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FOOD, NUTRITION & SAFETY MAGAZINE

NATURAL COLOURS - CHANGING PERSPECTIVE

Also Inside

Claim Substantiation

Regulatory Round Up

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NUTRITION DEVELOPMENT
ASSOCIATION OF INDIA

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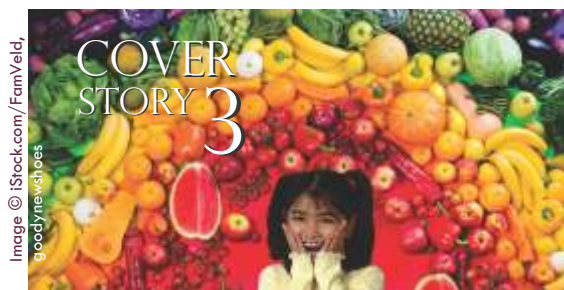


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EDITORIAL

Urbanisation has taken place in India over the last couple of decades and Indian cities are growing enormously. To keep supplying the produce to such rapidly growing cities is an enormous task. To keep up with the pace of growth and economy, the supply chain is also undergoing changes.

One commonly seen example is in the supply of foods. Milk used to be delivered by boys on bicycles but now many have taken to motorcycles. Similar things have taken place in case of dabbawallas who traditionally used to transport their dabbas in bicycles or even walking. But the fast pace of today's life demands that they also speed up and many have taken to motorcycles. We may probably see in near future they delivering in vans.

Even there have been changes in supply chains of fresh produce from farms. In Mumbai city about 40 to 50 years ago much of the fruits and vegetables used to be produced in farms near the city, say in places like Vasai. These Vasaiwallas used to carry kawadi bringing fresh produce travelling by trains. However many farms were converted to housing complexes or commercial premises so the farms have moved further away from cities.

Most of the metro cities receive their fruits e.g. bananas from farms which are located hundreds of kilometres away. As Indians prefer to have fresh bananas they need to be transported in unprocessed forms. When bananas ripen when they are transported there is extensive spoilage due to physical damage that occurs to softer tissues. So normally they try to transport them in unripe forms which can withstand mechanical shocks during transport without much damage.

When they reach the cities they need to be sold immediately. Otherwise they have to pay

heavy storage charges in warehouses. However, consumers will not buy unripe bananas. The only way to ripen them within a short time is artificial ripening.

Fruits ripen naturally because they produce within tissues the gas ethylene which is a natural ripener. One can expose unripe bananas to ethylene to ripen them. World-over the same process is used to quickly ripen the fruits. There are many safe processes available to produce ethylene and use it for ripening. They are now available in India as well. This can be done by ethylene gas in cans which can be used as spray on bananas and keeping them enclosed. One can also let in gas through cylinder into roomful of fruits. This ripening is safe.

There are some cheaper ways of ripening using calcium carbide which produces acetylene gas in presence of water. Calcium carbide is harmful and may contain small amounts of carcinogenic impurities. Calcium carbide is banned in most countries including India. However, it has been observed to be used because of low cost and ignorance.

Awareness about safer uses of artificial ripening is necessary. This would not only lead to safer fruits but also commercial viability due to less losses of fruits.

Prof. Jagadish S. Pai,
Executive Director
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Image © Magic eye
Source: <https://magictravels.blogspot.in/2010/07/vasai-fort.html>

NATURAL COLOURS - CHANGING PERSPECTIVE



By
Dr. Hormazdiar Patva,
Sensient Technologies
Corporation



A food product impression is grounded in visual appeal. Lasting colour impression is made within few seconds and these few seconds are precious to marketers and best chance of converting a browser into a buyer by appealing to their senses, values and emotions which in turn also induces flavour perception.

It is rightly said *Colour bring life to products.*



Colour can be divided into these basic categories: Artificial, Nature Identical, Natural. But one another important category that is growing world-wide is colouring foodstuffs (used as vegetable and fruit concentrates)(food ingredients used for colouring purposes without any E number.)

Artificial colouring has a bad

reputation. A study conducted and published by researchers from Southampton University on the effect of a combination of certain artificial food colours on childhood behavior. These azo-dyes have become known as the 'Southampton 6' colours (Sunset yellow, Quinoline yellow, Carmoisine, Allura red, Tartrazine, Ponceau 4R).

Also driven by the introduction of the Southampton Six colours legislation in July 2010, Europe has moved strongly towards natural colours. (The regulation states if the colours E102 tartrazine, E104 quinoline yellow, E110 sunset yellow, E122 carmoisine, E124 ponceau 4R or E129 allura red are used, products must carry the warning; 'consumption may have an adverse effect on activity and attention in children'.

Consequently, a decrease in the use of artificial colours has been seen and natural colours have become the norm across Europe, even in the categories most reliant on artificial colours including sugar and gum confectionary and carbonated soft drinks.

With Europe leading the way, other

regions are converting more and more to natural colours. This is reinforced by large multinational players continuing to reformulate products, converting artificial colours for natural alternatives. According to 2017 Mintel data, 78% of new products launched in North America use colour from natural sources.

This global shift to natural colours will continue as consumer demand for natural ingredients rises across the board. The split between natural and artificial colours continues to widen with future looking at gradually phasing out of artificial colours across food and drink products with Natural Alternatives.

Companies are seeking colouring foodstuffs concentrated from foods themselves. The use of fruit and vegetable extracts (as colouring foodstuffs in particular in Europe) is growing. Colouring foodstuffs are more in line with consumers understanding of natural wherein the product will not have an additive number associated with it.



Currently NATURALNESS IS SLOWLY BECOMING MORE VISIBLE, and there are so much misconceptions and concerns regarding Natural colours,

- Is less stable,
- Are expensive,
- do not deliver same colour vibrancy as that of synthetic colours,
- off flavours associated with high dosage of Nat colours
- colour shade batch to batch variation

Application of appropriate colour to food is very challenging and wrong selection of colour can lead to lot of problems thus impacting Natural colour stability.

A thorough understanding on food

matrix, pH of the product, ingredients in product formulation, processing conditions, water activity of food product, regulatory compliance for carryover ingredients in Natural colour, packaging of the food product, shelf life desired, label claims, etc. will govern selection of Natural colour.

Not only the above parameters, but a thorough knowledge on understanding of colour pigment properties, its interaction with food matrix, degradation behaviour, sensitivity to acidulants etc. are important to tackle stability issues. So a tailor made solution to suit various applications has to be designed to provide better stability.

Many manufacturers desire to replace Synthetic colour with Natural colour but at same cost in use which cannot be achieved. It's true that Natural colours are more expensive than synthetic, but given that colour is at least as important as flavour when it comes to determining consumer preference, natural colour are not necessarily costly. Plus, a Natural claim highlighting the details differentiates a product.

"Naturally replacing artificial colours can be tough because not all natural colours are created equally, but is possible". A robust portfolio of natural colour solutions and innovations can tackle most stability challenges for product developers today.

Image © iStock.com/bhofack2

COMING EVENTS

Anuga Food Tec

March 20 - 23, 2018

Location: Cologne, Germany

T: +49 1806 578 866

E: anugafoodtec@visitor.koelnmesse.de

W: www.anugafoodtec.com

India Expo Beurs, Netherlands

March 29 - April 2, 2017

De Broodfabriek Event Zall,

Ruswuk/Den Haad, Netherlands

Contact: India Trade Promotion Org

T: 011-23371688

W: meenukapur@itpo.gov.in

F&B Pro World Expo

Expo & Conf in Mumbai & Goa

May 11-13, 2018

World Trade Centre, Cuffe Parade, Mumbai

Aug 2-4, 2018

Dr Mukherjee AC Indoor Stadium, Panaji

M: +91 9769555657

E: trinity.cmd@gmail.com

IFT 18

A Matter of Science + Food

July 15-18, 2018

Chicago, IL, USA

W: iftevent.org

21st World Congress on Nutrition & Food Sciences

July 09-10, 2018

Sydney, Australia

E: worldnutrition@conferencesworld.org

3rd Nutraceutical and Functional Food

Asia Pacific Summit & Exhibition 2018

June 6-8, 2018

in Singapore

T: +86 21 55800330*8006

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E: marcia.liu@duxes.cn

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World Congress of Food Sci & Tech

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W: <https://www.iufost2018.com/index.php>



GOOD BUY! NUTRELA SOYA. GOODBYE! INDIA'S PROTEIN-DEFICIENCY.



Recent survey suggests that 73% of Indian diets are protein-deficient*. Part of the reason lies in the insufficiency of protein content in conventional protein sources such as eggs, lentils, meat, milk etc. Moreover, the steep cost (per 100 gms of protein) of these sources further makes it difficult for families to fulfil their daily protein need. We at Ruchi Soya; the makers of Nutrela Soya Chunks & Mini Chunks and Soya Granules, help consumers bridge this gap by providing the richest source of protein at the most affordable price. Soya contains 52% protein which is significantly above the protein content in eggs, lentils & milk all put together. We urge you to make soya an integral part of your diet recommendations. Let us join hands to help India say a GOODBYE to protein-deficiency!

FOOD	Approx Protein% /100gm	Approx Price/100gm
NUTRELA SOYA CHUNKS	52	9
DAL	25	10
MEAT	22	45
PANEER	19	32
EGG	14	12



CLAIM SUBSTANTIATION



By **Dr. V. Sudershan Rao,**
Deputy Director (retd),
National Institute of Nutrition,
Hyderabad

similar, for example a nutrient in biscuit cannot be compared with a nutrient in a leafy vegetable as it could mislead the consumer to replace leafy vegetable in diet with a biscuit.

Food labelling is one of the important population-based approaches that can help consumers make healthy food choices by providing the necessary information about the food on the pack and food industry also uses these labels to make claims of different types to attract the attention of the consumers.

Markets are flooded with many food products with variety of claims and consumers are often confused to make sense out of them. Given this back ground there is a need to create awareness on the claims made on the foods and their validity to various stake holders like industry, consumers, regulators etc. The first and foremost requirement of any claim is that, it should be clear, accurate and it should be based on scientific evidence. If these three things are ensured in any claim, the purpose is served for all the stake holders.

There are two types of claims made on the food i.e. nutritional claims and health claims.

Nutritional claims :

Nutritional claims means any representation which states, suggests or implies that a food has

particular nutritional properties including but not limited to the energy value and to the content of protein, fat and carbohydrates, as well as the content of vitamins and minerals. There could be three different of nutritional claims, i.e. Nutrient content claim, Nutrient comparative claim & Nutrient function claims.

Nutrient content claim:

Nutrient content claim is a nutrition claim that provides information on the level of a nutrient contained in a food. It could be like that “this food is “a good source of calcium” or “low in fat” or “high in fibre” etc. The conditions for these claims are provided in the regulations, i.e., that quantity of calcium to present in the food product to claim “a good source of calcium”.

Nutrient comparative claim:

Nutrient comparative is a claim that compares the nutrient levels and/or energy value of two or more foods. It can be comparing different versions of the same food or similar foods. For example, one can compare two cooking oils to indicate one has better fatty acid profiles than other or same oil differently processed to make it nutritionally different. But comparison should not be made between two foods which are not

Nutrient function claim:

Nutrient function is a nutrition claim that describes the physiological role of the nutrient in growth, development and normal functions of the body. For example, Iron is required for formation of haemoglobin, calcium for bone strength etc.

Substantiation of nutrition claims:

Among the three different types of nutrition claims, the Nutrient content claim is essentially to indicate the quantity of the nutrient as per the regulation of each country for the claim, while the comparative claim is to understand the concept of conditions for comparison, as such they do not need any further substantiation. As far the nutrition function claim, it should be accepted authoritative statement by recognized expert scientific body, verified and validated overtime. It does not need any additional substantiation. However, these claims are very few.

The second type of claims are health claims. Health claim means any representation that states, suggests, or implies that a relationship exists between a food or a constituent of that food and health.

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- (i) ingredients (nutrient or nutritional) function claims
- (ii) enhanced function claims
- (iii) disease risk reduction claims
- (iv) health maintenance claims
- (v) immunity claims – increased resistance (excluding vaccines)
- (vi) anti-ageing claims.

Except for the nutrient function claims where accepted authoritative statement by recognized expert scientific body, verified and validated overtime is sufficient, for other health claims there is a process suggested by the Codex Alimentarius Commission(International Food standards making body working under the aegis of Food & Agriculture Organisation and World Health Organisation). As per these guidelines :

The second step of substantiation is to identify appropriate valid measurements for the food or food

The third step is to gather all the relevant scientific data and fourth step is to assess the quality and interpretation of each scientific data. Finally evaluate the totality of the available relevant scientific data, weigh the evidence across studies and determine if, and under what circumstances, a claimed relationship is substantiated.

constituent and for the health effect. One should be able to measure the food constituent or food, for example in case of salt and

Human observational studies are not sufficient per se to substantiate a health claim but they may contribute to the totality of evidence. Studies carried on animal models, in vivo or in vitro studies may help as supporting information for establishing the relationship between food/food constituent and health effect, but is not sufficient for the substantiation of any health claim.

Methods followed by different countries for substantiation of a health claim: While basic principles of substantiation of health claims remain same, the methodology may be different. However for the purpose of understanding the process of substantiation of health, the template provided by the Australia-New Zealand may be a good example. The essential components of systemic review for the substantiation of health claim are

- After the list of scientific studies are prepared, the following key information should be included for each study.

8

- (b) Study design
- (c) Objectives
- (d) Sample size in the study groups and loss to follow-up or non-response
- (e) Participant characteristics
- (f) Method used to measure the food or property of food including amount consumed
- (g) Confounders measured
- (h) Method used to measure the health effect
- (i) Study results, including effect size and statistical significance
- (j) Adverse effects.

Once the key information from each scientific study is collected, the quality of the scientific study is assessed by the following criteria. The study has

- (a) A clearly stated hypothesis
- (b) Minimum of bias
- (c) Adequate control for confounding variable
- (d) The information on study participants' background diets and other relevant lifestyle factors
- (e) Adequate duration and follow-up to demonstrate the health effect
- (f) The statistical power to test the hypothesis.

The final assessment of the scientific review is done group of experts to check that

- (a) there is a consistent association between the food or property of food and the health effect across all high quality studies
- (b) there is a causal association between the consumption of the food or property of food and the health effect that is independent of other factors (with most weight given to well-designed experimental studies in humans)
- (c) the proposed relationship between the food or property of food and the health effect is biologically plausible
- (d) the amount of the food or property of food to achieve the health effect can be consumed as part of a normal diet of the Australian and New Zealand populations.

The conclusions of scientific review finally provides that

1. A causal relationship has been established between the food or property of food and the health effect based on the totality and weight of evidence.
2. The amount of the food or property of food required to achieve the health effect is derived
3. The amount of the food or property of food to achieve the health effect is likely to be consumed in the diet of the Australian and New Zealand populations or by the target population group, where relevant.

The Australia-New Zealand has developed a decision tree to establish Food Health Relationship

1. Formulate Food Health Relationship
 2. Formulate Literature Search Strategy
 3. Identify & categorise studies (Y/N)
 4. Are there any human studies (Y/N)
 5. A well designed experimental, cohort, case control studies (Y/N)
 6. Assess and interpret evidence are the studies likely to be of sufficient quality to allow a subsequent assessment of the totality of evidence? (Y/N)
 7. Assess totality of evidence consistent association? Causal relationship independent of other factors? (Y/N)
 8. Food-health relationship likely to be established under identified circumstances (Y/N)
- Note : Consider amount of food/property of food required to achieve the health effect in context of ANZ populations

Method of using decision tree :

The first step in the decision tree is to formulate Food Health Relationship, and the second step is to formulate the literature search strategy and collect the information. In the third step, identify and categorise the collected scientific data for the support of Food Health

Relationship. If you cannot (No) identify and categorise the data, then there is no Food Health Relationship. If you can identify and categorise the data(Yes), then proceed to 4th step. If there are human studies (Yes), then proceed to step 5. If the studies are well designed, then proceed to step 6. If these studies have sufficient quality to help in assessing totality of evidence then proceed to step 7. If the studies have shown consistency in food health relationship, then conclude that there is a food health relationship in defined circumstances. After the food health relationship is established, the consideration should be given amount of food / property of food required to achieve the health effect in the context of Australia -New Zealand populations.

Conclusion: Well-designed human-interventional trails are essential requisites for claim-substantiation, all other types of studies like human observational studies or studies on animal models or in vitro studies may be useful as supporting evidence, but not sufficient enough to make any claim.

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REGULATORY ROUND UP



By
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Grapevine says that new regulation on labelling could be out sooner than later. The regulation is expected to stipulate stricter aspects in product labelling which is expected to ignite a heated debate. By the way, have you sent your suggestions and objections on the draft Claim regulation? If not please do so. Please find below regulations published since the last round up.

Standards

[Final Gazette notification on the fatty acid composition of different edible vegetable oils listed in the regulation.](#) This should be helpful in identification and prevention of adulteration of oils in case the composition is outside the permissible range.

[Draft notification amending the Licensing and Registration regulation.](#) The draft defines e commerce and also specifies the conditions to be followed by Food Business Operators involved e commerce. The conditions include

the way in which products are displayed in e platform. The draft also replaces the existing Part II of Schedule IV which lists the GMP requirement for a manufacturing unit. The requirements are in greater detail. Specifies the quality of water that can be used as an ingredient. Similarly, GMP requirements for Catering and Food Service establishments, specified under Part V of Schedule IV, has been replaced. Operation personnel to have a close look at it. The draft regulation has been operationalized.

[Draft notification requiring water sold or offered through vending machines to comply with the packaged drinking water standards except that they not be BIS certified.](#) A tall order and wonder how FSSAI is going to ensure compliance.

[Draft notification](#) introducing new ingredients like cocoa mass, cocoa liquor, vegetable protein products, quick frozen French fries, mushrooms and amendments in cocoa powder, tomato ketchup and sauce standards.

[Draft notification setting standards for hitherto proprietary foods like whey protein concentrate, milk protein concentrate, colostrum and](#)

[colostrum products.](#)

General

Products falling under erstwhile category – Proprietary Food – Seasoning and Condiments has now been brought under standard product “Seasoning”. Through an [Order](#), FSSAI has permitted the use of packaging material with old categorization.

[Relief for manufacturers of Health Supplements, Nutraceuticals, Functional foods.](#) They are now allowed to use the non-compliant packaging material (in terms of labelling requirements) till 30th June 2018. However, the product must comply with the current standards.

[FSSAI has issued a revised Food Safety Inspection Check list to Food Safety Offices for auditing GMP in different sectors of food industry.](#) The FBOs may incorporate these points in their GMP implementation programme.

[FSSAI has released the official method to determine melamine in milk and milk products.](#)

[Latest list of NABL accredited recognized by FSSAI](#)



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RESEARCH IN HEALTH & NUTRITION

Could micronutrient supplements combat ADHD?

Medical News Today 16 October 2017 By Tim Newman

A recent study examined whether or not vitamin and mineral supplements might ease ADHD symptoms, and it yielded encouraging results.

Attention deficit hyperactivity disorder (ADHD) is characterized by hyperactivity, attention difficulty, and impulsiveness. Although estimates differ, ADHD is thought to affect around 5 percent of children in the United States. ADHD increases the likelihood that a child will experience problems at school, and, later in life, they are more likely to develop substance addictions and have ongoing psychiatric problems. Medications that minimize some of the symptoms of ADHD are available, but their side effects can be significant, and it is not clear that they make a substantial difference to long-term outcomes.

Diet and ADHD: What's the connection?

Over recent years, interest has developed around diet and its influence on ADHD. For instance, a study looking at the diets of adolescents concluded that "[a] Western-style diet may be associated with ADHD." Similarly, the authors of a study looking at the potential benefits of the Mediterranean diet on ADHD wrote, "Our data support the notion that not only specific nutrients

but also the whole diet should be considered in ADHD."

Another research team — who investigated the relationship between vitamins and ADHD in young adults — found that lower concentrations of B-2, B-6, and B-9 were associated with ADHD, and B-2 and B-6 were linked to the severity of the symptoms. In general, studies into the relationship between micronutrients and ADHD have concentrated on manipulating one specific nutrient at a time. This is generally the best method for scientific inquiry: change just one variable and measure the outcome.

However, the authors of the current study argue that the body needs a range of micronutrients to function, many of which interact with each other. They believe that changing just one might not be the best course of action in this case. For the recent study, Julia Rucklidge and her colleagues from the University of Canterbury in New Zealand used Daily Essential Nutrients (DENs), which contain 13 vitamins, 17 minerals, and four amino acids. Their study was the first fully blinded randomized, controlled trial of children with ADHD who were not taking medication.

In total, 93 children aged 7–12 were involved. Roughly half of them received DENs, and the others took a placebo for 10 weeks. The results were published earlier this month in the *Journal of Child Psychology and Psychiatry*. Across the study's

duration, the researchers collected data from doctors, parents, teachers, and the participants themselves. They measured ADHD symptoms, general functioning and impairment, levels of aggression, mood, and emotional regulation.

The impact of micronutrients According to clinicians' ratings, 47 percent of the participants taking the micronutrients improved "much" or "very much." This is compared with 28 percent in the placebo group. Nobody in the placebo group was identified as improving "very much," compared with 11 percent of those receiving DENs. Also, 32 percent of the participants receiving micronutrients showed improvements in attention, compared with 9 percent in the placebo group. There were no differences measured in hyperactivity or impulsivity.

And, compared with the placebo, micronutrients were shown to improve participants' control over emotion, aggression, and general functioning, according to reports from doctors, parents, and teachers. The authors write about the improvements in mood: "Twice as many of the children who entered the trial with severe mood dysregulation, and were randomized to micronutrients, showed a clinically significant improvement in emotional dysregulation compared with placebo (41 percent vs. 20 percent)."


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They point out that the "direct benefit for core ADHD symptoms was modest, with mixed findings across raters." However, because the intervention had very few adverse reactions, is relatively cost-effective, and makes differences across a range of ADHD functions in just 10 weeks, it warrants further investigation. This is not the first time that vitamin and mineral supplements have been found to positively influence ADHD. More studies are guaranteed to follow, and, although ADHD is a complex problem, this relatively simple intervention may hold real promise.

How a green tea compound could prevent Alzheimer's

Medical News Today
13 October 2017 By
Honor Whiteman

Image © iStock.com/dolgachov

Studies have tied green tea to a reduced risk of Alzheimer's, but the mechanisms underlying this link have been unclear. Now, a new study reveals how a compound in the popular beverage disrupts the formation of toxic plaques that contribute to the disease.

Researchers say that the green tea compound EGCG may help to prevent Alzheimer's disease. Researchers found that the green tea polyphenol epigallocatechin gallate (EGCG) stops the formation of beta-amyloid plaques — a hallmark of Alzheimer's disease — by interfering with the function of beta-amyloid oligomers. Lead study author Giuseppe Melacini, of the Departments of Chemistry and Chemical Biology at McMaster University in Canada, and colleagues recently reported their findings in the *Journal of the American Chemical Society*.

Alzheimer's disease is a progressive neurodegenerative condition characterized by a decline in memory and thinking, as well as behavioural problems. It is estimated that almost 50 million people worldwide are living with the disease. By 2050, this number is expected to rise to 131.5 million.

The precise causes of Alzheimer's disease remain unclear, but it is believed that beta-amyloid plays a key role. This "sticky" protein can clump together, forming plaques that disrupt communication between nerve cells. The new study from Melacini and his team sheds light on how EGCG could help to prevent beta-amyloid plaque formation, bringing us closer to much-needed prevention strategies for Alzheimer's disease.

EGCG 'remodels' beta-amyloid oligomers

The researchers came to their findings by using nuclear magnetic resonance to get an in-depth look at how EGCG might affect the formation of beta-amyloid plaques. The team explains that beta-amyloid monomers — which are tiny binding molecules — form beta-amyloid oligomers. Over time, these oligomers can stick together and form toxic beta-amyloid plaques. In their analysis, Melacini and colleagues found that EGCG "remodels" beta-amyloid oligomers, which stops them from creating harmful plaques. "At the molecular level," explains Melacini, "we believe EGCG coats toxic oligomers and changes their ability to grow and interact with healthy cells."

These findings not only support previous studies suggesting that EGCG can help to prevent beta-amyloid plaque formation, but they also shed light on the mechanisms underlying this association. Based on their findings, the researchers suggest that extracts from green tea could be used in the prevention of

Alzheimer's disease. "We all know that currently there is no cure for Alzheimer's once symptoms emerge, so our best hope is early intervention. That could mean using green tea extracts or their derivatives early on, say 15 to 25 years before any symptoms ever set in," Giuseppe Melacini. The team notes, however, that it is difficult to deliver EGCG directly to the brain, so future research will need to focus on finding ways to modify the compound and overcome this problem.

Omega-6 could lower type 2 diabetes risk by 35 percent

Medical News Today 12 October 2017
By Honor Whiteman

Eating a diet rich in omega-6 polyunsaturated fatty acids could reduce the risk of type 2 diabetes by more than a third, a new review concludes.

From an analysis of almost 40,000 adults across 20 studies, researchers found that people who had higher blood levels of linoleic acid — a main form of omega-6 — were less likely to develop type 2 diabetes than those with lower levels of the fatty acid. Study co-author Dr. Jason Wu, of the George Institute for Global Health in Australia, and colleagues recently reported their findings in *The Lancet Diabetes & Endocrinology*. Type 2 diabetes occurs when the body is no longer able to effectively use insulin — the hormone that regulates blood glucose — or when the pancreas does not produce enough insulin. As a result, blood glucose levels become too high.

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According to the Centers for Disease Control and Prevention (CDC), around 30.3 million people in the United States have diabetes, and the majority of cases are type 2. Following a healthful diet is deemed one of the best ways to prevent type 2 diabetes. Polyunsaturated fats (PUFAs) such as omega-3 and omega-6 should form a part of a healthful diet, albeit in moderation. The new review, however, suggests that we might want to consider increasing our intake of omega-6 to protect against type 2 diabetes.

Omega-6: A help or hindrance?

Omega-6 fatty acids are considered to be essential for health; not only do they aid brain function, but they also play an important role in skin and hair growth, and they help to regulate metabolism and support bone health. However, since the body is unable to produce omega-6, we can only get these fatty acids from certain foods, including soybean oil, sunflower oil, corn oil, and some nuts and seeds.

Current guidelines from the American Heart Association (AHA) recommend that omega-6 fatty acids should make up no more than 5–10 percent of our daily total energy intake, as they have been linked to increased inflammation and heart disease. "Based on concerns for harm, some countries recommend even lower intakes," says Dr. Wu. However, Dr. Wu and team note that while there are an array of studies that have investigated the effects of omega-6 on heart health, little is known about how omega-6 influences the risk of type 2 diabetes. "[...] only a handful of prospective studies have evaluated associations between linoleic acid or arachidonic acid biomarkers and type 2 diabetes," write the study authors, "resulting in potential limitations of publication bias and inadequate power to assess interactions by demographic, medical, or genetic characteristics."

"Thus," they add, "the potential effects of omega-6 PUFAs, including linoleic acid and its metabolite arachidonic acid, on type 2 diabetes remain unresolved and are of considerable clinical, scientific, and public health importance."

'Striking evidence'

To find out more about the link between omega-6 and type 2 diabetes, the researchers conducted an analysis of 20 prospective cohort studies on the subject. The studies included a total of 39,740 adults aged 49–76 years from 10 countries, including the U.S., the United Kingdom, Germany, France, Finland, Australia, Iceland, the Netherlands, Taiwan, and Sweden. All study participants were free of type 2 diabetes at study baseline. During a follow-up period of 366,073 person years, 4,347 new cases of type 2 diabetes occurred.

As part of the studies, participants' blood was assessed for levels of linoleic acid and arachidonic acid, and the team looked at whether or not these levels might be linked to the development of type 2 diabetes. Compared with subjects who had low blood levels of linoleic acid, the researchers found that those who had higher levels of the omega-6 fatty acid were 35 percent less likely to develop type 2 diabetes. "This is striking evidence," says senior author Prof. Dariush Mozaffarian, of the Friedman School of Nutrition Science and Policy at Tufts University in Middlesex County, MA.

"The people involved in the study were generally healthy and were not given specific guidance on what to eat. Yet those who had the highest



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levels of blood omega-6 markers had a much lower chance of developing type 2 diabetes," he adds. There was no significant link between blood levels of arachidonic acid and risk of type 2 diabetes, the team reports. These findings persisted after accounting for a number of possible confounding factors, including body mass index (BMI), age, sex, race, and levels of omega-3 fatty acids.

'Little evidence for harms'

Interestingly, the researchers say that their findings — together with results from previous studies — "do not suggest that high levels of dietary omega-6 PUFA[s] are harmful."

"Additionally," the team adds, "although omega-3 and omega-6 PUFA has been hypothesized to compete, we did not identify any evidence of a physiologically relevant interaction in this large, well-powered consortium analysis."

The researchers caution that many of the studies included in their analysis were observational, so they are unable to prove cause and effect between higher linoleic acid levels and reduced risk of type 2 diabetes. That said, they believe that their results indicate that we may benefit from increasing our intake of omega-6. "Some scientists have theorized that omega-6 is harmful to health. But based on this large global study, we have demonstrated little evidence for harms, and indeed found that the major omega-6 fat is linked to lower risk of type 2 diabetes." Dr. Jason Wu



Image © iStock.com/Anawat S

Obesity's many risks may include worsening asthma in children

Nutrition Insight 20 Oct 2017

Obesity has been found to be a risk factor for repeated hospital admissions among children in Japan hospitalized for asthma, researchers report in a Pediatric Allergy & Immunology study.

Asthma and obesity are common chronic illnesses and public health problems for children in developed countries like Japan. The prevalence of asthma and obesity is increasing, and the study authors note that several studies reported an association between obesity and asthma in children.

Obese group more likely to be readmitted

The study authors obtained the hospital discharge records of inpatients aged 3 to 8 years with a diagnosis of asthma using a national inpatient database in Japan. The researchers excluded children with chronic medical conditions other than asthma and obesity (congenital heart, kidney, pulmonary, endocrine, hematologic, gastrointestinal, and neurologic diseases; cancer or leukemia; and autoimmune disease) using version 2 of the pediatric complex chronic conditions classification system.

The study included 38,679 patients, including 3,177 underweight, 28,904 normal weight, 3,334 overweight and 3,264 obese patients. Those in the obese group were more likely to be readmitted to the hospital within 30 days of discharge and to have longer

hospital stays than those in the normal-weight group. No significant difference was observed between the four groups regarding the need for intensive care and total hospitalization costs.

The study authors point out that obesity is an economically complicating factor for children hospitalized with asthma in the US. Nationwide studies in the US from 2000 to 2012 revealed that obesity was associated with increased hospitalization costs and prolonged length of stay among children with asthma. The differences in cost and length of hospital stay between normal weight and obese pediatric inpatients with asthma were US\$1,588 to US\$2,145 and 0.24 to 0.59 days, respectively. In contrast, the results of the Pediatric Allergy & Immunology study demonstrated the difference in total costs between obesity and normal weight asthma patients was insignificant, which may have reflected the different payment and insurance systems between the US and Japan.

Furthermore, the study showed that the difference in length of hospital stay was 0.12 days between the two groups. "These differences in length of hospital stay may reflect the difficulty and complexity of procedures such as airway management, complications and greater severity of the illness," the researchers note.

Limited but important

The researchers admit there were several limitations in the study. The number of preexisting allergic disorders may have been underestimated and led to the bias toward the null because of possible misclassifications. Several potential confounders could not be adjusted because detailed clinical information, patient socioeconomic factors, and laboratory data were unavailable in the Diagnosis Procedure Combination database, they add.

However, it is noted that a unique feature and strength of the study was the use of a national inpatient database to examine the associations between body mass index (BMI) and the clinical outcomes of asthma among hospitalized children in Japan. Using the Japanese database, researchers were able to calculate robust national estimates of the effects of obesity on asthma exacerbations among pediatric inpatients.

"Pediatric obesity was significantly associated with an increased risk of 30-day re-admission for Japanese children hospitalized with acute asthma exacerbation," conclude the authors of the study. "Our investigations provide important information for the prevention of obesity in children with asthma." In other recent news, preventing asthma attacks may also be accomplished with vitamin D, according to another recent study showing nutrition's effects on the condition. The research led by Queen Mary University of London (QMUL) found that taking oral vitamin D supplements in addition to standard asthma medication could halve the risk of asthma attacks that require a visit to the hospital.

Satiety: Mushrooms may trump meat in helping to feel fuller for longer

Nutrition Insight 19 Oct 2017

If breakfast is the most important meal of the day, then a new

Mushroom Council-funded study suggests mushrooms may be one of the most important ingredients.



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The study on satiety, published in the October issue of the journal *Appetite*, indicates that eating a mushroom-rich breakfast may result in less hunger and a greater feeling of fullness after a mushroom breakfast compared to a meat breakfast. "Previous studies on mushrooms suggest that they can be more satiating than meat, but this effect had not been studied with protein-matched amounts until now," says gut health and satiety researcher and study author Joanne Slavin, Ph.D., Professor at the University of Minnesota.

"As with previous published research, this study indicates there may be both a nutritional and satiating benefit to either substituting mushrooms for meat in some meals or replacing some of the meat with mushrooms," Slavin continues.

Because protein appears to be the most satiating macronutrient according to the scientific literature, researchers wanted to match the amount of protein in the mushroom and meat interventions to essentially control for the influence of protein on satiety. After matching the mushroom and meat by protein content, both ended up containing comparable amounts of calories as well, which is a common way to match interventions in satiety studies.

"This new study adds to a growing body of evidence that suggests mushrooms may aid weight management and satiety, and thus contribute to overall wellness," says Mary Jo Feeney, Nutrition Research

Coordinator to the Mushroom Council. "Consumers are interested in the benefits of protein food

choices, so it's important for them to know that plant-based sources of protein, such as mushrooms, can be satisfying."

Mushrooms curbed hunger and prospective consumption
The objective of the study was to assess the differences in satiety and a ten-day food intake between *Agaricus bisporus* mushrooms, commonly known as white button mushrooms (226g), and meat (28g) in a randomized open-label crossover study. Participants included 17 women and 15 men who consumed two servings of mushrooms or meat for ten days.

Participants were given either sliced mushrooms or 93 percent lean/7 percent fat ground beef to consume for a total of ten days, twice a day. Portion sizes were based on matching the same protein content and similar calorie counts. Results showed a significant difference in satiety ratings between the mushroom and meat consumption. Participants reported significantly less hunger ($p=0.045$), greater fullness ($p=0.05$) and decreased prospective consumption ($p=0.03$) after consuming a mushroom breakfast compared to a meat breakfast.

Blending could make meals better
The 2015-2020 Dietary Guidelines encourage healthy eating patterns that are low in saturated fat, which is found in animal proteins. From meatless meals to plant-centric plates, there are many ways to gradually decrease meat consumption without loss of flavor, and research has shown that blending finely chopped mushrooms with meat can be a nutritious cooking technique, according to the Mushroom Council press release.

For example, the Mushroom Council cites a one-year randomized clinical trial at Johns Hopkins Bloomberg School of

Public Health. It indicated increasing intake of low-energy-density foods, specifically mushrooms, in place of high-energy-density foods, like lean ground beef, can be an effective method for reducing daily energy and fat intake while still feeling full and satiated after the meal. Participants following the mushroom-rich diet lost seven pounds (3.18kg), showed improvements in body composition and maintained these changes for six months after losing weight.

Another study conducted by University of California, Davis and the Culinary Institute of America found that substituting mushrooms for a portion of meat helped improve nutrition and flavor. According to the Mushroom Council press release, adding mushrooms to the mix helped lower calorie, saturated fat and sodium intake, while adding nutrients to the plate such as B vitamins, vitamin D, antioxidants and potassium.

Black tea may help with weight loss, too

Science Daily October 4, 2017

UCLA researchers have demonstrated for the first time that black tea may promote weight loss and other health benefits by changing bacteria in the gut.

Image © iStock.com/grafvision



In a study of mice, the scientists showed that black tea alters energy metabolism in the liver by changing gut metabolites. The research is published in the European Journal of Nutrition.

UCLA researchers have demonstrated for the first time that black tea may promote weight loss and other health benefits by changing bacteria in the gut. The study found that both black and green tea changed the ratio of intestinal bacteria in the animals: The percentage of bacteria associated with obesity decreased, while bacteria associated with lean body mass increased.

Previous studies indicated that chemicals in green tea called polyphenols are absorbed and alter the energy metabolism in the liver. The new findings show that black tea polyphenols, which are too large to be absorbed in the small intestine, stimulate the growth of gut bacterium and the formation of short-chain fatty acids, a type of bacterial metabolites that has been shown to alter the energy metabolism in the liver. "It was known that green tea polyphenols are more effective and offer more health benefits than black tea polyphenols since green tea chemicals are absorbed into the blood and tissue," said Susanne Henning, the study's lead author and an adjunct professor at the UCLA Center for Human Nutrition, which is part of the David Geffen School of Medicine at UCLA. "Our new findings suggest that black tea, through a specific mechanism through the gut microbiome, may also contribute to good health and weight loss in humans."

"The results suggest that both green and black teas are prebiotics, substances that induce the growth of good microorganisms that contribute to a person's well-being," she said.

In the study, four groups of mice received different diets -- two of which were supplemented with green tea or black tea extracts:

- Low-fat, high-sugar
- High-fat, high-sugar
- High-fat, high-sugar and green tea extract
- High-fat, high-sugar and black tea extract

After four weeks, the weights of the mice that were given green or black tea extracts dropped to the same levels as those of the mice that received the low-fat diet throughout the study. The researchers also collected samples from the mice's large intestines (to measure bacteria content) and liver tissues (to measure fat deposits). In the mice that consumed either type of tea extract, there was less of the type of bacteria associated with obesity and more of the bacteria associated with lean body mass. However, only the mice that consumed black tea extract had an increase in a type of bacteria called *Pseudobutyrvibrio*, which could help explain the difference between how black tea and green tea change energy metabolism.

Dr. Zhaoping Li, director of the UCLA Center for Human Nutrition, chief of the UCLA Division of Clinical Nutrition and the study's senior author, said the findings suggest that the health benefits of both green tea and black tea go beyond their antioxidant benefits, and that both teas have a strong impact on the gut microbiome. "For black tea lovers, there may be a new reason to keep drinking it," she said. The findings build on a 2015 UCLA study that demonstrated that both green tea and black tea helped prevent obesity in mice that consumed a high-fat, high-sugar diet.

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A spoonful of oil: Fats and oils help to unlock full nutritional benefits of veggies, study suggests

Science Daily October 9, 2017

The song says a spoonful of sugar helps the medicine go down, but an Iowa State University scientist has

published new research suggesting a spoonful of oil makes vegetables more nutritious.

A new study led by Wendy White, an associate professor of food science and human nutrition, shows that eating salad with added fat in the form of soybean oil promotes the absorption of eight different micronutrients that promote human health.

Conversely, eating the same salad without the added oil lessens the likelihood that the body will absorb the nutrients. The study appeared recently in the peer-reviewed American Journal of Clinical Nutrition, and the results may ease the guilt of countless dieters who fret about adding dressing to their salads.

White's study found added oil aided in the absorption of seven different micronutrients in salad vegetables. Those nutrients include four carotenoids -- alpha and beta carotene, lutein and lycopene -- two forms of vitamin E and vitamin K. The oil also promoted the absorption of vitamin A, the eighth micronutrient tracked in the study, which formed in the intestine from the alpha and beta carotene. The new study builds on previous research from White's group that focused on alpha and beta carotene and lycopene.

White said better absorption of the nutrients promotes a range of health benefits, including cancer prevention and eyesight preservation. The study also found that the amount of oil added to the vegetables had a proportional relationship with the amount of nutrient absorption. That is, more oil means more absorption. "The best way to explain it would be to say that adding twice the amount of salad dressing leads to twice the nutrient absorption," White said.

That doesn't give salad eaters license to drench their greens in dressing, she cautioned. But she said consumers should be perfectly comfortable with the U.S. dietary recommendation of about two tablespoons of oil per day.

The study included 12 college-age women who consumed salads with various levels of soybean oil, a common ingredient in commercial salad dressings. The subjects then had their blood tested to measure the absorption of nutrients. Women were chosen for the trial due to differences in the speed with which men and women metabolize the nutrients in question.

The results showed maximal nutrient absorption occurred at around 32 grams of oil, which was the highest amount studied, or a little more than two tablespoons. However, White said she found some variability among the subjects. "For most people, the oil is going to benefit nutrient absorption," she said. "The average trend, which was statistically significant, was for increased absorption."

Research collaborators include Yang Zhou, a former ISU postdoctoral researcher; Agatha Agustiana Crane, a former graduate research assistant in food science and human nutrition; Philip Dixon, a University Professor of Statistics, and Frits Quadt of Quadt Consultancy, among others.

So a spoonful or two of salad dressing may indeed help you derive the optimal nutritional benefit from your veggies. The relationship between a spoonful of sugar and the medicine going down, however, remains outside the scope of White's research.

Turn up the heat: Spicy food may curb unhealthy cravings for salt

Nutrition Insight 31 Oct 2017

Subjects who enjoyed spicy foods appeared to eat less salt and have lower blood pressure, potentially reducing their risk of heart attack and stroke, according to new research from China.

The study was published in the American Heart Association's journal *Hypertension*. "If you add some spices to your cooking, you can cook food that tastes good without using as much salt," says senior study author Zhiming Zhu, M.D., Professor and Director of the Department of Hypertension and Endocrinology at the Third Military Medical University in Chongqing, China. "Yes, habit and preference matter when it comes to spicy food, but even a small, gradual increase in spices in your food may have a health benefit."

Flavor preferences linked to blood pressure
The study enrolled 606 Chinese adults and determined their preferences for salty and spicy flavors. Researchers then linked those preferences to blood pressure. "Previously, a pilot study found that trace amounts of capsaicin, the chemical that gives chili peppers their pungent smell, enhanced the

perception of food being salty," Zhu says. "We wanted to test whether this effect would also reduce salt consumption."

They found that, compared to those who least enjoyed spicy foods, participants with a high spicy preference had 8mm Hg lower systolic (upper) and 5mm Hg lower diastolic (bottom) blood pressure numbers. They also consumed less salt than participants who had a low spicy preference.

Researchers also used imaging techniques to look at two regions of the participants' brains – the insula and orbitofrontal cortex – known to be involved in salty taste. They found that the areas stimulated by salt and spice overlapped, and that spice further increased brain activity in areas activated by salt. Authors say this increased activity likely makes people more sensitive to salt so that they can enjoy food with less of it.

Considering that all participants in this study were from China, further research is needed to determine if these findings may be generalized to other countries, the American Heart Association press release notes. Salt and sodium are often used interchangeably, but they are not the same, the American Heart Association press release notes.

More than 75 percent of the sodium Americans eat comes from processed, prepackaged and restaurant foods – not from the salt shaker. The American Heart Association recommends no more



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Food fortification: Improving ingredients with nutritional merit

By Paul Creasy in Nutrition Insight 30
Oct 2017

Food fortification is an area of the nutrition space that is being explored by many different companies.

As consumers increasingly look to make dietary changes to benefit their health, the idea of food fortification is helping companies to develop foods that are fit for a wide variety of lifestyles. NutritionInsight looks at the latest developments in food fortification.

Fortifying to solve global issues

Food fortification has been proposed as a solution to global problems. In Pakistan, for example, it has previously been suggested as a way to support local mills and food factories and therefore has a substantial impact on the wellbeing of close to 100 million people. The UK-based Food Fortification Program has awarded Bühler a multi-million contract to supply more than 1,000 micro feeders in 2017 and 2018. Pakistan has one of the highest rates of child malnutrition in the world: more than 40 percent of children are affected by stunting, and 30 percent are underweight. The fortification of staple foods is an effective way of increasing nutritional intake of a broad base of the population, for example through the addition of vitamins and minerals to wheat flour during the wheat milling process.

Fortification's benefits also extend to sustainability. "Consumers are

integrating 'green' attitudes and behaviors into all areas of their lives, from the foods they eat, to the personal care product they use, to the cars they drive," says Ho-Ling Chack from the DSM Nutritional

Products Food & Beverage marketing team in the US.

"Consumers are interested in aligning their personal values with manufacturers/brands they buy, raising the bar for companies to clearly define and articulate their values." Chack says DSM is at the forefront in sustainability and has identified key focus areas where its core business competencies closely intersect with identified global societal trends that affect people, economies and markets.

Useful ingredients fortify the market

Consumers today want to eat healthy as it helps them feeling in control of their lives or proactively managing their health conditions, and thus, food fortification becomes a critical factor in their purchasing decisions, according to Chack.

"With that said, however, consumers are struggling to understand which foods or nutrients are associated with specific health benefits," Chack says. "For example, 49 percent of consumers couldn't name a food/a nutrient that promotes cardiovascular health benefit (source: 2017 IFIC Food & Health Survey). This disconnect may be fueled by the abundance of conflicting nutrition information available in the marketplace today. Thus, whoever (manufacturers/brands) can break through the clutter and establish itself as the preferred food/nutrient for a specific health benefit will be handsomely rewarded."

Dr. Paul Lohmann produces more than 40 different magnesium salts, from bisglycinates and different

citrates, to carbonate and oxides. These mineral salts differ in regards to solubility, mineral content and physical appearance. Magnesium is an element of particular interest to the sports nutrition sector as there are some highly desirable health claims associated with it, and consumers quickly notice the benefits of taking magnesium to reduce muscle pains after and during sports.

The highly soluble magnesium salts are quickly available to the body, Dr. Paul Lohmann Sales Director Klaus Brockhausen says, adding that, for example, these magnesium bisglycinates can benefit the sports nutrition sector. For sport beverages, minerals like magnesium carbonate can be used as a buffering agent and provide a magnesium fortification at the same time. "Depending on the application you can also add either a good soluble magnesium salt or you can work with a non-soluble magnesium salt like magnesium oxide," Brockhausen says.

Trends take industry away from traditional delivery systems

Claire Baker, Cambridge Commodities' Head of Product Development, certainly sees a huge shift in the nutrition market toward demand for functional foods: healthy snacks, healthy children's snacks and ways in which people can get their added vitamins and minerals without taking a capsule or a tablet. "At the moment we're looking at things like fortified jelly pots, carbonated drinks with added nutritional benefits, ready-to-drink juices and oral sprays. We've got active projects going on in all of those areas while still developing traditional formats such as tablets and capsules," Baker says.

There are many trends driving innovation, according to Chack. He cites omega 3 in value-added milk like Horizon and Fairlife; plant-based proteins in beverages or bars like Bolthouse and Evolve; and

and probiotics and prebiotics in beverages like Suja and Tropicana.

Future of fortification

“Dr. Paul Lohmann is a middle-sized German company, but we are active globally. We have a growing business in Europe – in Western Europe, we are seeing a growing interest in iron and zinc,” Brockhausen says. “In third world countries, these deficiencies are much more obvious, but it is one area that we want to tap into for Western Europe. We also work with international organizations such as UNICEF and GAIN. These organizations will also try to work on these deficiencies, and we have projects that support this, to find out which source is bioavailable, where costs are not too high, so it’s about finding the right options for these application areas,” Brockhausen adds.

Additionally, Brockhausen notes that the company is trying to gain more knowledge on how food fortification is accomplished in different regions of the world. Dr. Paul Lohmann’s further plans include new product groups. “The focus will be on high-value mineral products, with a focus on pharmaceutical applications,” Brockhausen concludes.

“In my opinion, the future is bright,” says Chack of DSM. “Consumers are more engaged than ever before; companies are getting nimbler; scientific advances are accelerating; and regulatory bodies are encouraging food choices around nutrient density. I believe the importance of nutrient density in food will continue to be a critical factor in consumers’ purchasing decisions going forward.” All in all, the impression is that food fortification will continue to be explored by big companies as the potential solutions to crucial nutritional issues become ever more varied and complex.

Taking iron supplements every other day may help with absorption

Nutrition Insight 20 Oct 2017

A study has found that in iron-depleted women, providing iron supplements daily as divided doses increases serum hepcidin and reduces iron absorption.

According to the results, providing iron supplements on alternate days and in single doses optimizes iron absorption and might be a preferable dosing regimen. The study, published in *The Lancet Haematology* and funded by the Swiss National Science Foundation, made sure supplements were given on consecutive versus alternate days and given as single morning doses versus twice-daily split dosing. Current guidelines to treat iron deficiency recommend daily provision of ferrous iron divided through the day to increase absorption. However, there was an idea that daily dosing and split dosing might increase serum hepcidin and decrease iron absorption from subsequent doses. The researchers note that their study aim was to compare iron absorption from oral iron supplements given on consecutive versus alternate days and given as single morning doses versus twice-daily split dosing.

Testing different doses

The researchers did two prospective, open-label, randomized controlled trials assessing iron absorption using (54Fe)-labelled, (57Fe)-labelled or (58Fe)-labelled ferrous sulfate in iron-depleted women aged 18 to 40 years recruited from ETH Zurich and the University of Zurich, Switzerland. In study 1, women were randomly assigned to two groups. One group was given 60 mg iron at 8am on consecutive days for 14 days, and the other group was given the same doses on alternate days for 28 days. In study

2, women were assigned to two groups, stratified by serum ferritin so that two groups with similar iron statuses could be formed. One group was given 120 mg iron at 8am and the other was given the dose split into two divided doses of 60 mg at 8am and 5pm for three consecutive days.

Eventually, 14 days after the final dose, the groups were each crossed over to the other regimen. Within-individual comparisons were done. The co-primary outcomes in both studies were iron bioavailability (total and fractional iron absorption), assessed by measuring the isotopic label abundance in erythrocytes 14 days after administration, and serum hepcidin. Group allocations in both studies were not masked and primary and safety analyses were done on an intention-to-treat basis.

Results find significant difference
For study 1, 40 women were enrolled on October 15 to 29, 2015. In addition, 21 women were assigned to the consecutive-day group and 19 to the alternate-day group. At the end of treatment (14 days for the consecutive-day group and 28 days for the alternate-day group), geometric mean cumulative fractional iron absorptions were 16.3 percent in the consecutive-day group versus 21.8 percent in the alternate-day group, and cumulative total iron absorption was 131.0mg versus 175.3mg. During the first 14 days of supplementation in both groups, serum hepcidin was higher in the consecutive-day group than the alternate-day group.

In study 2, 20 women were enrolled between Aug 13 and 18, 2015. Ten women were assigned to receive



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once-daily dosing and ten were assigned to receive twice-daily divided dosing. No significant differences were seen in fractional (day 1-3 geometric mean: 11.8 percent once daily versus 13.1 percent twice daily) or total iron absorption (day 1-3: 44.3mg once daily versus 49.4mg twice daily) between the two dosing regimens. Twice-daily divided doses resulted in a higher serum hepcidin concentration than once-daily dosing. No grade 3 or 4 adverse events were reported in either study. "Providing iron supplements on alternate days and in single doses optimises iron absorption and might be a preferable dosing regimen," the researchers conclude. "These findings should be confirmed in iron-deficient anemic patients."

Health claims on snack bar packaging lead to better consumer sensory acceptance: study

Nutrition Insight
19 Oct 2017

A study looking into the influence of package and health-related claims on perception and sensory acceptability of snack bars has found that when health claims were given to consumers, a better sensory acceptance was observed.

Among other findings, package attributes, price and flavor were also highlighted on purchase intention of bars. Concerns for health can lead to healthier food choices, especially if the consumer is well informed, the Brazilian study, published in Food Research International, points out. It aimed to evaluate the importance of package and health-related claims on Brazilian consumers' acceptance of snack bars.

Most important purchase factors identified

In order to evaluate package attributes, in focus group discussions, 19 consumers chose the most important factors that influence their purchase decisions. Next, 102 consumers evaluated six commercial brands of snack bars in a three-session acceptance test: the first with no information about the product, the second containing the product package and the third with information on health-related claims associated with consumption of the bar. In general, package attributes, price and flavor were the most important factors that influenced the purchase of snack bars. Health claims positively influenced consumer acceptance, but information concerning the absence of gluten and lactose did not significantly alter sensory acceptance. The presence of omega 3s, sugars, preservatives, flavorings and colorings have the potential to improve acceptability, because they were able to raise the acceptance of the seed bar, removing it from the rejection region, the study notes. It adds that protein and nut bars are not well known to the general public and the lower mean acceptance of the seed and protein bars demonstrated the need for sensorial improvement.

Benefits of polyphenols on gut microbiota uncovered by review study

By Emma Cash 28-Sep-2017
NutraIngredients

The health benefits of polyphenols have been examined by a new review study, in which their impact on gut microbiota is the main focus. Polyphenols are natural compounds found in plants, fruits, vegetables, cereals, tea, coffee and wine, and are split into two groups: flavonoids and non-flavonoids.

Polyphenols and their biotransformation

The beneficial properties of polyphenols are dependent on their bioavailability, which is low compared to micro and macronutrients. The research group from Instituto de Salud Carlos III, Madrid, Spain, looked at the bioavailability of polyphenols and their impact on the human body. "The bioavailability and effects of polyphenols greatly depend on their transformation by components of the gut microbiota," the team said. "Different studies have been carried out to understand the gut microbiota transformation of particular polyphenol types and identify the microorganisms responsible."

However, they commented that despite both polyphenols and gut microbiota being studied extensively, not much is known about their relationship with each other. The report comments that only a small percentage of dietary polyphenols, around 5-10% of total intake, are directly absorbed into the small intestine. These polyphenols are then subjected to extensive Phase I (oxidation, reduction and hydrolysis) and Phase II (conjugation) biotransformations, which results in a series of water-soluble conjugate metabolites that are distributed to organs. Colonic bacteria in the large intestine react with the remaining polyphenols.

Effects of dietary polyphenols

Previous studies have shown that polyphenols can be converted by the colonic microbiota to bioactive compounds that can affect the intestinal ecology and influence host health.



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Dzevonila

PFNDI Dec 2017

Animal and human studies have both shown that certain doses of selected polyphenols may change the gut microbial composition, which can help some bacterial groups thrive. One report referenced in the review was an in-vitro study which used a batch-culture model of the distal region of the large intestine to suggest that flavan-3-ol monomers could be capable of influencing the large intestinal bacterial population. Furthermore, this study found that the flavan-3-ol monomer (+) catechin significantly inhibited growth of *Clostridium histolyticum* and enhanced growth of *E. coli* and members of the *Clostridium coccoides*-*Eubacterium rectale* group, whilst the growth of *Bifidobacterium* and *Lactobacillus* spp. were unaffected.

Another study the review looked at was a human intervention study that suggested the consumption of red wine polyphenols significantly increased the number of *Enterococcus*, *Prevotella*, *Bacteroides*, *Bifidobacterium*, *Bacteroides uniformis*, *Eggerthella lenta*, and *Blautia coccoides*-*E. rectale* group. The report noted that previous studies have also suggested polyphenols have potential benefits for immunity by reducing concentrations of the plasma C-reactive protein (CRP), which is a blood marker of inflammation. Red wine polyphenols have suggested health benefits also, as they have been shown to reduce blood pressure, triglycerides and high-density lipoprotein cholesterol. The research team concluded their report by stating that dietary polyphenols are clear to contribute to the maintenance of gut health. "It is clear that dietary polyphenols and their metabolites contribute to the maintenance of gut health by the modulation of the gut microbial balance through the stimulation of the growth of beneficial bacteria and the inhibition of pathogen bacteria, exerting prebiotic-like effects," the team said. More studies are needed to fully understand the health effects of polyphenols the group said.

Could curcumin benefit gut diversity and prevent postmenopausal weight gain?

By Tim Cutcliffe 24-Oct-2017 - [NutraIngredients Asia](#)

Curcumin may help reverse decreases in gut bacteria diversity after ovariectomy, according to a recent rodent study in *Nutrients*.

Rats fed curcumin for 12 weeks after undergoing removal of their ovaries showed greater gut microbiome diversity than those administered distilled water, observed the research team from the China Academy of Chinese Medical Sciences, Beijing. Curcumin, an active ingredient of turmeric, had demonstrated weight-gain prevention effects in previous studies in menopausal rats. The researchers wondered whether possible changes in gut microbial composition induced by curcumin might be involved; an aspect which had not been investigated until this study.

Rats which had undergone the ovariectomy (OVX), but were fed distilled water, showed reduced gut bacterial diversity compared with the control group rodents (SHAM) which underwent a sham operation. However, ovariectomised rats given curcumin (CUR) displayed significantly different numbers of seven bacterial genera compared with the OVX group. "Estrogen deficiency induced by ovariectomy caused changes in the distribution and structure of intestinal microflora in rats, and curcumin could partially reverse changes in the diversity of gut microbiota," wrote first author Dr. Zhiguo Zhang.

Curcumin prevents weight gain

Consistent with previous studies, rats in the OVX group displayed significant weight gain compared with the SHAM group. However,

curcumin supplementation prevented this weight gain in the CUR group. The curcumin did not however have an estrogenic effect, as it prevented neither reduced serum estradiol levels nor uterine weight loss. The small size (18 subjects) is a limitation of the study. However, if results are replicated in subsequent larger animal trials, they may justify for future intervention trials in humans; with curcumin as a possible therapeutic agent to prevent post-menopausal weight gain and maintain gut health.

Other effects

"At the phyla level, compared to SHAM rats, model (OVX) rats had a higher ratio of phyla Firmicutes and Bacteroidetes in the gut, which may lead to overweight rats," observed the researchers. Previous studies in both menopausal women and animals have displayed significant changes to microbiome composition after ceasing ovulation. Additionally, a higher Firmicutes/Bacteroidetes ratio has been associated with obesity in humans.

The study observed two other potentially beneficial effects of curcumin. The CUR group showed lower levels of *Anaerotruncus*, a bacterium which has been linked with pre-natal stress and age-related macular degeneration. Additionally, the researchers found that curcumin lowered the abundance of *Helicobacter pylori*, the bacterium responsible for stomach ulcers. More research is needed to explore the relationship between *H. pylori*, menopause and curcumin, the researchers proposed.

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Fish oil able to reduce mortality in gastrointestinal injury patients with sepsis: Chinese study

By Cheryl Tay, 17-Oct-2017 -
NutraIngredients Asia

Fish oil can the lower mortality rate from sepsis caused by acute gastrointestinal injury , according to a Chinese study. Sepsis, a systemic inflammatory reaction brought on by serious infection, has a prominent role in AGI.

Therefore, researchers from The Second Clinical Hospital of Jinan University conducted a study to ascertain the effects of omega-3 fish oil on AGI patients suffering from severe sepsis. They randomly separated 48 AGI patients aged 18 and above, who had been diagnosed with severe sepsis, into two groups. Each subject in both groups was administered 50g of long-chain fatty acid (LCFA) soybean oil, but the subjects in one of the groups was also parenterally administered 10g of fish oil each.

Mortality rate down

Although there were no major differences between the two groups at baseline, the researchers found that the 60-day mortality rate was lower in the group that had been given fish oil. During the 28-day follow-up with the study's participants after its conclusion, the average mortality rate was observed at 27.1, similar to the rate reported in an earlier study. Despite all the patients having received sepsis resuscitation bundle treatment, the mortality rate in the

control group was 41.7, a factor the researchers attributed to the study's small sample size, and / or the participants' healthcare conditions differing from those of the previous study. The patients who had received fish oil, on the other hand, had a much lower mortality rate of 12.5. Their ICU stay was also considerably shorter than that of those in the control group.

Organ failure

Apart from a lowered mortality rate, the fish oil-supplemented group's Marshall score which measures the extent of organ failure was significantly lower than in the control group. At the same time, the patients who were suffering from abdominal infection "demonstrated a lower mortality rate, fewer CD3 T lymphocytes, and fewer helper / inducer T lymphocytes in the fish oil group compared with the control group".

The study also credited immune-modulation with alleviating abdominal infection and intra-abdominal pressure in the fish oil-supplemented AGI patients. It further stated that patients suffering from intestinal dysfunction may have immune-deficiencies that can be countered with omega-3 fatty acids by way of modulating immune function, thereby reducing mortality rates. The study concluded that fish oil has "positive effects in terms of improving the long-term prognosis" of AGI patients with severe sepsis, and that "large-scale randomised controlled trials will need to be conducted in order to confirm the current findings".

limelight with other dark, leafy greens, hot peppers, 'superfoods' and produce linked to Hispanic culture, all of which are gaining popularity, according to a new report from Packaged Facts that details produce winners, losers and the flavour trends they inspire.

According to the consumer research firm's recently released Fresh Produce: US Retail Market Trends, consumption of fresh produce in the US reached a whopping 106.2 billion in 2016, after increasing steadily at 1.3% annually for the past five years. Much of this growth can be attributed to consumers' desire for more fresh, novel foods that they perceive as healthier, as well as a rise in produce-centric diets such as flexitarian, paleo, low-carb and raw, according to the report.

In response, marketers are making produce easier to eat in convenient packaging, such as small bags of baby carrots, pre-made vegetable 'noodles' and microwavable 'steam' bags with seasoned vegetables inside, Packaged Facts reports. The popularity of fruit & vegetable juices, smoothies and ready-to-drink smoothies also is contributing to a boost in production consumption. As such, consumption of kale, which many see as an ultimate health food and which often is used to give products a green health-halo, has increased 4.6% to 200 million pounds in 2016 compared to consumption in 2011, according to Packaged Facts.

Move over Kale - hot new veggie trends are linked to nutrient density, spice and Hispanic culture

By Elizabeth Crawford, 04-Oct-2017,
Food Navigator USA

While kale remains popular, increasingly it must share the



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KIDS
SPECIAL



SOMETIMES, HAPPINESS IS
A CHOCOLATE MILK MOUSTACHE.

INTRODUCING
BABYCCINO
HOT CHOCOLATE MILK
WITH HAPPY MEAL.



The leafy green's compound annual growth rate will slow slightly to 3.7% through 2021 in part because it is maturing and already saturates many diets, creating a large base for increased consumption. But also, likely because consumers are reaching for new options, including brussels sprouts, consumption of which Packaged Facts predicts will grow 10.1% in the coming five years, compared to a 13.8% compound annual growth rate from the past five years. Consumption of collard greens also will remain solid with a predicted compound annual growth rate of 6.3% through 2012, it notes.

Other green veggies that are captivating consumers include broccoli, consumption of which increased 8.3% to 2.6 billion pounds in the past year and cucumbers, which are up 8.7% to 2.5 billion pounds in the past year. In addition to green veggies, red and orange options are also gaining traction with consumption up 1.2% in the past five years and are predicted to grown 0.8% in the next five, according to the report. It adds, this growth comes in part from continued interest in pumpkins and sweet potatoes as 'superfoods', and sweet potatoes' starring role in pies and veggie burgers.

The other big winner in the vegetable category are chili peppers, consumption of which is projected to have a compound annual growth rate of 2.4% for the next five years to 2.4 billion pounds in 2021, according to Packaged Facts. Much of this growth comes from sustained interest in "super-hot peppers" fueled in part by hot pepper challenges, in which people eat Ghost Peppers or Carolina Reapers, the report notes. At the same time, less spicy chilli peppers such as jalapenos gained more mainstream appeal as an increasing Hispanic population and growing interest in Mexican and South American cuisine took off, especially among millenials," it notes. The growing Hispanic population and its influence on food

also have fueled interest in avocados and papayas, the research revealed.

Not just a sweet leaf: Stevia extracts may help tackle obesity

By Niamh Michail
25-Sep-2017 - Food Navigator

Stevia's health benefits go beyond sugar reduction - it could also be a natural alternative for treating metabolic disorders, such as obesity and type 2 diabetes, say researchers.

Publishing their findings in the peer-reviewed Journal of Medicinal Food, the Mexican researchers reviewed both in vitro and in vivo studies which looked at the beneficial effects reported for steviol compounds – aqueous and alcoholic stevia extracts – derived from the leaves, flowers and roots of the stevia plant.

These studies analysed the plant's anti-obesity, anti-hyperglycemic, anti-hypertensive and anti-hyperlipidemic effects, all of which make it interesting to tackle the symptoms of metabolic syndrome. This is characterised by factors such as abdominal obesity, inflammation and diabetes, that are associated with an increased risk of cardiovascular diseases.

While there are several chemically synthesized pharmaceuticals for treating these diseases, many of them have secondary undesirable effects such as lactic acidosis, metallic taste, and vitamin B12 deficiency, according to the reviewers from the Autonomous University of Yucatan.

"Therefore, there is a demand for new natural-based medicinal compounds and Stevia rebaudiana Bertoni is a potential source for these compounds," they write, particularly due to its absence of toxicity and reputation as an edible plant worldwide.

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Cardiovascular risk factors are on the rise. According to the World Health Organisation (WHO) the number of people suffering diabetes alone rose from 30 million globally in 1995 to 347 million in 2014. By 2030 it predicts this number will rise to 366 million. It also estimates that worldwide obesity has more than doubled since 1980. Currently, stevia is commercially cultivated to extract its sweeteners but it also contains other compounds, such as phytochemicals, that provide beneficial properties to health.

Theses include: diterpenes, labdabos, triterpenes, stigmasterol, tannins, ascorbic acid, alkaloids, steroids, saponins, flavonoids, b-carotene, chromium, cobalt, magnesium, iron, potassium, phosphorus, riboflavin, thiamine, tin, zinc, apigenin, austroinilina, avicularin, b-sitosterol, caffeic acid, campesterol, caryophyllene, centaureidin, chlorogenic acid, chlorophyll, kaempferol, luteolin and quercetin.

The authors identify three separate rat or mice studies in which orally administered stevia for a period of between three and nine weeks led to a weight reduction. One 2015 study looking for sucrose replacement in beverages found that satiety levels of SR, aspartame, and saccharose were similar among each other but stevia reduced the glucose and postprandial insulin levels, write the authors.

Other human and animal studies identified stevia as beneficial in lowering blood pressure. For instance, one study, hypertensive patients were given 250 mg of steviosides for one year. "Results indicate that their systolic and diastolic APs decreased after 3 months of starting the treatment without any negative effect on the biochemical parameters." The authors conclude that more research is needed to determine the diverse mechanisms of action of stevia-based treatments.

Turmeric extract eases osteoarthritis pain in mouse study: Natural Remedies trial

By Gary Scattergood 18-Oct-2017 -
NutraIngredients Asia

A turmeric extract containing bioactive polysaccharides termed 'turmero-saccharides', and only a negligible amount of curcuminoids, has been found to ease osteoarthritis pain in a mouse study.

The trial was undertaken by researchers in Bengaluru who work for Natural Remedies – the company which markets the product as

Turmacin.

Writing in Pharmacognosy Magazine, the researchers said they assessed the impact of the product on animal models of osteoarthritis pain. In addition to control groups, the mice were supplemented with the turmero-saccharides rich fraction at 22.5, 45, and 90 mg/kg dose levels, while others received the turmero-saccharides less fraction at 22.5, 45, and 90 mg/kg dose levels. Another group received the painkiller Tramadol.

The researchers found the turmero-saccharides rich fraction showed superior activity on pain when compared to the turmero-saccharides less fraction

Furthermore, the "turmero-saccharides rich fraction at 45 and 90 mg/kg has similar effects on OA pain as that of Tramadol." They added: "We also observed that 57% of analgesic activity was exhibited by turmero-saccharides rich fraction while turmero-saccharides less fraction produced 35% of analgesic activity. Thus, the current study findings indicate that turmero-saccharides are the major phytoactives that contribute to the analgesic activity of NR-INF-02 [the turmero-saccharides rich fraction]."

The paper concluded that the mechanism of action for turmero-saccharides at molecular level were yet to be explored, but stated "the current study demonstrated that turmero-saccharides rich fraction attenuated osteoarthritis pain."

"Thus, the study findings suggest that turmerosaccharides remain the major phytochemical actives of turmeric in decreasing osteoarthritis pain. Bioactive turmero-saccharides from Curcuma longa Extract (NR-INF-02): Potential ameliorating effect on osteoarthritis pain."



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Low calcium may raise cardiac arrest risk by twofold

Medical News Today 8 October 2017
By Honor Whiteman

Calcium is best known for its role in bone health, but a new study suggests that its role in heart health should not be overlooked.

It was found that people with low levels of calcium in their blood may be at greater risk of sudden cardiac arrest, one of the leading cause of death in the United States. Researchers have linked low blood calcium levels to an increased risk of sudden cardiac arrest. Lead investigator Dr. Sumeet S. Chugh, of the Cedars-Sinai Heart Institute in Los Angeles, CA, and colleagues believe that their findings may pave the way for much-needed new diagnostic and treatment strategies for sudden cardiac arrest (SCA). The researchers recently reported their findings in the journal Mayo Clinic Proceedings.

SCA is when the heart suddenly stops beating. This is due to a malfunction in the heart's electrical activity, which causes an irregular heartbeat, or arrhythmia. According to the American Heart Association (AHA), around 350,000 out-of-hospital SCAs occur in the U.S.



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every year, and almost 90 percent of people who experience SCA die as a result. While coronary heart disease is considered the primary cause of SCA, Dr. Chugh and colleagues note that around half of women and around 70 percent of men who die from SCA have no clinical history of heart disease. Such statistics highlight the desperate need for ways to identify people who are at increased risk of SCA, as well to find new treatments for the condition. Could the new research from Dr. Chugh and colleagues help to meet this need?

Calcium and SCA risk

The researchers gathered data from the Oregon Sudden Unexpected Death Study. They identified 267 people who experienced SCA between 2002 and 2015, alongside 445 healthy controls. The blood calcium levels of each subject were measured as part of the study. For SCA patients, these measurements were taken in the 90 days before their cardiac arrest. Calcium is an essential mineral present in an abundance of foods, primarily dairy products such as milk and cheese.

Elevated calcium levels raise heart attack risk

Researchers have linked high calcium levels to increased risk of heart attack. The team then divided the patients into groups based on their blood calcium levels and looked at whether or not these levels might be associated with the risk of SCA. ***The results revealed that the risk of SCA was increased by 2.3-fold for participants who had the lowest blood calcium levels (under 8.95 milligrams per deciliter) compared with those who had the highest blood calcium levels (9.55 milligrams per deciliter).*** These results remained after accounting for a number of possible confounding factors, including cardiovascular risk factors, medication use, and demographics.

"This is the first report to show that low serum calcium levels measured close in time to the index event are independently associated with an increased risk of SCA in the general population," says Dr. Hon-Chi Lee, of the Department of Cardiovascular Medicine at the Mayo Clinic in Rochester, MN, in an editorial linked to the study.

Findings may lead to better patient care

The team notes that participants who experienced SCA were more likely to have diabetes, chronic obstructive pulmonary disease, and chronic kidney disease than the controls, and there was a higher percentage of African American subjects in the SCA group. Dr. Chugh and team say that their findings should be interpreted with caution, and that the link between blood calcium levels and SCA risk should be investigated in future research. "Overall," concludes Dr. Chugh, "it seems that further study is required to elucidate the mechanisms underlying the adverse associations with lower calcium levels and to determine whether controlling calcium levels improves the prognosis in the general population or in high-risk patients." However, they believe that their results indicate that low blood calcium levels could be a risk factor for SCA.

"Our study showed that lower serum calcium levels, even within the normal range of values, may increase risk for sudden cardiac death." First author Dr. Hiran Yarmohammadi, Cedars-Sinai Heart Institute "Although our findings may not be ready for routine clinical use in patients at this time, they are a step toward the goal of improving patient care by better prediction of risk," Dr. Yarmohammadi adds.



High-sugar diets raise heart disease risk in healthy people

Medical News Today 6 October 2017
By Catharine Paddock PhD

A groundbreaking study has found that just 3 months on a high-sugar diet alters fat metabolism in such a way that it may cause even healthy people to raise their risk of heart disease. Researchers find that consuming too much sugar can alter the fat metabolism of a healthy person to raise their risk of heart disease.

The study suggests that the liver deals with fat differently on a high-sugar diet than it does on a low-sugar diet. The researchers, led by a team from the University of Surrey in the United Kingdom, describe their findings in the journal *Clinical Science*. They report how otherwise healthy men had higher levels of fat in their blood and liver after consuming a high-sugar diet for 12 weeks.

They also found that the men's fat metabolism bore similarities to that of people who have non-alcoholic fatty liver disease (NAFLD), a condition that develops when fat builds up in the liver. "Our findings provide new evidence that consuming high amounts of sugar can alter your fat metabolism in ways that could increase your risk of cardiovascular disease," comments Bruce Griffin, a professor of nutritional metabolism at the University of Surrey.

NAFLD raises heart risk

Estimates suggest that NAFLD affects 30 to 40 percent of adults in the United States. It is more common in people who have obesity and type 2 diabetes. Although NAFLD most often develops in adults, there is evidence to suggest that it affects nearly 10 percent of children in the U.S. aged between 2 and 19. ***There is also evidence to suggest that NAFLD can increase people's risk of cardiovascular disease, which is also known as heart and blood vessel disease or simply heart disease.***

Just 30 minutes of activity on 5 days could save lives

Discover how physical activity of all types, inside and outside of leisure time, reduces deaths and heart disease risks. Cardiovascular disease is mainly associated with atherosclerosis, a condition that develops when a fatty deposit called plaque builds up in the linings of blood vessels and restricts blood flow. This can lead to a blood clot that blocks the vessel, resulting in a heart attack or stroke. Around 92.1 million adults in the U.S. have "some form of cardiovascular disease" or are living with the after-effects of stroke.

Changes to fat metabolism

In the new study, 11 men with NAFLD and 14 healthy men were fed one of two diets, a high-sugar diet or a low-sugar diet, for 12 weeks. Both had the same amount of daily calories, except that in the high-sugar diet, sugar accounted for 26 percent of total calories, whereas in the low-sugar diet it accounted for 6 percent. The study was designed as a "randomized cross-over," which means that each participant followed first one diet and then the other, and that the order in which they followed them was randomly assigned.

The team wanted to find out whether the amount of fat in the liver affects how sugar consumption

influences cardiovascular health.

The liver plays an important role in fat metabolism, or the process through which fats are transported and broken down for use in cells throughout the body. The researchers compared changes in various biomarkers of fat metabolism, including lipids and cholesterol in the blood, in the two groups as they followed the two diets.

They found that, after 12 weeks on the high-sugar diet, the men with NAFLD showed changes in fat metabolism that have been linked to a raised risk of heart disease. It was also found that, after the high-sugar diet, the healthy men - whose livers had previously shown a low level of fat - had higher levels of fat in the liver, and their fat metabolism also resembled that of the men with NAFLD.

The researchers note that while most adults are unlikely to consume the amount of sugar in the study's high-sugar diet, some children and teenagers may actually consume this amount due to their high intake of sugar-sweetened drinks and candy. "This raises concern for the future health of the younger population, especially in view of the alarmingly high prevalence of NAFLD in children and teenagers, and exponential rise of fatal liver disease in adults." Prof. Bruce Griffin

Leafy greens may contribute to a healthy heart

Medical News Today 6 October 2017
By Ana Sandoiu

Kale, parsley, broccoli, and spinach: according to new research, these leafy green vegetables may hold even more

health benefits than previously thought, as vitamin K - found in abundance in all four - may contribute to a healthy heart.

Leafy greens, such as broccoli and kale, are great sources of vitamin K-1, and they may help to keep the heart healthy. A new study published in The Journal of Nutrition examines the link between vitamin K levels and heart structure and functioning in young people.

Vitamin K plays a key role in blood coagulation and bone health. Deficient levels of the vitamin raise the risk of hemorrhage, osteoporosis, and bone fractures. In its dietary form, vitamin K is known as phyloquinone, or vitamin K-1. This is abundantly found in leafy green vegetables such as kale, parsley, broccoli, spinach, iceberg lettuce, and cabbage. The new research suggests that insufficient levels of the vitamin may affect the structure of the heart, leading to a condition called left ventricular hypertrophy (LVH).

The left ventricle is the heart's major pumping chamber, and in LVH, this chamber is enlarged to an unhealthy degree. As the authors of the new study explain, a larger heart can malfunction with time, becoming less effective at pumping blood. LVH tends to affect adults, but the researchers decided to study this heart structure in young people because cardiac abnormalities that begin in childhood tend to predict the risk of cardiovascular disease in adulthood.



To the best of the authors' knowledge, this is the first time that a study has examined links between vitamin K levels and heart structure in teenagers. Mary K. Douthit and Mary Ellen Fain, both of the Georgia Prevention Institute at Augusta University, are the study's co-first authors. Dr. Norman Pollock, a bone biologist at the same institute, is the study's corresponding author.

Low vitamin K-1 intake correlates with LVH

Douthit and colleagues examined 766 healthy adolescents aged between 14 and 18. Half of the participants were male and half were female. Half of the participants were also black Americans.

Meditation may help to lower heart disease risk

A report from the American Heart Association (AHA) confirms that mindfulness benefits the heart. The researchers assessed the diet and physical activity habits of these teenagers over a period of 7 days, using the participants' self-reporting and accelerometry devices. Left ventricular structure and functioning were assessed using echocardiography. **Overall, the study found that the teenagers who consumed the least amount of vitamin K-1 had considerably greater left ventricles compared with those who consumed sufficient amounts of the vitamin.**

The researchers divided the results into tertiles, or thirds, of vitamin K-1 intake. They found, "The prevalence of [LVH] progressively decreased across tertiles of phyloquinone intake." In other words, the more vitamin K-1 the teenagers consumed, the less likely they were to develop LVH.

Dr. Pollock spoke to Medical News Today about the findings. He said, "[Teens] consuming 42 micrograms per day or less of vitamin K were

more than three times [more] likely to have left ventricular hypertrophy than those consuming 90 micrograms per day or more."

"Strikingly," Dr. Pollock added, "this relationship persisted even after taking into account potentially confounding factors such as age, sex, race, pubertal stage, blood pressure, body composition, physical activity, and other factors of dietary intake." Around 10 percent of the teenagers had LVH to some degree, as determined by measurements of the overall size of the ventricle and the thickness of its walls.

Clinical implications of the findings

The findings, the authors write, help them to "clarify the importance of phyloquinone intake to cardiovascular development." Speaking of MNT about the clinical implications of the study, Dr. Pollock said that "cardiovascular disease risk factors have been shown to track during childhood and later life and may be affected by dietary intake, [so] it is of clinical relevance to study dietary determinants of cardiovascular development." "Our observational data suggest that greater vitamin K consumption may favourably influence subclinical markers of cardiac structure and function in a population of U.S. adolescents." Dr. Norman Pollock

The study authors write that although further research is now needed, the new findings could ultimately "lead to phyloquinone interventions in childhood aimed to improve cardiovascular development and to reduce the subsequent risk of [cardiovascular disease]." In fact, Dr. Pollock is currently the lead investigator in four vitamin K trials aiming "to determine the effect of vitamin K supplementation on risk markers of cardiovascular disease and diabetes."

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Child, teen obesity soars tenfold worldwide in 40 years

According to Reuters, a new World Health Organization (WHO) study published in The Lancet shows that the number of obese children and adolescents worldwide has jumped tenfold in the past 40 years and the rise is accelerating in low- and middle-income countries, especially in Asia.

. "Over 40 years we have gone from about 11 million to a more than tenfold increase to over 120 million obese children and adolescents throughout the world," said lead author Majid Ezzati of Imperial College's School of Public Health. This means that nearly 8% of boys and nearly 6% of girls worldwide were obese in 2016, against less than 1% for both sexes in 1975. An additional 213 million children aged 5–19 were overweight last year, but fell below the threshold for obesity, according to the largest ever study, based on height and weight measurements of 129 million people.

If current trends continue, in 2022 there will be more obese children and teenagers worldwide than underweight ones, who now number 192 million, half of them in India, the study said. Polynesia and Micronesia had the highest rates of child obesity last year, 25.4% in girls and 22.4% in boys, followed by "the high-income English-speaking region" that includes the United States, Canada, Australia, New Zealand, Ireland, and Britain.

Among high-income countries, the United States had “the highest obesity rates for girls and boys,” 19.5% and 23.3%, respectively.

In conjunction with the release on the new obesity estimates, WHO is publishing a summary of the Ending Childhood Obesity (ECHO) Implementation Plan. The plan gives countries clear guidance on effective actions to curb childhood and adolescent obesity. WHO has also released guidelines calling on frontline healthcare workers to actively identify and manage children who are overweight or obese.



Study debunks egg consumption, diabetes and CVD link

Since the 1970s, U.S. dietary recommendations have advised limiting egg intake to 2-4 a week for the healthy population and even less for people diagnosed with cardiovascular disease (CVD) and type 2 diabetes.

A study published in the European Journal of Clinical Nutrition suggests that there isn't a link between higher egg consumption and cholesterol imbalance, elevated risks of cardiovascular disease (CVD) events, or type 2 diabetes.

The researchers set out to analyze human studies from the past 10

years on the topic of egg consumption and CVD and type 2 diabetes risk. They found that there is little or no consistency between egg consumption and the risk of type 2 diabetes in studies with follow-ups as long as seven years. It was also shown that, in healthy people and people with type 2 diabetes, no direct associations exist between egg consumption and coronary artery calcium, a marker for the development of atherosclerosis.

In terms of the impact of eggs on cholesterol levels, a few well-designed studies found no adverse effects of a high (one to three eggs daily) versus low egg consumption for up to one year among healthy adults and those with type 2 diabetes or metabolic syndrome. There is sometimes a higher increase of total and LDL (“bad”) cholesterol, but this is almost always accompanied by an increase in protective HDL cholesterol which tends to persist over time while triglycerides stay low and total and LDL cholesterol stop rising.

The researchers concluded that “dietary patterns, physical activity, and genetics affect the predisposition of CVD and type 2 diabetes more than a single food item, such as eggs.” They went on to write that “up to seven eggs per week can safely be consumed, but in patients with established CVD or type 2 diabetes only with special emphasis on a healthy lifestyle.”

Black, green tea may decrease weight gain, alter microbiome

An animal study published in the European Journal of Nutrition suggests that polyphenols from black tea and green tea may induce weight loss

by altering the microbiota and increasing hepatic 5'adenosylmonophosphate-activated protein kinase (AMPK) phosphorylation.

The researchers fed four groups of mice different diets: a high-fat, high-sugar diet; a high-fat, high-sugar diet supplemented with green tea extract; a high-fat, high-sugar diet supplemented with black tea extract; and a low-fat, high-sugar diet. After four weeks, the researchers found that the mice who had the green tea and black tea extracts lost the same amount of weight as those who had the low-fat diet.

They then examined the intestines of the mice to measure bacteria and inspected the liver to measure fat deposits. The mice who consumed the black and green teas had less of the bacteria associated with the obesity and more of the bacteria linked with lean body mass. The mice that consumed the black tea had more *Pseudobutyrvibrio* bacteria and intestinal formation of short-chain fatty acids (SCFA).

The researchers concluded that “both black and green tea polyphenols induced weight loss in association with alteration of the microbiota and increased hepatic AMPK phosphorylation.” They also hypothesized that black tea polyphenols “increase pAMPK through increased intestinal short-chain fatty acid production, while green tea polyphenols increased hepatic AMPK through green tea polyphenols present in the liver.”

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FOOD SCIENCE & INDUSTRY NEWS

A switch to plant protein may restore 'fundamentally broken' food system

By Will Chu 06-Oct-2017 - Food Navigator

A shift to plant protein as a replacement for animal protein is “desperately needed” as the UK’s food system is “fundamentally broken”, according to the Vegan Society.

The warnings come as the charity group publish a new report, which believes the UK’s food system is environmentally unsustainable and unhealthy. The Grow Green II report, written by the New Economics Foundation, also urges the government to rethink the UK agricultural system as the country prepares to leave the European Union. Such preparatory measures include the introduction of a farmed animal tax and a Protein Aid Scheme for those who grow plant protein crops such as peas, beans and lentils.

The report recommended that Common Agricultural Policy (CAP) programmes post-2020 should over schemes designed to support

farmers interested in transitioning from livestock farming to protein crops production for human consumption. “We are working in various ways to bring about vegan-friendly policy making,” said Louise Davies, Vegan Society’s head of campaigns and policy. “Encouraging more plant protein agriculture, and a move away from animal agriculture, would be a step towards the vegan future that the animals and our planet so desperately need.”

According to the Food and Agriculture Organization (FAO), the UK currently consumes an average of around 50% more protein than recommended in a healthy diet. The report suggests reduction of meat, dairy, eggs and fish consumption be accompanied by an increase in protein crop production for human consumption. The group pointed to the UK climate, which provides good conditions for growing plant proteins such as fava beans, peas, hemp seed or sweet lupin.

UK’s excess meat consumption
“However, the UK currently assigns only 16% of its agricultural land to growing protein crops, much of

which are used to feed farmed animals,” the report highlighted. “Those crops could serve as substitutes for meat and dairy products and provide carbon savings, as well offering many health benefits for the UK population.”

Hemp and fava beans

Hemp and fava beans are two examples that illustrate the benefits of plant protein sources with regard to the environment, as well as farmers’ livelihoods. Hemp is considered one of the most sustainable crops, being a highly efficient CO2 reducer. It requires relatively low fertilizer, herbicides or pesticide inputs as well as needing little water, land and maintenance. Likewise, fava beans add essential nitrogen to soil as well as provide food to beneficial insects. Its nutrition profile shows it is high in protein, fibre and vitamins. They are also relatively inexpensive to produce. “Encouraging more plant protein agriculture, and a move away from animal agriculture, would be a step towards the vegan future that the animals and our planet so desperately need,” added Davies.

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Grin Carpenter, senior researcher at the New Economics Foundation, said: "Our research shows that to supply British diets with food that is sustainable, healthy, affordable, and ethical, protein crops represent a win-win-win-win across all four dimensions."

"With a major shakeup to farming policy on the horizon, now is the time to create new programmes and incentives for the development of protein crops."

Asia leading the world for new probiotic product launches

By Ester Wan 13-Oct-2017 Food Navigator Asia

Asia Pacific is now the leading region for new probiotic product launches across food, drinks and supplements, with firms innovating in the confectionery, dessert and fermented food sectors.

Michelle Teodoro, a food science and nutrition analyst at Mintel, said at our Probiota Asia 2017 summit in Singapore that more firms were looking beyond dairy for probiotic products, including candy, chocolates, baked goods and snacks. Products she highlighted included the Solgar Ohso Good Chocolate with probiotics, which claims to deliver probiotic bacteria three times more effectively than dairy products. Probiotic ice creams are

already available in Asia, such as Ho-Eat Bifido Apple Flavoured Ice Bifido from Taiwan, Zhen Xi Original Flavoured Frozen yoghurt Ice Cream from China, and Amul Probiotic Chocobar Ice Cream from India.

Teodoro added that shelf-stable probiotic products present untapped potential in APAC, especially around ambient yogurts. Nevertheless, she said APAC was now leading the way in probiotic product launches, driven by China, South Korea and Australia. APAC accounted for 35% of probiotic food, drink, vitamin and supplement launches between October 2012 and September 2017, compared to Europe at 2% and North America at 25%. Among other indications, she said % of mothers in China are highly concerned about digestive disorders, while 2% of Chinese consumers purchase drinks with digestion benefits.

Teodoro stated that these are good indications for the rest of Asia, as country markets in the region tend to take market and demand cues from their larger neighbours, as well as from Western countries such as the US and in Europe. She also stated that in Asian countries, probiotics and digestive health are part of cultural tradition, leading to a certain level of openness to further learning.

Nonetheless, transparency is critical in building trust for probiotics with consumers, especially about the strains of probiotics used, as well as mixes or multiplying of strains, which is seen as multiplying goodness and functionality. Consumers tend to look approved health claims of probiotics, and the information needs to be clearly displayed or available in order to assure Asian consumers, she argued.

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Roman Samokhin

Taste, texture, nutrition formulating with plant-based proteins

By Elaine Watson 27-Sep-2017
NutraIngredients USA

Plant-based proteins are creeping into a dizzying array of foods and beverages, from dairy-free milk, cheeses and yogurts to protein bars, chips, powders and meat analogs. But what are they like to work with? FoodNavigator caught up with experts to find out.

From a nutritional perspective, most plant proteins with the exception of soy are not complete proteins in that they don't contain adequate levels of all nine essential amino acids. So popular combinations often include pea (which is low in cysteine and methionine but high in lysine) and rice or oats (which are lower in lysine but higher in cysteine and methionine), says strategic marketing manager Orlaigh Matthews.

From a sensory perspective, however, they each present different challenges, she says, with consumers citing taste and texture as top of the priority list when choosing protein products, she notes.

Pea protein can have off notes, while rice protein can be gritty. But she adds: "Just combining multiple proteins doesn't overcome these challenges, so in our range which combines pea, rice and oat protein to create a complete protein and uses natural flavours to tackle



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Good Bacteria



Bad Bacteria



off-tastes we've used proprietary processing and flavour masking technology, and come up with products that are optimized for specific applications such as bars and beverages.

"Product officially launched in March 2017 and the feedback has been very positive, because formulators want to use plant-based proteins, but they also want a complete protein, an improved flavour profile and reduced grittiness and chalkiness, so what we're doing really resonates."

Company has also been able to combine product with its TNT (total novel texture) technology to stop high-protein bars from hardening over their shelf life, she says. "We're seeing growth in bars, baked goods, milk alternatives, ready-to-drink active lifestyle products, sports nutrition products, smoothies, and powdered products."

Company, which has worked with soy protein for a long time, has been working with pea proteins from Puris (formerly World Food Processing) for a couple of years, and is now "in the process of finalizing its protein strategy and scoping out different protein sources," says Paige Ties, senior technical service specialist. She can't provide further details, but says that, "In the future you'll definitely see more options in the vegetable protein space coming from Cargill."

Pea protein is still in its infancy. From a formulation perspective, she says, "Soy, egg and whey are highly functional proteins that people have been working with and optimizing for years, whereas pea protein is still in its infancy, so there are functional gaps the industry is trying to address."

"What gives us an advantage is that we also have a portfolio of

texturizing solutions we can use to help customers formulating with proteins in a variety of applications, from using trehalose to mask protein bitter off notes; pectin and gellan gums to protect and suspend proteins in beverage applications; to chicory root fibre for texture and flavour advantages in non-dairy yogurts and ice creams."

When it comes to beverages one of the biggest growth areas for proteins pea protein presents challenges as it is not as soluble as soy or whey protein, she says.

"The goal is to keep the protein as far away from its isoelectric point as you can, for pea protein the isoelectric point is around pH 4.5, so some of these dairy alternative beverages with a neutral pH are fine, but when you're dealing with a more fruity beverage with a lower pH, pea protein can precipitate out of the solution, or is not able to solubilize, so pectin is a fantastic tool to protect the protein from acids, while gellan gum and other texturizers can help suspend it."

When it comes to formulation trends, she says: "The market has completely changed. Previously people were really focused on the typical athlete looking for performance – and you still see some of that - but our primary interest is coming from more general consumer products."

As for how much protein customers are looking to include, it depends on the application, she says: "In plant-based milks, some people are trying to push the needle from, say 5g to 10g per serving, so there's a need for more highly soluble proteins. Rice pairs particularly well with pea protein, as do potato and pumpkin protein, she says. "Chickpea also pairs well with pea in a beverage product, and it has better solubility than rice protein."

We have a PDCAAS [protein digestibility-corrected amino acid score] estimator that helps our customers formulate faster and understand what using different protein blends might mean from a nutritional perspective."

When it comes to price, she says, pea is more expensive than soy or whey, but less expensive than specialty proteins such as hemp, pumpkin seed and "It's not out of reach." Soy protein, meanwhile, will "always have a place in the market, as it has great functionality and nutrition, great emulsification and solubility, and it's the only plant protein that's a complete protein," she says, although interest has cooled a little in recent years amid concerns about allergens, GMOs and health concerns even if the latter are not supported by the evidence.

They managed to generate delayed milk from an enzymatic extract

Food News LATAM OCTOBER 16, 2017

In a meeting with foreign and national media, developed in the Image Foundation of Chile, the academic of the Department of Campus Biology, Dr. Renato Chávez, unveiled the IDEA-FONDEF project "Enzyme of Antarctic origin with beta-galactosidase activity, highly efficient in hydrolysing lactose in milk at low temperature".

The research seeks to mass produce milk powder, delicacy, cheese and yogurt without this sugar, which, according to the INTA, affects more than 40% of Chilean children and young people.

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According to a study conducted in 2012 by the World Health Organization (WHO), food intolerances and allergies affect between 3% and 4% of the world population. In the case of Chile, more than 40% of children and young people present intolerance specifically to lactose, according to the Institute of Nutrition and Food Technology (INTA).

This genetic condition, which produces annoying symptoms due to the lack of the enzyme lactase (responsible for metabolizing and digesting milk sugar), has led the market to offer products for these consumers, but the development of some -particularly, those that they follow a strict cold chain-, it is inefficient, since these commercial enzymes carry out the process at temperatures bordering 40 degrees Celsius.

Aware of this problem, scientists from the University of Santiago de Chile managed to generate a delayed milk from an enzymatic extract of an Antarctic body, which was presented at a press conference organized by Fundación Imagen de Chile.

According to Dr. Renato Chávez, director of the study led by researchers from the Faculty of Chemistry and Biology, and the Center for Studies in Food Science and Technology of the University of Santiago de Chile, "this enzyme, used at 10°C, presents a ability to hydrolyse milk lactose approximately 2.6 times higher than that used commercially. This result allows us to project an important impact on the efficiency of the production process".

The research is supported by FONDEF of CONICYT, the Chilean Antarctic Institute, and the Spanish company Biópolis SA, and will allow to optimize the cold processes and to produce more

efficiently lactose-free foods, mainly milk powder, as well as new uses for the delicacy and the cheese. The Vice-Rector for Research, Development and Innovation of the University, Dr. Claudio Martínez, highlighted the role that the University of Santiago is taking in the Antarctic territory, in matters as different as the development of medical innovations, products for the food industry and research on global warming.

"As a public university, we are concerned about giving pertinent answers, of excellence and with impact to the problems of society. For this reason, we now have a climatological research laboratory (TARP-02) on Rey Jorge Island, next to the Escudero Base of the Chilean Antarctic Institute, constituting the only university in the territory with its own infrastructure. In addition, we have a large number of projects, like others that can respond to such complex issues as climate change," he said.

Myriam Gómez, Executive Director of Image of Chile, emphasized that "Chile is positioning itself internationally thanks to this type of undertakings, which are a contribution to the challenges facing society today. It should be noted that recently our nation was chosen as the best country in Latin America and the Caribbean in terms of innovation, according to a study conducted by Cornell University, the Insead business school and the World Intellectual Property Organization, dependent on the UN".

Delayed milk with the Antarctic microorganism has already been approved successfully by potential consumers through a sensory panel. The next step is to achieve scale production of the enzyme and perform tests at the production level.



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"Instead Of Giving Farmers A Barn With 50,000 Chickens, Why Not Give Them A Small Factory And 10,000 Machines?"

Future Meat Technologies: The future of clean meat production is local

By Elaine Watson 03-Oct-2017 - Food Navigator USA

While it might be a while before steaks grown in bioreactors (instead of on the farm) become standard fare at your local steakhouse, 'locally produced' cultured meat could quickly gain traction in nuggets, burgers, meatballs, and hot dogs if the price is right, predicts Israeli biomedical engineer Professor Yaakov Nahmias.

"I think cultured meat products will gain traction pretty fast in Japan and China, whereas maybe countries like France might hold out a lot longer," said Professor Nahmias, a professor of bioengineering at the Hebrew University of Jerusalem and a specialist in tissue engineering techniques refined from regenerative medicine. Ultimately, plant-based and cultured meat will likely displace a significant percentage of conventional meat production, predicted Nahmias, who was speaking to FoodNavigator-USA after Israel inked a \$300m trade deal with

China that will see the two collaborate on a variety of clean-tech projects from clean meat (meat grown from cells in bioreactors instead of animals) to clean energy.

"I think everyone – including [conventional] meat companies – realizes that these companies are really the future of meat production worldwide. Even if people in some countries are trying to reduce meat consumption, in China alone there are still hundreds of millions of people that are demanding it, and if we don't change anything, meat costs will spiral up." Indeed, large meat companies are logical partners for clean meat companies as they have the infrastructure, contacts and marketing capabilities to take it to a mass audience, noted Professor Nahmias. "Cultured meat technologies, once validated at scale, will probably be bought off by large corporations and replace most traditional farming techniques. Cellular agriculture could ultimately replace traditional animal agriculture," added Nahmias.

Professor Nahmias, who had licensed his cultured meat technology to a company called SuperMeat a couple of years ago, has since set up his own operation called Future Meat Technologies, while SuperMeat cofounder Ido Savir has retained the SuperMeat trademark, but not the IP. "The way we see it, instead of giving farmers a barn with 50,000 chickens, why not give them a small factory and 10,000 machines," added Nahmias, who is about to close a \$2m funding round to help him develop his 'distributive manufacturing' model, whereby small businesses (and ultimately even consumers) could produce small quantities of 'meat' locally in their own bioreactors using capsules containing 'starter' tissue produced by Future Meat Technologies. "They buy packets from us and sell meat directly to consumers," said Nahmias, who

likes the terms 'clean meat' and 'cultured meat' but prefers 'animal-free meat,' "as it is the most straightforward.

"We essentially give the farmers a collection of cells in a matrix or a piece of tissue that's roughly the size of an espresso capsule – just a few milligrams – and the nutrients to feed the cells, and then they grow them for about 10-18 days and that would produce fully fledged tissue i.e. 'meat, or a raw material [such as fat, or muscle] – that would get sent on to a meat preparation facility.

"It's a better model than having everything done centrally by a mega corporation. We're effectively sending out the equivalent of seeds to farmers to grow their own biomass," added Nahmias, who claims his company is the only one with "a GMO-free, unlimited cell source capable of differentiating to both muscle and fat, growing in an [animal] serum-free, antibiotic free cultured medium."*

Another Israeli clean-meat start-up, tentatively named Meat the Future, has been set up by Professor Shulamit Levenberg (dean of the biomedical engineering department at Israel's Technion institute of technology), who is supported by incubator, The Kitchen, and is working toward commercializing tissue-engineering technology to create steak from bovine cells in a bioreactor.

Distributive manufacturing

The first factories would be our own But who would these potential partners be? Farmers looking to diversify? Meat wholesalers, processors and distributors? A new breed of clean meat specialists? Or further down the line, consumers? In the first instance, farmers, said Nahmias: "That would be the most socially correct and economically appropriate model." However, he added, "The first

factories would be our own. We would start working with restaurant and food chains to gain widespread consumer acceptance."

So what kinds of cells is Professor Nahmias working with?

"Like everyone else we start with a biopsy, so we take cells, but we don't take muscle cells or muscle stem cells, which are satellite cells, we use a different type of cell – a mesenchymal type of cell [from chickens] that grows faster and in a cheaper medium as it has fewer nutritional requirements than myocytes [muscle cells] and satellite cells. Our cells have the unique potential of differentiating into myocytes and adipocytes [fat cells]," he said.

"We are using connective tissue cells that is spontaneously immortalized [they have an unlimited capacity to reproduce and divide] without genetic modification [some companies are using GM techniques to make this Muscle cells, fat cells, connective tissue... happen]. These cells can be pushed 'sideways' toward muscle or fat, which is very important for the taste, aroma and texture of the meat, and we're growing them in a patent-protected serum-free, animal-free culture medium only using FDA approved materials and without the use of antibiotics.

He added: "We can produce animal fat en masse; we've patented it, and we think it is going to be one of the major breakthroughs. I have a feeling that we might see hybrid products in future that might use this, things like plant protein combined with animal fat [made in bioreactors]. We established our propriety chicken cell line in January, our serum-free medium formulation in April, and efficient differentiation to fat in June, so that's a lot of major discoveries in six months. The next milestone is

scaling production toward a public tasting of chicken nuggets or meatballs in 2018 with the first working bioreactor prototype expected in 2019.”

The design mimics animal physiology using a dialysis circuit to recirculate the culture medium, eliminating ammonia and slashing consumable costs, claimed Nahmias, who predicts each unit will cost around \$300, and will be capable of producing clean meat for around \$5 per kg.

* Future Meat Technologies does not use animal serum (the liquid part of blood) in its process (some start-ups growing cultured beef, for example, began by using fetal bovine serum, a byproduct of the livestock industry, although they have since claimed to have validated animal-free alternatives).

Genetically modified wheat variety used to make celiac-friendly bread : Study

By Will Chu 01-Oct-2017 - Food Navigator

Wheat strains that do not produce the gluten forms that trigger a dangerous immune reaction could be used to replace regular wheat in baked goods, according to a study.

The new strains are treated to remove around 90% of proteins called gliadins, thought to be the main culprit behind the symptoms seen in celiac disease.

According to the researchers, the new strains, which still contain a small quantity of gluten, can still

be used to bake bread amongst other products. “Bread from the genetically modified (GM) wheat can be suitable for those who simply want to reduce the intake of gluten,” said Dr Jan Chojecki, managing director of PBL Ventures, the business start-up and mentoring arm of Plant Bioscience Limited (PBL). “In the lines, the levels of the immunoactive “toxic” gluten is reduced up to 95%, and sensory tests showed comparable properties of normal bread, and much better than, for example, rice bread.” Dr Chojecki added that in terms of physical baking properties, the wheat would not be suitable for large volume bread loaves. For pasta though, which is traditionally made from Triticum durum wheat, there would be no technical obstacle to applying the approach to pasta wheat. The use of genetically modified wheat, especially targeting gluten reduction or elimination has made headlines with news that German company GoodMills Innovation has recently developed a wheat based on ancient grains.

These grains, called 2ab Wheat, are the first to be grown and processed specifically for its improved digestibility, suitable for those who are gluten sensitive. Created as a joint venture between GoodMills Group and Palsgaard, the grain wheat does not contain the D genome, which causes digestive discomfort for many people.

Led by Dr Francisco Barro, the team from the Institute for

Sustainable Agriculture in Spain, began using a genomic modification technique called CRISPR/Cas to remove the genes that code for the gliadin protein. This task is made all the more difficult as there are no less than 45 copies of the gene for the main problematic gliadin protein. However, efforts from Dr Barro’s team resulted in a knock out rate of 35 of the 45 genes. “Up to 35 different genes were mutated in one of the lines of the 45 different genes identified in the wild type, while immunoreactivity was reduced by 85%,” the study said. “Transgene-free lines were identified, and no off-target mutations have been detected in any of the potential targets.”

In total 21 mutant wheat lines were generated, all showing strong reduction in gliadin content. Dr Chojecki added that along with actual baking properties, the taste and sensory properties of the products produced from this wheat improved on that currently available on gluten-free shelves. He added that the considerable interest he had received from the food industry would need to take into account the GM aspect that formed one part of the complex developmental challenge. “The agricultural science and crop industry is largely focussed on growers/farmers as their primary customer and are, largely speaking, not focussed on developing products with downstream consumer benefits, which for them represents a challenging business model,” he said. “So we have approached

alternative investors who have the vision and will to take these products forward, and are now working with them. What is also very evident is that there is very strong acceptance of the GM aspect from people with gluten pathologies.”

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Health conscious Indonesians cutting down on rice

By RJ Whitehead
27-Sep-2017 - Food Navigator Asia

Rice-loving Indonesia has been seeing growth in consumption of the staple slowing as people there get more conscious about their health. According to Mintel, retail volumes of rice will drop to a mere 1.5% growth from 2017-21, having increased at an average annual rate of 3.5% from 2012-16.

The country is still one of the world's biggest consumers of rice, in spite of this slowing growth. Compared to the Vietnamese, who consume a world-leading 232.5kg each, Thais (163.2kg) and Chinese (119.1kg), Indonesia weighs in in fourth place with an average per-capita consumption of 103kg, just ahead of Malaysia (100.2kg), according to Mintel estimates. Jodie Minotto, agency's food and beverage research manager for Asia-Pacific, believes this flagging growth in Indonesia could be due to the rising attention given to the country's high prevalence of diabetes. "In light of the negativity that surrounds rice today, consumers are reacting and an interest in low-carb diets is forming," she said.

Indeed, Mintel's research found that 27% of urban Indonesians have been avoiding carbohydrates in 2017. This figure increases to a third when taking into account consumers aged 35 and above. Among the reasons behind this avoidance of carbs, 64% said they

believed it was healthier to do so, while 37% stated that their diet plan would not allow them to eat rice. Minotto said the glycaemic index of many popular rice varieties would continue to be an issue as cases of diabetes grow. "Rice companies in Indonesia are looking for solutions, and unless lower GI strains of rice are developed and made widely available, rice consumption will likely continue to experience slowing growth," she added.

Indonesians are also starting to choose organically certified groceries. But while nearly three in 10 consumers claim they seek out organic options while shopping, just 3% of all new food and drink products launched this year in Indonesia have featured an organic claim, suggesting that companies are behind on the trend. As many as three quarters of urban Indonesians said they had bought organic rice and noodles in the first half of 2017, even though these command premium prices for foods that are seen as staples. "Recent food safety scandals involving rice have fuelled consumer distrust in food and drink brands, prompting them to seek reassurance in organic certifications. Urban Indonesian consumers are going for organic options because they believe them to be not only healthier, but safer as well," said Minotto.

Mintel found that 42% of urban Indonesian consumers associate organic food with the absence of harmful ingredients including chemical residues, and a similar number buy organic because they see them as healthier alternatives. "There is likely to be an increasing supply of organic rice going forward, particularly as organic rice farming continues to attract the interests of local farmers in Indonesia," Minotto added.

"To counter the impact of food safety scandals on their product,

non-organic rice brands have the opportunity to provide consumers with information about where and how the rice is grown, and provide assurances of product safety."

NZMP sees consumer trends driving Asian demand for protein

By Jim Cornall 17-Oct-2017 - Dairy Reporter

With the Asia protein ingredients market forecast to grow by 11.5% from 2016 to 2021, NZMP - Fonterra's dairy ingredients business - is intent on capitalizing on its strong ties to the region.

Fonterra NZMP Ingredients general manager for South & East Asia, Hamish Gowans, spoke with DairyReporter recently about the region, and how Asian consumers are increasingly seeking specific nutritional benefits to support their growing interest in health and active living, while demanding greater convenience to fit urban, time-poor lifestyles.

Gowans said the diverse region covers 19 countries, from Afghanistan to the Indian sub-continent, on through Malaysia, Singapore, Indonesia and the Philippines. "It's diverse in terms of many things including cultures and language, things around market access, around just the evolution of our customers in those regions, and in the consumer evolution," Gowans said. "Markets like Indonesia, Thailand, Vietnam, Singapore, are becoming a bit more sophisticated in terms of the consumer offerings and convenience requirements."

Image © iStock.com/GOLFX

He said protein is rapidly evolving from a 'fitness' to a 'health and wellness' ingredient, as incomes rise and people become more aware of its benefits. He added that while protein has long been associated with body builders and elite athletes, protein-fortified food has now expanded into the mainstream. "Dairy in particular is an excellent source of high quality protein," he said.

However, making the connection between dairy and protein can be a challenge. "In some areas just the general knowledge from when we talk from a dairy perspective around dairy protein, you talk to a lot of people about dairy and for them it probably means calcium, but do they automatically make a link to dairy protein and the great protein that it is, certainly around the amino acid profile, which is critical for muscle development and satiety?"

"So there is a little bit of education and engagement required and certainly the engagement we have with our customers here, they get it. They can hear this trend coming." He said there will likely be an evolution of products as education and product knowledge grows.

NZMP is committed to Asia for the future, and has already been in the market for some time, which Gowans acknowledges is a positive. "We've got a long history with a lot of a lot of customers in the region so that certainly helps. Some of the free trade agreements that the New Zealand Government has been able to negotiate into this part of the world certainly helps that flow.

"This has partly been because of a deeper understanding of the markets. Another has been the structure of NZMP." He noted the ingredients business is built on five key pillars: dairy beverages, consumer powders, pediatrics, active nutrition and dairy foods.

"Within those pillars you have a full complement of resource, right from manufacturing, R&D, market insights and a lot of research to understand where we should be heading," Gowans explained. "We spend around NZ\$100m (US\$72m) a year on R&D through our research centre in Palmerston North. So you've got 350 people, with the bulk of them being scientists, purely focused around dairy protein and so we are starting to see more and more new launches."

Wearable tech driving interest in supplements in India as health consciousness soars

By Cheryl Tay
05-Oct-2017 - NutraIngredients Asia

India's dietary supplement market will expand at an estimated compound annual growth rate (CAGR) of almost 12% over the next four to five years, with tech start-ups driving overall interest in health and wellness. According to a joint study by venture capital firm Kalaari Capital and accounting and advisory outfit Grant Thornton, wearable technology is expected to contribute to supplement sales growth, as consumers are now more invested in maintaining healthy lifestyles.

Entitled *BillionFit: Technology Redesigning Healthcare*, the study said online retailers such as Amazon, Healthkart, Medisys and Neulife were increasing access to supplements and functional foods, and contributing to the rise in 'super foods' such as barley and quinoa. It added that India's fitness technology

segment is predicted to double to US\$250m by 2023, with wearable fitness devices responsible for nearly 90% of this growth.

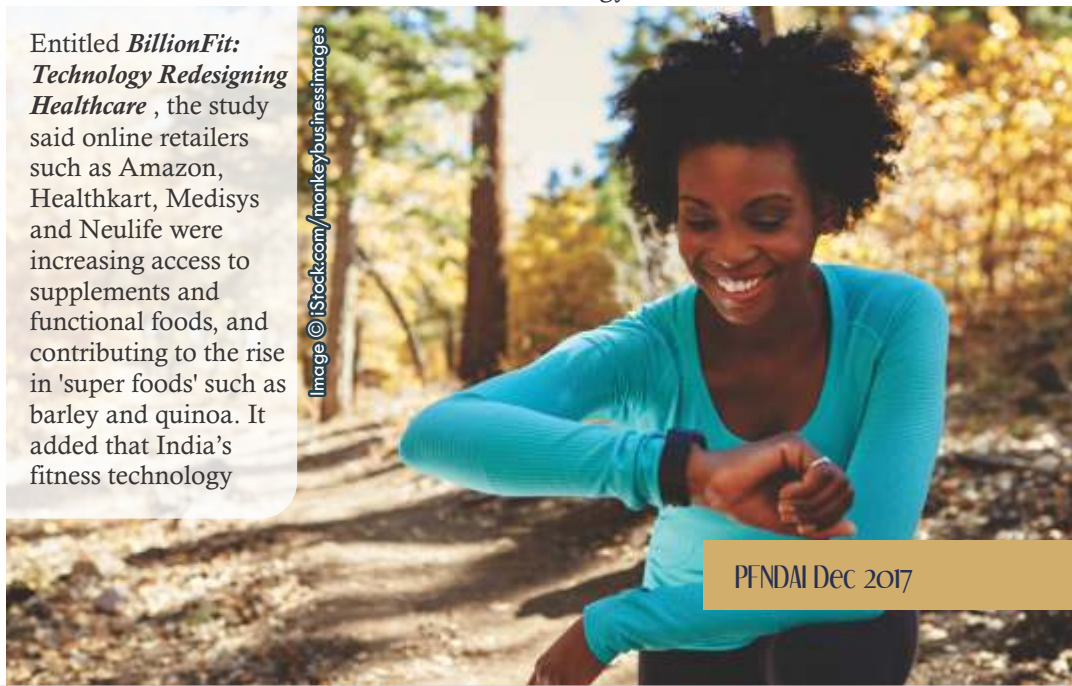
Vrinda Mathur, a partner at Grant Thornton India, said: "The global realm of healthcare has radically shifted from 'detect and manage' to 'predict and prevent'. "This change in mindset, combined with the rapid technological and socio-political impetus on improving health, is resulting in a fitness and health boom across the globe. Hospitals are no longer primary to tertiary care providers...patients are now consumers of holistic wellness products and services. Technology is the enabler of this transition."

Several start-ups are already generating buzz in India. Bolt, an international wearable tech firm headquartered in India, has developed an AI ecosystem that pairs fitness apps with hardware such as smart shoes, an activity tracker and a stride sensor. In addition to wearable devices like fitness trackers, smart-wear technology is also gaining traction.

Transition enabler

One such company is the Washington-based Sensoria, whose AI-centric sportswear can monitor its wearer's heart rate. Similarly, the California-based Athos specialises in clothes integrated with wearable technology.

Image © iStock.com/monkeybusinessimages



REGULATORY NEWS

Commission advises authorities how to crack down on dual quality food

By Niamh Michail 26-Sep-2017 - Food Navigator

The Commission has published guidance to help member state authorities crack down on dual quality foods using existing legislation - but how workable is it?

The notes do not create any new rules to stamp out the issue dual quality but offer guidance to help consumer and food safety authorities determine whether a breach in existing EU law has taken place and, where possible, act to enforce the law. In addition to the guidance notes, the Commission has also released €1m in funding to the Joint Research Centre (JRC) to develop a methodology that will improve comparative tests for food products. This will allow countries to discuss the issue "on a sound and shared scientific basis that is the same for all", it said.

Another option being explored, the Commission said, is a Code of Conduct for producers which would set out standards to be respected to prevent dual quality problems, although FoodDrinkEurope (FDE), the lobby which represents the interests of European food and drink manufacturers, said it has not committed to a creating a code "as such". It has agreed to engage in a

multi-stakeholder dialogue, which is "essential for all to assess the situation and understand what is clearly expected of us", spokesperson for FDE Florence Ranson said. "A form of code of conduct may or may not be the outcome but the dialogue is key to finding the right way forward."

The guidance comes on the back Commission President Jean-Claude Juncker's State of the Union speech earlier this month in which he promised action. "I will not accept that in some parts of Europe, people are sold food of lower quality than in other countries, despite the packaging and branding being identical," Juncker said. "We must now equip national authorities with stronger powers to cut out any illegal practices wherever they exist."

Industry has defended changes in recipe formulations across regions, citing a number of reasons from catering to regional preferences to using locally sourced raw materials. But the issue has been increasingly seen as a way food manufacturers treat Eastern Europeans as second-class citizens. Bulgarian prime minister Boyko Borissov slammed it as "food apartheid" while Czech agriculture minister Marian Jurečka said it was "unacceptable and discriminatory".

A case-by-case basis
The guidance advises authorities to use three pieces of EU legislation to tackle the issue of dual quality: the General Food Law Regulation,

Food Information to Consumers Regulation and the Unfair Commercial Practices Directive. The Commission notes that manufacturers are legally allowed to vary the ingredients of a branded product for different countries as long as the ingredients are clearly indicated on the label. However, a product would be breaching the EU's Unfair Commercial Practices Directive (2005/29/EC), for instance, if the authority can demonstrate three factors. Firstly, if consumers have "legitimate specific expectations" from a product compared to a 'product of reference' and this significantly deviates from these expectations.

Secondly, if the manufacturer fails to provide sufficient information, meaning consumers cannot understand that a difference with their expectations exists. And thirdly, if this lack of information could lead consumers to buy a product they would not have bought otherwise.

'A step in the right direction'

Food law expert and managing director of Hylobates Consulting, Luca Bucchini, said the guidance is a step in the right direction, and the Commission should be praised for being proactive in dealing with this "tricky issue". Importantly, the guidance also provides a framework for enforcement authorities to act, Bucchini said. "Much of the issue stems from the fact that national authorities have been incapable or unable to build legal cases showing that consumers were misled."

An EU authority with enforcement powers, such as in the case of anti-trust law, would help, he said, "but the Commission is doing its best in the present situation. The key is whether the consumer is buying product X because he or she believes it has the same formula everywhere in the EU. When she is alerted that is not the same, then the misleading factor should be gone."

"The guidance correctly implies that no further legislation is required. It also focuses the attention on the key aspect: if the consumer was informed of the differences, would she or he still buy the product? Would a Hungarian consumer still buy internationally famous snack X if it carried a label saying 'adapted to Hungarian taste'?"

Whether the guidance results in companies being taken pursued by national authorities for breaching EU food law remains to be seen. In the meantime, Bucchini advises food businesses to "take notice". "If they use exactly the same formula across the EU, there could be a market opportunity. Second, they should perform an honest self-assessment, and consider some label changes." But Bucchini warned: "Having multilingual labels which suggest the same product is sold across markets (for example, with German and Hungarian), where in reality it is not (Hungary only) may be considered suspicious."

Meanwhile, a market for parallel sales could open up for "enterprising" food business operators who add a 'German recipe version' to Eastern European products, Bucchini suggested. Next month the Commission will take part in a high-level ministerial Consumer Summit on dual quality food in Bratislava. It is also organising workshops with consumer protection and food safety authorities in September and November.



Defining 'vegan' and 'vegetarian' in Europe

By Katia Merten-Lentz & Oliver Hartmann, 04-Oct-2017 Food Navigator

Pressure is rising for the development of a legal definition of 'vegan' and 'vegetarian' food in Europe but national governments are moving ahead of the European Commission in this regard.

Based on the growing demand for vegetarian and vegan food products, the use of vegetarian or vegan symbols and labels on food by business operators is on the rise. Yet, it is often unclear in concrete terms what is meant by 'vegan' or 'vegetarian' terminology used on food labelling.

This relates to the fact that the terms 'vegan' and 'vegetarian' have not been legally defined by EU food law so far. However, pursuant to the EU Labelling Regulation 1169/2011, the Commission is obliged to adopt an implementing act on voluntary labelling information pertaining to the suitability of a food for vegetarians or vegans. The requirement to adopt such an implementing act is not subject to a specified deadline.

Calls for a binding definition Of interest, a submission by the European Vegetarian Union (EVU) on the need to define the terms 'vegan' and 'vegetarian' was made to the REFIT platform that has been established by the Commission to provide an opportunity for

stakeholders to submit suggestions how to make EU laws more effective. In June 2017, the government group and the stakeholder group of the platform expressed their support for the submission and urged the Commission to fulfil rapidly its obligation to

adopt an implementing act on the criteria related to the suitability of a food for vegetarians or vegans.

Also at a national level, authorities are progressively supporting the establishment of clear definitions for the terms 'vegan' and 'vegetarian'. In Germany, consumer protection ministers of the federal states agreed on uniform definitions for 'vegan' and 'vegetarian' already in 2016. These definitions will be used as a reference by German enforcement authorities when controlling food products labelled as 'vegan' or 'vegetarian'. In addition, work is currently undertaken to include horizontal guidelines for vegan and vegetarian food products in the German food code that serves as the orientation for business operators.

'Not a priority' for EC

Despite the pressure from the REFIT platform and developments at a national level with regard to vegan and vegetarian definitions, as in Germany, the Commission has recently made clear that the drafting of an implementing act regarding the suitability of a food for vegetarians or vegans is not a priority. In response to an MEP written question, the Health and Food Safety Commissioner Andriukaitis made clear that the Commission cannot commit at this time to a specific date or content of the implementing act.

Accordingly, legal clarification concerning the use of 'vegan' or 'vegetarian' terms on food products at EU level is not likely to occur in the near future.

EFSA: Modified starches pose no safety concerns

By Will Chu 13-Oct-2017 - Food Navigator

A dozen modified food starches used to make sauces and pie fillings have received regulatory backing after a re-evaluation found no safety concerns with levels currently used in food products.

Conclusions reached by the European and Food Safety Authority (EFSA) ruled that 12 modified starches (E 1404, E 1410, E 1412, E 1413, E 1414, E 1420, E 1422, E 1440, E 1442, E 1450, E 1451 and E 1452) could be authorised as food additives.

Modified starches (i.e. E 1413, E 1414, E 1420, E 1450) were well tolerated in adults up to a single daily dose of 60,000 milligrams per person (mg/person) (860 mg/kg bw)," EFSA stated. "The Panel concluded that there is no safety concern for the use of modified starches as food additives at the reported uses and use levels and that there is no need for a numerical acceptable daily intake (ADI)."

Absorption questions

There were concerns over the way modified starches were not absorbed intact posing distribution, metabolism and excretion issues in the human body that can result in toxic build-up. However, supporting studies indicated that the two major components of starches, amylose and amylopectin, are fermented during their passage through the large intestine by strains of bacteria found in the human colon. The main end products of this colonic anaerobic digestive process are short-chain fatty acids (SCFA) such as acetic, propionic and butyric acids, which are absorbed from the

colon. Despite the absence of data for two modified starches (E 1451 and E 1452) and the absence of in vivo studies in humans for other modified starches, the Panel were satisfied that modified starches were excreted via intestinal enzyme break down and intestinal microbiota fermentation. Commercial starches are generally extracted from potatoes and cereals. Their value lies in their potential for modification in order to function properly under conditions encountered during processing or storage, such as high heat, low pH, freeze/thaw and cooling. As an additive for food processing, food starches thicken and stabilize foods such as soups and salad dressings. They also function as thickeners, extenders, emulsion stabilizers and are strong binders in processed meats.

Industry offerings

A Global ingredients company recently made available a waxy maize modified starch designed to remove the pasty texture associated with other texturisers, contributing to cost savings of up to 15. It is a cold-water swelling modified starch can be used in mayonnaise, dressings and creamy sauces, allowing manufacturers to reduce the fat content by acting as an all-in-one emulsifier and viscosifier, thickening and binding the end product. However, consumer preferences that demand a shift away from modified starches and onto more 'clean-label' ingredients suggest health concerns haven't entirely gone away.

Earlier this year another company launched two instant functional starches to add to its clean label range, which the firm claimed could help manufacturers banish modified starches. The global availability of the ingredients, claim to help manufacturers 'clean up' their food labels due to the similarity of performance when compared to traditional instant modified food starches.

Food fraud investigations increasing - FSAI

By Joseph James Whitworth 06-Oct-2017 - Food Quality News

The Food Safety Authority of Ireland (FSAI) has said it is increasingly investigating suspected breaches of the law relating to food fraud. There were 21 investigations in 2014, 35 in 2015; 34 in 2016 and 20 to date this year.

This pattern is reflected in Europe with the European Commission's Food Fraud Network dealing with 156 cases in 2016, up from 108 in 2015 and 60 in 2014.

Protecting food chain and consumers

Combating increasing levels of fraud requires inter-agency collaboration and intelligence-led insights to protect the food chain and consumer interests and health, according to speakers at a two-day conference in Ireland. More than 300 delegates attended Safeguarding the Food Chain – Protecting Authenticity and Integrity hosted by the FSAI in partnership with Safefood.

It looked at how regulators, inspectors, industry, scientists and academics can collaborate to protect consumers when violations of food law are detected in relation to food crime. The event covered authenticity and integrity of food, the public health implications and prevention and control strategies. Dr Pamela Byrne, CEO of FSAI, said it must remain vigilant and enhance inspection and enforcement systems to keep pace with new and emerging risks.



Image © iStock.com/Wavebreakmedia

"Now more than ever with the increasing globalisation of food there is a need for increased focus on ensuring a secure, safe and authentic food supply chain as consumers have a right to expect the food they purchase is unadulterated, contains what is described on the label and ultimately is safe and trustworthy," she said.

"The more we know about food crime, the motivation behind it, the potential threat it poses to our €26bn food and drink manufacturing industry; the more we can develop expert and intelligence-based approaches to focus investigations on the highest risk areas."

Focus of Irish investigations

Dr Byrne said Irish investigations have focussed on fish, olive oil, honey, soft drinks, alcohol and beef. "All provide evidence that while current controls are effective there are always opportunities to enhance them, strengthen national protocols and further increase collaboration with our enforcement colleagues in the official agencies, Revenue & Customs and An Garda Síochána."

Ray Dolan, CEO of Safefood, said it can help share knowledge and enhance relationships to maintain consumer confidence in the food chain. "The recent Brexit vote also poses many wide-ranging issues for consumers when it comes to our food authenticity and traceability."

Bérengère Dreno, specialist intellectual property crime at Europol, said food fraud harms consumers and the economy of all EU Member States. "Intelligence gathered at Europol clearly shows the involvement of organised criminal groups in these illicit activities."

Digitalisation in food safety
Meanwhile, emerging digital

innovation is creating opportunities in the industry according to speakers at the 9th annual Maple Leaf Foods Food Safety Symposium. More than 250 attendees from 130 companies and organizations discussed issues and trends in food safety. Topics included traceability using blockchain, DNA-based analytics and regulatory developments such as risk based modelling to drive outcome based inspection.

Maple Leaf Foods is a protein company employing 11,500 people and does business in North America and Asia. Speakers included Frank Yiannas, VP, food safety and health at Walmart; Paul Glover, president, Canadian Food Inspection Agency; Hugo Andres Gutierrez, VP, quality, food safety & regulatory affairs at The Hershey Company; Martin Wiedmann, professor of food safety at Cornell University and Tom Zander, SVP & general manager, Food & Beverage at Ecolab.

FSSAI chief: India has 'a long way to go' when it comes to food fortification

By Cheryl Tay
10-Oct-2017 - Food Ingredients Asia

The Food Safety and Standards Authority of India's (FSSAI) proposal to introduce more fortified foods to combat malnutrition in the country has not received sufficient industry support with regard to some ingredients.

The FSSAI established a panel earlier this year to help set guidelines for food fortification, and more recently, announced plans to introduce doubly fortified salt and wheat flour for those suffering from calcium and iron deficiencies.

But FSSAI CEO Pawan Kumar Agarwal announced at an Associated Chambers of Commerce and Industry of India (ASSOCHAM) conference in New Delhi that progress in some areas had been slow.

Agarwal told Indian media: "We have received (a) fairly good amount of success in getting the free market availability of fortified oil and milk but in (the) case of wheat flour, rice, and (the) double fortification of salts, the progress has been slow.

He added the FSSAI was working with the food industry to better handle the difficulties of fortifying certain foods. "We are working with the food industry to persuade them to understand...the challenges they are facing."

He added that with the backing of Tata Trust, the FSSAI had established the Food Fortification Resource Centre to monitor the progress of the food fortification process: "We have a dedicated team working to promote large-scale fortification of these five staples in the country."

Some industry players are concerned that the new rule will require food companies to hire specialists, and obtain raw ingredients and standardised

chemicals for the fortification process, thereby incurring added costs. They are also wary of the possible regulatory changes that will likely accompany large-scale food fortification. Overall, Agarwal revealed there has been a 'lukewarm response' from the industry.



Dedicated team

He said, "In (the) last one year, we have made significant progress in terms of standards, giving some structure to the space." But going around the country, we still feel that (the) whole idea of socialisation of the importance of food fortification amongst key stakeholders in the states is still not complete."

The few bright spots have come in the form of individual officers who recognise the importance of fortified staples, especially for India's poor. In Agarwal's opinion, "Merely issuing orders and notifications from (the) government of India will not suffice". He said state governments often need "hand-holding" to warm to the idea of fortification, so they can procure fortified staples through various programmes. But many state officials are still unclear on the importance and process of fortification, he revealed. "Many of these programmes, particularly where you are depending on local initiatives at the state government level, are not easy to implement. They take their own time."

FSSAI to draw up new packaging regulations

By RJ Whitehead
17-Oct-2017 Food Navigator Asia

Cases of contamination owing to the use of substandard materials have prompted the Indian regulator to take action by preparing new food packaging guidelines.

"There will be separate regulations for packaging, for which draft regulations will be out soon," said Pawan Kumar Agarwal, chief executive of the Food Safety and

Standards Authority of India, adding that these will cover boxes, bottles, pouches and foil containers.

The new standards to govern materials and printing are intended to make food companies more accountable. The regulations in use already have been adopted from Bureau of Indian Standards and focus more on labelling than on packaging. The FSSAI now plans to publish its own benchmarks to ensure all packaging used in food and drinks is safe and can be monitored. These will be based on a study conducted by the FSSAI and the Indian Institute of Packaging on the quality of packaging materials manufactured in India.

The research was commissioned following mounting calls to assess whether chemicals in food packaging pose health and safety risks for want of stricter regulations. "During the study, we found that 100% of the samples did not pass the tests. In some samples, the colour was coming out of the packaging material," said NC Saha, director of the IIP.

Currently, aluminium, copper, brass, glass, plastic and tin can be used for packaging and should conform to Indian Standards specifications. The re-use of tin and plastic containers is prohibited, especially for packaging edible oil and fat, while there are specific rules for packaging of products such as milk, dairy products, edible oil, fruits and vegetables, canned meat and drinking water.

Image © iStock.com/searymsakov



India sets up body to oversee new export packaging standards

By RJ Whitehead 24-Oct-2017 - Food Navigator Asia

Faced with mounting import rejections overseas, India is working on new packaging standards for food shipments to developed markets that it is hoped will also boost trade.

The Ministry of Commerce and Industry has so far set up a standing committee to devise regulations governing the packaging 500 export goods, including fresh fruits and vegetables, spices, tea, and coffee. The committee's mission is to formulate these standards so they plug into the regulations of countries and trading blocs such as America, Japan, Asean and the European Union.

Comprised of representatives of the Indian Institute of Packaging, the Agricultural and Processed Food Products Export Development Authority, and research institutes and industry associations, the body will also help introduce a degree course in packaging, and research appropriate materials for different products. "A large amount of contamination can happen during transit if the packaging is not done properly," an anonymous ministry official told Economic Times, adding that the new regulations will help in increased business for exporters at a time when the government is keen to promote exports of fresh and processed foods.

"We have already suggested standards for packaging fresh fruits and vegetables and submitted it to the ministry and are working on packaging for spices and tea," said NC Saha, director of Indian Institute of Packaging, and a member secretary of the standing committee.

Meanwhile, India is tightening up quality controls for consumer goods and food imports in a bid to curb cheap imports from China. The sectors targeted are reportedly ones which China controls more than two-thirds of the market, for which there have been complaints of substandard products.

Officials have been told to ramp up their monitoring and testing of compliance to 23,000 Indian standards across a number of segments. Bilateral trade between India and China boomed to \$71.45 billion in 2016-17 from \$1.83 billion in 1999-2000—albeit mostly in China's favour.

Undeclared anabolic steroids discovered in sports supplements sold in NZ and Australia

By Cheryl Tay 26-Sep-2017 - NutraIngredients Asia

Anabolic steroids have been found in six sports supplements sold in Australia and New Zealand, according to researchers from the University of Technology Sydney and the University of Otago.

Their findings on the steroids, which were not stated on the supplement labels, were published in the International Journal of Sport Nutrition and Exercise Metabolism.

Anabolic steroids, or androgens, pose a possible health risk to their users. Athletes who use them are likely to fail doping tests and therefore, be banned from competition. The researchers bought 116 over-the-counter sports supplements that were marketed as 'performance-enhancing' from several different retailers in Australia, selecting only products that did not have any androgens listed on their labels.

The supplements included vitamins, herbal extracts, fat metabolisers, pre-workout formulations, and protein powders. They subsequently found that 5.4% of the supplements tested positive for androgens, meaning that "more than one in 20 contained anabolic steroids that the users would be unaware of if they were relying on information on their labels".

Team leader Professor Alison Heather, from the University of Otago School of Biomedical Sciences' physiology department, said it was too early to tell if the contamination of the supplements is due to adulteration or substandard manufacturing. They are now undergoing more tests to determine exactly which androgens are contaminating them, before the team contacts the companies responsible with the results.

Heather said: "Supplements can contain ingredients that may have useful properties. However, due to poor manufacturing practices or adulteration, sports supplements can contain compounds that are

banned for use in sports, but that are not included on the label as an ingredient."

Elite athletes

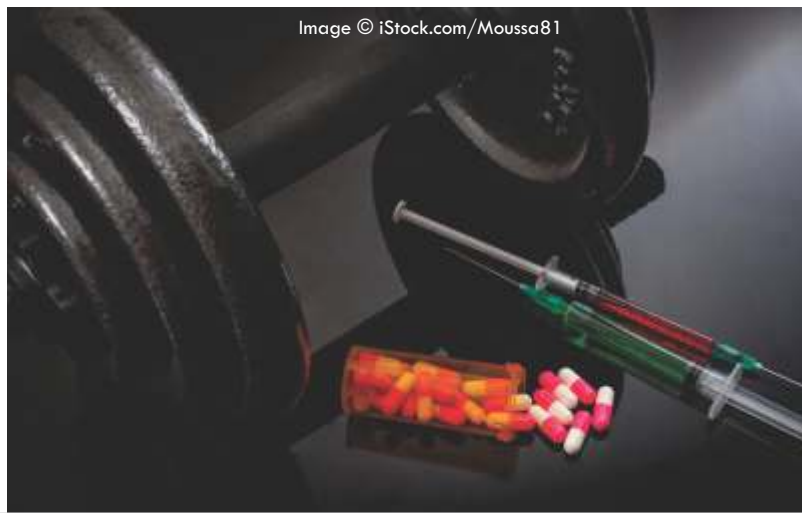
A 2014 report stated that 70% of the New Zealand first XV rugby players regularly consumed supplements. According to a 2015 report, 95% of elite Kiwi athletes took supplements. Heather revealed, "Our research shows that there is a real risk for health and doping violations that athletes must consider when taking sports supplements, even those sold over the counter."

The paper concluded: "The findings reinforce the need to increase awareness of the dangers of nutritional supplements and highlight the challenges that clinicians face in the fast-growing market of nutritional supplements."

In addition to finding out which androgens the abovementioned supplements contain, Heather and her team are in the process of developing a first-of-its-kind test for anti-doping agencies, which could be ready within a year. At present, anti-doping agencies test athletes for a specific set of illegal substances and masking agents. The new test, however, will detect the presence of any anabolic steroid or androgenic substance and its biological effects in the human body, regardless of its chemical structure or the type of drug taken.

While testing is currently carried out in a laboratory, Heather said the team was working on a more user-friendly version for agencies to use on athletes in order to detect anabolic steroid use in a cellular context, therefore eliminating the need for different tests for different types of steroids. She said: "We hope to have that ready in 12 to 15 months."

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HEALTH BITES

Cumin: Six health benefits

By Megan Metropulos, and Megan Ware, Medical News Today 29 September 2017

Cumin is a spice that comes from the *Cuminum cyminum* plant. It is native to Asia, Africa, and Europe, but it is widely used in cooking throughout the world. It is the second most popular spice after black pepper.

Cumin is usually purchased in the form of whole dried seeds or as ground powder. It is a typical ingredient in many spice blends, such as curry powder.

Cumin is a staple spice in many cuisines, especially Mexican, Indian, African, and Asian. Aside from cooking, cumin has also been used medicinally in many parts of

the world for some years.

In some Southeast Asian countries, it is used to help with digestion, coughs, pain, and liver health.

In Iran, people use cumin to treat seizures, while people in Tunisia use it to help fight infections and lower blood pressure.

Interest in cumin has been growing as newer research supports some of its acclaimed health benefits.

Read on to learn more about the potential health benefits and risks associated with cumin, as well as how to add cumin to your diet.

1. Weight loss

Cumin may be helpful for people trying to lose weight.

A study involving overweight adults compared the effects of cumin with a weight-loss medication and a placebo on weight.

After 8 weeks, the researchers found that the cumin and weight-loss medication groups both lost significant amounts of weight.

People in the cumin group also experienced a decrease in their insulin levels.

Another study found that overweight and obese women who consumed 3 grams (g) of cumin powder in yogurt daily for 3 months had significant decreases in body weight, waist size, and body fat.

3. Diabetes

A study in adults with type 2 diabetes looked at the effects of cumin essential oil on blood sugar. Study participants received either 100 milligrams (mg) of cumin oil per day, 50 mg of cumin oil per day, or a placebo. After 8 weeks, both cumin-oil groups had significantly lower blood sugar, insulin, and hemoglobin A1c levels.

The cumin-oil groups also saw improvements in the signs of insulin resistance and inflammation. Other studies in humans have shown mixed results with cumin and blood sugar levels.

4. Irritable bowel syndrome

A small pilot study looked at the effect of consuming cumin essential-oil drops on symptoms of irritable bowel syndrome (IBS). After 4 weeks, study participants noted improvements in many symptoms, such as stomach pain and bloating. At the end of the study, those with IBS who had mainly experienced constipation as a symptom had more frequent bowel movements. Those who had mainly experienced diarrhea as a symptom had fewer bowel movements.

5. Stress

Cumin may play a role in helping the body handle stress. A study in rats looked at the effect of cumin extract on signs of stress.

When the animals received cumin extract before a stressful activity, their bodies had significantly less of a stress response than when they did not receive the treatment. Cumin may help fight the effects of stress by working as an antioxidant. The same researchers found that cumin was a more effective antioxidant than vitamin C in the rats they studied.

6. Memory loss

Further research is required before cumin can be recommended as a supplement.

The same study in rats also looked at the impact of cumin extract on memory. The study found that the animals that had received cumin extract had better and faster recall. Nutrition facts According to the United States Department of Agriculture National Nutrient Database, 1 teaspoon of whole cumin seeds contains: 8 kilocalories 0.37 g of protein 0.47 g of fat 0.93 g of carbohydrate

The same amount of cumin seeds also provides 20 mg of calcium, 1.39 mg of iron, and 8 mg of magnesium. Additionally, cumin contains antioxidants, which may be responsible for some of its associated health benefits.

Possible risks and side effects

Consuming foods that are cooked with cumin is likely safe for most people. Some people may have an allergy to cumin, in which case they should avoid it. More research is needed before supplemental doses of cumin are recommended. In one study, some people experienced nausea, dizziness, and stomach pain after consuming cumin extract.

As with all supplements, people should tell their healthcare provider what they are taking. Many supplements may impact how certain prescription medications

work. The U.S. Food and Drug Administration (FDA) do not monitor supplements for quality or purity. Do your research on different brands.

Research in rats found that products from cumin seeds interacted with a medication and increased blood levels of an antibiotic used to treat TB. People with diabetes, especially those who take medication for diabetes, should use cumin with caution since it may change their blood sugar levels.

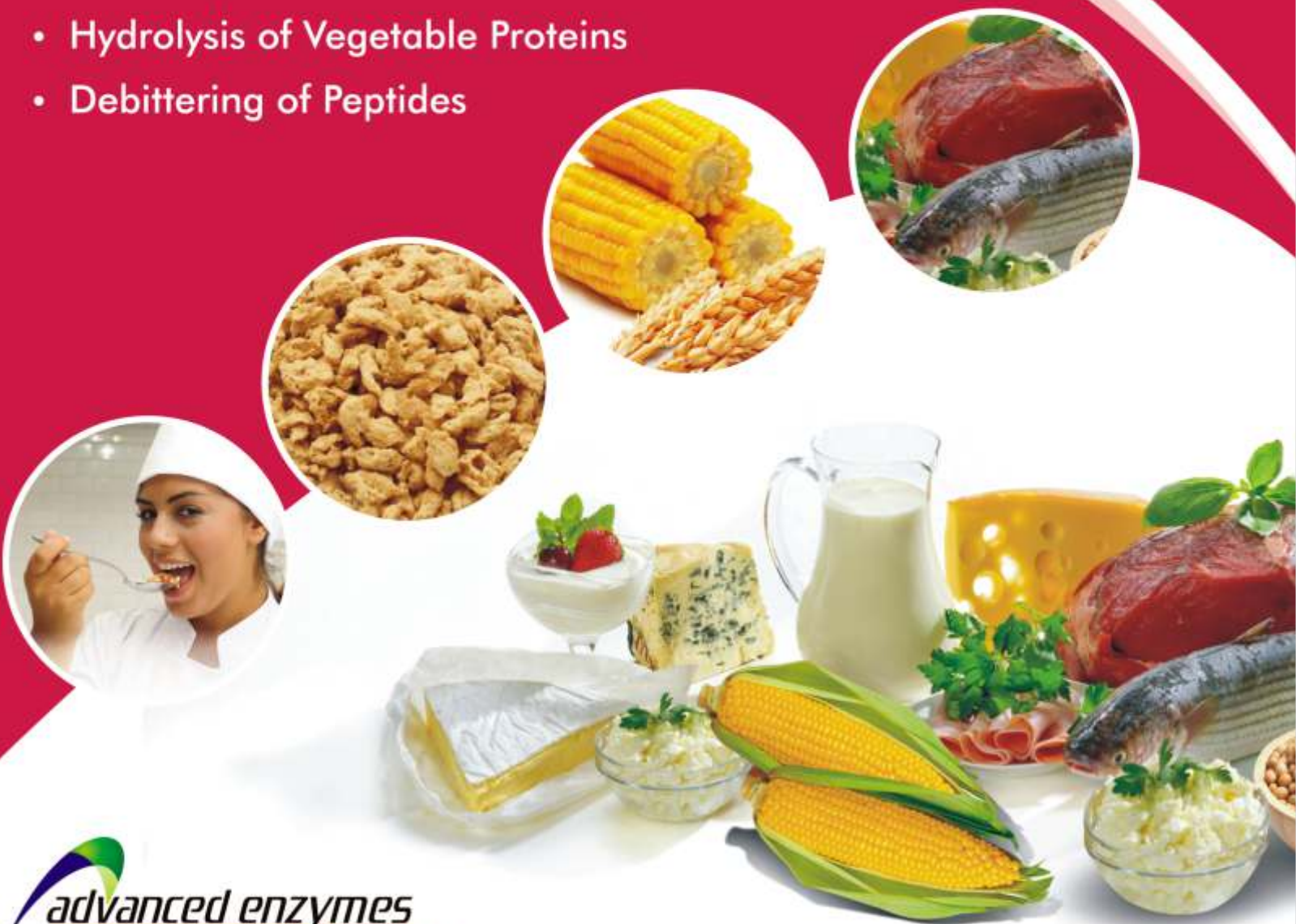
Ways to incorporate cumin into your diet Cumin is a common ingredient in many savory ethnic dishes. It adds a warm flavor and works especially well in soups, stews, and curries.

This spice can also be used to season vegetables or meats before roasting.

Research has shown that cumin may boost the immune system and help fight certain types of bacterial and fungal infections. Animal studies have also suggested cumin may help prevent some types of cancer. More research is needed, especially in humans, but cumin seems to have promise in the medical world. The best supplement form and dose is currently unknown. For now, cumin is likely best enjoyed in food instead of as a supplement.

Enzymes for Protein Modification

- Meat Tenderization / Fish Protein Hydrolysis
- Gluten Hydrolysis & Production of Savory Flavours
- Hydrolysis of Vegetable Proteins
- Debittering of Peptides





Hi, I'm Soy.

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plant based and
economical. But people say
my best quality is I'm
versatile – I can protein
fortify practically
anything and I work
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