



PFNDAI

PFNDAI Bulletin

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FOOD, NUTRITION & SAFETY MAGAZINE

THE POWER OF PULSES

Also Inside

Standardization & Equivalence
in Herbal Medicines

Regulatory Round Up

PROTEIN FOODS AND
NUTRITION DEVELOPMENT
ASSOCIATION OF INDIA

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EDITORIAL

A large amount of food products as well as dietary supplements are now being purchased through E-Commerce platform. In addition many restaurants are now letting customers order on-line foods which they deliver or could be picked up by customers themselves. This has increased convenience substantially as not only the time is saved but also the hassle of going to the store or restaurant.

Nowadays with so many bad roads travel is not pleasant or safe. Also there may not be parking place if you take your car. You may also be facing long lines at the cash counters making it even more inconvenient. Indians have become used to ordering food products on-line and enjoying them sitting at home probably in front of TV watching a football or cricket match.

The market of on-line purchase has grown steadily and is so large that it has attracted the attention of our regulators. FSSAI has recently made certain rules to regulate this trade of E-Commerce Food Business. Of course all these operators need to register with FSSAI. The regulations lay down conditions of display on the website, storage of goods and delivery.

An important point is that it allows the marketer not to show batch number or lot number, best before, expiry date or date of manufacture or packing as well as MRP. The reason for this may be that while different batches or lots from different locations would be sourced for sending to the on-line customer so the exact details of the product will only be known at the time of dispatch and not before so this exemption has been made.

FBO however will need to have shelf life of

30% of total or 45 days before expiry at the time of delivery to the customer. This will ensure that there is enough shelf life left of the product after consumer gets it to last during the consumption period. It should not happen that delivery takes a long time due to many reasons and that delay should not deprive a consumer from very short time for consumption or that product should not arrive after the best before date.

Consumers are further protected by ensuring that on the website a legible and clear picture of the 'principal display panel' of the product is made available. This does not mean that only some picture of the product to be given but all the items mandatory for the principal display panel should be clear and legible so consumers can read the contents to make a well-informed choice. A few things that are very important part of principal display panel are list of ingredients, and the nutrition panel giving various nutrients to be mandatorily declared.

Many packages of food may have multiple sides and FBOs may provide name and picture of the product with weight etc. on the front side whereas another panel may carry the nutrition information as well as ingredients list. Many times there are multiple pictures of the product from different angle so consumers can get all the necessary information but some only provide pictures which do not give the necessary information or the information is not clear or legible.

On-line marketers must take care to rectify this so consumers get all the relevant information and make a proper choice.

Prof. Jagadish S. Pai,
Executive Director,
PFNDI

THE POWER OF PULSES

Pulses are dried seeds of legumes and include beans, dried peas, lentils and chickpeas. They are functionally multipurpose and highly nutritious ingredients.

Moreover, they are label-friendly, plant-based proteins with wide appeal among all. Consumers are becoming more and more interested in the ingredients used in food products. They are looking for nutritious as well as delicious. It is important to them that ingredients used are clean and simple, non-GMO, gluten-free, vegetarian and sustainably sourced. Vegetable-based ingredients are showing rapid increase in interest with a third of total consumers prefer a vegetable-sourced protein to one from animal. Pulse-based ingredients like flours and proteins made from lentil, pea, chickpea and fava bean can be uniquely positioned meeting the requirements of consumer demands for ingredients used in their food products.

Desirable Features of Pulses

Pulses are popular as they are quite versatile and nutritious ingredients which could be used in products from soup staples to baked goods, giving 9g protein and over 7.5g fibre per half cup serving. Also pulses are shelf stable and are quite cost-effective protein sources (around \$

0.10/serving) for food service operators and food manufacturers. Pulse ingredient experts say that pulses are low allergen and naturally gluten-free and sustainable, making them quite appealing to consumers. They appeal to health-conscious consumers too.

Whole pulses are used in burritos, soups and chilli and may also be processed into different functional ingredients. Dried pulses are milled into raw or pre-gelatinised flour. The latter is made from raw flour which is heated to partially gelatinise starches and inactivate enzymes. This can function as flavour carrier and enhance dough yield, firmness and texture. Starch, fibre and protein from pulses may be separated and used to enhance nutrition of food products and in some instances provide water binding, thickening, emulsifying and fat absorption and others.

Due to both the nutritional advantages and functional properties of pulses, many developers are using these ingredients to formulate many products sold around the world. Having natural dietary fibre (both soluble & insoluble) along with resistant starch and the high-quality is quite useful. Hence specialty and

commercial bakers and pasta processors & others are considering pulses and their derivatives to meet consumer demands while taking a portion of functional food market which is expected to grow rapidly. Pulses allow product differentiation. There is increasing interest for use in bakery and snacks as they differentiate from others due to the whole food ingredients.

Another opportunity in pasta category is natural colour of beans give pasta a visual appeal while offering a nutritious product. While adding yellow pea flours into spaghetti formulation, quality attributes can be created similar to 100% durum spaghetti with higher protein. Using different forms like whole, pureed, as flour or in isolated protein or starch forms, pulses help developer achieve flavour, texture and nutrition in most applications. Adding pea or lentil flour enriches product's fibre and protein content besides giving light golden appearance and positive blending and mixing attributes. Precooked pulse flours provide stability comparable to wheat flour and at lower risk of microbial growth.

Besides pulse flours, pulse proteins are used in baked & extruded snacks, pasta, baked goods, bars,



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Janine Lamontagne

creating a full-bodied mouthfeel, improvement in uniformity and consistency and reduction in product breakage.

High water-binding capacity of pea fibre as well as fat absorption and dough conditioning properties contribute to its being ideal for many baked

batter and breadings. They are also used in high-moisture applications like soups, sauces and dressings. They allow products to be positioned as clean label, gluten-free, non-GM, grain-free or having added protein and fibre. They also save cost by reducing eggs and provide functions like emulsification, water-holding and adhesion. In bakery products, they provide water-holding capacity and structure when replacing gluten and pulse fibre helps reduce breakage and can enhance dough yield replacing gums. Pea ingredients like starch, flour and fibre can function in batter and breadings applications providing clean label standards.

The pea ingredients will have better results like batter viscosity, batter pick-up and texture than others depending on the application. Pulse ingredients could also be used in meat products such as luncheon meat, sausage, burgers and meatballs due to their ability to form gels, emulsification and bind water. In vegetarian applications pulse flour or protein concentrates, protein isolates or a blend could be used. Pea protein has potential to replace soy protein which is normally used in these applications.

Bakers use pulse flours because they are a natural, more economical and nutritious alternative to gums. There are functional components from peas that could be used for their potential benefits for bakery applications. Pea fibre fortification provides enhanced dough yield along with modification of texture,

applications especially low-fat or colour sensitive products. Increasing water absorption and easily substituting partially or totally wheat flour in cakes, cookies and muffins, pea flour allows development of products with excellent source of fibre claim.

There is a proprietary process for making insoluble pea fibre from its cotyledon that is 70% fibre and has emulsifying and gelling properties. It can enhance nutrition and also improve crispness, loaf volume and appearance of bakery products.

Range of Pulse Ingredients

Ingredients manufacturers with specialisation in pulses continue have been developing new and novel pulse-based ingredients for various needs of developers. One range offers pulse flours and pulse protein concentrates derived from peas, lentils, faba beans and chickpeas grown in the US and Canada. The companies promote the pulse flours as healthier types of flours stating that they contain almost twice the protein as cereal grains and high amounts of soluble and insoluble fibre and resistant starch. The pulse concentrates contain even more protein (55 to 60%) and are positioned as vegetarian ingredients and replacement for allergens as egg and dairy. They could even replace whole eggs or egg white in pasta and bakery products.

Pea protein isolate by another company is derived from dry, split peas. This ingredient delivers 80%

protein and has protein digestibility-corrected amino acid (PDCAAS) score of 0.82. This allows use of protein ingredient without much sacrificing eating quality as only a little is needed and it does not have bitter pea flavour as it is processed using wet extraction. However it tends to have less water-binding capacity compared to soy proteins.

Use of pea protein isolate necessitates developers to tweak their formulation. In bakery products, they recommend replacing one-to-one with flour first before making water adjustment for viscosity. The solution is to use a blend of proteins to deliver the desired protein claim without impacting flavour and performance. Other forms of pulse ingredients are also available each with specific functions. Precooked flakes and grits allow manufacturers to incorporate pulses into products while maintaining functionality. Various forms such as raw, precooked, or pre-gelatinised flour, precooked flakes and raw or precooked grits are options to raw flour will go well into finished product while still maintaining the intended functionality and benefits of added protein and fibre.

Controlling Beany Taste

Pulse ingredients provide beneficial functions and nutrients to help improve food and beverage products. However, there is one characteristic of pulse ingredients that may cause manufacturers to stay away from them in formulation efforts namely the beany flavour profile that they contribute to some finished products.

Clean taste pulse ingredients allow product developers a bland flavour profile for easier incorporation in applications in which flavour is an issue. Pea protein concentrate and faba bean concentrate with 55-65% protein and some pea and lentil flours are positioned as clean label neutral tasting protein ingredients



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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



for pudding, cheeses, yogurts, smoothies, pastas, snacks and cereals. Some ingredient manufacturers have cooked and dehydrated bean ingredients to help developers overcome the beany taste that is often detected when pulse ingredients are used at higher levels. These have neutral taste to palate. They could be incorporated in any food and beverage application. These ingredients are also available from pinto beans, black beans, small red beans, navy beans and chick peas and in formats like whole, grit, meal and powder.

Research Review

Product developers are not the only ones studying functionality of pulses. Researchers in academia are looking at potential of pulses. Some of the studies on potential applications of pulses and pulse-derived ingredients are as follows:

Long chain polyunsaturated fatty acids (linoleic & linolenic) in lentil and chickpea flours make them susceptible to oxidation resulting in off-flavours. Flours that underwent infra red micronisation treatments

improved the consumer acceptability of burgers made with the flours.

Some types of dry beans are fast-cooking and take less time to cook. They not only cook in less time to become palatable, they retain more nutrients and had better iron bioavailability than slow-cooking varieties.

Gluten-free precooked pasta made from 2 to 1 blend of rice flour and yellow pea flour had improved nutritional profile and adequate quality properties. They were convenient because of short preparation time without cooking.

Pulses such as red beans, navy beans, dried peas and chickpeas and their ingredients are typically used in various recipes and commercial products. Less common like rice bean, winged bean and marama bean are generating interest because of their potential higher yields and nutrient contents.

Eating meals based on beans and peas which are protein-rich may help increase satiety better than those based on pork and veal.

One recent review article studies

pulse protein hydrolysates and bioactive peptides from pulses to develop new protein-derived ingredients for use as ingredients in functional foods.

Markets

Global launches of products with pulses have increased by 3% whereas in the US market, there was an increase of 12% in 2015 and a further 6% in 2016 as per Innova Market Insights. Protein as ingredient continues to grow in popularity. Meat, fish and dairy are traditional sources but they can be expensive, subject to supply issues and may not be acceptable to vegetarians and vegans. Hence researchers are looking to plant sources like legumes for suitable options. There are efforts to make legume milk as non-dairy substitute in products like cheese or yogurt and as egg substitute in mayonnaise and dressings.

(Condensed from an article by Karen Nachay from Food Technology March 2017)

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COMING EVENTS

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August 16-18, 2018

Indian Institute of Food Processing Technology

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Food Ingredients India & Health Ingredients (Fi India & Hi)

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W: <https://www.figlobal.com/india/>

Aahar: International Food & Hospitality Fair

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E: idacon2018@gmail.com

W: www.idacon2018.com

IUFoST 2018 India

World Congress of Food Sci & Tech

October 23-27, 2018

Mumbai

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

STANDARDIZATION & EQUIVALENCE IN HERBAL MEDICINES

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Reliable and consistent quality is the basis for efficacy and safety of herbal medicinal products.

Ancient systems of health remedies evolved used herbal medicines. In spite of much advancement in medicinal science, plants still contribute greatly to healthcare. It has been proven by research studies that many herbal extracts show efficacy for certain conditions. Over 120 chemical substances extracted from plants are considered important drugs used currently and many others are simply the synthetic modifications of natural products.

Some herbal medicines, due to their complex chemical content and the multiple bioactivities, can provide poly-pharmacology that orthodox drugs cannot deliver. However, one must realize that all medicinal compounds are chemicals, whether synthesised by humans in manufacturing places or in plants or in animals. Hence, all medicinal chemical compounds should be held accountable to similar standards of quality with respect to identity, purity & stability, and clinical effectiveness as well as

safety. It has been said that if the medicinal compound is found to be reasonably safe and effective, it will be acceptable whatever the source be.

The efficacy and safety of herbal medicinal products depends on the reliable and consistent quality. Since plant materials are natural substances which are prone to high level of variability and containing complex substances with many biologically active compounds. These are rarely completely identified. Hence the therapeutic results and safety issues vary greatly from product to product. This is true even within a single class. Therefore, the evidence of both benefits and risks is specific to the product tested and cannot be necessarily extrapolated to other products as is done in synthetically derived compounds.

Due to the above and because of the inherent variability of the composition of herbal products, it is generally difficult to establish quality control parameters and maintain consistent quality from batch to batch. Variability may start from the raw materials increase

during storage and then in processing etc.

As was suggested generally, application of traditional medicinal, medicinal substances from plants and dietary supplements must be based on Quality, Safety, Efficacy & Consistency (QSEC). In many parts of the world before the aspirin was introduced, traditional medicine was the sole form of healing based on drugs.

Gradually biologically active plant materials have been used in treatments and in 2007 over 50,000 plants containing substances of biological activity have been described. Increasingly food or dietary supplements and herbal medicinal products have been under scrutiny and surveillance.

Various official regulatory agencies including Food & Drug Administration (FDA), European Medicines Agency (EMA), European Food Safety Authority (EFSA), Therapeutic Goods Administrations (TGA), Health Canada etc. have been emphasising the importance of Quality Assurance programmes.



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Botanicals and herbal medicinal products quality could be linked to the different value chains and sustainability. It has been shown that many rural communities and indigenous groups especially in Asia depend upon medicinal plant collection for their livelihoods. Unfortunately in this form of collection, as collected plants are depleted in the wild, their scarcity causes their economic value in the market places. On the other hand, an integrated chain using cultivated material could provide alternative to this which may be superior. However, this makes the finished products quite expensive at the retail level.

Due to increasing pollution of air and soil, particularly in Asia, the level of pesticides, heavy metals and residues are predominantly present in herbal extracts. Herbal materials that are organically cultivated may be a better alternative for these cultivators. As before, organically grown materials are more expensive than wild-cultivated materials, especially in developed countries.

Increase in demand for herbal products may also lead to

adulteration of the crop with similar species (as in case of *Rhodiola* species) or adulteration somewhere in the value chain. There are also concerns about the cultivated material being inferior to wild-collected material and thus the finished product being less effective.

Standardisation of processes for minimising variation in finished botanical products could cover the entire field of study from cultivation of medical plants to the final clinical application. This should involve many steps starting with the sourcing of high quality raw material and developing the criteria for precise identification of components of each material as well as documentation of the role of the combination of constituents.

It is finally also essential to establish the efficacy using biological assays and to determine any adverse effects profile through literature and/or from toxicological studies using both short-term and long-term periods followed by controlled clinical trials.

Lack of clinical as well as pharmacological data on most herbal medicinal products represents a major impediment to the acceptance of natural products by conventional medicine. For a clinical trial, it is necessary to identify plant components clearly. Accurate botanical identification is

the starting point.

In order to avoid probability of adulteration and to provide consistent quality products to consumers, it is necessary to have traceability of herbal raw material for applications in herbal medicines. Agricultural practices and post-harvest & primary processing of plant or herb have direct impact on the active ingredients quality. Robust QA system for collecting, harvesting, storage and processing of plant material is an essential basis for consistent composition of active ingredients.

Summarising, if there is no quality control for plant or herbal material and hence not equivalent or if the extract or final product cannot be shown to be equivalent then the evidence used to support any efficacy would not hold true to the same level.

Quality issues of herbal or botanical medicines fall in two categories: external and internal. External issues are contamination (including toxic metals, pesticide residues and microorganism), adulteration and misidentification. The internal factors include complexity and non-uniformity of ingredients in herbal medicines. Rigorous implementation of Good Agricultural Practices and Good Manufacturing Practices would certainly reduce the risk of external quality issues. Modern analytical methods and pharmaceutical techniques could manage internal issues.

(Extracted from an article by Dilip Ghosh, *Nutraceuticals World* 03.01.18)



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REGULATORY ROUND UP



By
Dr. N. Ramasubramanian,
VR Food Tech Private Limited
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Dear Readers

Find below the regulations, notices, directives, etc from FSSAI since the last round up.

The big regulations on Labelling and Display, Claims and Advertisement are yet to be out as final notification. Hope you have studied in detail and assessed the impact on your products and services.

Strangely, FSSAI has removed the proposed amendments in the Food Safety and Standards Act (2006) from the website after its brief appearance.

Make sure you send in your comments and suggestions to FSSAI on drafts and notices.

[Draft standards for Chia oil.](#) Chia seed is gaining importance and its

cultivation is on the rise necessitating setting up of standards. Chia seed oil is rich in poly unsaturated omega 3 fatty acid linolenic acid.

[FSSAI has proposed an amendment in the Packaging and Labelling regulation](#) requiring all food service establishment (Hotels, Restaurants, etc) with central license or with outlets at more than 20 locations to display the calorific value of all the dishes served.

In addition, at the point of sale, information with regard to vegetarian/non-vegetarian origin of the food, allergen warning, etc to be displayed. They are also expected to keep a booklet containing the nutritional information of all the foods served. Wonder how this is going to be implemented and monitored.

The smaller eateries (which are usually registered with FSSAI) are

exempted possibly for the reason that they are not equipped both financially and technically. In a typical restaurant hundreds of dishes are served and it would require a huge board and fat booklet to convey all the information.

It should be sufficient that customers are given an idea about the nutrient content of different categories of food so that they make an informed choice.

Food safety officers should support the establishment in compliance. Other way could be to issue this requirement as guideline to the establishments. Hope HORAC sector would have a serious look at the proposed regulation.

[Draft amendments in the standards of synthetic syrup and sherbet.](#) New parameters like acidity, pH, etc have been introduced.



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For details, please contact our India partner VR Food Tech Private Limited, Mumbai.

Dr. Ashlesha Parchure: ashlesha.parchure@vrfoodtech.com



DECERNIS

Another major regulation dealing with processing aids in foods has been announced.

The draft regulation defines processing aid and lists permitted processing aids, the functionality, usage and the residual level in different foods and food categories. The troubling feature of the regulation is labelling of processing aid. The regulation blandly states that the labelling of processing aid should follow the general regulation on Packaging and Labelling.

It is not clear as to how to treat the processing aid when added to a food from the labelling point of view. Is it to be declared under the list of ingredients? Processing aid functionality is only during the processing/manufacture and though may be present in the final product (in a modified form) has no technological function during the shelf life of the product.

Hence, many regulatory bodies like EU do not require listing of processing aids under the list of ingredients. The present draft regulation may be interpreted to mean that processing aids need to be declared under the list of ingredients on the label.

This will lead to odd situations like declaring Nickel (used as a catalyst) on the label in case of products like Vanaspati. Relevant Associations must take up this matter with FSSAI.

A notice by FSSAI on the implementation of Health Supplement, Nutraceutical regulation. The notice lists banned substances in the products under this regulation. Certain ingredients presently used in Health Supplement, Nutraceutical products to be discontinued from 01 September 2018.

A FSSAI notice permits a milk to be claimed from a particular species provided all the constituents are from the same species.

FSSAI through a notice has directed all the State Food Safety Commissioners to take a lenient approach to minor product labelling deviations. The Food Safety officers have been asked to give an opportunity to the food business operator to rectify the error instead of launching the prosecution.

Creatine Monohydrate which was earlier banned has now been permitted under certain conditions. Such a flip flop approach will continue if safety and standards are not based on risk analysis.

Latest list of FSSAI approved laboratories has been announced.

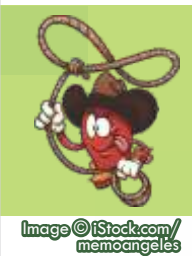


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RESEARCH IN HEALTH & NUTRITION

Eating more protein may not benefit older men

Science Daily April 2, 2018

Regardless of whether an adult is young or old, male or female, their recommended dietary allowance (RDA) for protein, set by the Institute of Medicine, is the same: 0.8-g/kg/day.

Many experts and national organizations recommend dietary protein intakes greater than the recommended allowance to maintain and promote muscle growth in older adults. However, few rigorous studies have evaluated whether higher protein intake among older adults provides meaningful benefit.

A randomized, clinical trial conducted by Brigham and Women's Hospital investigator Shalender Bhasin, MD, and colleagues has found that higher protein intake did not increase lean body mass, muscle performance, physical function or other well-being measures among older men. The results of their study are published in the April issue of JAMA Internal Medicine.

"It's amazing how little evidence there is around how much protein we need in our diet, especially the value of high-protein intake," said corresponding author Bhasin, director of the Research Program in Men's Health in the Division of Aging and Metabolism at BWH.

"Despite a lack of evidence, experts

continue to recommend high-protein intake for older men. We wanted to test this rigorously and determine whether protein intake greater than the recommended dietary allowance is beneficial in increasing muscle mass, strength and wellbeing."

The clinical trial, known as the Optimizing Protein Intake in Older Men (OPTIMen) Trial, was a randomized, placebo-controlled, double-blind, parallel group trial in which men aged 65 or older were randomized to receive a diet containing 0.8-g/kg/day protein and a placebo injection; 1.3-g/kg/day protein and a placebo injection; 0.8-g/kg/day protein and a weekly injection of testosterone; or 1.3-g/kg/day protein and a weekly injection of testosterone. All participants were given prepackaged meals with individualized protein and energy contents and supplements. Seventy-eight participants completed the six-month trial.

The team found that protein intake greater than the RDA had no significant effect on lean body mass, fat mass, muscle performance, physical function, fatigue or other well-being measures. "Our data highlight the need for re-evaluation of the protein recommended daily allowance in older adults, especially those with frailty and chronic disease," the authors

concluded.

Pasta can be part of a healthy diet without packing on the pounds

Science Daily April 3, 2018

Carbohydrates get a lot of bad press and blame for the obesity epidemic, but a new study suggests that this negative attention may not be deserved for pasta.

Unlike most 'refined' carbohydrates, which are rapidly absorbed into the bloodstream, pasta has a low glycemic index, meaning it causes smaller increases in blood sugar levels than those caused by eating foods with a high glycemic index. Researchers at St. Michael's Hospital undertook a systematic review and meta-analysis of all of the available evidence from randomized controlled trials, the gold standard of research design. They identified 30 randomized control trials involving almost 2,500 people who ate pasta instead of other carbohydrates as part of a healthy low-glycemic index diet. Their results were published today in the journal BMJ Open.

Image © iStock.com/
Anna_Shepulova



"The study found that pasta didn't contribute to weight gain or increase in body fat," said lead author Dr. John Sievenpiper, a clinician scientist with the hospital's Clinical Nutrition and Risk

Modification Centre. "In fact analysis actually showed a small weight loss. So contrary to concerns, perhaps pasta can be part of a healthy diet such as a low GI diet." The people involved in the clinical trials on average ate 3.3 servings of pasta a week instead of other carbohydrates. One serving equals about one-half cup of cooked pasta. They lost about one-half kilogram over a median follow-up of 12 weeks.

The study authors stressed that these results are generalizable to pasta consumed along with other low-glycemic index foods as part of a low-glycemic index diet. They caution more work is needed to determine if the lack of weight gain will extend to pasta as part of other healthy diets. "In weighing the evidence, we can now say with some confidence that pasta does not have an adverse effect on body weight outcomes when it is consumed as part of a healthy dietary pattern," said Dr. Sievenpiper.

This work received funding from the Canadian Institutes of Health Research through the Canada-wide Human Nutrition Trialists' Network; the Diet, Digestive Tract and Disease Centre, funded through the Canadian Foundation for Innovation, and the Ministry of Research and Innovation's Ontario Research Fund, among other non-industry sponsors. Some of the authors have received prior research grants, in-kind donations of pasta for a randomized controlled trial, and travel support from the pasta maker Barilla.



Obesity impacts liver health in kids as young as 8 years old

Science Daily April 4, 2018

A new study published today in the *Journal of Pediatrics* is the first to show that weight gain may have a negative impact on liver health in children as young as 8 years old. The study found that bigger waist circumference at age 3 raises the likelihood that by age 8, children will have markers for nonalcoholic fatty liver disease.

"With the rise in childhood obesity, we are seeing more kids with nonalcoholic fatty liver disease in our pediatric weight management practice," said Jennifer Woo Baidal, MD, MPH, assistant professor of pediatrics at Columbia University Vagelos College of Physicians and Surgeons and lead author of the paper. "Many parents know that obesity can lead to type 2 diabetes and other metabolic conditions, but there is far less awareness that obesity, even in young children, can lead to serious liver disease."

Nonalcoholic fatty liver disease occurs when too much fat accumulates in the liver and triggers inflammation, causing liver damage. The condition affects an estimated 80 million people in the U.S. and is the most common chronic liver condition in children and adolescents. While the disease is generally symptomless, progression of nonalcoholic fatty liver disease

can lead to cirrhosis (scarring) of the liver and, in some instances, liver cancer.

Previous studies have focused on fatty liver disease in adolescents and young adults. In the current study, Woo Baidal and colleagues looked for fatty liver risk factors in younger children.

The researchers measured blood levels of a liver enzyme called ALT -- elevated ALT is a marker for liver damage and can occur in individuals with nonalcoholic fatty liver disease and other conditions that affect the liver -- in 635 children from Project Viva, an ongoing prospective study of women and children in Massachusetts.

By age 8, 23 percent of children in the study had elevated ALT levels. Children with a bigger waist circumference (a measure of abdominal obesity) at age 3 and those with greater gains in obesity measures between ages 3 and 8 were more likely to have elevated ALT. Approximately 35 percent of 8-year-olds with obesity had elevated ALT versus 20 percent of those with normal weight.

"Some clinicians measure ALT levels in at-risk children starting at around 10 years old, but our findings underscore the importance of acting earlier in a child's life to prevent excess weight gain and subsequent liver inflammation," says Woo Baidal, who is also director of pediatric weight management and a pediatric gastroenterologist in the Center for Adolescent Bariatric Surgery at NewYork-Presbyterian Morgan Stanley Children's Hospital. "Currently, the best way for kids and adults to combat fatty liver disease is to lose weight, by eating fewer processed foods and getting regular exercise. We urgently need better ways to screen, diagnose, prevent, and treat this disease starting in childhood."



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Vegetables may help protect elderly women from hardening of neck arteries

Science Daily April 4, 2018

Elderly Australian women who ate more vegetables showed less carotid artery wall thickness, according to new research in *Journal of the American Heart Association*, the *Open Access Journal of the American Heart Association/American Stroke Association*.

Cruciferous vegetables including broccoli, cauliflower, cabbage and Brussels sprouts proved the most beneficial. "This is one of only a few studies that have explored the potential impact of different types of vegetables on measures of subclinical atherosclerosis, the underlying cause of cardiovascular disease," said Lauren Blekkenhorst, study lead author and Ph.D. candidate at the University of Western Australia in Crawley.

Researchers distributed food frequency questionnaires to 954 Australian women aged 70 and older. The women noted their vegetable intake in a range from "never eating vegetables" to "three or more times per day." Vegetable types included cruciferous, allium (for example, onions, garlic, leeks and shallots), yellow/orange/red, leafy green and legumes. Sonograms were used to measure carotid artery wall thickness and entire carotid trees were examined to determine carotid plaque severity.

Researchers observed a 0.05 millimeter lower carotid artery wall thickness between high and low intakes of total vegetables. "That is likely significant, because a 0.1 millimeter decrease in carotid wall thickness is associated with a 10

percent to 18 percent decrease in risk of stroke and heart attack," Blekkenhorst said. In addition, each 10 grams per day higher in cruciferous vegetable intake was associated with 0.8 percent lower average carotid artery wall thickness. Other vegetable types did not show an association with carotid artery wall thickness in this study.

"After adjusting for lifestyle, cardiovascular disease risk factors (including medication use) as well as other vegetable types and dietary factors, our results continued to show a protective association between cruciferous vegetables and carotid artery wall thickness," Blekkenhorst said. However, due to the observational nature of this study a causal relationship cannot be established. "Still, dietary guidelines should highlight the importance of increasing consumption of cruciferous vegetables for protection from vascular disease," Blekkenhorst said.

More dairy associated with higher bone density and greater spine strength in men over 50

Science Daily April 5, 2018

Researchers from Hebrew SeniorLife's Institute for Aging Research (IFAR), Wageningen

University, Tilburg University, University of Reading, and Beth Israel Deaconess Medical Center (BIDMC) have discovered that higher intake of dairy foods, such as milk, yogurt, and cheese, is associated with higher volumetric bone mineral density and vertebral strength at the spine in men. Dairy intake seems to be most beneficial for men over age 50, and continued to have positive associations irrespective of serum vitamin D status.

In women, researchers found no significant results except for a positive association of cream intake in the cross sectional area of the bone. Study participants included 1,522 men and 1,104 women from the Framingham Study, aged 32-81 years. Researchers examined quantitative computed tomography (QCT) measures of bone to determine associations with dairy intake.

Shivani Sahni, Ph.D., Director Nutrition Program and Associate Scientist at IFAR and senior author of the study said, "This study related dairy intake with QCT-derived bone measures, which are unique because they provide information on bone geometry and compartment-specific bone density that are key determinants of bone strength. The results of this study highlight the beneficial role of a combination of dairy foods upon bone health and these beneficial associations remain irrespective of serum vitamin D status in a person."



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Food packaging could be negatively affecting nutrient absorption in your body

Science Daily April 9, 2018

Food packaging could be negatively affecting the way in which your digestive tract operates, according to new research by faculty and students at Binghamton University, State University at New York.

"We found that zinc oxide (ZnO) nanoparticles at doses that are relevant to what you might normally eat in a meal or a day can change the way that your intestine absorbs nutrients or your intestinal cell gene and protein expression," said Gretchen Mahler, associate professor of bioengineering. According to Mahler, these ZnO nanoparticles are present in the lining of certain canned goods for their antimicrobial properties and to prevent staining of sulfur-producing foods. In the study, canned corn, tuna, asparagus and chicken were studied using mass spectrometry to estimate how many particles might be transferred to the food.

It was found that the food contained 100 times the daily dietary allowance of zinc. Mahler then looked at the effect the particles had on the digestive tract. "People have looked at the effects of nanoparticles on intestinal cells before, but they tend to work with really high doses and look for obvious toxicity, like cell death," said Mahler. "We are looking at cell function, which is a much more subtle effect, and looking at nanoparticle doses that are closer to what you might really be exposed to."

"They tend to settle onto the cells representing the gastrointestinal tract and cause remodeling or loss of the microvilli, which are tiny projections on the surface of the intestinal absorptive cells that help to increase

the surface area available for absorption," said Mahler. "This loss of surface area tends to result in a decrease in nutrient absorption. Some of the nanoparticles also cause pro-inflammatory

signaling at high doses, and this can increase the permeability of the intestinal model. An increase in intestinal permeability is not a good thing -- it means that compounds that are not supposed to pass through into the bloodstream might be able to."

Although Mahler studied these effects in the lab, she said she is unsure what the long-term health implications might be. "It is difficult to say what the long-term effects of nanoparticle ingestion are on human health, especially based on results from a cell culture model," said Mahler. "What I can say is that our model shows that the nanoparticles do have effects on our in vitro model, and that understanding how they affect gut function is an important area of study for consumer safety." The researchers are looking at how an animal model (chickens) responds to nanoparticle ingestion.

"We have seen that our cell culture results are similar to results found in animals and that the gut microbial populations are affected. Future work will focus on these food additive-gut microbiome interactions," said Mahler. This is the first research that analyzes how ZnO nanoparticles affect the human body. The study was done by Mahler, Fabiola Morena-Olivas, a graduate student studying biomedical engineering, and their collaborator Elad Tako from the Plant, Soil and Nutrition Laboratory, Agricultural Research

Services, U.S. Department of Agriculture, Ithaca, N.Y. The research is funded by the National Institute of Environmental Health Sciences.

Pregnant moms and their offspring should limit added sugars in their diets to protect childhood cognition

Science Daily April 19, 2018

A new study published in the American Journal of Preventive Medicine has determined that poorer childhood cognition occurred, particularly in memory and learning, when pregnant women or their offspring consumed greater quantities of sugar.

Substituting diet soda for sugar-sweetened versions during pregnancy also appeared to have negative effects. However, children's fruit consumption had beneficial effects and was associated with higher cognitive scores. Research is increasingly focusing on the adverse impact of sugar consumption on health, especially high-fructose corn syrup. Sugar consumption among Americans is above recommended limits, and the Current Dietary Guidelines for Americans emphasize the importance of reducing calories from added sugars. They are incorporated into foods and beverages during preparation or processing, with sugar-sweetened beverages (SSBs) being the greatest contributor in Americans' diets. Evidence is also emerging that sugar consumption may negatively impact children's cognitive development.



"The aim of our study was to examine associations of pregnancy and offspring sugar consumption (sucrose, fructose) with child cognition," explained lead investigator Juliana F.W. Cohen, ScD, School of Health Sciences, Merrimack College, North Andover, MA, and Department of Nutrition, Harvard T.H. Chan School of Public Health, Boston, MA. "Additionally, we examined associations of maternal and child consumption of SSBs, other beverages including diet soda and juice, and fruit with child cognition." Investigators collected dietary assessment data for more than 1,000 pregnant women from 1999 to 2002 who participated in Project Viva. Their offspring's diets were assessed in early childhood. Child cognition was assessed in early- and mid-childhood (at approximately age 3 and 7, respectively).

The results of this study indicate that consuming more fruits and less sugar, as well as avoiding diet soda during pregnancy, may have a meaningful impact on child cognitive functioning. Key findings include:

- Maternal sugar consumption, especially from SSBs, was associated with poorer childhood cognition including non-verbal abilities to solve novel problems and poorer verbal memory.
- Maternal SSB consumption was associated with poorer global intelligence associated with both verbal knowledge and non-verbal skills.
- Maternal diet soda consumption was associated with poorer fine motor, visual spatial, and visual motor abilities in early childhood and poorer verbal abilities in mid-childhood.
- Childhood SSB consumption was associated with poorer verbal intelligence at mid-childhood.
- Child consumption of both fructose and fruit in early childhood was associated with higher cognitive scores in several areas and greater receptive vocabulary.
- Fruit was additionally associated

with greater visual motor abilities in early childhood and verbal intelligence in mid-childhood.

• Fruit juice intake was not associated improved cognition, which may suggest the benefits are from other aspects of fruits, such as phytochemicals, and not fructose itself.

"This study provides evidence that there should be no further delays in implementing the new Nutrition Facts label. The new label will provide information on added sugars so that pregnant women and parents can make informed choices regarding added sugars and more easily limit their intake. This study also provides additional support for keeping federal nutrition programs strong, such as Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and the National School Lunch Program, because their promotion of diets higher in fruits and lower in added sugars may be associated with improved childhood cognition," commented Dr. Cohen.

Consuming protein supplements with meals may work better for weight control

Science Daily April 25, 2018

A new systematic review of available evidence appearing in Nutrition Reviews indicates that consuming protein supplements with meals may be more effective at promoting weight control than consuming supplements between meals in adults following a resistance training regimen.

It is well established that consuming dietary protein proximate to resistance-type exercise sessions promotes a positive net protein balance

during post-exercise recovery.

Protein supplements are available in ready-to-drink, powdered, and solid form and are marketed for different outcomes such as weight gain, weight loss, and weight management. However, for each outcome, the promoted timing of protein intake varies. Protein supplements designed to augment weight gain or support weight stability are promoted for consumption between meals. Protein supplements either with meals or as meal replacements are often recommended for ingestion to promote weight loss.

Consuming protein supplements between meals may decrease compensatory eating behaviors, thereby increasing energy intakes and body weight. Conversely, adults undergoing a resistance training program and consuming protein supplements twice daily with meals may compensate for the protein supplement by decreasing their self-chosen diet. Consequently, the timing of protein supplementation may be of particular importance, depending on the desired body weight and body composition outcome. The impact of timing the consumption of protein supplements relative to meals has not previously been evaluated systematically. In the newly published review of the literature, the researchers investigated whether the existing research studies support consuming protein supplements between meals, vs. with meals, to differentially change body composition in adults who initiate resistance training regimens.

Image © iStock.com/PeopleImages



Researchers here assessed 34 randomized controlled trials with 59 intervention groups. Of the intervention groups designated as consuming protein supplements with meals vs. between meals, 56% vs. 72% increased their body mass, 94% vs. 90% increased their lean mass, 87% vs. 59% reduced their fat mass, and 100% vs. 84% increased the ratio of lean to fat mass over time, respectively. With-meal ingestion of protein was defined as consumption of a dietary protein-rich supplement immediately after a meal, with a meal, or as a high-protein meal replacement. Between-meal ingestion of protein was defined as consumption of a dietary protein supplement predominantly either very near a workout or during another non mealtime.

The results from this systematic review provide novel information for people who choose to consume protein supplements as part of their dietary pattern to promote body mass gain or improve body composition through fat mass reduction. However, consuming protein supplements with meals, rather than between meals, may be a more effective dietary strategy to improve resistance training-induced changes in body composition by reducing fat mass, which may be relevant for adults looking to improve their health status. Consuming protein supplements between meals may be more effective at increasing overall body mass.

How nutritious is veganism? Dietitians on key nutrients and areas for NPD

27 Apr 2018 Nutrition Insight

Vegan eating patterns have emerged from a relative niche position to one gaining increasing attention among consumers, the media and the food and beverage industry. New food and beverage

launches with a vegan positioning found an average annual growth rate of +44.8 percent globally (CAGR '13-'17) when 2013 is used as a base of 100, an Innova Market Insights analysis has shown.

However, despite its popularity, veganism has on occasion been criticized as being a fad and unbalanced in terms of nutrition. NutritionInsight speaks with three dietitians about veganism, key nutrients and how the food and beverage industry can help by spurring on appropriate NPD.

NutritionInsight: What are the key nutrients vegans may miss out on by not consuming animal-derived products? Is the consumption of supplements advisable?

"The nutrients that should be supplemented are vitamins B12 and K2, iodine, zinc and long-chain omega-3 fatty acids (EPA and DHA)," says Julieanna Hever, MS, RD, CPT and author of *Plant-Based Nutrition (Idiot's Guide) Second Edition*. "Importantly, it is likely that the very nutrients vegan diets happen to be limited in may be – at least in part – what makes it so successful at reducing the risk of age-related chronic diseases. For example, saturated fat, excessive essential amino acids and heme iron have been associated with increased disease risk and are found in higher doses in animal products."

"Fortified foods and supplements play important roles. For example, dairy should be replaced by foods that are really rich in calcium, such as fortified plant-based alternatives to milk and yogurt," says Heather

Russell, Dietitian with the Vegan Society. "It's essential to obtain vitamin B12 from a supplement and fortified foods, and iodine supplementation is arguably the best way of ensuring a reliable intake of this mineral. Selenium supplementation should be considered too, unless you're eating a couple of Brazil nuts daily. Also, everyone in the UK should consider vitamin D supplementation during autumn and winter as a minimum; D3 from lichen and D2 are animal-free options."

Kirsty Barrett, a Registered Dietitian and spokesperson for the British Dietetic Association (BDA), similarly highlights the importance of vitamin D. "Vitamin D is generally advised for everyone during the winter months (September through April) anyway due to the sun light being at the wrong wavelength. You get some from food (e.g., fortified breakfast cereals, some plant-based milks, oily fish and eggs)," lists Barrett.

"Calcium - if choosing organic plant-based milks, non-organic versions are usually fortified with calcium to the same level as cows' milk, vegan cheese isn't usually fortified and some yogurts are, you would need to check the label. Bread is also a good source of calcium, kale is too. Calcium-set tofu can also be useful. Iodine [also could require supplementing as it is] usually found in cow's milk/dairy products, and also in white fish and seaweed. I can only think of two plant-based milks that are fortified with iodine so this generally needs to be supplemented," Barret notes.

NutritionInsight: What sort of product categories could use further R&D to meet vegan demands? And what can the food and beverage sector do in this regard?

"The Vegan Society's new 'Catering for Everyone' campaign is calling for good vegan food on public sector menus every day.



In addition to meeting vegan needs, a strong vegan offering can promote inclusivity, sustainability and good nutrition. It's important that manufacturers, suppliers and caterers are able to meet the increasing demand for vegan-friendly foods and drinks. In hospitals, nourishing options are required, like higher calorie meals and puddings, as well as healthy choices," says Russel.

"I am concerned about vegans over-consuming highly processed and hyper-palatable foods now with the recent explosion of vegan products in the marketplace because I am seeing more vegans coming to me for similar health issues typically associated with an omnivorous diet," states Hever. "Some of the plant-based meat and dairy substitutions have similar nutritional profiles as the animal product it is emulating. I would love to see more whole food plant products such as ready-to-eat convenience foods that are not filled with sugars, oils, flours and salts, on the market," she says. Barret, meanwhile, notes that the possibilities for NPD in fortified dairy alternatives. "Definitely plant-based milks, I think there is a massive gap in the market for a plant-based milk fortified with iodine. More calcium fortified yogurts also would be good," Barret says.

NutritionInsight: Is veganism ultimately a healthy or advisable diet for all?

"The Vegan Society works with the British Dietetic Association to share the message that well-planned vegan diets can support healthy living for people of all ages. We recommend that anyone with concerns about their diet talks to their doctor about seeing a dietitian for expert support," Russel says. "According to the Academy of Nutrition and Dietetics, appropriately planned vegetarian, including vegan, diets are healthful, nutritionally adequate, and may provide health benefits for the prevention and treatment of certain diseases. These diets are appropriate for all stages of

the lifecycle, including pregnancy, lactation, infancy, childhood, adolescence, older adulthood and for athletes," notes Hever. The vegan diet is "completely safe as long as it is well considered and can be extremely healthy due to high intake of fruit, vegetables and fiber. I think it does require some planning and also accepting that you most likely will need to supplement something," Barrett concludes.

By Lucy Gunn

Chocolate on the brain: The candy may impact cognitive functions such as stress, study finds

25 Apr 2018 Nutrition Insight



Chocolate that has a high concentration of cocoa (minimally 70 percent cacao, 30 percent organic cane sugar) could have positive effects on stress levels, inflammation, mood, memory and immunity, two studies have found. The studies, which will be presented today at the Experimental Biology 2018 annual meeting in San Diego, are the first to determine the effects of chocolate on cognitive, endocrine and cardiovascular health in human subjects.

"For years, we have looked at the influence of dark chocolate on neurological functions from the standpoint of sugar content - the more sugar, the happier we are," says Lee S. Berk, DrPH, associate dean of research affairs, School of Allied Health Professions and a researcher in psychoneuroimmunology and food

science from Loma Linda University, who served as principal investigator on both studies.

"This is the first time that we have looked at the impact of large amounts of cacao in doses as small as a regular-sized chocolate bar in humans over short or long periods of time, and are encouraged by the findings. These studies show us that the higher the concentration of cacao, the more positive the impact on cognition, memory, mood, immunity and other beneficial effects." The flavonoids found in cacao are extremely potent antioxidants and anti-inflammatory agents, with known mechanisms beneficial for brain and cardiovascular health.

First study: Dark chocolate's effect on the brain

This pilot feasibility experimental trial examined the impact of 70 percent cacao chocolate consumption on human immune and dendritic cell gene expression, with focus on pro- and anti-inflammatory cytokines. Study findings show cacao consumption up-regulates multiple intracellular signaling pathways involved in T-cell activation, cellular immune response and genes involved in neural signaling and sensory perception. The latter was potentially associated with the phenomena of brain hyperplasticity (the brain's ability to learn new skills).

Second study: Dark chocolate on behavioral and brain benefits

This study assessed the electroencephalography (EEG) response to consuming 48 g of dark chocolate (70 percent cacao) after an acute period (30 mins) and after a chronic period (120 mins), on modulating brain frequencies 0-40Hz, specifically beneficial gamma frequency (25-40Hz). Findings show that this superfood of 70 percent cacao enhances neuroplasticity for behavioral and brain health benefits.

Berk asserts that the studies require further investigation, precisely to determine the significance of these effects for immune cells and the brain in larger study populations. New research is in progress to elaborate on the mechanisms that may be involved in the cause-and-effect brain-behavior relationship with cacao at this high concentration.

Vitamin A may play vital role in preventing lethal liver cancer

24 Apr 2018 Nutrition Insight

Acyclic retinoid, an artificial compound derived from vitamin A, may prevent the reoccurrence of liver cancer tumors.



Image © iStock.com/Yuliya_M

The vitamin A compound targets one common class of liver cancer cells, hepatocellular carcinoma (HCC) which are indicative of a highly lethal cancer with an extremely high rate of recurrence and relapse. The study proves how the acyclic retinoid can slow the growth of the cancer: by targeting levels of the dangerous MYCN in cells, this is true even amongst highly treatment-resilient “cancer stem cells.”

“We hope that in the near future, MYCN levels will be measured as a biomarker for judging the effectiveness of acyclic retinoid therapy, in the prevention of the recurrence of liver cancer,” Soichi Kojima, Ph.D, Professor and Unit Leader, Liver Cancer Prevention Research Unit, RIKEN Center for Integrative Medical Science, Japan, tells NutritionInsight.

Previous studies have found that acyclic retinoid was effective in stopping the recurrence of tumors.

However, they were not sure as to why that was the case. Researchers in this study found that the expression of MYCN - a gene that is often found in tumors and is associated with poor life outcomes - was the key. They looked at the transcriptome of cells that had been exposed to acyclic retinoid, and found that compared to untreated cells, they had low expression of MYCN. Further experiments, which

involved deliberately repressing the appearance of the gene in cancer cells, showed that the reduction in MYCN led to slower cell progression, proliferation, and colony formation and to more cell death; essentially the acyclic retinoid on MYCN was slowing the cancer's growth. Following this, the group focused on the role of “cancer stem cells”—cells that often survive the onslaught of chemotherapy treatment and often go on to divide and lead to reoccurrence of the cancer. They found, indeed, that high expression of MYCN was correlated with the expression of a number of markers that are associated with cancer stem cells.

Future applications

Cancer research is an on-going process, as a vast number of people are afflicted with the disease each year. Cancer is an extremely heterogeneous sickness, of which its umbrella term comprises of 200 different conditions, according to Worldwide Cancer Research. Treatments that work for some cancers don't work for others and sometimes those treatments simply stop working.

HCC is a particularly lethal cancer, which causes approximately 600,000 deaths each year around the world, making it the second deadliest cancer after non-small cell lung cancer. One of the reasons for the high lethality is that it has a high rate of recurrence – surgery and

other treatments are initially effective, but the cancer then often relapses. This research could mark potential clinical treatment with MYCN levels being used as a biomarker. Moreover, the group hope to see a clinical treatment stemming from the research in a few years' time, “We will start to explore the idea using patient data samples, and this will take one to two years for strong answers. Following this, the findings can hopefully be applied clinically.”

Kojima also points to a possibility that the method would work amongst other types of liver stem cells: “The most interesting part of our finding,” says Kojima, “is when we then looked at different subpopulations of heterogeneous cancer cells. We found one specific group of EpCAM-positive cancer stem cells, where MYCN was elevated. We wondered if perhaps the key to acyclic retinoid's effect was its ability to target these hepatic cancer stem cells. We also obtained similar results with CD133 positive liver cancer cells.” Regarding the use of the treatment in other organ types, Kojima speculates that acyclic retinoid will indeed target MYCN similarly. However, for now, research is moving on to “studying a molecular mechanism(s) by which acyclic retinoid down-regulate the expression of MYCN at the transcriptional level through nuclear trans-glutaminase,” she concludes.

In related news that aligns nutrients and cancer, NutritionInsight has reported on the impact of biomarkers on the formation of colon cancer. In this case, researchers from Chalmers University of Technology, Sweden, found that two commonly used iron compounds – ferric citrate and ferric EDTA – increased the formation of a known biomarker – amphiregulin – for colon cancer, marking them as possibly carcinogenic properties. However, further research is needed. By Laxmi Haigh



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Fish protein found to prevent “Parkinson’s protein” formation, study shows

23 Apr 2018 Nutrition Insight

A common protein found in species of fish, parvalbumin, may prevent the formation of specific protein structures that are closely associated with Parkinson’s disease. The study, conducted at the Chalmers University of Technology, Sweden, shines a light on the link between fish consumption and brain health and expands the healthy reputation of fish beyond the famous omega fatty acids.

One of the hallmarks of Parkinson’s disease is the amyloid formation of a particular human protein called alpha-synuclein. Alpha-synuclein is often referred to as the “Parkinson’s protein.” The Chalmers researchers have discovered that parvalbumin can form amyloid structures that bind together with the alpha-synuclein protein. Parvalbumin effectively “scavenges” the alpha-synuclein proteins, using them for its own purposes, thus preventing them from forming their own potentially harmful amyloids at a later point. “Parvalbumin collects up the ‘Parkinson’s protein’ and prevents it from aggregating, simply by aggregating itself first,” explains Pernilla Wittung-Stafshede, Professor and Head of the Chemical Biology division at Chalmers, and lead author on the study.

The researchers state that with the parvalbumin protein being so highly

abundant in certain fish species, increasing the amount of fish in the diet may be a simple way to ward off Parkinson’s disease. Herring, cod, carp, and redbfish, including sockeye salmon and red snapper, have particularly high levels of parvalbumin, but it is also common in many other fish species. The levels of parvalbumin can also vary throughout the year:

“Fish is normally a lot more nutritious at the end of the summer, because of increased metabolic activity. Levels of parvalbumin are much higher in fish after they have had a lot of sun, so it could be worthwhile increasing consumption during autumn,” says Nathalie Scheers, Assistant Professor in the Department of Biology and Biological Engineering, and researcher on the study.

Future potential for other neurodegenerative diseases

The research may hold future promise, in terms of other neurodegenerative diseases. Alzheimer’s, Amyotrophic lateral sclerosis (ALS) and Huntington’s disease are also caused by specific amyloid structures interfering in the brain. The researchers are therefore keen to research this topic further, to see if the discovery relating to Parkinson’s disease could have implications for other neurodegenerative disorders as well.

Pernilla Wittung-Stafshede stresses the importance of finding ways to combat these neurological conditions in the future, “These diseases come with age, and people are living longer and longer. There’s going to be an explosion of these diseases in the future – and the scary part is that we currently have no cures. So we need to follow up on anything that looks promising.”

A follow-up study, looking at parvalbumin from another angle, is planned for autumn 2018. Nathalie Scheers, together with Professor Ingrid Undeland, also of Chalmers,

will investigate parvalbumin from herring, and its transport in human tissues. “It will be very interesting to study how parvalbumin distributes within human tissues in more depth. There could be some really exciting results.”

NutritionInsight has previously reported on efforts to detect treatments for wide-spread neurodegenerative diseases. These efforts include research that revealed the links between the gut microbiome – the population of microorganisms living in the gastrointestinal tract – and brain diseases such as Parkinson’s and Alzheimer’s. The research expanded on budding research on the gut-brain axis and its potential in providing a promising pathway to cures. Furthermore, strengthening the age-old saying, “we are what we eat,” research has detailed that following a low-fat diet in combination with limited caloric consumption could prevent age-related brain dysfunction.

MenaQ7 Full Spectrum K2 closest ingredient to dietary cheese intake, study finds

20 Apr 2018 Nutrition Insight

Based on a global state of vitamin K2 deficiency and the strong evidence showing it is a cardio-protective nutrient, researchers recommend cheese as a component of a heart-healthy diet due to its vitamin K2 content. However, for those unable to consume enough cheese daily, NattoPharma has introduced its MenaQ7 Full Spectrum K2, which aims to deliver the range of menaquinones found in foods.



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Nutrients has published a new paper, “Menaquinone Content of Cheese,” which examines the vitamin K2 content of cheeses and other foods. The analysis was conducted by researchers at VitaK, Maastricht University (the Netherlands). Vitamin K2 (menaquinone) concentrations were measured in a range of cheeses and the effects of fat content, ripening and cheese origins were investigated.

The researchers found that “cheese and curd are the most important sources of long-chain menaquinones in the Western diet. However, the actual menaquinone content varies substantially and is dependent on the type of cheese, the time of ripening, the fat content and the geographic area where the cheeses are produced.” The findings showed that the total amount of K2 in cheese was between 3 and 802ng/g. To that end, the researchers’ recommendation for K2 is between 180-360mcg/day, which means one needs to eat at least 225/445g of French cheese a day (Münster) and at least two times more with cheese from Scandinavia.

In the past decade, increasing attention has been paid to the health benefits of the K2, notably the long-chain menaquinones MK-6 through MK-9. This research adds to important population-based studies that have shown that food-derived vitamin K (such as from cheeses) improves long-term cardiovascular health outcomes because it more specifically delivers the spectrum of long-chain menaquinones.

“Interestingly, vitamin K2 was first discovered in the fermented soy food called natto,” says Hogne Vik, Chief Medical Officer with NattoPharma. “However, in the early 2000s, the researchers working with NattoPharma discovered that fermented cheese is also an excellent source of the menaquinones, ranging from menaquinones 5 through 10, while menaquinones 6, 7 and 9 are amongst the most bioactive.” While fermented cheeses are the best dietary

source of menaquinones in the West, most cannot consume enough daily to obtain optimal amounts of vitamin K2, nor is cheese a practical source for extracting the menaquinones, researchers note. To that end, NattoPharma has introduced MenaQ7 Full Spectrum K2, which delivers the range of menaquinones found in foods.

MenaQ7 Full Spectrum delivers a gamut of menaquinone isomers and is naturally fermented using chickpea protein, offering an all-trans K2 that is free from gluten, soy and all-known allergens, and is suitable for vegans. MenaQ7 Full Spectrum provides the vital menaquinone isomers for optimal K2 delivery concerning absorption, half-life and biological activity. “NattoPharma’s R&D team has created several forms of the ingredient to allow brand marketers to seize opportunities of delivering viable MK-7 in almost any form desirable,” Eric Anderson, NattoPharma Senior Vice President of Marketing and Business Development, tells NutritionInsight.

“We have a rapidly growing portfolio of scientific evidence showing the mechanism of action (MOA) and efficacy specific to bone and cardiovascular health in various population groups (both healthy and patient populations, adult and child). Consumers’ preferences of how they may want to take their supplements may change, but what they need to rely on and trust in is that what is promised to them is being delivered,” Anderson notes.

Speaking on further avenues for R&D, Anderson tells NutritionInsight that NattoPharma has received a grant from The Norwegian Research Council funding a four-year study to document the effects of calcium

metabolism in the body based on the presence or absence of vitamin K2, MK-7 (using MenaQ7). The research team is studying the utilization of calcium in preclinical models for postmenopausal bone loss to determine how supplemental calcium is metabolized in the presence or absence of supplemental MK-7.

“In addition, there are currently 18 recognized K-dependent proteins in the body that, when activated, help the body operate optimally. Aging causes proteins to slow down productivity (or become ‘uncarboxylated’), leading to systemic degradation. MenaQ7 specifically has been shown to carboxylate, or activate, two key proteins – osteocalcin and Matrix Gla Protein (MGP) – which can stave off aging of the skeleton and cardiovascular system,” he adds. By Lucy Gunn

Infant food allergy linked to genetics and skin exposure to food, dust and wipes

19 Apr 2018 Nutrition Insight

Food allergy is triggered by perfect storm of genetics and skin exposure to infant wipes, dust and food, according to a new Northwestern Medicine study. Infant and childhood food allergy, whose cause has long been a mystery, has now been linked to a mix of environmental and genetic factors that must coexist to trigger the allergy.

Image © iStock.com/Evgen_Prozhyrko



The factors contributing to food allergy include the genetics that alter skin absorbency, use of infant cleansing wipes that leave soap on the skin, skin exposure to allergens in dust and skin exposure to food from those providing infant care.

Food allergy is triggered when these factors occur together. Food allergies are on the rise and affect an estimated 4 to 6 percent of children in the US, according to the Centers for Disease Control and Prevention. The prevalence of reported food allergy increased 18 percent among children under age 18 years from 1997 to 2007. Recent data also show hospitalizations with diagnoses related to food allergies have increased among children.

The good news is factors leading to food allergy can be modified in the home environment, says lead study researcher Joan Cook-Mills, a professor of allergy-immunology at Northwestern University Feinberg School of Medicine. “Reduce baby’s skin exposure to the food allergens by washing your hands before handling the baby,” Cook-Mills says. “Limit use of infant wipes that leave soap on the skin. Rinse soap off with water like we used to do years ago.”

Cook-Mills made the discovery by using clinical evidence about food allergy in humans, the effects of food allergen and environmental allergen exposures and neonatal mice with genetic mutations that occur in humans. Clinical evidence shows up to 35 percent of children with food allergies have atopic dermatitis and much of that is explained by at least three different gene mutations that reduce the skin barrier.

Cook-Mills used a neonatal mouse model with skin barrier mutations and tried exposing its skin to food allergens like peanuts. The peanuts alone had no effect. “Then I thought about what are babies exposed to,” she says. “They are exposed to environmental allergens in dust in a

home. They may not be eating food allergens as a newborn, but they are getting them on their skin. Say a sibling with peanut butter on her face kisses the baby. Or a parent is preparing food with peanuts and then handles the baby.”

Next, she read about skin research studies that delivered compounds through the skin by using soap and realized the significance of infant wipes. The top skin layer is made of lipids (fats), and the soap in the wipes disrupts that barrier, Cook-Mills explains. Skin problems that occur with skin barrier mutations may not be visible until long after a food allergy has already started. The neonatal mice with the mutations had normal-appearing skin, and the dry itchy skin of dermatitis did not develop until the mice were a few months old, the equivalent of a young adult in human years.

After the neonatal mice received three to four skin exposures of food and dust allergens for 40 minutes during a two-week period, they were given egg or peanut by mouth. The mice had allergic reactions at the site of skin exposure, allergic reactions in the intestine, and the severe allergic food reaction of anaphylaxis that is measured by decreased body temperature.

A skin barrier dysfunction was necessary for food allergy to develop in the mice, but there is a wide continuum of severe to mild skin dysfunction with eczema or atopic dermatitis, which in its mildest form may simply appear to be dry skin. In patients with skin-barrier defects, there are changes in the proteins in the skin that are a result of mutations in the genes. These gene mutations in patients are primarily heterozygous, which means there is a mutation in one of the two copies of a gene.

Accordingly, in the preclinical studies, neonatal mice were also heterozygous for skin barrier

mutations. The mice were co-exposed to food allergens such as egg and peanut proteins, allergens in dust (house dust mite or *Alternaria alternata* mold) and sodium lauryl sulfate, a soap present in infant cleansing wipes. She is currently studying molecular responses in the skin that are unique to this combination of genetics and skin exposures. The goal is to determine unique signals in the skin that occur during development of food allergy. This will lead to approaches to intervene with those skin signals and block the development of food allergy.

Light roast coffee could contribute to cancer prevention, study shows

10 Apr 2018 Nutrition Insight

Light roast coffee holds anti-cancerous properties that darker roast coffee does not, a study has found. The study, published in *The Journal of Food Science*, compared coffee roasted at five different levels, against the growth inhibitory activity of cancer cells that are associated with oral and colon cancers.

Coffee is one of the most widely consumed beverages in the world and contains numerous phytochemicals, such as gallic, caffeic, and chlorogenic acid, that are beneficial to consumer health. The phytochemical profile of coffee, however, can be affected by the roast level. Researchers sought to detect how such a roast level would affect cancerous cells growth activity.



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The researchers compared the effect of roasting level on the growth inhibitory activity of colon (HT-29) and oral (SCC-25) cancer cell lines.

The five different roasting stages selected for this study went from light to dark: green, cinnamon/blonde, medium, medium-dark, and dark. To detect the effect of coffee on cancer cell growth, the cells were treated with concentrations of coffee extracts for 72 hours. Cell viability was quantified using the thiazolyl blue tetrazolium bromide assay.

Results showed that the lighter roast extracts, Cinnamon in particular, reduced cell growth more than darker roast extracts. The Cinnamon extract had the most significant amount of total phenolic content and antioxidant activity. Relative levels of bioactive phytochemicals gallic, caffeic, and chlorogenic acid in the extracts were also compared. The Cinnamon coffee extract had the highest levels of gallic and caffeic acids, which have both been widely-regarded as bioactive phytochemicals. They concluded that the consumption of lighter roasted coffee may contribute to the prevention of certain types of cancer such as oral and colon.

In terms of practical applications, the researchers outlined how the chemical compounds that may reduce the risk of certain cancers were particularly abundant in lighter roasted coffee, and therefore, lighter roasted coffee could contribute to the prevention of cancer through a healthy diet. Consumer consumption of coffee is high, and Innova Market Insights data even shows that the number 5 trend of 2018 is “Beyond the coffeehouse,” indicating that consumers are more adventurous with their coffee choices.

Innova Market Insights states that the tea & coffee sector appears to be undergoing somewhat of a renaissance, with several major acquisitions taking place in 2017

among key manufacturers. The percentage of Americans drinking coffee on a daily basis increased to 62 percent in 2017, up from 57 percent in 2016, according to the National Coffee Association’s (NCA) 2017 National Coffee Drinking Trends (NCDT) consumption tracking report.

Research that indicates the health benefits of coffee may aid it to tap into other overarching trends, such as the mindful consumer who is continually searching for food that delivers additional benefits and “good for you” feelings. NutritionInsight has previously reported on the effect that roasting coffee can have on health benefits, as well as taste.

Study uncovers interplay between omega 3, sleep and cognition in kids

05 Apr 2018
Nutrition
Insight

Frequent fish consumption may aid better quality sleep and cognitive functioning in children, a Chinese study has found. The study, published in Nature, claims to be the first study to delineate the mediating pathways between greater fish consumption and improved cognition amongst children.

Significantly, omega three fatty acids are said to play critical roles in cognitive performance. Studies have demonstrated positive findings on this topic at a range of life-stages. Firstly, in the first year of life as a result of the mother taking omega during pregnancy, also during adolescence and lastly, as aiding a reduction in cognitive decline and dementia in older age peoples. This

longitudinal study sought to assess three central relationships: Firstly, whether more frequent fish consumption was associated with better quality sleep and high IQ scores in children. Secondly, whether or not such relationships were in fact documented for by social or economic factors and thirdly, if sleep quality mediated the fish-IQ relationship.

In the words of the TapIntegrative, the study’s findings were dose responsive: “When compared with no fish consumption, fish consumption 2 times per month or more was significantly associated with high verbal, performance and full scale IQ. These associations held true after adjusting for 13

sociodemographic covariates.

There was a dose-response relationship between fish consumption frequency and IQ scores, such that those who ate fish weekly scored 4.80 points higher on full-scale IQ, and those who ate fish at least twice a month scored 3.31 points higher, than those who seldom or never ate fish.” The study describes the “robust” findings as demonstrating that of the 541 Chinese schoolchildren participating, frequent fish consumption was related to both fewer sleep problems and higher IQ scores and that sleep partially mediated the relationship between fish consumption at age 9–11 years and cognitive ability as measured by IQ at age 12 years.

The study claims to have essential findings for public health efforts regarding the dietary habits of children and adolescents, and standouts as a study not limited to a Western population. It calls for further research to explore the mechanisms through which intake of omega three fatty acids may contribute to improving neurodevelopment and cognitive function.

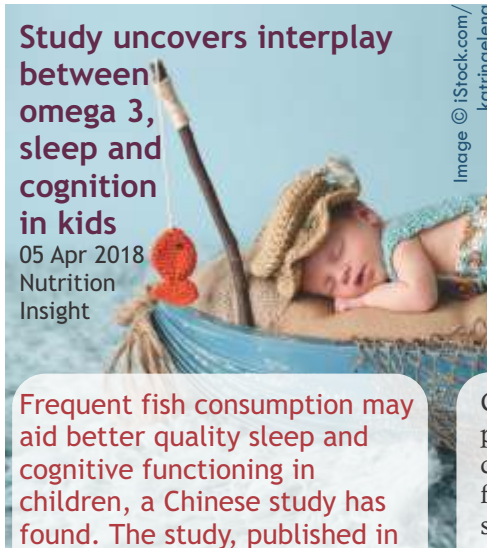


Image © iStock.com/katrinaelena

NutritionInsight has reported widely on the health benefits of the omegas, and correlating studies. Fish oils are well known to contain high levels of omega fatty acids, whose health benefits can be far-reaching. From cardiovascular health, to healthy aging and during pregnancy. The market for supplying omega rich supplements is vast, and NPD innovations span from flavor disguise techniques to dosage forms that appeal particularly to children and even food-chain omega supplementation. NutritionInsight has previously conducted an in-depth report into these trends, with a particular insight into omega three's positive cardiovascular health benefits.

Could eating fish stave off Parkinson's disease?

Medical News Today 24 April 2018 by Tim Newman

According to the latest research, a chemical commonly found in fish might prevent Parkinson's disease. The team also unearth a unique mechanism that could help design better drugs to attack neurodegenerative diseases.

Over the decades, a serious amount of research has gone into investigating whether eating more fish could help to reduce the risk of dementia and improve cognitive health. To date, the evidence supporting this theory is strong. Omega fatty acids were initially considered to be the chemicals behind fish's neuroprotective powers, but studies backing this theory up have not been forthcoming.

Although plenty of marketing companies earnestly inform us that omega supplements will prevent dementia and keep our minds nimble for longer, the science does not back this claim up. So, what component of fish does benefit our brains? According to the latest study to address this question, it might be a

protein called parvalbumin. A calcium-binding protein, parvalbumin is found in large quantities in many types of fish, particularly in muscle tissue. It is the most common trigger of allergic reactions in those who have fish allergies; parvalbumin is able to fire up the immune system by avoiding our digestive juices and passing into the blood.

From fish to Parkinson's

Although the exact mechanisms that drive Parkinson's disease are still being unraveled, a particular protein formation is known to be important. Alpha-synuclein, sometimes called the Parkinson's protein, is found in clumps in the brains of people with Parkinson's disease. When proteins fold incorrectly, they tend to stick together, forming fibrils, or amyloids. Amyloids are not always unhealthy, but they are present in a number of neurodegenerative conditions, including Huntington's, Parkinson's, and Alzheimer's. Recently, researchers from Chalmers University of Technology in Gothenburg, Sweden, ran tests to investigate how parvalbumin interacts with alpha-synuclein. Their findings are published this week in the journal Science Reports.

They revealed that parvalbumin "scavenges" alpha-synuclein, binding it up so that it can't form the disruptive clumps seen in Parkinson's. Lead study author Prof. Pernilla Wittung-Stafshede, head of the Chemical Biology Division at the university, explains: "Parvalbumin collects up the 'Parkinson's protein' and actually prevents it from aggregating, simply by aggregating itself first." In this

way, parvalbumin has the potential to clean up abnormal amyloids before they get a chance to form. So, it is possible that eating fish with high levels of these proteins could have a protective effect. Among many others, fish such as herring, cod, redfish, carp, red snapper, and sockeye salmon harbor high quantities of parvalbumin. However, levels fluctuate throughout the year. "Fish is normally a lot more nutritious at the end of the summer, because of increased metabolic activity. Levels of parvalbumin are much higher in fish after they have had a lot of sun, so it could be worthwhile increasing consumption during autumn." Nathalie Scheers, assistant professor, Chalmers University of Technology

A much-needed discovery

Because this type of aggregated protein is common in a number of neurodegenerative conditions, the researchers are keen to investigate the activity of parvalbumin further. The excitement surrounding these findings is two-fold: firstly, they have identified another molecule that might help to fight neurodegenerative conditions; and, secondly, they have uncovered a new mechanism of action for drug designers to target.

Prof. Wittung-Stafshede explains the importance of this research and projects similar to it: "These diseases come with age, and people are living longer and longer. There's going to be an explosion of these diseases in the future — and the scary part is that we currently have no cures. So we need to follow up on anything that looks promising." Researchers from the same university are already planning follow-up investigations. Specifically, they plan to study how parvalbumin from herring is transported into human tissues. Although this line of investigation is in its infancy, it makes exciting reading.



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High-protein supplements boosts recovery, blood oxygen levels in elite basket-ballers: Study

By Stephen Daniells 24-Apr-2018
NutraIngredients

Elite basket-ballers taking a high-protein post exercise supplement experienced accelerated recovery. Their blood oxygen levels were also found to be higher.

Data from a randomized, counterbalanced crossover study, published in *Nutrition*, indicated that high protein supplementation (equivalent to 36% of all calories) further enhanced increases in cerebral oxygen saturation observed during a cycling test. High protein was also found to attenuate increases in cerebral blood perfusion which led to a 16% longer cycling time, report scientists from the University of Taipei (Taiwan) and the Competitor Institute of Sports Nutrition in Beijing. "The key finding of the present study is that increasing protein content in a carbohydrate-based supplementation after an exercise recovery significantly increased cerebral oxygenation with less blood demand in the frontal brain during the next high-intensity exercise challenge," they wrote. "This brain hemodynamic change occurred in parallel with a 16% improvement in high-intensity endurance performance."

Study details

The researchers recruited 15 Division 1 basketball players aged

between 18 and 20 to participate in their study. The young men were randomly assigned to consume carbohydrate-based drink formulated with high-protein (36% of total calories) or an isocaloric low-protein (12% of total calories) immediately after a one hour cycling test at 70% VO₂max.

The men were allowed to rest for two hours and then challenged on the exercise bike at 80% VO₂max. Results showed that the high-protein group recovered faster after the cycling. In addition, consuming the high-protein supplementation led to an enhancement in cerebral oxygen saturation during the second cycling test.

"It is mechanistically unclear how protein supplementation during post-exercise recovery acutely increased oxygen saturation during high-intensity exercise. Protein is a major nitrogen source in diet, which is essential for growth. One possibility accounted for the increased oxygen saturation during exercise could be associated with better endothelial adaptation after more protein supplementation," wrote the researchers. "An alternative possibility accounted for the hemodynamic adaptation after high-protein supplementation is an improved brain mitochondria function."

The researchers also noted that carbohydrates and not protein is the main fuel for rapid ATP synthesis during high-intensity exercise, and they proposed that the benefits observed from protein supplementation may be linked to improved brain metabolism during recovery. "In this study, the observed improvement in high-intensity endurance performance may be explained by the oxygen-sparing effect of whey protein, which alleviates blood competition between brain and periphery (such as muscle for oxygen and skin for heat dissipation)," they added.

IBD and diet: How much can what we eat help inflammatory bowel disease

By Tim Cutcliffe 29-Mar-2018
NutraIngredients Asia

Speaking at the recent Nutrition in Medicine in London, experts outlined a number of recently identified foods that may help protect against and potentially reverse inflammatory bowel disease, alongside others which may increase risk.

Speaking at the event, Dr Alan Desmond, Consultant Gastroenterologist at South Devon Healthcare NHS Foundation Trust, U, suggested that active Crohn's Disease (CD) can be successfully reversed by adopting a Whole Food Plant Based Diet (WFPBD). He cited data from two trials which have shown diets like the WFPBD, which restricts animal protein, animal fat, omega- PUFAs, dairy, emulsifiers and food additives while providing dietary fibre can bring improvements in people with Crohn's in just six weeks. Patients in the trials obtained 50% of caloric intake from an enteral formula (an artificial complete nutrition' product) and the remaining 50% from a WFPBD. Desmond noted that people with newly diagnosed Crohn's, in addition to people with an established and difficult-to-treat condition, showed complete remission rates of 62% and 71% while significant clinical improvements of 90% and 79% were seen. Even more remarkably, according to Desmond, out of 18 patients who refused to take the enteral formula and instead pursued a WFPBD solely, 14 achieved complete remission.



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PFNDI June 2018

Evidence also suggests that CD remission may be maintained over the longer-term even if only a semi-vegetarian diet is followed, he said.

Fibre - good for Crohn's?

A low-fibre diet has always been the standard advice for Crohn's patients, with the underlying rationale of avoiding are-ups. Yet many studies showed no benefit, or even harmful effects of this regime, Desmond pointed out. Although limited in size and numbers of trials, evidence exists to show that soluble fibre can in fact induce improvements in Crohn's, he said - adding that a small trial of CD patients given a breakfast high in soluble fibre reported improvements in many symptoms - including improved quality of life. "We know that soluble fibre reduces inflammation of the gut. We know that fibre actually helps maintain the integrity of the epithelial barrier," said Desmond.

Animal fats and proteins
Observational data has shown that those who consume the highest levels of animal protein carry the highest risk of developing IBD, noted the expert. One study also showed that other risk factors for IBD include a higher ratio of animal: vegetable protein intake, higher omega-3 ratio and higher iron intake, Desmond added. Strong evidence also exists that dairy consumption may be a culprit in bowel disorders, he noted. "A high milk-fat diet can induce or exacerbate Crohn's disease or colitis by multiple mechanisms." These mechanisms include reduced mucus layer, higher gut permeability, increased production of inflammatory molecules, greater bacterial penetration of the gut wall and unfavourable changes to the gut bacteria composition, he said.

Evidence-based advice

According to Desmond, foods to include in diets include: soluble fibre (oats, psyllium, pulses) insoluble

fibre (whole grains and nuts, as tolerated) fruit and vegetables, sources of omega-3 fatty acids. He added that there is no strong evidence for gluten-free or low FODMAP diets, or to exclude soy or yeast. However, items that should be avoided are meat, dairy fats and cheese large quantities of fruit juice and juices with high-fructose content food emulsifiers and maltodextrin. "When I see my patients with I or Crohn's this is the evidence-based advice I give them," said Desmond.

Nutritional status and frailty have 'multiplicative effect' on adverse outcomes for elderly: Korea study

By Cheryl Tay 02-Apr-2018
NutraIngredients Asia

Malnutrition compounds frailty in older adults and raises their risk of adverse outcomes, say researchers in Korea.

The elderly population worldwide is growing, from 461 million people aged 65 and older in 2004 to an estimated 2 billion by 2050. In South Korea, the percentage of elderly in the country's population rose from 7.2% in 2000 to 11% in 2010, and is predicted to increase to 20.8% by 2026. Along with this comes a higher prevalence of frailty and malnutrition, the former having been found to raise the risk of adverse outcomes like impaired functional and cognitive status, falls, long-term hospital assistance, and mortality. However, while nutritional deficiency affects frailty and both are closely related to mortality and morbidity in seniors, there have been no studies on the subject. Researchers at Chonnam National University and Korea Institute of Health and Social Affairs therefore conducted a study to determine whether the interaction of frailty and nutritional deficiency is additive

and / or multiplicative.

Surveying seniors

Taking data from the 2008 Survey on Health and Welfare Status of the Elderly in Korea, they assessed 8,907 respondents aged 65 and above. They then reported that when it came to mortality, the hazard ratios of frailty and high nutritional risk were 2.63 and 1.04, respectively. In terms of mortality and long-term hospitalisation, the respective values were 2.56 and 1.18. They added: "In the interaction effect model, multiplicative interaction existed between frailty and nutritional status. Participants with frail x high nutritional risk had much higher hazard ratios for mortality and mortality and long-term hospitalisation risk."

They further stated that malnutrition and frailty are 'two distinct conditions' despite being closely linked, and for this reason, should be separately evaluated using 'specific instruments' as part of a geriatric assessment. They were referring to a previous study that had found almost 90% of its participants well-nourished and only 1.8% malnourished. However, among frail individuals, only 63.9% were malnourished and 36.1% were well nourished. In conclusion, they wrote: "We found that frailty and nutritional status have a multiplicative effect on adverse outcomes in community-dwelling older adults. "Frail, malnourished individuals have a higher risk of adverse outcomes than frail, well-nourished individuals. Nutritional status assessment in older adults is important because improving nutritional status through supplementation may also improve frailty."

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Omega-3 eggs: Team looking to boost heart-healthy fats in eggs

reveal 'surprising' results

By Tim Cutcliffe 05-Apr-2018
NutraIngredients USA

Scientists looking to boost the levels of healthy fats in eggs have found that that increasing oleic acid - the main fatty acid found in olive oil - had an unexpected effect on levels of omega-3.

Researchers aiming to boost the levels of healthy fats in eggs have uncovered a surprise finding that could have implications beyond the production of eggs. Writing in the journal *Lipids*, the team behind the study looked to modify the way chickens are fed to help produce eggs with naturally improved levels of key essential lipids and healthy fats.

When chickens were fed increased amounts of flaxseed oil, which is a rich source of the short-chain omega-3 alpha-linolenic acid (ALA), the chickens produced eggs with up to 9.4 times more total omega-3 content than controls - and up to 2.2 times more heart healthy long chain omega-3 polyunsaturated fatty acids (PUFAs).

Building on these findings the team then aimed to further enrich eggs with healthy oleic acid - in addition to the improved omega-3 levels - by feeding chickens the same flaxseed oil in combination with high-oleic acid soybean (HOSO).

However, the Penn State University research team reported a 'surprising' finding at this point - although the HOSO successfully increased the MUFA content of the eggs as expected, the combination also reduced the accumulation of omega-3 fats within the yolk when

compared to providing the flaxseed oil alone.

Indeed, at the highest dose of supplementary HOSO, the accumulation of ALA, long-chain omega-3 PUFAs, and total omega-3 fatty acids were found to be reduced by 37%, 15% and 32% respectively, said the authors - led by Professor Robert Elkin. "Thus, in the context of producing a more heart-healthy egg, these results suggest that dietary oleic acid is not neutral with regard to the overall process by which dietary ALA is absorbed, metabolised, and deposited into egg yolk, either intact or in the form of longer chain/more unsaturated n-3 PUFA derivative," said Elkin.

Significance

Elkin noted that this study is the first study to demonstrate that dietary oleic acid can reduce the accumulation of omega-3 fats in the eggs yolks of chickens fed flax oil. But the findings may also have implications for humans, as many elements of the fat digestion and absorption process are similar in humans and chickens, the team stated.

"It is possible that in oleic acid might oils rich hinder the body's ability to reap the full nutritional benefits of EPA and DHA if consumed along with fatty fish or omega-3 fatty acid supplements, such as fish oil capsules," said Elkin. "This also could be occurring in people consuming a Mediterranean diet, in which oleic acid-rich olive oil is the principal source of fat, and moderate to low amounts of fish are eaten," he added.

Oleic acid effect?

However, Elkin noted that the study does not establish whether the surprising effect of lowering omega-3 absorption was due to oleic acid itself or specifically from high-oleic soy oil. The authors said further investigations are already in progress using other oleic acid-rich

oils to determine this.

The team also suggested that competition between oleic acid and ALA for absorption in the intestine may have been responsible for the result.

"The importance of this research to the (egg) industry is that we have learned of a potential new hindrance to enriching eggs with omega-3 fatty acids, and that information can be used when trying to develop the 'next generation' of enriched eggs," Elkin concluded.

Rosemary and tomato extract shown to protect eye health

By Noli Dinkovski 03-Apr-2018
Food Manufacture

Evidence that a lycopene-containing tomato and rosemary extract can protect eye health has been strengthened following the publication of pre-clinical results in scientific journal *Molecular Vision*.

Research into Lycovision carried out by scientists at Hadassah-Hebrew University Medical Center in Israel, highlighted how adding the phytonutrient combination of tomato and rosemary to the already well-researched Age-Related Eye Disease Study composition, could better balance the cellular response to different challenges and key processes that affect eye health.

Overall natural protection mechanisms

The combination was shown to boost overall natural protection mechanisms against different stresses and provide antioxidant Research also suggested that protection. The study found that while lycopene did not contribute directly to macular pigmentation (like lutein did), it worked in tandem with the nutrients to help create the most potent combination of eye-protecting nutrients. lycopene sacrifices itself for lutein by protecting it from oxidation.

Study links lutein levels to higher IQ

By Stephen Daniells 30-Mar-2018
Nutra Ingredients Asia

Superior macula pigment optical density (MPOD) a measure of lutein levels in the eye and brain is associated with higher IQ levels says a new study.

Data from 114 overweight and obese people revealed that higher MPOD was an independent predictor of IQ and fluid intelligence, according to a new paper in *Nutrients* by scientists from the University of Illinois at Urbana-Champaign.

“We demonstrate these relationships among individuals with overweight and obesity, known to be at risk for lower MPOD status,” they wrote. “Given that excess fat mass has also been related to poorer cognitive function and brain health, the finding that MPOD was positively related to intelligence provides a potential opportunity to counter obesity-related cognitive impairment

using dietary approaches”

Lutein and brain health

The link between lutein and eye health was first reported in 1994 by Dr Johanna Seddon and her co-workers at Harvard University, who found a link between the intake of carotenoid-rich food, particularly dark green leafy vegetables like spinach, and a significant reduction in age-related macular degeneration (AMD).

Numerous studies with data from primates, children, middle-aged people, and the elderly now support the importance of lutein in brain health, which is unsurprising given that the eyes and the brain are connected.

Indeed, recent findings from pediatric brain tissue studies have shown that about 60% of the total carotenoids in the pediatric brain tissue is lutein, and yet NHANES data show that lutein is only about 12% of the carotenoids in the diets, so there is a preference for lutein in the brain.

A 2017 study by scientists from Queens University Belfast and the Macular Pigment Research Group at the Waterford Institute of Technology found that higher blood levels of lutein and zeaxanthin may be associated with better cognition, memory, and executive function.

“Although many studies in recent years have linked greater MPOD with multiple aspects of cognitive function, to our knowledge, this is the first study to examine the influence of both adiposity and macular xanthophylls and their implications for cognitive abilities

among individuals with overweight and obesity,” wrote the authors of the new *Nutrients* paper.

“Further, the extent to which macular xanthophylls contribute to the intellectual abilities has not been directly investigated Superior MPOD status in the current sample was related to higher general intelligence as indicated by IQ”

Led by Naiman Khan, PhD, RD, the UIUC scientists assessed MPOD, dietary lutein and zeaxanthin intakes, and intelligence (using the Kaufman Brief Intelligence Test-2) in 114 overweight and obese people aged between 25 and 45.

The results showed that MPOD was inversely related to a person's percentage fat, and it was also positively associated with IQ and fluid intelligence, which is our ability to problem solve in novel situations, and to think creatively and flexibly in response to everyday challenges. On the other hand, no significant associations were observed between MPOD and crystallised intelligence, which is the ability to retrieve and use information acquired throughout life.

“One of the novel implications of the present work is that it demonstrates that the positive implications of macular xanthophylls for intellectual abilities are evident even among adults with overweight and obesity or individuals with greater risk for suboptimal macular xanthophyll status,” wrote the researchers. public sector menus every day.

FOOD SCIENCE & INDUSTRY NEWS

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3-D Printed Food could change how we eat

Researchers 3-D print food with customized texture and body absorption characteristics

Science Daily April 24, 2018

According to recent findings, 87% of the U.S. population fails to meet vegetable intake recommendations, with unpleasant taste being the primary reason for the shortfall.

Jin-Kyu Rhee, associate professor at Ewha Womans University in South Korea, will discuss his new research and the potential of 3-D printing technology for food production at the American Society for Biochemistry and Molecular Biology annual meeting during the 2018 Experimental Biology meeting to be held April 21-25 in San Diego.

"We built a platform that uses 3-D printing to create food microstructures that allow food texture and body absorption to be customized on a personal level," said Rhee.

"We think that one day, people could have cartridges that contain powdered versions of various ingredients that would be put together using 3-D printing and cooked according to the user's needs or preferences."

3-D printing of food works much like 3-D printing of other materials in that layers of raw material are deposited to build up a final product.

In addition to offering customized food options, the ability to 3-D print food at home or on an industrial scale could greatly reduce food waste and the cost involved with storage and transportation.

It might also help meet the rapidly

increasing food needs of a growing world population.

For the new study, the researchers used a prototype 3-D printer to create food with microstructures that replicated the physical properties and nanoscale texture they observed in actual food samples. They also demonstrated that their platform and optimized methods can turn carbohydrate and protein powders into food with microstructures that can be tuned to control food texture and how the food is absorbed by the body.

"We are only in early stages, but we believe our research will move 3-D food printing to the next level," said Rhee.

"We are continuing to optimize our 3-D print technology to create customized food materials and products that exhibit longer storage times and enhanced functionality in terms of body absorption."

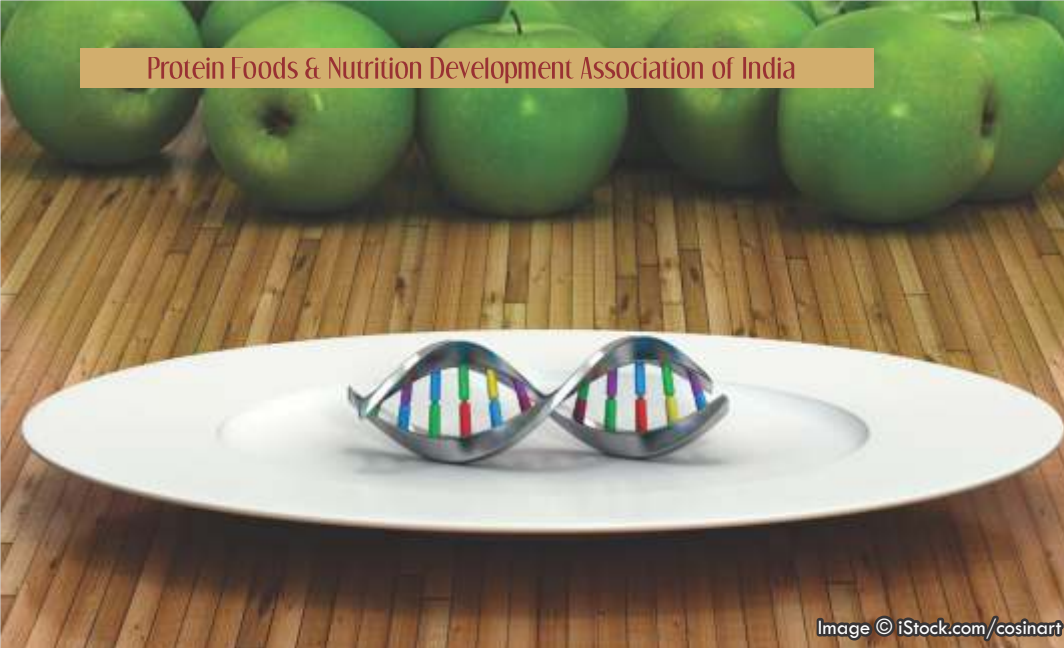


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Industry interest in nutrigenomics on the rise, Vitafoods Europe survey finds

24 Apr 2018 Nutrition Insight

Industry interest in personalized genetic testing and nutrigenomics is growing, suggests a survey on the most important trends for the future of the industry.

Of the more than 200 nutrition professionals surveyed, a quarter (26 percent) identified new personalized assessment technologies as a key long-term trend, followed by provenance and traceability (19 percent), transparency (18 percent) and sustainability (11 percent).

The findings come from a survey of 218 industry professionals by the organizers of Vitafoods Europe, which takes place between May 15 and May 17 in Palexpo, Geneva.

The organizers report that industry trends will lead the Education Program at this year's event, and the opportunities for personalized dietary advice created by nutrigenetics and nutrigenomics will be key topics of the interactive personalized nutrition workshop.

The research also reveals a sharp increase in interest in

nutrigenomics, the science that allows companies to offer consumers nutritional advice based on their DNA. Fourteen percent of respondents said nutrigenomics would be a key trend over the coming year – up from 8 percent a year ago.

“Personalized assessments are already driving the next stage of growth for the industry. For example, quick blood panels can reveal nutritional deficiencies, some of them in a few hours.

Major advances have been made in nutrigenomic technology, and nutrition companies are increasingly responding to the opportunities. However, there is a lot more to learn to fully provide a reliable picture of nutrition and the role of genetics,” comments Monica Feldman, President of Consumer Health Strategy Inc.

In a recent special report, NutritionInsight explored a number of developments and offerings in the personalized nutrition space, with industry experts noting that consumers are increasingly open to a more science-based approach to personalization.

“The next progression of the personalization trend sees consumers making decisions based on their unique genetic profile, metabolism or disease risks,”

Fonterra Program Manager Nutrition and Health, James Dekker told NutritionInsight. “These are the consumers wanting to make changes in their diet based on their individual needs, which could be through DNA testing, microbiome (gut) profiling or other tests.”

“We’re seeing the rise of consumers taking an interest in genetic profiling; the next question is how do we, in partnership with food manufacturers, translate this into products people can buy.”

“From new non-invasive continuous tracking and analysis systems (i.e. wearable devices) to the application of Artificial Intelligence (AI) and Machine Learning (ML) techniques to identify patterns and correlations in between the gathered user data and specific health-related conditions, there is plenty of room for improvement in several areas.

These correlations, already known at some forums as Digital Biomarkers, will empower preventive health approaches,” Marcos Lopez, Monteloeder, Digitized Ingredients Brand Manager told NutritionInsight. “The technologies currently available might not be perfect or mature, but are good enough to start this journey that will lead us to a better future.”

Meanwhile, the survey ahead of Vitafoods Europe also suggests there will be a shift in attitudes to gender-targeted marketing of nutrition products.

Nearly half (46 percent) of the industry professionals surveyed said their companies would adopt more gender-neutral marketing over the next ten years, while 11 percent said there would be more marketing aimed at women, and 5 percent said there would be more marketing aimed at men.



Bone and joint health: Consumer demands and promising ingredients

19 Apr 2018 Nutrition Insight

Mobility, which incorporates bone and joint health, is becoming a key concern for a range of demographics. NutritionInsight spoke with a number of key suppliers in the bone and joint health space about the key ingredients to look out for, as well as some key consumer demands driving innovation in this space.

Key market drivers

World populations are getting older and with age the risk of bone and joint health issues – such as osteoporosis, rheumatoid arthritis and osteoarthritis – increases. “Bone and joint health is a key concern for consumers. A recent DSM study involving 7,500 consumers across ten countries found that 55 percent of the global population have expressed it as a worry. Understandably, bone and joint health is the main concern for mature adults, aged over 51 years, with 54 percent of respondents putting it at the top of their list,” says Dr. Igor Bendik-Falconnier, Senior Scientist Human Nutrition & Health, DSM Nutritional Products.

However, bone and joint health concerns do not just affect seniors. “It also has an impact on younger consumers, such as so-called ‘weekend warriors,’ who exercise once or twice a week. As this group leads busier, more active lifestyles, a bone and joint health positioning is

also adding value to sports and performance nutrition products. Fitness enthusiasts are often already supplement users and this demographic is therefore primed to consider bone and joint support earlier in life, particularly as regular wear and tear starts to take its toll,” says Dr. Bendik-Falconnier.

On the topic of bone and joint health, suppliers are seeing a demand for clean label and natural solutions, as well as solutions that have preventative benefits. “We have seen a shift away from chemical, synthetic drug treatments towards a more natural, holistic and preventative approach when it comes to health and wellness in general, including maintaining structural health. Botanicals, for instance, are attracting renewed attention, as consumers go back to basics with natural options,” says Lisette van Lith, Global Director at Peptan.

Although almost a third of consumers already take dietary supplements to keep their bones (32 percent) or joints (28 percent) healthy, purchasing behavior is generally for relief products when they are already suffering from a complaint, a 2017 DSM study found. “As more people adopt healthier, more active lifestyles, the market looks set to focus on prevention, rather than treatment. Increasing numbers of consumers are realizing that strengthening bone and joint health from an early age could help to reduce complications later in life,” Dr. Bendik-Falconnier notes.

“In terms of applications, capsules are a firm favorite amongst many bone and joint health manufacturers, as they enable the safe and secure containment of a wide range of ingredients including powders, liquids and semi-solids. Such dosage forms are a popular choice with consumers too, with

almost half of shoppers preferring food supplements in a capsule form,” says Juliana Erickson, Marketing Director, Consumer Health & Nutrition at Lonza. In a survey conducted by the Natural Marketing Institute (NMI) and commissioned by Capsugel, now part of Lonza, convenience was high on the list for many buyers when surveyed on the most important attributes of supplement products. Indeed, 83 percent of consumers stated that they look for products which are easily digestible, and 76 percent preferred supplements that are easy to swallow, Erickson states.

New ingredients gaining popularity “There are several emerging ingredients, such as herbals and beetroot, that are showing promise in the bone/muscle and joint health market,” says Dr. Bendik-Falconnier. “However, it is the more established ingredients like vitamin D that are really gaining momentum, as the topic of healthy aging takes center stage. Studies show that vitamin D is crucial in maintaining bone health in later years, particularly when taken together with calcium and could help to reduce the risk of osteoporosis. Vitamin K is also showing great potential for bone health specifically, and the European Commission has authorized that vitamin K contributes to the maintenance of normal bone.”

Eric Anderson, Senior Vice President of Global Marketing and Business Development with NattoPharma, similarly highlights the potential for vitamin K, and vitamin K2 in particular, within the bone and joint health space. “Vitamin K, specifically menaquinone-7 (MK-7), is a necessary companion ingredient to calcium and vitamin D for the preservation of bone health, supporting the desired rate of bone turnover,” Anderson notes.

Adding K2 to bone-health formulas has been found to simultaneously ensure that calcium is prevented from being deposited into cardiovascular arteries, which, over time, can cause them to stiffen. This can ultimately contribute to increased cardiovascular risks.

"This is important because women (and men, too) specifically do not yet realize how much calcium they are likely consuming: calcium is not only abundant in dietary supplements, but naturally occurring in healthy diets, and is added to many foods," Anderson notes.

"A typical daily calcium tally of a healthy diet including supplementation can show an overabundance of the mineral. At the same time, our bodies do not produce calcium on their own, so it is important to make sure we are getting it through diet or supplementation to ensure multiple systems in the body are supported (including bone health)," Anderson notes. He adds that pairing calcium with vitamin K2 as MK-7 is key to ensuring that calcium is safely delivered to bones where it is needed, instead of the arteries and blood vessels.

Also within the mobility space, collagen peptides are gaining interest. Already known to support joint and bone health, collagen peptides are expected to become an even bigger trend in 2018 and beyond. Collagen is already popular in the beauty industry for its skin benefits, and consumers are now becoming more aware of its potential for sports nutrition, healthy aging, bone and joint health, experts note. "The latest NBJ Supplement Business Report estimates that collagen sales went up 7.2 percent over 2016-2017 reaching US\$1.1 billion in 2017, with projected fast-growing sales in 2018. Consumers are increasingly looking for preventative health

supplements, whether it is to support their active lifestyles or healthy aging. Collagen plays a vital role in a healthy musculoskeletal system and products such as collagen peptides, have therefore become widely favored by consumers for their multiple holistic benefits," says van Lith.

"Looking at the joint health market specifically, consumers are increasingly turning to products and ingredients that can support in reducing the effects of aging, to help them maintain a healthy and active lifestyle. When we get older, our natural ability to produce collagen slows down, leading to joint discomfort. As such, Lonza's UC-II undenatured type II collagen is particularly gaining traction in the joint health arena, where multiple clinical studies have shown it be more effective at maintaining optimal joint function than traditional ingredients, such as glucosamine and chondroitin," according to Erickson.

In one study, 186 people with osteoarthritis of the knee took either 40 mg of UC-II cartilage containing undenatured type II collagen, a combination of 1,500 mg of glucosamine + 1,200mg chondroitin or a placebo for 180 days. Compared to the placebo and glucosamine + chondroitin combination, the UC-II brand significantly improved joint function, mobility and flexibility when results were measured using three different assessment tools: WOMAC, VAS and the Lequesne functional index.

"We have seen many innovative new product developments recently containing collagen, such as nutrition bars, a variety of RTD or instant drink powders. While the popularity of collagen will keep growing, consumers demand more enticing and innovative product formats and formulation to incorporate supplements into their

daily diets. Collagen peptides have a neutral taste profile, therefore can easily be integrated in all kinds of functional food and drinks, from dairy to fortified gummies," van Lith notes. The latest addition to the Peptan range, Peptan IIm, for instance, is an all-round hydrolyzed collagen type II matrix, containing both type II collagen and glycosaminoglycans in one single ingredient. It is specifically designed to boost joint health and is suitable to be used in pills and capsules due to its low daily dosage.

Scientific backing is the key

"The segment presents a viable opportunity for the nutraceutical industry. The challenge will be that the bone and joint health landscape is so competitive, meaning manufacturers need to look at trending ingredient combinations to provide a point of differentiation," says Dr. Igor Bendik-Falconnier. "Consumers are taking a holistic view of their health and favoring products with numerous benefits, often as part of a presentation-led approach. This, in turn, is leading manufacturers to adopt innovative dosage forms which enable the effective delivery of multiple ingredients for optimal health benefits. Delayed release and improved bioavailability of ingredients are other key challenges facing the industry, which are driving supplement producers to seek solutions to formulation challenges," Erickson adds.

Consumers are becoming increasingly aware and educated on ingredients and their benefits, prompting growing demand across the industry for manufacturers to create products which are backed by substantial scientific evidence. "This may present a challenge, but also an opportunity, for many ingredient suppliers, as they invest more time and resources into formally proving their products' health benefits," Erickson concludes.

By Lucy Gunn

Time to get personal? How to embrace digital technology in tomorrow's nutraceuticals

12 Apr 2018 Nutrition Insight

Image © iStock.com/JohnDWilliams

Within the world of nutrition, personalization has quickly climbed the ranks to become a key industry phrase, with both larger players and newer start-ups seeking to profile themselves as capable of offering their customers, and ultimately consumers, cutting-edge solutions for all their health needs. NutritionInsight looks at some of the developments in this space, as well as the challenges involved in the pivotal strategy of using digital tools with personal consumer input.

Mindful, digital-savvy consumers set the agenda

As populations become more digitally savvy, they are taking personal well-being into their own hands. Roshena De Leon, Global Insights Manager at NZMP [Fonterra's ingredients arm] tells NutritionInsight: "The use of digital tools and mobile devices helps people understand and track health and well-being needs. They then choose and consume products for the dietary requirements being addressed. Diets are no longer 'one size fits all' and this will continue to drive consumer demand for products tailored to people's specific needs within the food and beverage sector." Marcos Lopez, Monteloeder, Digitized Ingredients Brand Manager, echoes this notion. "We live in the digital era. Digital customers look for self-management services, superior customer experience and proven efficacy. Companies must be ready to change and adapt to these new demands,"

he notes.

"Digitalization of health ingredients"

Increasingly, companies look into marrying digital tools with nutritional/nutraceutical offerings to meet these consumer

demands. "One way to meet the demand for personalization is to build portfolios to accurately target fragmented, and increasingly niche, consumer groups. An interesting area of personalization that is enabled by digital is co-creating with the consumer," says de Leon.

Last month, DSM and digital health company Mixfit entered into a strategic partnership to deliver personalized nutrition solutions by providing individuals with the right blend of nutrients based on a set of health and activity measurements. Mixfit's Intelligent Nutrition Assistant (Mina) is an Artificial Intelligence solution that analyzes a person's genetic makeup, alongside their diet, lifestyle and health goals. Mina then identifies nutritional gaps and creates and dispenses beverages containing a customized mix of DSM's Quali Blends with vitamins and minerals throughout the day.

"Mina will work effectively with some very general personal health information, provided to Mina during the setup process. Mina's intelligence and accuracy improves as users connect their real-time health data, medical data and wearables devices," Nelleke Barning, Global Director Communications & External Affairs, DSM Nutritional Products, tells NutritionInsight. Personalized nutrition will be central to DSM's Vitafoods Europe 2018 theme, as was clear from an interview with Frédéric Boned, EMEA Vice President (VP) of its Human Nutrition & Health business.

Last month, BASF announced that it had joined the Personalized Nutrition & Health consortium founded by TNO and Wageningen University & Research. As part of the collaboration, BASF is to contribute to the consortium's research fields with its health ingredients brand, Newtrition, and use its scientific capabilities on optimized micronutrient intake for improvement of health and prevention of diseases, along all stages of life. "This collaboration is a key milestone in our commitment to shape the future with ecosystems that foster the progress of personalized nutrition and health," says François Scheffler, Head of BASF Global Human Nutrition. "We are passionate about developing innovations that can enable each one of us to reach our full potential with science-based choices underpinned by personal needs."

Consumer-based solutions

Also aiming to provide its customers with the capabilities to provide consumer-based solutions, Monteloeder has for the past four years been working on a new concept, dubbed the "Digitalization of health ingredients." The company uses mobile technologies and wearable devices during a product's development. With the information gathered, Monteloeder develops digital solutions where product effects, consumer personal characteristics and context are taken into consideration.

"Each of our products has a mobile App incorporated to interact with the consumer in an easy, comfortable and personalized manner," Lopez explains.



Natural remedy to help
lose weight and improve
your health



PFNDI June 2018

“We have created our new development methodology based on design thinking principles. Our digital solutions are designed to provide our partners with the right tools to implement a consumer-centric strategy,” Lopez tells NutritionInsight. For example, “Paired with Monteloeder’s Metabolaid functional ingredient comprised of two plant extracts: Hibiscus sabdariffa and Lippia citriodora, the mobile application can track product consumption and its effects on users while evaluating the consumer’s habits, providing them with guidelines towards a healthy lifestyle,” Lopez says.

The digital nutraceutical concept aims to accompany and support consumers in their journey and help them achieve their goals, demonstrating the product’s effectiveness and adding value along the way. Apart from supporting consumers, Monteloeder’s approach to personalized, digitalized nutrition allows companies to gain the ability to interact with their consumers, get insights, learn their habits and needs to continuously grow and improve their products and services day by day.

So where should industry look for further development?

To further capitalize on the convergence of technologies and health personalization demands, it is essential to invest in ways to gather, order and analyze big data, Jenny Arthur, Head of Nutrition and Product Development, Leatherhead Food Research, notes in the March edition of *The World of Food Ingredients*. “Deriving actionable insights from behavioral data generated via social media, mobile applications and online shopping can inform business decisions at a strategic level. This ensures innovation is rapid and focused enough to keep pace in a digitally transformed world,” she adds. An online survey conducted by Leatherhead Food Research last

year reveals a tranche of confident, informed consumers who want to control and shape their own healthy eating patterns. A fifth (20 percent) of all UK adults, and more than a quarter of women (26 percent) have created their own meal plan or diet based on the research [a total sample size of 2,104 adults]. This corresponds with an increased use of personal technology to measure and manage health-related behaviors. “We found that 39 percent of 35-44-year-olds and 26 percent of all UK adults have used an app or wearable device to count steps or measure burned calories,” Arthur writes.

Technology will also play an important role overcoming any challenges regarding health personalization on a larger scale. “The logistics and economics of contemporary food and beverage manufacture are firmly rooted in mass-production models. Finding ways to reconcile this with the need for enhanced personalization will require innovation and reinvention,” Arthur notes.

Challenges to widespread adoption

Although there is enough impetus and interest in the realm of personalized, digitalized nutrition, on the consumer side especially, there may be hurdles involved in assuring acceptability. With social media powerhouse Facebook embroiled in a huge data collection scandal right now, it will not be surprising if consumers become much more timid in how they share their data for the foreseeable future. “It would be naive to think that people are not concerned about sharing their personal data, especially considering the scandals that we see in the news lately,” Lopez notes. “Nevertheless, with the right data access security protocols, these hurdles can be overcome.”

“As we conceive it, the exchange is

more like a collaboration. Users share their personal data with companies to receive value in return, [such as] personalized offers and support that empower and facilitate their self-care. Thus, if you as a company can provide a good value and demonstrate your products effectivity, consumers will accept the deal,” he states.

Looking forward

So where should we be looking for the future of personalized nutrition? “The next progression of the personalization trend sees consumers making decisions based on their unique genetic profile, metabolism or disease risks,” Fonterra Program Manager Nutrition and Health, James Dekker tells NutritionInsight. “A small group of consumers are increasingly open to a more science-based approach to personalization. These are the consumers wanting to make changes in their diet based on their individual needs, which could be through DNA testing, microbiome (gut) profiling or other tests.” “We’re seeing the rise of consumers taking an interest in genetic profiling; the next question is how do we, in partnership with food manufacturers, translate this into products people can buy.”

“From new non-invasive continuous tracking and analysis systems (i.e. wearable devices) to the application of Artificial Intelligence (AI) and Machine Learning (ML) techniques to identify patterns and correlations in between the gathered user data and specific health-related conditions, there is plenty of room for improvement in several areas. These correlations, already known at some forums as Digital Biomarkers, will empower preventive health approaches,” Lopez notes. “The technologies currently available might not be perfect or mature, but are good enough to start this journey that will lead us to a better future.”

By Lucy Gunn

Processing breakthroughs 2018: HPP, PEF and REV technologies

09 Apr 2018 Nutrition Insight

Three of the most promising processing technologies for the nutrition space gaining momentum in 2018 are High Pressure Processing (HPP), Pulsed Electric Fields technology (PEF) and Radiant Energy Vacuum technology (REV).

These technologies meet the increasing demand for more cost-effective and sustainable food processing while maintaining the natural qualities of foodstuff. NutritionInsight spoke to experts in these forward-thinking areas at Anuga FoodTec 2018, Cologne.

HPP Innovators, Avure
HPP is a cold pasteurization technique by which products already sealed in final packaging are inserted into a vessel and exposed to a high level of isostatic pressure (300-600MPa/43,500-87,000psi) transmitted by water. The extreme pressure created crushes harmful bacteria while preserving the vitamins, taste and texture of the food. HPP is also known to extend shelf-life considerably – salsa made fresh will last two weeks, while HPP can extend the shelf-life to four months, while preserving the same levels of freshness. Unlike heat pasteurization techniques, HPP prevents damage to vitamins, antioxidants, flavor and the color of foods. It can be used for a growing list of products, including sauces, dips, dressing, juices, meat, pet food, baby food, seafood and wet salads.

Errol Raghubeer, Vice President of Avure, the first company to commercialize HPP, speaks to NutritionInsight about the growing market for HPP and its benefits. “HPP is a pasteurization

technology that has been used in the industry from the late 1990s, but we are seeing a tremendous amount of growth in new categories of product. During the developmental stage, it was used in guacamole, salsa and RTE meats, but we have seen huge growth in the beverage industry in a wide variety of fruit and vegetable juices. We have also seen dramatic growth in new applications such as ready meals, both in the US and Canada, but also in Asia and Europe.”

“There are three reasons for this. Firstly, HPP achieves high food safety levels, secondly, HPP uses an all-natural process without chemicals and thirdly, HPP does not affect nutrients, thereby meeting the consumer demand for natural, healthier products.”

Avure was acquired by JBT in 2017, a move which has allowed Avure's HPP technologies to reach a wider market. “Being part of JBT increases our worldwide reach and we can get into markets more competitively with more sales forces,” explains Errol Raghubeer. “JBT is a good supporter of us as far as the technology is concerned, and there are always opportunities to grow as the technology becomes more accepted by the industry.”

“Avure has just introduced a few larger models that are expandable. Without changing the system, we can upgrade the speed of the system by just adding additional pumps. That will meet customer requirements. You are not changing the system, just intensifying the pumps to speed the process up. It changes the time in which necessary pressure is achieved, but it also allows customers to get into the market at a lower capital investment.”

PEF Innovators, EnergyPulse Systems

PEF processing, also known as electroporation, is a non-thermal food processing technique for the mild preservation of liquid foods and beverages. It uses short, high voltage pulses to cause cell disintegration and microbial inactivation, retaining the freshness, nutritional and functional value of the product. The technique is energy-efficient and time-effective as it requires minimal heat while accelerating the diffusion processes, such as water removal. PEF is known to increase shelf-life while maintaining better nutritional value in comparison to traditional food processing techniques.

The EU funded FieldFood project aims to demonstrate the successful and real-scale capabilities of PEF technology in the processing of plant-based foods. The project analyzed the production of fruit juice, tomato products, wine, cider and olive oil, creating flexible and portable low-cost pulse generators.

Marcos Pereira of EnergyPulse Systems – a participant in the FieldFood project – speaks to NutritionInsight about the high quality, low energy benefit of PEF processing. “PEF means less heat, more efficiency and less water usage. It goes with the customer trend asking for higher product quality with greater energy efficiency.”

“The focus of the FieldFood project was on small producers, ranging from tomato producers, to wine producers, to those processing apples and cherries. The project was successful. We demonstrated very efficient production with a long shelf-life. We used modulators that only cost a fraction of the market price and we were also able to link them on a time basis. The key conclusion is that small producers can use PEF for better product quality, increased yield, and lower costs, including wineries and olive oil producers.”

PEF technology is evidently one of the key areas to watch in future food processing, including for snacks. Elea – the world's leading provider of PEF to the food, beverage and scientific sectors with over 70 installed systems – showcased their new application at Anuga FoodTec 2018. “An ordinary sweet potato is quite difficult to process, especially if you want to do more extreme cuts,” says Julian Witt of Elea, “but if you do a pretreatment with PEF you open up the cell membranes, which causes a leakage of the content and the pressure is released so the structure becomes more flexible. This is used in the chips industry to make it easier to cut, where there is less starch in your process water that you are losing and you can go for more extreme cuts too. We have developed the concept for a crinkle cut sweet potato product, which is difficult to do on an industrial scale.”

“The product is delivered on a belt between two electrodes where the pulsed electric field is applied. It is basically a conveyor belt, where the entry to exit takes about 10 seconds.”

“We have about 100 units installed already, mostly in the snacking industry. We have a strong focus on R&D and help a lot with the implementation in the best possible way. Different applications are possible, so if you look at drying applications you can see that you can evaporate the water much faster too. You could also do a gentler drying. There are also applications in the field of reduction of microorganisms in liquids, juices and smoothies to make a better product.”

REV innovators, EnWave

REV dehydration technology uses a combination of pressure and microwave energy to deliver a high-speed, low-temperature, efficient drying process. REV technology

homogeneously removes water from organic materials, providing superior flavor and texture while preserving the nutritive value of food products. Similarly, it also preserves the bioactivity of pharmaceutical products. The technology is more economical and much faster than freeze drying and produces superior products over air and spray drying. It is a continuous process that can control final moisture levels in a cost-effective manner and typically has a smaller footprint than competing processes.

Brent Charleton, Senior Vice President EnWave, tells NutritionInsight about the innovator's commercialization of the REV technology and its benefits. “We have commercialized it into eight different market verticals, including fruits, vegetables, spices and herbs, meat snacks, the dairy industry in the form of shelf-stable cheese and yogurt snacks.”

EnWave brand Mooncheese was launched to the US product in 2014, demonstrating to other manufacturers that REV could create value. “Fortunately for us, Mooncheese is now distributed in all Starbucks coffee chain outlets in North America, as well as in Costco and many others. In fact, it now has over 25,000 points of distribution. It is a US\$8 million revenue stream for our company. It was then replicated by eight other companies around the world, including those based in Chile, Turkey and Australia, where they launched their own branded shelf-stable cheese snack,” says Brent Charleton.

The second option is dried 100 percent natural fruit snacks, which he stresses are not the same as freeze-dried fruits. “They are dried under vacuum, and therefore tend to puff up more and have a softer crunch, while still maintaining the nutrient values that you would

expect in a premium product. We have now launched on Amazon on a test basis. This is a one-ounce product that sells at US\$4-5 and the reviews have been phenomenal thus far.”

“Shelf-life really depends on the quality of packaging. We dry down the raw material to below the necessary water activity threshold, in order to ensure a longer shelf-life, which will be impacted by the packaging quality,” he notes. The company has all of the certifications expected from a processing company. “Microwaves are used frequently in the industry and because we are creating a low-temperature drying process, we are not damaging the foodstuff like you potentially would in your household microwave,” he concludes.

Meeting the sustainability and health trends

Anuga FoodTec 2018 demonstrated that sustainability is one of the major drivers in processing innovation, as regulations around industrial waste and emissions continue to intensify. Moreover, a decrease in energy expenditure without affecting the product's safety or quality can offer a large economic advantage for the plants where advancements will be applied. Consumer demand for more natural and healthy products also continues to grow and accordingly, mild processing techniques will become a necessity in specific product categories. Products produced with mild processes maintain a high nutritional value, appealing color and flavor and have a decreased production cost due to lower energy expenditure. HPP, PEF and REV technologies are demonstrating this much-desired ability to increase the sustainability levels of processing while also retaining the natural qualities of foodstuff.

By Joshua Poole



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Bayn uses E-sensory tech to enhance sugar-reduced gingerbread taste

By Will Chu 09-Apr-2018 Bakery & Snacks

Bayn details the use of electronic sensory (E-sensory) technology that determines the aroma profile of a sugar-reduced food to mimic the taste of the original full sugar version.

This technique, which uses gas chromatography to build up a database of molecule aroma profiles, isolated cinnamon, cardamom, ginger and clove as key ingredients in creating the gingerbread flavour. "By mapping the aroma profile, we found that possibly more cinnamon and orange peel could be added to the sugar reduced dough, recipe one, to make the aroma profile more like the original recipe," the Swedish ingredient firm's whitepaper outlined. "On the contrary, more cloves should be added to the sugar reduced recipe two to match the aroma profile." By building databases of e-sensory data from a larger number of samples, changes to the texture, sweetness, and matrix effects of the food as a result of sugar reducing measures can be mitigated.

Replacing sugar 'not easy'

"To replace sugar is not an easy task for the food industry as sugar is not only added to sweeten, but also plays an important role for texture, taste and colour," said Mathias Lundgren, physical chemistry, Bayn Europe AB. "The use of e-sensory

has been shown to be a valuable tool when developing new recipes of food products to match the aroma profiles to the target recipe. "Looking at the results from the study I believe that using modern technology, such as e-sensory, can be an excellent and effective tool to reach healthier sugar reduced products."

Lundgren's work uses two recipes of gingerbread. One replaced sugar with Eureba Bakery Blend, Bayn's sweetener blends that include polyols (sugar alcohols) and dietary fibres. He then used data from ten different gingerbread cookie manufacturers in the Swedish market to compare the sensory data measured from the two recipes. Lundgren's findings revealed that adding more cinnamon or orange peel to the sugar-reduced recipe would make the sensory more like the original recipe.

"E-sensory technology is one of the components that will be used on the cloud platform that Bayn Europe is currently building," said Patrik Edström, CEO of Bayn Europe. "Looking at the results from the gingerbread study, we can see that e-sensory can successfully be used to help optimize sugar reduced recipes to be more like full sugar recipes. "We are certain that this technology development can shorten the development time and eliminate the risk of uncertainty for food and beverage producers looking to reduce sugar. We will now continue to conduct research using e-sensory on other types of recipes."

Sense-led products

In the e-sensory of food and beverages, measurements such as hardness, colour, viscosity and also chemical analyses are carried out, to ensure that low fat, low sugar, high fibre foods match their less healthy counterparts for sensory quality. So for example, when eating, the human nose senses the

volatile molecules released from the food matter when it is heated to body temperature in the mouth. The aromatic sensation is then recorded and can refer to previous experiences, feelings and memories.

In recent years, a number of product launches have harnessed a sense-led approach in recreating the desirable sweet and salty taste. Knorr flavour pot gels have been touted as a solution to enhance the salt flavour. In a similar vein there are products available that make use of ingredients to enrich the umami 'meat' taste. In addition, the launch of several frozen fruit and vegetable snacks, have paralleled recent offerings of low calorie, flavoured popcorn snacks such as Manchester-based Yumsh Snacks' orange- and apple-flavoured popcorns, called Poptang Tango.

Better bioavailability: Novel curcumin formulation could overcome absorption issues

By Tim Cutcliffe 06-Apr-2018 NutraIngredients USA

The use of a gamma-cyclodextrin formulation in curcumin supplements could provide a significant boost to bioavailability say researchers who report a 10-fold improvement versus standardised unformulated curcumin.

Cyclodextrins have been widely used in pharmaceutical and nutritional formulations to improve bioavailability particularly for compounds with low water solubility, explained the researchers writing in the European Journal of Nutrition.

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Furthermore, gamma-cyclodextrin has the advantage over other forms of being completely digested by the enzyme amylase produced by the pancreas and in saliva, the authors added. The team reported that participants supplemented with the novel gamma-cyclodextrin curcumin formulation (CW8), showed the highest absorption of curcumin measured by blood levels over 12 hours.

Compared with a control product unformulated standardised curcumin those given the CW8 supplement also showed the highest blood levels of total curcuminoids and the individual curcuminoid demethoxy-curcumin (DMC). "The CW8 formulation showed a 39-fold increase in relative bioavailability compared with unformulated standard curcumin," commented co-author Dr. Valentina Razmovski-Naumovski of the University of New South Wales.

"The data presented suggest that gamma-cyclodextrin curcumin formulation CW8 significantly improves the absorption of curcuminoids in healthy humans," she added. While many approaches have tried to improve curcumin bioavailability, the 39-fold improvement versus unformulated standardised curcumin reported in the new randomised double-blind crossover trial is one of the highest results achieved to date. However, since the trial was essentially pilot scale in size, further larger studies are needed to confirm the findings, commented the team.

The curcumin challenge

Curcumin, the principal active ingredient in the spice turmeric, has demonstrated multiple health benefits in previous research. Its properties include anti-oxidant, antimicrobial anti-inflammatory and anti-diabetic effects. Razmovski-Naumovski and colleagues noted that realising the optimal health benefits of curcumin

has historically been limited by its low solubility in water and poor intestinal absorption. The new study examined novel curcumin formulations to identify possible ways of improving oral bioavailability in 12 people. The subjects were given four different oral supplements of curcumin, separated by a seven day washout period between formulations.

The four formulations were CW8 (mentioned above) a phytosome formulation of Curcumin: Soy Lecithin: Microcrystalline Cellulose in a ratio 1:2:2 (CSL) a formulation of curcuminoids and essential oils of turmeric rhizome (CEO) and the unformulated control product standard curcumin (StdC). The formula products were not named in the study due to absence of consent for disclosure. Fasting blood samples were taken at baseline and various time points up to 12 hours. The blood plasma samples were analysed for curcumin, DMC and bismethoxycurcumin (BMC). The subjects were given two standardised turmeric-free meals during the twelve-hour period. The researchers calculated the relative bioavailability of the three formulated products compared to the control (StdC) using the area under the plasma concentration time curve.

Category crossovers and savoury swaps: Mintel on the future of sweet flavours

By Niamh Michail 29-Mar-2018
Food Navigator

As the backlash against sugar continues,

manufacturers of sweet products are coming up with eye-catching solutions to win consumers' attention from chocolate pizza to vegetable muffins, says Mintel.

According to associate director for food and drink at market research company Mintel Jenny Zegler, the future of sweet flavours has many potential opportunities. "Sugar continues to be a concern for consumers globally so we're seeing brands making less sweet options," she said, referencing Canadian brand Garden of Eatin', which has launched a blueberry and oat muffin that also contains fresh courgettes and carrots.

"Vegetables are invading a host of sweet categories and can be used to create flavour profiles that are inherently less sweet," said Zegler in an online blog post. "In bakery, carrots and other naturally sweet vegetables such as beetroot, parsnips, pumpkin, sweet potatoes and courgettes can add flavour and texture to cakes, and help keep them fresh and moist."

In Europe, German brand Verival has an organic pumpkin and tomato porridge that is high in protein and made with whole vegetable pieces, herbs and spices. Marcia Mogelonsky, global analyst at Mintel said the idea is to use vegetables with a certain flavour profile, resulting in cereals that "tend not to be really savoury, but less sweet".

Image © iStock.com/Imagesbybarbara



Companies are also experimenting with products featuring new combinations of sweet with savoury or spicy flavours, or even sweet versions of traditionally savoury categories. Launched in Portugal by family owned, Germany-headquartered manufacturer Dr. Oetker, the Ristorante Dolce Al Cioccolato is a frozen dessert pizza topped with chocolate sauce and three types of chocolate.

Meanwhile, last year, German biscuit manufacturer Bahlsen launched Leibniz Pick Up! sandwich cookies filled with chocolate and whose sweetness was offset by chilli.

Tying flavours to a specific location could also provide "approachable innovation", Zegler added. US confectionery giant the Hershey Company is one firm doing this with its introduction of limited edition products that have flavours inspired by six US states, such as Florida Key Lime Pie Twizzlers.

They develop a microcapsule of garlic oil with potential healthy effects

Food News LATAM APRIL 25, 2018

The Ramón y Cajal University Hospital, specialist in the prevention of cardiovascular diseases, is going to carry out a pilot study with patients to verify the preventive and / or beneficial effect of the regular consumption of purple garlic oil extract on endothelial function.

The microencapsulated garlic oil improves the bioavailability of its bioactive compounds in the body. These results are part

of a study conducted within the framework of the ENDOTALLIUM project in which the beneficial effects of regular consumption of purple garlic in the cardiovascular system have been studied. Specifically, in the prevention of injuries related to the endothelium (tissue that covers the internal area of all blood vessels and the heart).

Research on the bioavailability (amount of bioactive compound potentially available in the intestine) of the compounds derived from garlic are important to know their potential effects in the organism, since not all the compounds present in garlic are able to cross the stomach without Degrade, reach the intestine in sufficient quantity and cross the intestinal wall to exert its functional effect on the cardiovascular system.

Microencapsulation technologies to obtain the highest concentration of bioactive substances in garlic In this sense, AINIA has made the identification and selection of purple garlic, as the variety with the highest concentration of bioactive compounds with a potential beneficial effect on endothelial function. Once selected, the oil has been extracted and innovative microencapsulation technologies have been applied to protect bioactive substances from garlic and achieve the highest bioavailability of their bioactive compounds.

To carry out the bioaccessibility tests of the bioactive compounds of microencapsulated purple garlic, the Dynamic Digestor in vitro of AINIA has been used, which reproduces the process of chewing, stomach and

intestinal digestion, in order to quantify the amount of bioactive compounds potentially accessible for the organism, after gastrointestinal digestion.

Once the most bioavailable format has been obtained, the Endothelial Pathology Unit of the Ramón y Cajal Hospital, specialist in the prevention of cardiovascular diseases, will be responsible for scientifically verifying the preventive and / or beneficial effect of consumption through a pilot study in vivo. Regular extract of purple garlic oil on endothelial function.

Beneficial properties of garlic on the cardiovascular system Garlic is one of the essential components of the Mediterranean diet, a prototype of heart-healthy nutrition. However, there are currently few scientific studies that support the specific effects of this product in the body.

The project "Potential benefits on the endothelial function of the bioactive compounds of a purple garlic extract: ENDOTALLIUM" is led by the cooperative COOPAMAN SCL, a company dedicated to the commercialization of garlic; and gutter with the participation of AINIA technological center and the Endothelial Pathology Unit of the Foundation for Biomedical Research of the Ramón y Cajal University Hospital (FIBIOHRC).

The company COOPAMAN has been responsible for valorizing the properties of garlic by analyzing the composition of the bioactive compounds present in different varieties. In the same way, it has evaluated the influence of the variables of the extraction process of garlic on its composition. In addition, it will participate in the study of the stability of bioactive compounds during their commercial life, as well as in the tests with consumers.



REGULATORY NEWS

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Food industry should reduce food product portion sizes, experts urge

Science Daily April 30, 2018

New research, published in the *American Journal of Clinical Nutrition*, highlights the benefits of the food industry changing food product portion sizes in order to make healthier eating more normal.

Historical increases in the portion sizes of commercially available food products are known to cause 'passive' overeating and have been linked to the emergence of the worldwide obesity crisis. One idea that public health bodies are currently promoting is that the food industry needs to reduce the portion sizes of the products they are selling. Research from the University's Institute of Psychology, Health and Society, led by Dr Eric Robinson, aimed to establish whether reducing a food portion size "renormalizes" perceptions of what constitutes a normal amount of that food to eat and results in people selecting and consuming smaller portions of that food in the future.

Experiments

During the first of three experiments participants were randomly served either larger or smaller portions of the same meal (quiche and salad). The participants were advised the experiments were part of a 'food, mood, and

reasoning' study as to not alert them to the real aim of the experiment which could have a detrimental effect. During the second experiment, which took place the following day, participants were advised they could serve themselves whatever they wanted to eat from the same type of food provided in the first experiment.

In the third experiment, the participants were asked what their preferred portion size of the food was a week later. The results from all three experiments showed that being served a smaller portion of food resulted in participants changing their perception of what a normal portion size was and this resulted in participants choosing to eat less food in future.

Recalibrating perceptions

Dr Eric Robinson, said: "There have been suggestions that shrinking the portion size of commercially available food products could be one approach to reducing overconsumption and tackling population-level obesity. "The present findings indicate that if portion sizes of commercially available foods were reduced, these smaller, more appropriate portion sizes may recalibrate perceptions of what constitutes a "normal" amount of food to eat and, in doing so, decrease how much consumers choose to eat."

Dr Inge Kersbergen, said: "It is unclear from our research how long the effect would last for. The effects we observed were larger when we

examined food intake the next day in the laboratory than when we looked at portion size preference one week later. "Based on the idea that our immediate environment influences our perceptions of what a normal portion size is, it is likely that the effect would only last if we encounter smaller portion sizes more often than supersized portions."

Does more access to nutrition information impact consumption choices?

IFT Weekly April 25, 2018

Consumers have access to a variety of sources of nutrition information, including the Nutrition Facts label on packaged foods, the U.S. Dept. of Agriculture's (USDA) MyPlate food guidance for healthy eating, and the posting of nutrition information in restaurants.

A recent study conducted by the USDA's Economic Research Service examines data from the agency's 2012–2013 National Household Food Acquisition and Purchase Survey (FoodAPS) to explore the correlation between consumers' use of nutrition information and the healthfulness of their food choices.

The researchers assessed the healthfulness of food purchases by conformance with the Dietary Guidelines for Americans as measured by the 2010 Healthy Eating Index (HEI-2010).

The researchers found that the HEI-2010 score is positively associated with nutrition information use. This positive correlation between nutrition information use and HEI-2010 also holds within each of the three categories of household participation in the USDA's Supplemental Nutrition Assistance Program (participant, low-income nonparticipant, and high-income nonparticipant). Examining the influence of nutrition information use separately on food-at-home and food-away-from-home purchases shows that the food-at-home HEI-2010 score is positively correlated with more nutrition information use while the food-away-from-home HEI-2010 score is not correlated with more nutrition information use.

Class actions move past 'natural' to attacking processing steps, other weaknesses, expert says

By Hank Schultz 20-Apr-2018 Food Navigator USA

Firms filing class action lawsuits have used actions aimed at companies making "natural" claims to springboard into a host of other vulnerable areas of labelling and packaging, according to an expert.

Denver-based attorney Justin Prochnow, a shareholder in the firm Greenberg Traurig, will be one of

the presenters in a session on class action trends at the upcoming Food Law Conference that will take place Monday and Tuesday in Chicago. In presaging his talk, Prochnow said that litigation about what the term "natural" means gave many of these plaintiffs firms their start, but they haven't stopped there.

HFCS gave birth to an industry High profile lawsuits against Ben and Jerry's and 7Up about those brands' use of HFCS (high fructose corn syrup) and whether that ingredient could be considered "natural" opened the curtain for these types of lawsuits. And they continue to be a facet of the class action landscape, Prochnow said.

"I'm starting the talk o with a conversation about natural, even though most of our clients don't try to use that claim anymore," he said. "These kinds of suits have morphed over the years. They started with HFCS and went on into suits attacking cocoa processed with alkali and then attacking GMO ingredients," Prochnow said.

Attacking the processing steps This is perhaps the aspect of the situation that drives most pointedly at the dietary supplements industry. Prochnow said class action filers are now drilling down into the provenance of ingredients to see if vulnerabilities can be found that could help them win a settlement. "A lot of what might be thought of as 'healthy' ingredients have become targets," he said. "Things like citric acid, or stevia. They have been attacked because the processing steps might not be seen as natural."

Some more cynical observers of the food and dietary supplement industries would say that in the absence of federal regulatory action to define what natural means, the present situation amounts to regulation by litigation. Prochnow said there isn't much precedential

value to these suits, since few of these cases get to the point where a judge might write an opinion. What they have done mostly is to encourage companies to steer clear of the claims altogether, as many of his clients have done. "A lot of these suits aren't led with the expectation that the plaintiffs might win. They are just trying to get a settlement," Prochnow said.

Specificity is the best defence Broadly speaking, Prochnow said the best defence against these type of suits is to be as specific and forthright as possible in the claims that go on the label. The raw material might be natural, but what if the ingredient then went through some processing steps that, while uncontroversial to a food chemist, could be spun to seem problematical to a consumer? Don't shy away from that, Prochnow advised. "For example, to defend against the processing claims, a company might say, 'made with naturally sourced ingredients,'" Prochnow said.

Slack fill, sugar claims

Prochnow said there are a couple of areas that might see more class action lawsuits led in the future. "No sugar added" claims is one, because there is a gray area surrounding the use of fruit concentrates or extracts as sweeteners. If the concentrate itself was made with added sugar, it could complicate using that claim in the finished product, Prochnow said.

Another growth area for lawsuits is in the amount of slack ll used in packaging. There a number of legitimate reasons for not filling certain containers right to the brim. But consumers could claim to feel defrauded if they buy a package of snack food or open a tub of powdered protein to find that the package contains a significant amount of air as opposed to product, he said.



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Healthy choices: Can nutrition labels help us stick to better diets

By Tim Cutcliffe 06-Apr-2018 Nutralngredients

Nutritional labelling could help motivate people to eat healthier, according to new Spanish research demonstrating a link between label use and intake of fruits, vegetables and fish.

The study, led by scientists at the Miguel Hernandez University, Alicante, surveyed more than one thousand university students about their use of nutritional labels and dietary intakes. Writing in *Nutrients*, the Spanish authors reveal that those who use nutrition labels had a closer adherence to a Mediterranean-type diet when compared with those who did not use labels. Nutritional label users were also found to consume greater intakes of fruits, vegetables and fish, and lower intakes of meat than those who did not use labelling, said the team led by Professor Manuela Garcia-de-la-Hera.

According to the team, the main reasons for using nutrition labels stated by participants were associated with health, or to follow a healthy diet and to lose and/or control weight. Furthermore, non-users of labels did so mainly because they did not have enough time or simply were not interested, the team said. "In our study, the proportion of nutrition label users was moderate, even considering that the participants were health science students, said the researchers - noting that the study population and the fact that students voluntarily participated may have created some response bias.

Garcia-de-la-Hera and her team said nutrition labels have potential to drive healthier diets, however a lack of research regarding strategies to motivate people to read nutrition labels - and improve their food choices and increase their nutritional knowledge -

means that further studies focused on this issue are required. The Diet, Health and Anthropometry - University Miguel Hernandez (DiSA-UMH) Project is a prospective cohort study. Participants were asked to answer whether they usually read the nutrition labelling of packaged foods and were classified as label users or non-users according to their response.

Adherence to the MD was assessed using the relative Mediterranean Diet Score (rMED) (a validated indexation method) in which positive scores are attributed for fruits, vegetables, legumes, fish, olive oil, and cereals. Negative scores are awarded for meat and dairy products. The total rMED scores were then aggregated into three groups: designating low, medium and high adherence. "Our approach contributes to exploring the role of nutritional labels use as a suitable tool to make healthier food choices from a different wider perspective based on dietary patterns such as Mediterranean Diet (MD), which can also indicate an overall healthy lifestyle," commented lead researcher Professor Manuela Garcia-de-la-Hera.

Of the 1,026 participants surveyed, the team reported that 58% of the population used nutritional labels. According to the team, label users were also more likely to be female and physically active or very active. In a sub-analysis, 738 participants were asked their reasons for using or not using nutritional labels. "Our data are far from being able to

establish a possible causal link between nutrition label use and higher adherence to MD, but they constitute a suitable rationale for replicating in other samples. Therefore, additional large-scale longitudinal studies are necessary to corroborate our findings and explore other aspects not covered in this study, such as nutritional knowledge, consumer preferences, or participant skills, the authors said.

New FSSAI regulations on organic farming impeding growth, says advocacy group

By Lester Wan 02-Apr-2018 Food Navigator Asia

An Indian organic food and farming advocacy group has hit out at new national regulations, which will make certification mandatory, claiming the rules are overly zealous and will be to the detriment of the sector.

The Alliance for Sustainable & Holistic Agriculture (ASHA) - a pan-Indian network of organisations that draws attention to issues relating to food and farmers - recently sent a letter to the chairman and chief executive officer of the Food Safety and Standards Authority of India (FSSAI), with copies to the Union Health and Agriculture Ministers. ASHA believes that the recently-published Notification of Food Safety and Standards (Organic Food) Regulation, 201 would be detrimental to the development of organic farming in the country.



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Gawrav Sinha

In a letter to the FSSAI on March 19, Kavitha Kuruganti, convener of ASHA and food safety activist, said that the set of regulations not only “comes in the way of spread of organic farming”, but that it also “does not protect consumer interest”. The letter requested for the FSSAI to “make some much-needed amendments” and sought to explain the reasons why.

Impediment to Organic Farming

The first point made by ASHA was that the Notification, which makes certification mandatory for all organic farmers, with very limited exemptions, would be an “impediment to the organic spread of organic farming. ASHA said this would have serious cost implications for both farmers and consumers. “The regulations could deter farmers to shift to and pursue safer food production systems because it will involve higher burden on farmers, beyond their financial and other capabilities. In a sense, this is self-defeating to the very mandate of FSSAI,” said Kuruganti.

The letter stated that, today, only a small number of farmers, who are covered under flagship organic farming programmes, are getting government support. Furthermore, third-party or National Programme for Organic Production (NPOP) certification is available only to a limited number of farmers who are associated with commercial entities, who are able to organise a small set of farmers to procure their organic produce and market them. ASHA stressed that the constraint is not just about costs, but the capability to comply with record-keeping requirements.

“What we need is an accountable mechanism where any farmer desirous to shift to organic farming, with or without being part of a collective and with or without being part of a government scheme, is supported for certification free-of-

cost, in time-bound, simple, integrity-laden/corruption-free systems without being burdened by unwieldy paperwork,” said Kuruganti. “This is missing, and in the absence of that, FSSAI rushing in with its unreasonable regulation is an impediment.” She also reiterated, as they had pointed out in the past, that existing quality assurance systems are not fool-proof and “we will have to collectively evolve systems that lay greater thrust on traceability more than anything else, in our effort to weed out “fake or spurious organic”.

She further stated that there was no justification for giving exemptions only to only small producers, and it should be extended to all organic farmers in India and their collectives. “This is a straightforward case since consumer interests are not being compromised in any way here, given a direct relationship and traceability in the transactions, which themselves are quality assurance mechanisms,” she said. She said the clause was based on a number of assumptions and presumptions, even in the definitions of the types of producers, and would be unfair and highly impractical.

Exemptions without intermediaries
ASHA also suggested that the FSSAI should exempt organic farmers who are sourced by direct retailers or stores, without intermediaries. “The ability to market organic produce in segregated supply chains, profitably, is what will help spread organic farming to more farmers. If this is curtailed, the very spread of organic farming is endangered,” said Kuruganti. She added that organic food sold in India is not more than 0.01 and “there is no reason why the regulator should be overzealous about regulating organic foods...”

She ended by saying, “It appears that the situation of small illiterate

farmers who desperately need organic farming as a way out of their agrarian distress is not considered when regulations are made.” ASHA stated its belief that there should be a process of widespread consultations across the country as organic farming is one of the potential strategies for addressing larger issues such as agrarian distress and environmental degradation in the South Asian country. ASHA comprises farmer’s organisations, consumer groups, women’s organisations, environmental organisations, individual citizens and experts committed to the cause of sustainable and viable farm livelihoods in rural India.

'Putting politics before progress': Industry boss slams anti- golden rice campaigners in the Philippines

By Gary Scattergood 11-Apr-2018
Food Navigator Asia

Philippine activists opposing the cultivation of Golden Rice - which is biofortified to address vitamin deficiency, have been accused of shameful behaviour in trying to halt a life-changing innovation.

Protestors last week gathered at the Department of Agriculture (DA) Central Office in Quezon City as part of an international campaign against the feed and field testing of the rice variety in the country.

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PFNDAI June 2018

The tests are a crucial step towards releasing the product on the market, and follow a confined field trial last year. Campaigners are concerned that the introduction of the seeds will ultimately see local farmers losing their right to choose their seed varieties.

But in a strongly-worded statement, Dr Siang Hee Tan, Executive Director of industry body CropLife Asia, said the protesters were holding technology to hostage. "On behalf of the plant science industry in Asia and as a concerned citizen, I am deeply disappointed in the actions of activists in our region who are putting politics before progress and trying determinedly to derail Golden Rice. "Make no mistake this agricultural innovation is not a game-changer, it's a life-changer Golden Rice has the potential to address critical Vitamin A deficiencies here in Asia and around the world, trying once again to hold this technology hostage and out of the grasp of those who need it most is a shameful act.

Innovative future

Golden Rice was developed by the The International Rice Research Institute (IRRI) and its research partners, including from industry. Countries wishing to adopt the Golden Rice technology are free to introduce it under criteria outlined in a Humanitarian Use Licence Agreement, subject to local regulatory arrangements. Dr Tan added: "Those who helped develop Golden Rice are to be commended for bringing this plant science technology forward Innovations such as this are paving the way to a brighter and healthier future for everyone". Elsewhere, Australian and New Zealand regulator FSAN recently recommended that products containing traces of golden rice should be able to be sold in the two countries. The regulator stressed the application was based on trade issues and did not permit the rice to be grown in Australia or

New Zealand.

"The Institute intends for olden ice to be grown in developing countries Permitting olden ice in the Australian Food Standards Code would mean if small amounts were present in other shipments of imported rice there would be no trade issues," it noted. This means that there would be no cost involved in having to exclude golden rice grain from co-mingling and hence that there would be no consequential need to increase the prices of foods that are manufactured using co-mingled rice grain, said the regulator.

Seaweed superfood: Malaysia seeks UN recognition to boost international awareness

By Lester Wan 23-Apr-2018 Food Navigator Asia

Malaysia is seeking recognition from the Food and Agriculture Organization (FAO) of the United Nations (UN) for its seaweed to be classed as a superfood.

Minister of Agriculture and Agro-based Industries Datuk Seri Ahmad Shabery Cheek said the proposal is among the efforts implemented by the South East Asian country to further enhance the promotion of its seaweed at the international level. "The seaweed is one of the superfoods produced by Malaysia due to its high content in nutrients including minerals, vitamins, iodine and its role as the base ingredient for producing, among others, jelly and crackers, apart from pharmaceutical purposes," said Ahmad Shabery.

"Previously, the

government focused on improving the seaweed production as well as providing facilities. However, I think better yield is not enough if the price is low. And this involves marketing problems and how to rectify the value chain system." Of Malaysia's total seaweed production, 88% is cultivated in Semporna, in the East Malaysian state of Sabah. Other districts in which seaweed is cultivated on a large scale include Lahad Datu, Kudat, and Kunak. The main cultivated species of seaweed is *Kappaphycus alvarezii* and *Eucheuma spinosum*.

Growing but with limitations Datuk Ahmad Shabery recently outlined how the government would help the seaweed industry increase exports. He said the Malaysian government would implement special programmes to increase the production and marketing of seaweed products, and that the Ministry, together with 1,600 seaweed producers, is developing an area of about 1,000 hectares into a seaweed "farming estate". However, he acknowledged that the main challenge in developing Malaysia's seaweed production industry was in increasing the price of the seaweed, which is RM3/kg for the dried product. "The price at the seaweed farmers is still low compared with those at the manufacturing end and retailers," he had said. "If we want (Malaysian) seaweed to be superfood, we have to promote its goodness."

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The Ministry of Agriculture of Malaysia had already highlighted seaweed as one of the country's most important aquaculture commodities in its Third National Agricultural Policy (1998-2010). However, the Maritime Institute of Malaysia (MIMA) had previously highlighted that in order to promote the local seaweed sector growth and boost seaweed production in Malaysia, five areas need to be improved on: infrastructure, manpower, quality of product, transfer of technology, industrial support and marketing.

Internal promotion

Datuk Ahmad Shabery made the statements on the proposal to the FAO to reporters after the National Fishermen's Wave 2018: Seaweed Splash programme at the Regatta Square in Semporna. The event was organised with the cooperation of the Sabah Agriculture and Food Industry Ministry to promote consumer awareness and to bolster business relationships. Datuk Ahmad Shabery believes FAO recognition would raise the profile and viability of Malaysian seaweed as a superfood. He added that there was also a proposal to introduce kelulut (sting-less bee) honey as a Malaysian super food.

FAO stresses need for fish traceability system to fight fraud

IFT Weekly April 11, 2018

Food fraud, while not a new phenomenon, has come under the spotlight in recent years. The fisheries and aquaculture sectors are recognized as among the most vulnerable sectors to food fraud.

According to a new report

published by the Food and Agriculture Organization (FAO) of the United Nations, an "effective science-based fish traceability system" is needed in order to combat global fish fraud. The 32-page report offers an overview of fraud in the fisheries and aquaculture sectors and provides recommendations for future actions.

According to the report, written by Professor Alan Reilly, former CEO of the Food Safety Authority of Ireland, the scale of the problem is a cause for international concern, with mislabelling and species substitution presenting the biggest challenge. In 2015, an INTERPOL-Europol investigation demonstrated that fish traded internationally was the third-highest risk category of foods with the potential for fraud, while in 2013 the European Commission classified fish in the second-highest category for fraud. In 2016, Oceana reviewed more than 200 published studies on fish fraud from 55 countries worldwide and found, on average, 20% of all fish in the retail and catering sectors was mislabelled.

The definitive scientific determination of the origin of fish is crucial in fisheries management and in preventing illegal, unreported, and unregulated fishing. The current system is open to abuse, some countries have limited enforcement capabilities, and traceability records can be falsified. In recent years, research has been under way to assess whether there are sufficient genetic differences between populations of fish from different geographical areas. The theory behind this research is that different genetic traceability markers can be identified in fish from different geographical regions based on the

adaptability of fish to environmental differences such as water temperature, nutrients, and salinity. The adaptation of fish to different environments will be reflected in their genetic code, which can be detected using new advanced DNA analyses, such as next-generation sequencing (whole genome sequencing). Once the specific sequences for "local adaptation" have been identified, these can be used to definitively determine the geographical origin of fish.

Additionally, the author recommends that labelling regulations need to provide sufficient data for consumers to be able to make informed choices about the products they purchase. "The information provided must be honest and accurate with respect to the identity, properties, composition, quantity, durability, country of origin or place of provenance, and method of manufacture or production," writes Reilly.

Finally, the report recommends that the Codex Alimentarius Commission, in association with EU member countries, should develop international principles and guidelines designed to identify, manage, and mitigate fraudulent practices in food trade. "The industry requires guidance on how to assure the authenticity of food by minimizing vulnerability to, and mitigating the consequences, of food fraud," concludes Reilly.

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