proteins into smaller pieces, destroying the IgE molecules' ability to recognize them.

When the researchers, Dr Chris Mattison and his team of the Agricultural Research Service, a branch of the US Department of Agriculture, tested the altered proteins by mixing them with IgE taken from people allergic to cashews, about 50% fewer of the IgE bound to the altered proteins compared with when they mixed the IgE with unmodified cashew proteins.

That is how the researchers could change their shape and found that that sodium sulfite can effectively disrupt the structure of the cashew allergens. Using a GRAS compound in this process is the only way the altered nuts could eventually be manufactured as a food product and could make nuts safe to eat for people hypersensitive to cashew.

Touch & feel Packaging

There are new technical advances in Food Packaging sector wherein two terms seem to dominate the landscape in packaging, these are active packaging and intelligent packaging (sometimes also called smart packaging), which in case food is contaminated or spoiled, can change the colour depending upon the sensors attached.

ACTIVE PACKAGING -

- As per the definition in EU Regulation (EC No. 450/2009), 'active materials and articles' means materials and articles that are intended to extend the shelf-life or to maintain or improve the condition of packaged food; they are designed to deliberately incorporate components that would release or absorb substances into or from the packaged food or the environment surrounding the food and INTELLIGENT PACKAGING means "Intelligent materials and articles" which monitor the condition of packaged food or the environment surrounding the food.
The term is commonly used in a broad sense including features concerning product identity, authenticity and traceability, tamper evidence and theft protection, as well as quality issues.

Indian packaging converters are finding much deserved recognition in the last few years. They are investing in better machinery and skills. To endorse them, the government needs to invest a lot more in the R&D segment because of which various Industrial problems relating to innovation on new technologies could be solved.

New types of active packaging systems as discussed above in this article (such as oxygen scavengers, ethylene scavengers, liquid and moisture absorbers, flavor and odor absorbers or releasers, antimicrobials, etc.) and intelligent packaging systems (time-temperature indicators, gas detectors, and freshness and/or ripening indicators) are developed globally which can also cater to special needs of the consumers in India.

However, recognition of the benefits of these technologies by the food industry and increased consumer acceptance is necessary for commercial realization of these packaging technologies.

COMING EVENTS

Global Economic Summit on Enabling Food for All
November 19-21, 2015
World Trade Centre, Mumbai
T: 022-6638 7393/7272
W: www.wtcmumbai.org

48th Annual National Conference of Indian Dietetic Association IDACON-2015
"Nutrition in Transition – A Global Challenge"
November 19-20, 2015
Lalit Ashok, Kumara Krupa High Grounds, Bengaluru
T: 080-2630 4023
E: idacon2015@gmail.com
W: www.idaindia.com

Caring for People
International Symposium on Community Nutrition & Health
9th Annual Event of Nutrition Society of India (Mumbai Chapter)
December 8-9, 2015
E: nehapaharia@gmail.com
M: 91672 52445
W: http://hwwe2015.org/

National Seminar on A Decade of Progress, Challenges & Opportunities in Food Processing Sector
December 17, 2015
India International Centre, Lodhi Rd, N. Delhi
T: 011-2651 8848
E: harender@aifpa.net
W: www.aifpa.net

Starch 360°
6th Starch Forum, India
January 16, 2016
Vivanta by Taj-President, Mumbai
T: 42243 91054
E: marketing@firstmr.com
W: firstmr.com

GulFood
February 21-25, 2016
Dubai World Trade Centre
W: www.gulfoodmanufacturing.com

Aahar 2016
International Food & Hospitality Fair
March 15-19, 2016
Pragati Maidan, New Delhi
E: fhsai@aaharways.com

Oils & Fats International Exhibition
OFI India 2016
April 13-14 2016
Hyderabad Intl Conv Centre (HICC)
Hyderabad, India
M: +91 93219 79888,
E: prasadtendulkar@quartzltd.com

Research in Health & Nutrition

Beet Juice Boosts Muscle Strength after Heart Failure

October 01, 2015 – Food Product Design

Beet juice is making a name for itself within the sports-nutrition category. And now, with the results from a new study published in Circulation: Heart Failure, beet juice may also be good for muscle dysfunction—i.e., muscle strength, velocity and power—for patients who have suffered from heart failure.

What researchers have figured out is the muscle dysfunction may be partially due to decreased nitric oxide (NO) bioavailability. So in the current studies, they examined whether ingestion of inorganic nitrate (NO3-) would increase NO production and improve muscle function in patients with heart failure due to systolic dysfunction using a double blind, placebo-controlled, randomized crossover design (July 15, 2015).

After fasting overnight, subjects drank beetroot juice containing or devoid of 11.2 mmol NO3-. Two hours later, dietary NO3- increased breath NO by 35 to 50 percent via 9-percent and 11-percent increases in peak knee extensor power at the two highest movement velocities tested. Maximal power was therefore greater after dietary NO3- intake. Calculated maximal velocity of knee extension was also higher following NO3- ingestion. Blood pressure was unchanged, and no adverse clinical events occurred.

The results of this pilot study show that acute dietary NO3- intake enhanced NO bioavailability and muscle power in patients with systolic heart failure. "Larger-scale studies should be conducted to determine whether the latter translates into an improved quality of life in this population," the researchers noted.

Ginger may delay diabetic complications

IFT Weekly October 7, 2015

A study published in Chemical Research in Toxicology shows that ginger compounds may be effective at stopping physiological processes that lead to diabetic complications.

The researchers investigated the ability of gingerols and shogaols—two compounds in ginger—to prevent the formation of advanced glycation end products (AGEs) via trapping methylglyoxal (MGO). MGO and glyoxal (GO) are reactive carbonyl compounds that are by-products of auto-oxidation of glucose, lipid peroxidation, and protein glycation, a process where protein and glucose interact, interfering with the function of protein in the body.

Research shows that diabetics are found to have two to six times the level of MGOs in their blood than non-diabetics. Although AGEs are part of the aging process, their damaging impacts are accelerated by high blood sugar. They are dangerous because they accumulate in organs contributing to the development of insulin resistance and diabetic complications. "Glycation of protein contributes to the known health complications from diabetes," said Shengmin Sang, associate professor of functional foods with the North Carolina Agricultural and Technical State University (NCA&T) Center for Excellence in Post-harvest Technologies at the NC Research Campus. "Glycation is life threatening far more than high blood sugar itself to diabetic patients."

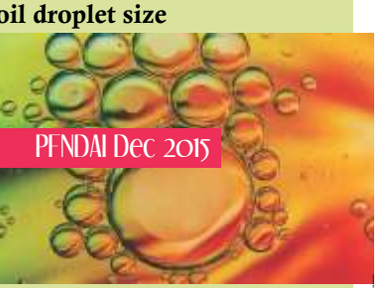
Ginger For Type 2 Diabetes

The study demonstrated in vitro that within an hour both ginger compounds "trapped" 80% of the MGOs present, forming the less reactive and harmful compounds mono-MGO adducts, 6S-MGO, and 6G-MGO. They found that the ability of these compounds to trap MGOs and prevent cellular damage began an hour after exposure and lasted up to six days in vitro.

Oil droplet size in emulsions may impact satiety

IFT Weekly October 7, 2015

A study published in the journal Appetite shows that the manipulation of oil droplet size within oil-in-



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water emulsion can affect appetite and food intake. Previous research has shown that oil droplet size in emulsions can affect sensory characteristics and hedonics.

Thirty-four male participants, aged 18–37, completed two test days, where they visited the laboratory to consume a fixed-portion breakfast, returning 3 hr later for a "drink," which was the emulsion preload containing either 2 or 50 μm oil droplets. This was followed 20 min later with an ad libitum pasta lunch.

The researchers found that the participants consumed significantly less at the ad libitum lunch after the preload containing 2 μm oil droplets than after the 50 μm preload, with an average reduction of 12% (62.4 kcal). Despite the significant differences in intake, no significant differences in sensory characteristics were noted.

The researchers concluded that "the impact that an emulsion has on satiety can be enhanced without producing significantly perceivable differences in sensory properties. Therefore, by introducing a processing step which results in a smaller droplets, emulsion-based liquid food products can be produced that enhance satiety, allowing covert functional redesign."

Cranberry juice may improve vascular function, blood flow

IFT Weekly October 14, 2015

A study presented at the Cranberry Health Research Conference shows that cranberry juice consumption may play a role in protecting against cardiovascular disease.

In a randomized, controlled crossover trial, researchers gave 10 healthy male subjects, aged 18 to 40, 450 mL of sweetened cranberry juice made from concentrate. The cranberry concentrate was prepared with varying water to concentrate ratios. The amount of cranberry polyphenols increased with the concentration. Non-invasive measurements of vascular function including flow-mediated vasodilation (FMD), blood pressure, and arterial stiffness were performed at baseline and at one, two, four, six, and eight hours post-consumption. Blood and urine samples were collected for 24 hours following consumption to detect changes in plasma and urinary cranberry-derived polyphenols.

The researchers found that all of the cranberry juices improved FMD, including 25% cranberry juice, which is equivalent to the common cranberry juice cocktail (25–27%). The highest concentration of cranberry-polyphenol juice also showed improvements in systolic blood pressure.

"Our results lay the groundwork to better understand the array of potential vascular and cardiovascular health benefits of cranberry polyphenols," said Ana Rodriguez-Mateos, Division of Cardiology, Pulmonology, and Vascular Medicine at the University Duesseldorf. "Significant improvements in vascular function from drinking two cups of cranberry juice suggest an important role for cranberries in a heart-healthy diet."

Boosting Beef's Nutritional Value with Omega-3s

October 14, 2015 – Food Product Design

Omega-3 fatty acids have many benefits including heart health, anticoagulant properties, and they may have a positive effect on cognition, cancer, immunity and arthritis.

Now new research has found omega-3s, which are found naturally in leafy green vegetables, vegetable oils, nuts, fish and fish oil, may help boost the nutritional value of beef.
Researchers at Kansas State University examined the potential of adding beef, enhanced with omega-3 fatty acids, to that list of heart-healthy foods and if consumers would be willing to pay a premium for the enhanced product. "The momentum behind this idea would be the nutritional attribute that beef producers could potentially use to enhance the demand for beef," said Sean Fox, agricultural economist, KSU.

He explained the American diet is low in omega-3 consumption. Salmon is a primary source of omega-3 fatty acids, but fish consumption levels are low. U.S. consumers eat, on average, about 16 pounds of fish per year compared to 63 pounds of beef, according to FDA. Enhancing beef with omega-3 fatty acids could provide an opportunity for the industry. While beef is already a popular source of protein, adding nutrition to beef products by enhancing the omega-3 levels could increase consumers' demand for beef, he said.

He pointed to a recent study that examined the overall trends in meat demand. The researchers found that nutrition is one of the main drivers for meat demand and is likely to be one of the main drivers over the next decade.

The fortification of omega-3 fatty acids in beef would occur in the cattle feeding process by adding ingredients high in omega-3s to the animal's diet in the feedlot. This has been done in the past using flaxseed as the added ingredient, and omega-3 beef products have been on the market for a while. The feeding process, however, can be adjusted to add more omega-3 health benefits.

When you add flax to the diet for animals, you enhance the ALA levels in the beef," Fox said. "But, it turns out that the EPA and DHA, the ones found in salmon and other fatty fish, are the ones that have the greatest health benefit (to humans)." K-State animal scientists have found adding an algae extract to the beef diet can enhance levels of EPA and DHA in the beef product.

Fox and a graduate student conducted a survey of consumers across the nation to gauge their response to a new style of a beef product, enhanced with omega-3s, should it become common in the market. The goal was to find what consumers would be willing to pay for it compared to other beef products. They found for ground beef and steak specifically, the survey showed an increased preference for grass-fed beef over the omega-3 enhanced beef. Prior studies have shown grass-fed beef to have somewhat higher levels of omega-3s compared to conventionally raised beef. However, the survey also showed a demand for the omega-3 enhanced product, and that people were willing to pay a premium for it.

"The average premium for steak was around $3.70 a pound for grass-fed steak compared to conventional steak," Fox said. "When we looked at the omega-3 enhanced product, the average premium was in the ballpark of $1.85 a pound. That is a premium over and above what they were willing to pay for the conventional product." There was a similar trend for ground beef. He stressed that the numbers are lower due to ground beef being a lower-value product with a lower baseline price: "For ground beef, the average premium for grass-fed beef was $1.27 a pound compared to about $0.79 a pound for the omega-3 enhanced product."

Fox said there is still work to be done if the beef industry chooses to move forward in offering omega-3 enhanced beef products, as the cost of enhancing the beef has not been analyzed.

Collagen peptides may help prevent, fight sarcopenia

IFT Weekly October 21, 2015

A study published in the British Journal of Nutrition shows that consuming collagen peptides in combination with resistance training may help fight sarcopenia.

A steady loss of lean muscle mass along with fat mass increase, a condition known as sarcopenia, is one of the hallmarks of aging and means a loss of strength and mobility.

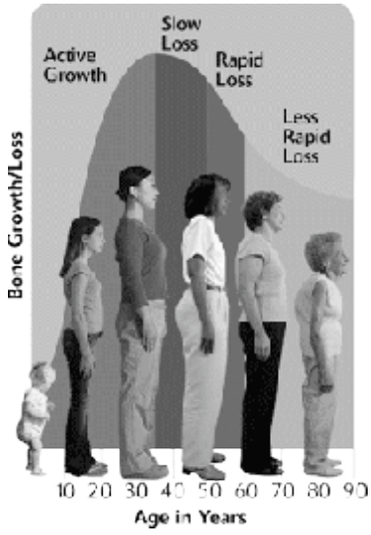
In a double-blind, placebo controlled study, the researchers investigated the effects of collagen peptides on the body composition and muscle strength of 60 men, aged 65 and older, with sarcopenia. The participants were divided into two groups. During the 12 weeks of the study, both groups underwent the same guided resistance training program, with three sessions per week. One group was daily supplemented with placebo, the other with collagen peptides (BodyBalance by Gelita): 15 g given in powder form dissolved in 250 mL water. The participants drank the solution within one hour after the training.

The researchers found that the collagen peptides further increased the benefits of the resistance training in elderly people with sarcopenia. Compared with placebo, participants in the collagen-supplemented group showed a significant increase in fat-free mass and muscle strength, as well as a statistically significant reduction in fat mass.

Nutritional needs for skeletal health change as you age, says new scientific review

October 6, 2015 Science Daily

How bone-healthy diets throughout life help to protect against osteoporosis in old age



Whether you're young or old, the right nutrition can make a difference to your bone health and influence your ability to live an independent, mobile, fracture-free life into your more senior years. That's the key message of a new scientific review published in the journal Osteoporosis International

by leading bone and nutrition experts, in anticipation of World Osteoporosis Day on October 20.

The review summarizes the latest evidence relating to the nutritional needs of mothers, children and adolescents, adults and seniors, in relation to developing and maintaining a healthy skeleton. Placing particular emphasis on calcium, vitamin D and protein, it shows how adequate nutritional intake of these and other micronutrients can support the primary objectives for good bone health:

• Achieving genetic potential for peak bone mass in children and adolescents
• Avoiding premature bone loss and maintaining a healthy skeleton in adults
• Preventing and treating osteoporosis in seniors

Findings from international studies and trials are summarized as well as current dietary guidelines.

Professor Cyrus Cooper, co-author and chair of the International Osteoporosis Foundation (IOF) Committee of Scientific Advisors, stated, "This new report shows just how important nutrition is for our bone health throughout life. In fact, nutrition plays a key role in the development of a healthy skeleton even before birth. Healthy maternal diets as well as adequate vitamin D levels are associated with greater bone mass in the off-spring."

The report also underlines how lifestyle trends which lead to poor diet and nutrient deficiencies are a growing cause of concern in people of all ages, and particularly in children. Milk and dairy products comprise the main stay of calcium intake for most children, yet a decline in milk consumption has been observed across the world during the last few decades. Furthermore, vitamin D insufficiency is widespread among youth, which has led to recommendations in several countries for vitamin D supplements to be given to infants and young children.

In adults and seniors, studies have shown that calcium intakes are often considerably below those recommended by national guidelines. Similarly, alarmingly low levels of vitamin D have been found in populations around the world. Lifestyle factors such as excessive alcohol consumption, smoking, and a very high or low body mass index (BMI) also elevate fracture risk for a substantial number of people.

The impact of nutrition on falls and fracture prevention in seniors, who are a growing segment of the population and most affected by osteoporosis, is discussed. The review shows how deficits in protein intake as well as malnutrition, which is sadly common in older people, can negatively affect their bone and muscle health. It also highlights how together with appropriate exercise, adequate nutritional intake in those at high risk of fracture plays an important complementary role to pharmacotherapy.

Professor Bess Dawson Hughes, co-author and professor at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University in Boston, commented, "The baby boomer generation is aging and as a result age-related musculoskeletal diseases are imposing an increasingly costly burden on society and health-care systems worldwide. This report shows how we can tap the potential of healthy nutrition within a systematic life-course approach to support osteoporosis and fracture prevention."

The scientific review complements a comprehensive report entitled Healthy nutrition, healthy bones: how nutritional factors affect musculoskeletal health throughout life also released today. The report is available freely online in nine languages, together with a wealth of World Osteoporosis Day campaign resources: http://www.worldosteoporosisday.org/resources/2015/thematic-report

MS may start later for those who spend teenage summers in the sun

October 7, 2015 Science Daily

A study of people with multiple sclerosis (MS) found that those who spent time in the sun every day during the summer as teens developed the disease later than those reporting not spending time in the sun every day.

The study, which was published in the October 7, 2015, online issue of Neurology®, the medical journal of the American Academy of Neurology, also found that people who were overweight at age 20 developed the disease earlier than those who were average weight or underweight.

"The factors that lead to developing MS are complex and we are still working to understand them all, but several studies have shown that vitamin D and sun exposure may have a protective effect on developing the disease," said study author Julie Hejgaard Laursen, MD, PhD, of Copenhagen University Hospital in Denmark. "This study suggests that sun exposure during the teenage years may even affect the age at onset of the disease."

For the study, 1,161 people with MS in Denmark filled out questionnaires and gave blood samples. They were put into two groups based on their sun habits during their teenage years: those who spent time in the sun every day

and those who did not spend time in the sun every day. They were also asked about their use of vitamin D supplements during their teenage years and how much fatty fish they ate at age 20.

The people who spent time in the sun every day had an average onset of MS that was 1.9 years later than those who did not spend time in the sun every day. A total of 88 percent of the participants were in the sun every day group. They developed MS at an average age of 32.9, compared to 31 for those who were not in the sun every day.

Those who were overweight at age 20 developed the disease an average of 1.6 years earlier than those who were average weight and 3.1 years earlier than those who were underweight. Eighteen percent of the participants were overweight; they developed the disease at an average age of 31.2.

"It appears that both UVB rays from sunlight and vitamin D could be associated with a delayed onset of MS," Laursen said. "However, it's possible that other outdoor factors play a role, and these still have to be identified."
Laursen said previous studies have shown a relationship between MS risk and obesity in childhood and the teenage years. Obese people are known to have lower blood levels of vitamin D. "The relationship between weight and MS might be explained by a vitamin D deficiency, but there's not enough direct evidence to establish this yet," Laursen said.

“A limitation of the study is the risk of recall bias because participants were asked to remember their sun, eating and supplement habits from years before," Laursen said. "In particular, someone with a long history of MS and onset of the disease at an early age, may wrongly recall a poor sun exposure. Additionally, only Danish patients were included into the study, so there should be caution when extending the results to different ethnic groups living in different geographic locations."

A cure for vitamin B6 deficiency

October 9, 2015 Science Daily

Plant scientists engineered the cassava plant to produce higher levels of vitamin B6 in its storage roots and leaves. This could help to protect millions of people in Africa from serious deficiencies.

In many tropical countries, particularly in sub-Saharan Africa, cassava is one of the most important staple foods. People eat the starchy storage roots but also the leaves as a vegetable. Both have to be cooked first to remove the toxic cyanide compounds that cassava produces.

But the roots have a disadvantage: although rich in calories, in general they contain only few vitamins. Vitamin B6 in particular is present in only small amounts, and a person for whom cassava is a staple food would have to eat about 1.3 kg of it every day for a sufficient amount of this vital vitamin.

Serious deficiency in Africa
Vitamin B6 deficiency is prevalent in several African regions where cassava is often the only staple food people's diet. Diseases of the cardiovascular and nervous systems as well as are associated with vitamin B6 deficiency.
Plant scientists at ETH Zurich and the University of Geneva have therefore set out to find a way to increase vitamin B6 production in the roots and leaves of the cassava plant. This could prevent vitamin B6 deficiency among people who consume mostly cassava.

Genetically modified lines produce more B6

Their project has succeeded: in the latest issue of Nature Biotechnology, the scientists present a new genetically modified cassava variety that produces several-fold higher levels of this important vitamin.

"Using the improved variety, only 500 g of boiled roots or 50 g of leaves per day is sufficient to meet the daily vitamin B6 requirement," says Wilhelm Gruissem, professor of plant biotechnology at ETH Zurich. The basis for the new genetically modified cassava variant was developed by Professor Teresa Fitzpatrick at the University of Geneva. She discovered the biosynthesis of vitamin B6 in the model plant thale cress (Arabidopsis thaliana). Two enzymes, PDX1 and PDX2, are involved in the synthesis of the vitamin. With the introduction of the corresponding genes for the enzymes, into the cassava genome, the researchers produced several new cassava lines that had increased levels of vitamin B6.

Stable under field conditions
To determine if the increased production of the vitamin in the genetically modified cassava was stable without affected the yield, the plant scientists conducted tests in the greenhouse and in field trials over the course of several years. "It was important to determine that the genetically modified cassava consistently produced high vitamin B6 levels under different conditions," says Gruissem.

Measurements of the metabolites confirmed that cassava lines produced several times more

vitamin B6 in both roots and leaves than normal cassava. The researchers also attributed the increased production to the activity of the transferred genes, regardless of whether the plants were grown in a greenhouse or the field. The increased vitamin B6 trait remained stable even after the cassava was multiplied twice by vegetative propagation.

Previously, the researchers had analysed several hundred different cassava varieties from Africa for its natural vitamin B6 content -- none had a level as high as the genetically modified variety.

Vitamin B6 from the genetically modified varieties is bioavailable, which means that humans can absorb it well and use it, as was confirmed by a research team at the University of Utrecht.

Accessible technology
"Our strategy shows that increasing vitamin B6 levels in an important food crop using Arabidopsis genes is stable, even under field conditions. Making sure that the technology is readily available to laboratories in developing countries is equally important," says Hervé Vanderschuren, who led the cassava research programme at ETH Zurich and recently became a professor of plant genetics at the University of Liège.

It is still unclear when and how vitamin B6-enhanced cassava will find its way to farmers and consumers. The new trait should be crossed in varieties preferred by farmers using traditional plant breeding or introduced into selected varieties using genetic engineering. Vanderschuren hopes this can be performed in African laboratories. He has previously trained scientists on site and organised workshops to build platforms for the genetic modification of crop plants in Africanlaboratories. "We hope that these platforms can help spread the technology to farmers and consumers."

The method for increasing vitamin B6 has not been patented because the gene construct and technology should be available freely to all interested parties.

Challenge of distribution and legislation
One huge hurdle, however, is the distribution and use of the new variety: "There are at least two obstacles: legislation for transgenic crops in developing countries and implementation of a cassava seed system to give all farmers access to technologies," says Vanderschuren.

He is currently supervising a project in India in conjunction with the School of Agricultural, Forest and Food Sciences (HAFL) in Zollikofen, which he hopes will result in guidelines for the development of sustainable seed system for cassava in India. "Our work in Africa will also benefit from this project," he asserts. Individual national organisations as well as the FAO and other NGOs are currently organising the spread of cassava stem cuttings for cultivation in Africa. However, a better and more efficient organisation for the distribution of healthy plant material is urgently needed, says the researcher.

On the legislative side, the cultivation of genetically modified cassava (and other crops) is not yet regulated everywhere. In numerous African countries, such as Uganda, Kenya and Nigeria, the governments have now enacted legislation for field trials of genetically modified plants. "This is an important step to ensure that improved varieties can be tested under field conditions," says Vanderschuren. "In order to allow the cultivation of genetically modified plants, the respective parliaments will have to develop further legislation."

More than just a substance
Vitamin B6 is a mixture of three similar molecules, namely pyridoxol, pyridoxine and pyridoxamine. These are the precursors of pyridoxal phosphate, one of the most important co-enzymes in the body involved in the assembly and modification of proteins. The human body cannot produce vitamin B6, which is why it must be supplied with the food. A high vitamin B6 content is found in soya beans, oats, beef liver and brown rice, for example. Avocados, nuts and potatoes are also good sources. The daily requirement of an adult is approximately 1.5 mg to 2 mg.

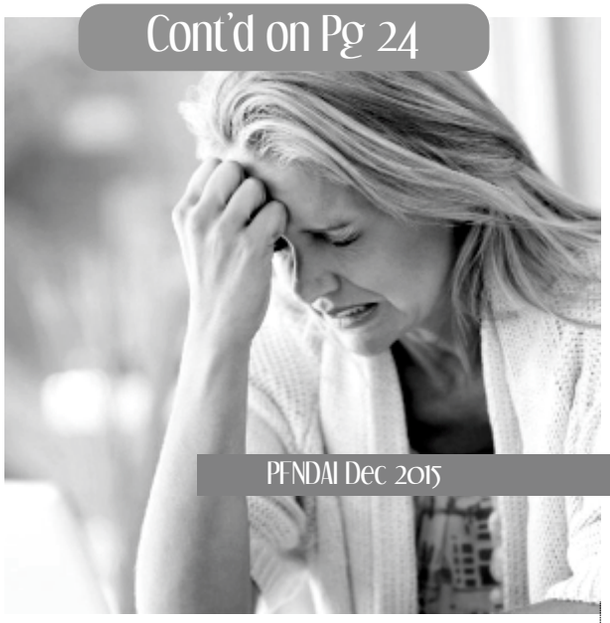
Larger percentage of bioactive forms of S-equol appear to play role in managing menopausal symptoms

1 October 2015 Medical News Today

A study of how the body processes a nutritional supplement containing S-equol, a novel soy germ-based ingredient, shows that metabolism yields two forms that are biologically active.

The new study, which builds on previously published peer-reviewed studies showing that daily 10 milligram (mg) doses of S-equol help relieve certain menopause symptoms, was reported in a peer-reviewed poster at the 2015 North American Menopause Society (NAMS) annual scientific meeting.

Cont'd on Pg 24



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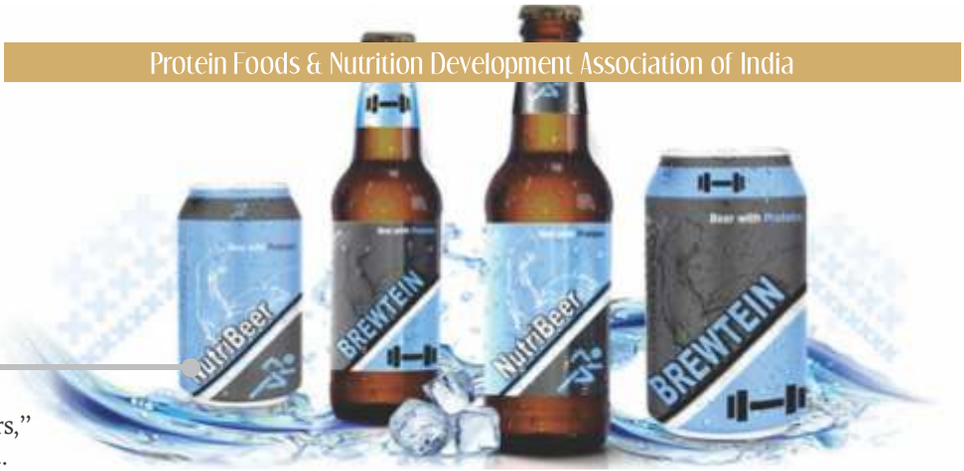

A post-workout brew: Crafting a protein-packed beer for the fitness crowd

06¬Oct¬2015
NutraIngredients

Supplemental Brewing has launched a protein-¬infused beer for athletes "who don't want their workouts to get in the way of their weekend."

Illinois resident Blake Konrardy created this protein beer to help athletes' recovery after a hard workout. "I found myself in the unique situation of drinking a protein drink but also drinking some beers," Konrardy, who has a background in the insurance industry, told Beverage Daily. "My friends called me out. I was sick and tired of getting made fun of for it, so I decided to start brewing my own protein beer." 'They don't want their workouts to get in the way of their weekend' Konrardy started experimenting with home brewing, where he created two styles of protein-¬infused brews.

Supplemental Brewing's beers include Brewtein, an American wheat ale with 7g of protein, 5% alcohol and 178 calories, and NutriBeer, a lager with 4g of protein, 4% alcohol and 122 calories. Whey protein concentrate is used to give the beer its added protein: a source Konrardy said is the most desirable to himself and other fitness enthusiasts. "These are for runners, weight lifters and athletes looking to get more protein to help muscle growth, but at the same time these are also beer drinkers," he said.

"They don't want their workouts to get in the way of their weekend, either." But how does it taste? For many people, the idea of a protein¬-packed beer may not sound like the most flavorful drink, but Konrardy said they have gone through multiple batches to get the recipe correct. "In both of them, you cannot taste the protein one bit," he said, adding that Brewtein has a "refreshing wheat flavour," while NutriBeer has a "subtle citrus flavour" from the cascade hops used in the brewing process.

EU project aims to slash food waste by 30% by 2025

28¬Sep¬2015 Food Navigator

A new EU-¬funded research project involving partners across the EU, as well as in China, will help reduce food waste by 30% by 2025, say those behind the project.

The Horizon 2020 project – known as Resource Efficient Food and dRink for the Entire Supply cHain (REFRESH) – is set to run from 2015 to 2019, and will work to reduce food waste and waste management costs, in addition to maximising the value from unavoidable food waste and packaging materials.

According to information provided by the project, around 100 million tonnes of food are wasted annually in the EU, and that if nothing is done, waste levels could rise to over 120 million tonnes by 2020. Indeed, the food resources being lost and wasted in Europe would be enough to feed all the hungry people in the world two times over, according to a 2015 European Commission report. "It's imperative that we take an EU¬wide, comprehensive approach to reducing avoidable waste, and finding better uses for what can't be avoided" commented Professor Keith Waldron, director of the UK Institute of Food Research (IFR) Biorefinery Centre – who will be leading work aimed at identifying key waste streams across the EU, and finding ways of adding value to them by turning them into other products.

Led by Wageningen UR, the four year project aims to develop strategic agreements to reduce food waste with governments, business and local stakeholders in four pilot countries (Spain, Germany, Hungary and the Netherlands), in addition to formulating EU policy recommendations and supporting national implementation of food waste policy frameworks. According to Waldron, the project will evaluate technological feasibility, economic viability, legislative compliance and environmental sustainability through four European pilot countries as well as in China.

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NUTRITION AWARENESS ACTIVITY

Karunya University, Coimbatore

Report by Ms. Preeti Panicker, Food Technologist, PFNDAI

Consumption of food should be done only when we are assured of its safety, nutritional qualities and overall health benefits.

As newer and exotic ingredients are being introduced into the Indian market, consumers need to be aware of safety of such new food products. Also nowadays foods are being fortified with vitamins and minerals. Hence consumption of foods should not only be in regard of taste and brand availability but we also need to know whether it is safe and nutritious.


Dr. Ramasubramanian

The Nutrition Awareness Activity was organized on 10th October 2015 in Coimbatore at Karunya University and the theme of the seminar was 'Food Safety, Nutrition & Health'.

Students from colleges like Avinashilingam, PSG College of Technology, CSI College of Engineering, and Kongu Engineering College participated in the competitions. The intercollegiate poster competition was on "Food Security through Social Protection" for which Mr. Tiroutchelvame & Dr. Ramasubramanian were judges. Recipe Competition theme was Low cost-High Protein Innovative Snacks judged by Dr Ashlesha Parchure & Dr Radhaisri. Calendar making competition topic was "Technologies that make a difference in food industry" judged by Mr Jony Blessing Manoj & Miss Shalini Kumarswamy.

The seminar had eminent speakers like Dr Ramasubramanian and Miss Shalini. Head of food Processing &Engineering Dr. Ranganathan welcomed


Giving Awards

participants. Registrar Dr C. Joseph Kennady and Director Dr Jannet Vennila were present.

Dr Ramasubramanian spoke about novel foods finding a way into regular diet of common man. Foods consumed for their therapeutic properties were earlier not a part of the diet. Even when they have health benefits these cannot be consumed unless tested for safety at the level of consumption. No Observed Adverse Effect Level (NOAEL) and Lowest Observed Adverse Effect Level (LOAEL) are some concepts in toxicological testing.


Posters Being Judged


Calenders Being Judged

Miss Shalini, Research Analyst with Giract talked about nutraceuticals and their health benefits, how food can be used to prevent illness, deficiencies and incorporation of micronutrients. She told how certain foods can lessen the dependence on medicines.

Mrs. Thenmozhi Palanisami, Senior Dietician, Ramakrishna Hospital talked about effects of oils on health and their combination is beneficial and their consumption should be moderated. She discussed the effects of fats and oils on the human health, the cardiovascular disease arising from high cholesterol levels, and nutritional properties of the oils.

Miss Preeti Panicker, Food Technologist, PFNDAI spoke about Transfat and their ill effects and how one should avoid them.

Dr. Ramasubramanian concluded the seminar and thanked the speakers for the day and the sponsors: Novozymes South Asia, Giract, Kelloggs India & Marico.


Calendar Competitors

Recipe A

Recipe B

Recipes Being Judged

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Cont'd from Pg 16

"The study documented that approximately 43 percent of the S-equol in the plasma of women, following their ingestion of the supplement, is in two bioactive forms, as free S-equol and as a sulfated conjugate. This large concentration may be the reason that S-equol can contribute to the relief of certain menopause symptoms, as documented in other controlled clinical trials," said coauthor Belinda H. Jenks, Ph.D., director of Scientific Affairs & Nutrition Education at Pharmavite LLC, the makers of Nature Made® vitamins and minerals and a subsidiary of Otsuka Pharmaceutical Co., Ltd., which supported the study. The new study is part of an ongoing scientific research effort to document the benefits associated with S-equol.

S-equol has the ability to bind to the same estrogen receptors as naturally occurring estrogen, with a stronger affinity to the beta receptor compared to the alpha receptor. On binding to the receptor, S-equol mimics some, but not all, activities of estrogen. Because of these actions at the receptor, it has been proposed that S-equol may alleviate some symptoms caused by diminished estrogen production during menopause. Daily doses of a supplement containing S-equol can relieve hot flash frequency and muscle and joint pain, as reported in previously published controlled clinical trials in both U.S. and Japanese postmenopausal women.

S-Equol [7-hydroxy-3-(4'-hydroxyphenyl)-chroman] is produced via natural metabolism of daidzein, an isoflavone found in whole soybeans, in the intestine. Not everyone can produce S-equol after soy consumption, as the production depends on the types of bacteria present in the large intestine. About 50 percent of Asians and 20 to 30 percent of North Americans and Europeans, who in general consume less soy than Asians, have the ability to produce S-equol. Preliminary evidence from observational studies suggests that women who are S-equol producers may experience fewer menopausal symptoms compared to non-producers.

S-equol-containing Supplements Metabolized to Two Active Types In the study, 11 healthy postmenopausal Japanese women (ages 43 to 62 years) each ingested one dose of the supplement containing 10 milligrams of S-equol. Blood plasma samples showed the presence of S-equol, both as free and sulfate conjugate forms. The study identified three sulfate conjugates: equol 7-sulfate, equol 4'-sulfate, and equol 4',7-disulfate. Both the free and sulfate conjugate forms of S-equol have biological activity, but until this study, their respective processing within the body (bioavailability and pharmacokinetics) had not been examined.

Metabolism in the liver of the S-equol-containing supplement yielded both forms. The time to reach the maximum plasma concentrations of the free and sulfate conjugates forms and total S-equol were each about one hour. The maximum plasma concentrations, the sum of the free and sulfate conjugates forms, was 0.85 μmol/L and in total S-equol were 2.38 μmol/L. A determination of the available plasma concentrations during the first 24 hours after dosing, called an Area Under the Curve (AUC) calculation, revealed that, together, the free and sulfate conjugated forms tallied 43.4 percent of the total S-equol present.

S-equol is excreted almost exclusively in urine. Elimination times for half of the concentrations of both free and sulfate conjugates forms were six to nine hours. Within 48 hours, 76 percent of the S-equol was excreted in the urine.

This was a single-center, randomized, open label study whereby the participants ingested a single tablet containing 10 mg of S-equol. Of the women, six were natural equol producers and five were non-producers. Investigators collected blood samples before and 0.5, one, two, four, six, eight, 12, 16, 24, 36 and 48 hours after the women ingested the supplement and urine samples during the same 48 hours. All pharmacokinetics measures of S-equol did not differ when examined by the women's equol producing status. The data will be submitted for peer-review publication.

Rhodiola rosea Study Suggests Polyphenols Protect against Viral Infection in Athletes

September 16, 2015 Nutraceuticals World

Human trials with marathon runners found that the herb Rhodiola rosea protects against viral infection. These findings build on previous human trials that demonstrate the anti-viral activity of blueberry and green tea polyphenols.

Both studies were led by David Nieman, DrPh, FACSM, director of the Appalachian State University (ASU) Human Performance Laboratory at the NC Research Campus (NCRC) in Kannapolis, NC.

Rhodiola rosea, also known as arctic root or golden root, is a member of the perennial herbaceous plant in the Crassulaceae family that is found at high altitudes in the Arctic and mountainous regions of Europe and Asia. The herb is credited with numerous health benefits including combatting fatigue and depression. Dr. Nieman's study "Rhodiola rosea exerts antiviral activity in athletes following a competitive marathon race," which was published on July 31, 2015 in Frontiers in Nutrition, is the first to show anti-viral activity.

In his study, 48 marathon runners participating in the 2012 Thunder Road Marathon in Charlotte, NC were randomly divided into two groups that ingested either 600 mg of Rhodiola rosea or placebo for a month before the race. Blood samples were collected the day before the marathon and 15 minutes and one-and-a-half hours post-race. Initial studies found no impact on inflammation and oxidative stress. Additional studies used an in vitro assay to measure the ability of the polyphenolic compounds to protect the cells against vesicular stomatitis virus. The results demonstrated thatRhodiola rosea delayed viral infection for up to 12 hours after the marathon.

Dr. Nieman was the first scientist to find that marathon runners are prone to viral illnesses such as upper respiratory tract infections after competing. This discovery motivated him to research plant-based compounds that could prevent infection and enhance recovery and overall athletic performance.

"Basically after heavy exertion bacteria and viruses can multiply at a higher rate than normal due to factors in the serum like stress hormones and inflammatory cytokines," Dr. Nieman said. "This is why runners are six times more likely to get sick after a marathon. We showed that in those who used Rhodiola rosea the viruses could not multiply, meaning it was acting as a countermeasure."

The in vitro assay used in the study was developed by Dr. Nieman and Maryam Ahmed, PhD, an ASU associate professor of biology who is a virology expert and study co-author.

"It is difficult to test the anti-viral functions of a lot of these types of compounds in humans," Dr. Ahmed said. "So the really unique aspect of this study is that we gave these individuals the supplements, and we were able to test their blood in the lab using the experimental procedures that we developed to find out whether the compounds in the blood can protect cells against viruses."

Using the specially-developed assays, Dr. Ahmed and Dr. Nieman also identified a mix of polyphenolic compounds from green tea and blueberries that is also effective at preventing viral replication in athletes after intense competition. Those findings were reported in the 2014 study "The Protective Effects of a Polyphenol-Enriched Protein Powder on Exercise-Induced Susceptibility to Virus Infection" that was published in the journal Phytotherapy Research. The study was led by Dr. Nieman in collaboration with the Dole Nutrition Institute and the NC State University Plants for Human Health Institute, both at the NCRC.

Both Dr. Nieman and Dr. Ahmed assert that the anti-viral effects of polyphenols are beneficial to more than athletes. In a 2012 study published in the journal Nutrients, Nieman lead a 1,000 person community study that demonstrated people who eat three or more servings of fruit per day substantially reduced their incidence of upper respiratory tract infections.

"These compounds that we are looking at are not only for athletes," Ahmed said. "They also possess anti-oxidant and anti-cancer functions and have other properties that can benefit the general public."

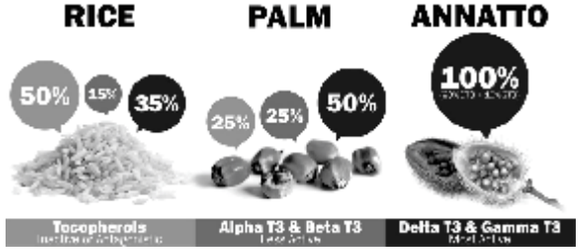
Dr. Nieman added, "We are producing some of the first human studies showing plant polyphenols the naturally occurring chemicals in fruits and vegetables that give them their colors like purple, red and yellow work with the immune system to help clear viruses and keep their ability to multiply under control."

Alpha-Tocopherol Improves Uptake and Distribution of Tocotrienol

September 25, 2015 Nutraceuticals World

A new study affirms that alpha-tocopherol does not interfere with tocotrienol uptake and distribution, and improves the uptake of tocotrienols.

Conducted at Iowa State University, the trial (Hansen H., et al., 2015) evaluated the distribution of vitamin E isoforms (tocopherol and tocotrienol) in laying hens. The study showed that the presence of alpha-tocopherol improved the uptake and enhanced the distribution of gamma- and delta-tocotrienols in certain tissues and organs. It also demonstrated the poor uptake of annatto tocotrienol



(tocopherol-free tocotrienol) as more than 90% of the tocotrienols are excreted.

Vitamin E family comprises eight chemically distinct compounds – four tocopherols and four tocotrienols (alpha-, beta-, gamma-, and delta- respectively). Alpha-tocopherol has been documented to be more bioavailable due to its strong binding affinity to alpha-tocopherol transfer proteins (alpha-TTP) in the liver. It was once thought that the presence of alpha-tocopherol is believed to exhibit bio-discrimination against other vitamin E forms, including tocotrienols. Hence, tocotrienols were mistakenly thought to be poorly absorbed in the presence of alpha-tocopherol.

In this tissue distribution study, alpha-tocopherol and tocotrienol preparation shows higher gamma-tocotrienol level in the liver, kidney and brain; while the distribution of delta-tocotrienol was higher in almost all the tissues tested (e.g. fat pad, liver, brain, oviduct, yolk, breast and thigh meat), compared to the tocopherol-free tocotrienol preparation (better known as Annatto Tocotrienol); suggesting that alpha-tocopherol facilitates the uptake and distribution of tocotrienols into tissues and organs.

In addition, the study reported that more than 90% of annatto gamma- and delta-tocotrienol intake was found in the manure, indicating that less than 10% had been absorbed. This corresponded to the finding in humans where pharmacokinetic study showed gamma- and delta-tocotrienol were poorly absorbed. The absolute absorption rate for gamma- and delta-tocotrienol is approximately 9.1% and 8.5% respectively (Yap SP, et al., 2001).

The results from this particular study compliment two other earlier studies conducted at the Ohio State University Medical Center that showed tocotrienols are well-absorbed in alpha-TTP knock-out mice (Khanna S, et al., 2005) and in human tissue distribution study (Patel V, et al., 2012) where the tocotrienols are absorbed and deposited in vital human organs in the presence of alpha-tocopherol.

β-Glucan-Enriched Pasta Boosts Good Gut Bacteria, Reduces Bad Cholesterol

ASM Society
September 18, 2015 –

People fed β-glucan-enriched pasta for two months showed increased populations of beneficial bacteria in their intestinal tracts, and reduced populations of non-beneficial bacteria.

They also showed reduced LDL (bad) cholesterol. This work is part of a broad effort to identify potential prebiotics—foods that could encourage the growth of health-promoting bacteria in the gastrointestinal tract. The research is published September 18, in Applied and Environmental Microbiology, a journal of the American Society for Microbiology.

β-glucans are healthy fibers that humans cannot digest, but that can be digested by some species of our gut bacteria. They are special types of sugars that are found in the cell walls of certain microbes, as well as in oats and barley. β-glucans are used clinically against diabetes, cancer, and high cholesterol, as well as to boost the immune systems of people whose immunity has been compromised by radiation, chemotherapy, stress, and other conditions.

The investigators hypothesized that by feeding study subjects β-glucan-enriched pasta, they could modify the species composition of the gut bacteria, possibly leading to improved human health, said coauthor Maria De Angelis, PhD, Professor in the Department of Soil, Plant and Food Sciences, University of Bari Aldo Moro, Bari, Italy.

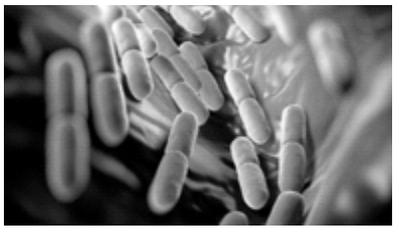
In the study, the investigators took fecal and blood samples before and after the study subjects spent two months on diet that included β-glucan-enriched pasta. At the study's end, assays of the fecal samples showed a notable increase in beneficial Lactobacilli, and a reduction in Enterobacteriaceae, and other non-beneficial bacteria in subjects' gastrointestinal tracts.

The investigators also discovered an unanticipated rise in the concentration of certain short chain fatty acids, 2-methyl-propanoic, acetic, butyric, and propionic acids, bacterial metabolites, for which there is evidence of anti-inflammatory activity.

From the blood samples, the investigators determined that the average LDL cholesterol among the study subjects had fallen from 107.4 to 93.8 MG/DL.

The β-glucan-enriched pasta made from a mixture of 75 percent durum wheat flour and 25 percent whole grain barley flour. The daily dose of pasta, 100 grams, contained 3 grams of barley β-glucans, the recommended daily dose in the US and in Europe.

"These results highlight the influence of fibers and of the Mediterranean diet on gut microbiota, and indirectly on human health," said De Angelis.



Collagen peptides plus exercise show muscle benefits for the elderly

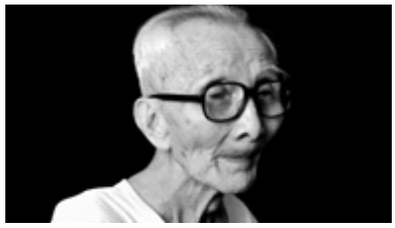
18¬Sep¬2015 NutraIngredients

A combination of resistance exercise and specific collagen peptides may increase muscle mass and strength and decrease fat mass, lessen age-¬related muscle loss, says a new study from Germany.

Supplements of collagen peptides for 12 weeks in addition to resistance exercise was found to increase fat¬-free mass, thigh strength, and decrease fat mass more than resistance training alone, according to findings published in the British Journal of Nutrition .

This is the first study to examine how collagen peptides may affect body composition and muscular power output, claimed the researchers, led by Prof Daniel Konig from the University of Freiburg. "The impact on body composition has not been in the focus, as it is generally believed that the relatively low biological value of collagen would not favour a significant improvement on muscular net protein synthesis," they wrote. "The results of the present investigation do not support this assumption, and the following findings could contribute to further explain the increase in FFM and strength following collagen peptides supplementation: it has been shown that collagen peptide intake was superior to whey protein in maintaining N balance and body weight during a low¬protein diet. Although collagen has a low protein digestibility corrected amino acid score, its N content may be higher compared with whey on a per gram basis due to a high proportion of amino acids having low molecular weight or containing more than one N atom."

Sarcopenia Muscle loss is a natural



part of aging, and researchers have estimated that, after the age of 50, we lose 1¬2% of our muscles each year. Strength declines as well, at a rate of 1.5% per year beginning at 50 years and accelerating to 3% after the age of 60. According to a monograph from the US Dairy Export Council, the direct health care cost attributable to sarcopenia were estimated to be $18.5bn in 2000 in the US, a number that represented about 1.5% of health care expenditures for that year.

Prof Konig and his co¬workers recruited 53 sarcopenic men with a mean age of 72 years to participate in their double-blind placebo-¬controlled study. All of the men underwent the same guided resistance training program, with three sessions per week, and half were randomly assigned to receive supplements of BodyBalance collagen peptides (15 gram given in powder form dissolved in 250 ml water) or placebo for 12 weeks. Results showed that the specific collagen peptides further increased the benefits of the resistance training in elderly people with sarcopenia.

Specifically, participants in the collagen¬ supplemented group showed a significant increase in fat--free mass (+4.2 kg compared to +2.9 kg in the placebo group) and muscle strength (+16.5 Nm compared to +7/3 Nm), as well as a statistically significant reduction in fat mass (¬5.4 kg compared to ¬3.5 kg in the placebo group).

"Our data demonstrate that compared with placebo, collagen peptide supplementation in combination with resistance training further improved body composition by increasing fat free mass, muscle strength and the loss in fat mass," wrote the researchers. "Further studies should investigate the effect of combined resistance training and collagen peptide intake in other study populations, including sex and different age groups and should focus on the mode of action as well as on the required dosage."

Consumers will pay more for products with additional information on ingredients, allergy

06¬Oct¬2015 Food Navigator

Manufacturers could help restore consumers' waning faith in the quality and safety of food and beverages, and potentially command a higher price point, by providing consumers with more information about how products are made and ingredients are sourced, reveals a new consumer survey. Only 12% of the 3,000 consumers worldwide that Trace One Network surveyed online this summer said they "whole heartedly" trust the safety of food and beverages today.

In addition, only 10% said they whole heartedly trust their quality. "That metric, the lower percentage of people who truly, fully believe and have confidence in the quality and safety of the products they consume indicates there is substantial room for improvement," said Chris Morrison, chief marketing officer at Trace One, a company that helps manufacturers and suppliers increase brand

transparency.

He added that the growing distrust by consumers in the industry extends to food labels, which 27% said they did not trust, according to the survey. In addition, it found 36% of respondents do not think manufacturers act quickly enough to address "health scares."

Why the increased alarm?
This distrust stems from the many high profile recalls across food and beverage categories in recent years, including those from the Peanut Corporation of America, Blue Bell Creameries and different types of produce. Social media also is helping raise awareness of food safety and quality concerns, added Morrison. "Consumers are becoming more savvy about what they are eating and they are trying to buy more foods that they consider safe," he said.

To do so, they are demanding more information, of which 62% of respondents said manufacturers do not provide enough, according to the survey. In particular, they want to know where food comes from, according to 91% of respondents. Many people also want more information about the health benefits and risks of specific ingredients, Morrison said. For example, he noted consumer interested in gluten and genetically modified ingredients. In order to provide this level of information and transparency, manufacturers must dig deeper than just their suppliers.

They also "need more visibility into their suppliers' suppliers' suppliers," Morrison said. Third party certifiers can help companies tunnel back far enough to appease consumers, and the small, recognizable icons certifiers allow manufacturers to use on their labels can provide extensive, reassuring information to consumers without taking up too much real estate. Unfortunately, these services are not free, which can give some manufacturers pause in adding transparency, Morrison said.

Consumers will pay more for information
Luckily, the survey revealed that consumers are willing to absorb at least part of the added cost. Specifically, it found, 40% of consumers said they would pay more for a food product with more ingredient and allergen information, according to the survey. This statistic demonstrates the value consumers place on additional information on labels and it hints at increased transparency's greater impact on consumers' overall confidence in a brand, Morrison said.

Certifications are not the only way to add extensive information to small labels, he added. He also extolled the benefits of using QR codes on labels that consumers could scan with a smart phone in stores to gain more information about a product instantly. While not all consumers will use QR codes or research each product online prior to buying it, if they do look up a product and the information they want is not available, they likely will not buy it for fear the company is hiding something.
With this in mind, Morrison said, providing extra information online is an instance of better safe than sorry.

Multi- ingredient formula shows good results in Mild Cognitive Impairment test

05¬Oct¬2015
Nutra Ingredients USA

A multi¬ingredient formula previously studied for cognitive effects has additional evidence to bolster its efficacy in cases of mild cognitive impairment with the results of a recent study.

Participants in a long¬term trial showed significant improvements in memory performance and cognitive scores. The formulation is branded as Perceptiv and is marketed by Sevo Nutraceuticals, which licensed it from the University of Massachusetts Lowell, where research Dr Thomas Shea works. Shea developed the formula over a period of years and has conducted trials, some with the support of the Alzheimer's Association, starting in 2008.

The formula consists of a blend of vitamin E, folic acid and vitamin B12 with 1500 mg of a proprietary blend added on that consists of n¬-acetyl l-cysteine, acetyl l¬-carnitine and SAMe. Shea said the proportions of the blend are important (600 mg, 500 mg and 400 mg of the ingredients, respectively), and the research program for the formula set out to prove its synergistic effects, something he believes has been accomplished. "The new results are incredibly exciting because people showed significant improvement over the course of a year.
The formula has been previously studied for people with Alzheimer's and now it has been shown to have similar effects for people with mild cognitive impairment," Shea said. The formula has also been studied with participants with no known cognitive impairment and showed good results there, also, he said.

Shea and his fellow researchers enrolled 34 participants whose age averaged 66 and split them into a 22¬member group receiving the formulation and 12 who got a placebo. Participants completed a Dementia Rating Scale questionnaire at

baseline and at 3 month intervals up to 12 months. They also participated in the CLOX¬1 test at the same interval (example pictured). This simple test has an important endpoint, Shea said, because it involves executive function, rather than other tests such as memorizing strings of words which test only simple memory.

"Drawing a clock from memory is simple, until suddenly you can't do it anymore," Shea said. "You have to picture the clock in your mind's eye, where the numbers and hands go, and then draw it. It's another step involving other parts of the brain."

The study was structured as a 6¬month trial, with a 6¬month open label extension, during which time the placebo group received the intervention as well. The Perceptiv group improved in DRS scale and maintained their performance on CLOX¬1, while the placebo group did not improve on the DRS scale and declined in CLOX¬1. After also receiving the intervention, the placebo group also improved in DRS and stopped declining in the clock drawing test.

The researchers said that 67% of the intervention group that improved or stayed level on their cognitive scores also maintained or improved their performance on the clock test, whereas the same was true for only 18% of the placebo group. The researchers said the latest data "demonstrate efficacy of (the nutritional formulation) for improvement in overall cognitive performance as quantified in the DRS and maintenance of executive function as quantified by CLOX¬1 for as long as one year for individuals with Mild Cognitive Impairment."

Label claims

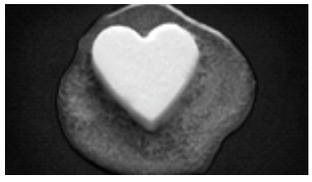
Some of Shea's previous work on the formula was conducted on individuals with full¬blown Alzheimer's. While the formula showed positive results, its not information that is of much use when marketing the product as a dietary supplement. These new results can be used to support a cognitive health structure function claim. Shea said this is true even thought the relationship of diagnoses such as Mild Cognitive Impairment or Age Related Cognitive Decline and the subsequent development of Alzheimer's is poorly understood.

"About half of individuals diagnosed with Mile Cognitive Impairment go on to develop full blown Alzheimer's and many of the others would, too, if they lived long enough. The term 'Mild Cognitive Impairment' came about because of the reluctance of physicians to tell their patients they have Alzheimer's when it was very mild," Shea said. But Shea said the good news is that this latest evidence bolsters the idea that lifestyle interventions such as diet, exercise and appropriate supplementation can help arrest the cognitive decline that many elderly consumer experience.

"Unfortunately, drugs that are effective for Alzheimer's disease are not good for us prior to manifestation of Alzheimer's disease, and therefore can't be used as a preventitive. Supplementation is awesome because you can use it as a preventive," he said.

Sat fat debate: 'Butter is not back', warn authors of new review

01¬Oct¬2015
Food Navigator



Replacing intake of dietary saturated fat with unsaturated fats may still be the best for heart health, according to new Harvard review that warns against increasing intake of saturated fats.

Research published in the Journal of the American College of Cardiology has warned that 'butter is not back', after reiterating evidence that replacing saturated fats with unsaturated fats (or whole grains) lowers heart disease risk. Led by Professor Frank Hu from the Harvard T.H. Chan School of Public Health, the review concludes that people who replace saturated fat in their diets with refined carbohydrates do not lower their risk of heart disease, while those who replace saturated fats with unsaturated fats or whole grains do have a lower heart disease risk.

"Our research does not exonerate saturated fat," said Hu. "In terms of heart disease risk, saturated fat and refined carbohydrates appear to be similarly unhealthful." The team noted that when it comes to trimming out saturated fats, many people fall back on carbohydrates – and especially refined carbs like white bread – which are no better for heart disease risk and may partly explain why researchers have questioned recommendations for limiting saturated fat for heart health, which have previously led to media headlines promoting the return of butter.

"Our findings suggest that the low¬fat, high¬carb trends of the 1980s and 1990s are not effective in reducing risk of CHD," commented Yanping Li, co¬first author aof the Harvard study. "It means that individuals should not replace saturated fat with refined carbs or vice versa. Dietary recommendations to reduce saturated fats should specify their replacement with unsaturated fats or with healthy carbohydrates, such as whole grains," said Li.

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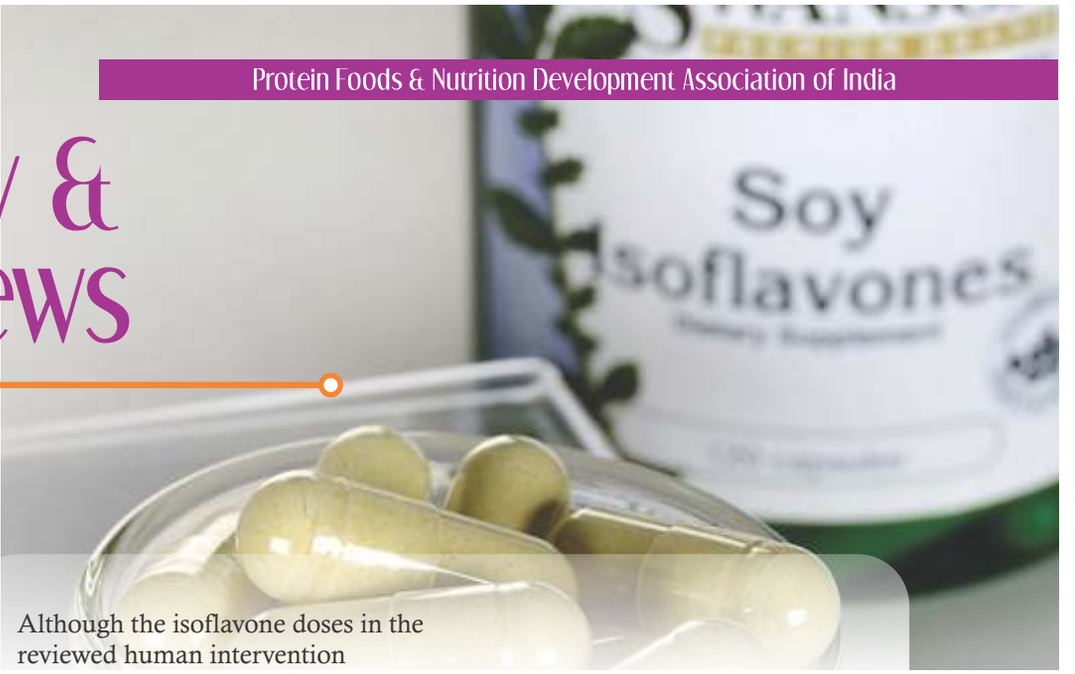
Regulatory & Safety News



Isoflavones: EFSA finds 'no evidence of harm'

IFT Weekly October 28, 2015

The European Food Safety Authority (EFSA) has conducted a comprehensive review of the available scientific evidence and released a report that says there is "no indication that isoflavones at levels typically found in food supplements cause harm to post-menopausal women."

Isoflavones are naturally occurring substances which are found, among other sources, in soy, red clover, and kudzu root.

Reviewing 43 human studies and 62 animal studies, the Panel on Food Additives concluded it is safe for post-menopausal women to consume soy isoflavones daily without concern of breast and uterine cancer and thyroid function.

Specifically the panel concluded that:

• Interventional human trials and population studies did not suggest an association between exposure to isoflavone and adverse effects in mammary glands in post-menopausal women.

• No reported statistical changes in endometrial thickness and no cases of endometrial carcinoma/uterine cancer in post-menopausal women taking up to 150 mg of isoflavone supplement for up to 2.5 years compared to controls.

• In controlled, randomized studies, there was no clinically relevant effect on thyroid function detected in post-menopausal women with normal thyroid function.

Although the isoflavone doses in the reviewed human intervention studies ranged from 30–900 mg/day, the panel did not set recommended values; they indicated a typical supplement can range from 35–150 mg/day of isoflavones. The panel also suggested people can get isoflavones by eating soy-based foods and beverages. For example, firm tofu has about 29 mg of isoflavones per half-cup serving, soy milk has 27 mg per 1-cup serving, and 1 oz of soy protein isolate has 27 mg, according to the U.S. Dept. of Agriculture (USDA) database.

FSMA poised to sweep dietary ingredient suppliers into regulatory fold, expert says

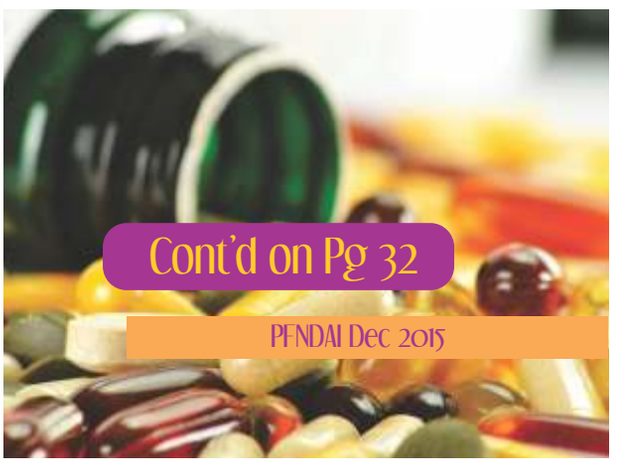
28¬Sep¬2015 Nutra Ingredients USA

The biggest change in food regulation in the US in the past 75 years is poised to sweep up the suppliers of dietary ingredients, an expert says.

Joy Joseph, founder of Joy's Quality Management Systems, spoke last week on the new Food Safety Modernization Act (FSMA) rules soon to be finalized. Joseph led a session on the topic at the Rocky Mountain Dietary Supplement Forum hosted by the consulting firm FDA Compliance Group in Boulder, CO.

Joseph said there are seven proposed rules under FSMA, two of which were finalized in mid September and are set to go into effect in late November. One of these pertains to animal food, the other to food for humans. The rule most of interest to dietary supplement companies is the Current Good Manufacturing Practice and Hazard Analysis and Risks Based Preventive Controls for Human Food ¬ Part 117.

Ingredient suppliers fall under new rule According to a briefing conducted by FDA earlier in September, dietary supplement companies are exempt from this rule, as they are already required to comply with GMPs specific to their operations. But dietary ingredient suppliers, who up to now fell outside the purview of the Part 111 dietary supplement GMPs, will now have to comply with Part 117. "Part 111 was specific to dietary supplement companies," Joseph said. "There were no definite rules for ingredient suppliers, no controls to ensure those products' quality.



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Dietary supplement manufacturers were responsible for making sure raw material suppliers were meeting their specifications." This change will fill in a gap that many have remarked on with a sense of consternation in the years since the GMP rule was finalized.

The way this was apparently supposed to work was the manufacturers, in setting product specifications and conducting identity and purity tests on incoming raw materials as they are required to do under GMPs, would ensure a base level of safety for incoming ingredients. A number of the manufacturers who were in attendance at last's week's meeting said that in practice this has meant that too much of the burden falls on them for policing the activity of suppliers, some of whom have appeared all too happy to kick that particular can down the road.

The new rule will replace 21 CFR Part 110, Joseph said, with an aim toward adopting a more prevention¬based approach toward food safety. The new rule includes the requirement for formulating and adopting a Hazard Analysis and Risk Based Preventive Controls plan. "You will have to have a food safety plan and any old person cannot write that plan. You will have to have a person qualified in hazard prevention in foods," Joseph said.

That plan would need to adopt a process control flow chart approach to look for points of risk, Joseph said. That includes risk of biological contamination from microbes or larger pests, chemical contamination such as from allergens or radiation, and physical contamination such as wood, rocks, plastic or metals from packaging or degrading machinery, etc. Foreign suppliers About 15% of the US food supply is imported, Joseph said. The percentage of overseas ingredients used within the dietary supplement industry is even higher. Subpart G of the new Part 117 rule specifically addressed foreign operations, and is the source of some blurring of lines of responsibility.

A definition in the rule of what is meant by a "receiving facility" will need some clarification, she said. "Is the dietary supplement manufacturer who imports an ingredient the 'receiving facility?' Or does that pertain to the overseas supplier, who receives raw materials in their facility?" Joseph said. The new rule also includes a Foreign Supplier Verification Program (FSVP).

This is a program of expanded overseas on site audits of food facilities that send food (and by extension dietary ingredients) into the US. In recognition of the potentially heavy burden this could place on an already overextended agency, Congress also included a Qualified Auditor Program, in which FDA would accept audits of foreign facilities conducted by overseas governments whose food safety regimes are deemed to fall sufficiently in line with FDA's own.

The agency currently accept audits conducted by New Zealand, and is close to accepting those conducted by a number of other governments, but much more needs to be done, Joseph said. Time to get prepared Joseph said it is imperative that all dietary supplement companies familiarize themselves with the new FSMA rules, even if some of these changes might not affect them directly.

"At the end of the day, have the responsibilities of dietary supplement manufacturers increased or decreased? I would argue that under FSMA things will be a little bit easier for these companies," Joseph said. "But you are still going to have to make sure your foreign suppliers are compliant with the FSVP, and that your domestic suppliers are complying with Part 117. We have had GMPs in place since 2008 and FDA says the industry is still not compliant. So I think dietary supplement companies need to get ready and be prepared, and not wait to find out that a shipment has been detained at the border because their supplier is not compliant."

India mulls reclassifying vitamins as drugs if they come with health claims

23¬Sep¬2015 In-Pharma Technologist

India may classify vitamin supplements as drugs rather than foods if the manufacturers of such products claim they can treat or prevent disease.

The proposal was put forward by the Central Drugs Standard Control Organization (CDSCO) this week and is based on the recommendations of its Drugs Technical Advisory Board (DTAB).

The board – which included regulators and industry representatives – said vitamins should be reclassified "if there is a claim for treatment, mitigation or prevention of any diseases or disorder." They also concluded that supplements containing vitamins already found in schedule V products should be labelled as drugs even if the ingredient is below recommended daily allowance

(RDA) limits.

The committee also made clear that: "Fortified powders which are supposedly exempted under schedule K [of the Drugs and Cosmetics Rules 1945] and for Special Medicinal products (SMP) to be used as substitute for food shall not be considered as food if the label of the product indicates name of disease."

Feedback sought
The board considered various vitamins straddling the boundary between clinically¬ proven, efficacious drugs and supplement products that manufacturers claim can treat disease. For example, the committee advised that Pfizer's Ferradol – a multivitamin marketed as a nutritional supplement – should be reclassified as a drug because it contains ingredients covered by schedule V of the Drugs and Cosmetics Rules 1945.

They reached the same conclusion about Ranbaxy's Revital, which is a multivitamin supplement for people with "hectic lifestyles and conditions that leave one drained physically and or mentally." The Drugs Controller General of India, Dr GN Singh, has requested industry feedback on the proposed reclassification.

Nutrition labelling helps, but self¬-control complicates food choices

30¬Sep¬2015 Food Navigator

Consumers can make healthier choices from both traffic light and numerical labelling, but individuals' levels of self-¬control can make a big difference to the effectiveness of an intervention, according to two new studies.

The papers, both to be published in the American Marketing Association's Journal of Public Policy & Marketing, both suggest researchers need to take particular care over how studies around consumer decision ¬making are constructed.

Lights and numbers
Researchers from Carnegie Mellon University looked at the efficacy of both traffic light labels – showing red, amber or green to indicate the relative calorie levels of food – and raw numerical nutrition information. To test this, they set up an online ordering system for employees at a large company, where participants could order lunch – with both interventions resulting in approximately a 10% reduction in calories consumed.

"The similar effect of traffic light and numeric labelling suggests that labels may merely facilitate comparisons between menu items, enabling consumers to select relatively healthier items at the point of purchase without leading to retention, or possibly registry in the first place, of verbatim knowledge about the items' calorie content," wrote the study's authors.

The authors did note that other studies, in less controlled environments, suggested labelling of any kind may not be as effective as their study suggests – and observed some consumers may not understand numerical information as easily as they might the traffic light signals.

But they also suggested advanced online shopping platforms such as Amazon may point towards new ways to positively influence consumers' decisions. "Researchers may want to contemplate ways to 'supercharge' such labelling and achieve additional calorie reductions, perhaps extending the effects beyond item substitution.

With technological advancements improving the speed and availability of user feedback and information provision, static nutrition labels can be compared to more dynamic approaches, particularly for decisions made in the online context," they wrote.

Another study, by researchers at the universities of Vanderbilt, Texas A&M and Rice, examined differences in people's general self¬-control and their eating self¬-control, and how this can influence their decision-¬making. The researchers set up a number of different experiments, including detailed surveys and consumption tests, including one testing the effectiveness of different interventions around food.

The Snickers test
One experiment, in the form of a smart-phone app, asked participants to think about eating a Snickers chocolate bar, then presented them with either numerical nutrition

information, or a picture of a person's feet walking, and a message reading "you must walk 65 minutes to burn off that Snickers bar" – and finally asked how likely they were to eat the bar.

The results suggested that participants with higher general self-¬control, and those shown the exercise message, were less likely to consume the bar. "These findings show that the differences in effectiveness were particularly prominent for those low in eating self-control… suggesting that this naturally vulnerable type of consumer responded much more favourably to the exercise equivalency than the nutrition information," wrote the study's authors.

"The results support our hypotheses that the individual's level of self-¬control not only affects significant outcomes (in this case, self¬-restraint in eating), but also affects the efficacy of interventions to promote such behaviours," they added.

Overall, the researchers recommend so¬-called "domain¬-specific" methods and measurements to assess self-¬control, rather than relying on a measurement of general self¬-control. While there was a strong correlation between those with spending self¬-control and eating self¬-control, of around +0.50, the study showed 38.5% of people scored highly on one type, but poorly on the other.

Because of this, the study's authors warned against linking food choices to financial choices: "From a public policy perspective, recommending interventions that help people improve their health and eat judiciously but simultaneously shift negative outcomes to the financial domain could be a real risk."

Organised food crime: time to face the threat

30¬Sep¬2015 Food Manufacture UK

The UK food and drink industry should start preparing now to beat the challenge of organised crime, which could plague the industry in "a few years' time", warns the head of food crime at the Food Standards Agency.

While organised crime is not yet a problem for UK food and drink manufacturers, it will become so, unless action is taken now, Andy Morling told delegates at the Food Manufacture Group's Food safety conference yesterday (September 29).

Six months into his role as the nation's top food and drink crime enforcer, Morling disagreed with Professor Chris Elliott, author of two reports into the origins of the 2013 horsemeat crisis, about the significance of organised crime in the UK. 'I'm not convinced yet' "I'm not convinced yet," Morling told conference delegates. "I've seen little evidence in my first six months within the job that organised crime has made significant inroads into food."

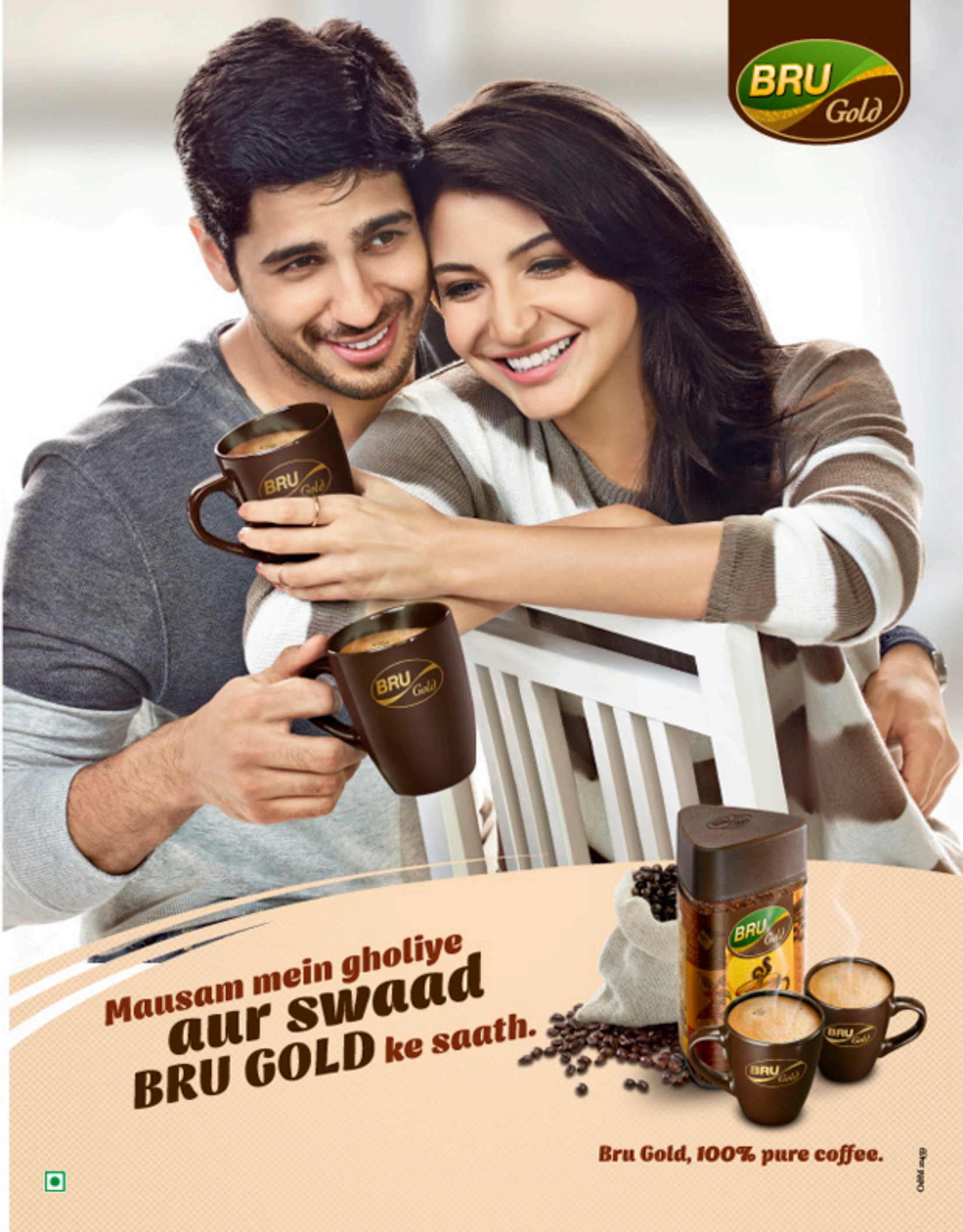
The fact that the food industry had managed to keep organised food criminals at bay was a tribute to the professionalism in the food industry, he added. But he warned that time was running out to combat the growing threat from large¬-scale criminal activity. "I'm sure that while organised crime is not a feature at the moment, if we don't give a response to match the threat, it could be something we are facing in a few years' time.

"If food crime goes unpunished … then it leaves the door open to organised criminal elements that we see in other parts of the world that do make inroads into this [the food and drink industry]."

'Not a crime of choice'
As examples, Morling cited the Mafia's infiltration of the Italian food industry and the establishment of a new Food Crime Unit in India. "The Italians do have problems with organised crime. We don't yet have that problem as far as I'm concerned. The barriers to entry to organised crime are still too high – it's not a crime of choice." Labour shadow secretary for environment Kerry McCarthy highlighted the threat of food crime during her party conference speech given in Brighton yesterday.

Meanwhile, watch out for more conference coverage on the latest food and drink manufacturing safety news – including video interviews with Morling and other speakers – later on FoodManufacture.co.uk and our sister publication Food Manufacture magazine. Later this week watch our video interview with Morling in which he makes a passionate plea for greater trust and cooperation between enforcement officers and the food industry to beat food crime in all its forms.

The one¬-day conference – Safer food and drink: from the harvest to the home – chaired by Professor Colin Dennis, took place at the Lowry, Manchester. The event was sponsored by Alcontrol, Checkit, the Institute of Food Research, Klipspringer.com, Mettler Toledo and Sartorius.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SCIENCE BEHIND FOOD SAFETY

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This paper discusses the critical need to integrate science-led approaches, and proposes some areas as priority in shaping our national food safety agenda.

Food safety is a multi-faceted subject, and especially in the context of modern food processing, it involves development and application of, analytical techniques, standards and regulations, systems and risk assessment and management practices to address issues involving microbial pathogens, chemical contaminants, natural toxicants, additives, allergens and more, to protect health of consumers.

Given the relevance of multiple scientific disciplines, applying sound science based thinking to food safety though challenging, is important. Against the backdrop of rising food safety concerns, and multiplicity of efforts to address food safety, we as industries or regulators need to ensure that our efforts yield the desired results around consumer health protection.

Analytical sciences, for example have made tremendous progress across the last two decades, and due to very high sensitivity, it is now possible, using routine techniques, to detect nano-gram quantities of chemical residues, or single microbes &/or their genetic materials in foods. Unless information about residual extraneous materials in foods is juxtaposed with assessment of such exposure on health, we run the risk of creating information without insights, potentially leading to undue panic and fear among the consumers and over regulation for the industry. In the midst of increasing challenges in meeting food demand of the rising population, continued reliance on hazard based thinking and / or promoting precautionary principles in policy and regulation, are unlikely to help consumers, nor help the industry.

As a country we have made good progress in institutionalizing food safety systems, at least within major food industry sectors. Good Manufacturing Practices (GMPs), and Hazard Analysis Critical Control Points (HACCP) have been adopted widely. This augurs well for food safety. There is now a need to consider, in the context of Indian foods and food supply chains, generating specific knowledge around chemical and biological contaminants, their occurrence, prevalence and potential health impact when humans are exposed to them.

The science of risk assessment and its application to food safety has advanced, and significant progress has been achieved in applying quantitative methods to address food safety issues. As a consequence of these advancements, scientific resources, including IT enabled systems, models and tools that enable data gathering, data analyses, risk assessment and decision making, have been developed. These are being widely used in developed countries. Several such tools are available as open source, and therefore an excellent opportunity for industry and academia involved in food safety to explore and use these, on the back of which, specific India relevant food safety resources

could be considered for development.

Hazardous materials, at levels harmful to human health, do get into foods and can cause illness or other adverse effects on health. In such cases, it is critical to examine the entire food supply chain, identify the specific steps where contaminants enter the chain, consider if there are further steps that exacerbate the situation (e.g. facilitate growth of food-borne pathogens) and institute steps to address those. Such scientific analyses and preventive approaches, based on rigorous data and traceability, helps industries and regulators to focus their mitigation efforts, resulting in safer outcomes as compared to an end of pipeline, finished product based safety assessment, which being sampling based, is often unreliable.

Surveillance of food borne illnesses is another area of critical importance. Often we know of outbreaks through news paper headlines that typically report only serious illnesses or fatalities. Rarely are lessons and root causes, shared and discussed among food safety professionals or in medical circles. This limits instituting preventive strategies. Epidemiology and Public Health aspects of food safety should therefore form a key pillar in the national food safety agenda.

Lastly, given our privileged status of being the food basket for the globe, and the world depending on this country for current and future food needs, it is equally critical to institutionalize food safety expertise and capacity building programs and achieve global excellence in food safety. Food safety, instead of being part of a curriculum, needs a shift, where graduate courses and post graduate specializations are offered. Modules and courses, designed to meet the needs of a specific food supply chain or food service sector needs to be developed and be recommended as a requirement for joining the food sector.

A national food safety agenda, founded on strong pillars of science, supported by globally benchmarked food safety expertise, will not only enhance food safety within country, but will also enhance the credibility and brand value of Indian food products in global markets.

This article is previously published elsewhere

Cont'd from Pg 16

Study examines role of vegetable food pairings in school plate waste

September 14, 2015 Science Daily

A study led by a team of Texas A&M University System researchers found school meals paired with popular vegetables are less likely to wind up in garbage bins.

A team led by Texas A&M AgriLife Research and the Institute for Obesity Research and Program Evaluation at Texas A&M University measured food waste in three elementary schools in Bryan and Dallas.

The schools are participants in the U.S. Department of Agriculture National School Lunch Program both in pre- and post-implementation of the new standards.

The study was funded by the Alliance for Potato Research and Education and is published in the journal, Food and Nutrition Sciences.

"Our research team looked at whether there is a relationship between consumption of certain entrees and vegetables that would lead to plate waste," said Dr. Oral Capps Jr., an AgriLife Research economist in College Station. "We found that popular entrees such as burgers and chicken nuggets, contributed to greater waste of less

popular vegetables."

Conversely, entrees paired with potatoes -- served as tator tots, oven-baked French fries, and wedges -- experienced the least amount of overall waste, Capps said.

"Our study shows that optimizing entrée-vegetable pairings in schools meals has the potential to positively impact vegetable consumption, which is especially important for those students relying on school meals for their energy and nutrient needs," Capps said.

The data were collected by a team of "plate waste warriors," Texas A&M students who were paid by the hour, Capps said. Each wore a different coloured apron that is associated with the assigned waste bin in which the entrée is discarded. A minimum of eight workers was needed at each school during the lunch periods, which were typically 10:45 a.m. through 1 p.m. The A&M students gathered the trays containing leftover portions.

Leftovers were separated into different waste bags and each bag was weighed on a scale for plate-waste measurement. When students went through the lunch line, a sticker was placed on the food tray to identify the vegetable and entrée chosen. Students on the free lunch program were are also evaluated for plate waste. The tray with the corresponding sticker was weighed and recorded to help calculate overall food waste.

USDA awards $8 million to support healthier foods in schools

IFT Weekly Sept 9, 2015

The U.S. Dept. of Agriculture (USDA) will be awarding more than $8 million in grants to help school nutrition professionals better prepare healthy meals for their students.

Approximately $2.6 million dollars in grants will support implementation of new national professional standards for all school nutrition employees who manage and operate the National School Lunch and School Breakfast Programs, and $5.6 million will go to help states expand and enhance foodservice training programs and provide nutrition education in school, child care, and summer meal settings.

In February, the USDA announced national professional standards for school nutrition employees that went into effect on July 1, 2015. These standards, which vary according to position and job requirements, ensure that school nutrition professionals have the training and skills they need to plan, prepare, purchase, and promote healthy meals.

In addition to several built-in flexibilities intended to facilitate the first year of implementation and address the challenges faced by smaller school districts, the USDA is providing a total of $2.6 million to 19 state agencies to develop and enhance existing trainings within their state that will allow school nutrition professionals to meet these standards. The Professional Standards Training Grants promote training in nutrition, operations, administration, and communications and marketing.

In addition, 19 states received a 2015 Team Nutrition Training Grant of up to $350,000—$5.6 million in total—to support trainings that focus on encouraging healthy eating.

Manipulation of food structure could lead the way to a healthier diet

3 September 2015 Medical News Today

A new study led by scientists at King's College London shows that preserving the natural structure of dietary fibre during food production can help to slow the rise in blood sugar levels after a meal.

This finding may lead the way for the development of a new generation of food products that contain similar ingredients to existing products, but with a more natural, enzyme resistant structure around the starch that enables it to be digested more slowly. Such products would be particularly beneficial in the prevention and management of obesity and type 2 diabetes which affects more than one in 17 people in the UK.

Starch is one of the largest sources of calories and an important component of a healthy diet. Understanding how starch is digested and metabolised is highly relevant to weight management, as well as prevention of other related conditions such as type 2 diabetes and heart disease.

Wheat is a good source of starch

and the predominant source of starch in the UK diet. It also contains dietary fibre, which forms a complex protective network of cell walls around the starch. Milling wheat grains to produce flour damages these cell walls, allowing the starch to be digested more quickly.

The research, funded by the BBSRC, found that when participants ate wheat porridge made from coarser, larger particles this gave rise to significantly lower blood sugar levels than when they consumed a 'smooth' porridge made of finer wheat flour. Both meals were made of the same ingredients and had the same nutrient contents, but starch was digested more slowly in the coarse porridge.

Within two hours of eating, the blood sugar responses were 33 per cent lower and insulin responses 43 per cent lower when participants ate the coarser particles. They also found that participants were less likely to experience an undesirable 'sugar low' following the earlier peak in blood sugar than when they ate the smooth porridge.

Researchers studied nine healthy volunteers with pre-existing stomas, allowing access to the contents of the small bowel without the use of surgery. When researchers examined the contents of the intestinal fluid, they identified a number of large pieces of food material containing unabsorbed nutrients. Larger food particles were found to contain more of the natural structure of the cell walls, which encloses starch and other nutrients and delays or prevents their release.

The results could have a significant impact on the food production industry and suggest that the development of new milling techniques which maintain the microstructure of wheat might in the future give consumers a greater choice of 'diabetic-friendly' foods or healthier versions of wheat based products such as white bread, breakfast cereals, or biscuits.

Dr Cathrina Edwards, lead researcher from the Division of Diabetes and Nutritional Sciences, said: 'Our research has shown that there is a relatively easy way to limit the availability of starch/calories from food simply by preserving more of the natural structure of plant-based ingredients.

'The way in which foods are processed clearly has a big impact on how much of the nutrients/calories are absorbed from that food, but this important information is not reflected on food labels. Greater understanding of the structure of food and its effect on the body provides an opportunity to transform ingredients and products such as bread, pasta, breakfast cereals and other wheat based products, into meals which provide slower energy release and prolonged fullness.' implementation o

International researchers say nutrition science must change to meet world food needs

9 September 2015 Medical News Today

An international team of researchers, including scientists at the Virginia Bioinformatics Institute at Virginia Tech, said nutrition science will have to change drastically to feed an exploding world population.

Writing in the open-access journal Frontiers in Nutrition, the researchers identified key opportunities taking place in nutrition science within the next five years that will be crucial to close a major gap between the amount of food available today and the amount projected to be available in 2050. Crop calories will need to increase about 69 percent to reach levels needed by 2050, according to the World Resources Institute.

"The grand challenges in 21st century nutrition research extend beyond individual health, encompassing all the massively interacting systems that help to sustain a global population," said Josep Bassaganya-Riera, a professor and director at the Virginia Bioinformatics Institute's Nutritional Immunology and Molecular Medicine Laboratory.

"This article provides concrete recommendations for assessing these issues at the macro-level such as the application of informatics, data analytics, and modeling approaches."
The researchers, from various disciplines including genetics, neuroscience, nutritional science, physiology, immunology, food science technology, and psychology, are reaching out to the scientific community with an ambitious set of research goals for nutrition science for the period of 2015 to 2020.

"Healthy nutrition for all is an ambition too important to be handled by detached interest groups," said Johannes le Coutre, head of perception physiology at the Nestlé Research Center and Field Chief Editor of Frontiers in Nutrition. "By bringing together this diverse set of experts we are trying to establish a platform that is asking the right questions to move the nutrition field forward."
The authors stress the importance and timeliness of eight axes of

research including sustainability, food safety, the human microbiome, and big data analysis.

"Nutrition science is evolving from reductionist approaches centered around the study of single molecules and pathways to in-depth, systems-wide analyses," Bassaganya-Riera said. "Embracing big data and computer modeling gives us a set of tools to identify nutritional benefits that are only observable in the interactions between multiple systems."
The article's contributors hope their grand challenge will provoke a lively discussion among their peers about how to improve nutrition as a science, allowing it fulfil its potential and make meaningful, sustainable contributions to global nutrition.

Blending soy and dairy proteins adds benefits for consumers, manufacturers, DuPont says

23-Sep-2015 Food Navigator Asia

Two sources of protein in a finished product are better than one when it comes to blending soy and dairy, according to DuPont Nutrition and Health.

"We are seeing a lot more interest in the marketplace in blending soy and dairy for economic advantages, sensory advantages and nutritional synergies," Jean Heggie, strategic marketing lead at DuPont Nutrition & Health, told FoodNavigator-USA.

She explained blending soy and dairy in high protein products creates a more neutral flavor than using only one or the other in part because the "blends tend to dull the negative flavor attributes inherent in both soy and dairy proteins."

This could simplify masking requirements for high protein products and allow intentional flavors to shine in finished products. Blending the two protein sources also provides nutritional benefits that will help finished products better meet consumer expectations of high protein products, Heggie said.
For example, she said, "certain dairy proteins, such as whey, are quickly absorbed in the body, whereas soy is a slow release protein. So, you can get this sustained release of amino acids to the blood stream with a blend that can provide more post exercise benefits."

Specifically, research by DuPont showed a blend of when and soy prolonged amino acid delivery twice as long as whey alone. In addition, the muscle net balance with the blend was greater than with whey at 60 and 120 minutes after ingestion, according to the research.
Finally, blending soy and dairy protein can help protect a manufacturer financially against the

supply and price volatility of dairy protein, Heggie said.

"Dairy protein prices fluctuate more than soy prices," and manufacturers cannot always pass the difference on to consumers, Heggie said. Blending in soy is one way to hedge against these changes, she added.

Opportunities for growth
Beyond blends, Heggie sees opportunities for growth in the rapidly increasing protein segment by crossing into children's and aging adults' specialty food segments.
Most protein packed products have focused on weight management and sports nutrition, but Heggie says there "will be huge market opportunities in targeting children."
She explained the evidence is mounting that children are not getting enough protein, which they need to grow.

"There are increasing arguments that getting the wrong balance of protein or not getting it at the right time of day" is hindering children's development, she said.
In particular, she sees opportunities in adding protein to children's breakfast foods and healthy snacks – concepts that are support by recently published research .

Heggie added that high protein foods that go beyond bars and shakes may hold more appeal to children. For example, adding protein to cereal or extruded snack clusters.

As for aging adults, she suggests protein-packed products make claims related to muscle retention and maintain an active lifestyle because atrophy is a serious concern among seniors who are not ready to slow down.

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