MAR 2018 **PENDAI PENDAI Bulletin** FOOD, NUTRITION & SAFETY MAGAZINE

ANTIBIOTICS POULTRY



Non- Addition Claims and Claims Related Regulatory Round Up to Dietary Guidelines or Healthy Diets

PROTEIN FOODS AND NUTRITION DEVELOPMENT ASSOCIATION OF INDIA

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EDITORIAL

Currently a lot of information is very easily made available and sometimes it is very difficult to sift authentic information from false. Because of great changes in information technology someone can very easily spread a lot of information to a large number of people including consumers. This is possible not just because of various blogs but also many social media avenues like Facebook, Instagram, Twitter, LinkedIn etc.

When one tries to find information on the net, when you try to Google a word usually millions of webpages appear. There are ways of making certain pages appear earlier. This makes a person genuinely interested in finding out authentic information totally confused. The government sites give only information about some of these aspects very sketchily which does not satisfy the needs of the consumers. Even most educational and research organisations provide information about themselves or their work rather than what consumers want to know. Even professional associations do not provide this adequately. So the consumers fall prey to easily available information from some interest groups which may not provide balanced viewpoints.

There are a lot of videos and articles which are circulating about harmful ingredients or products in markets. Most times these are done not with the intention of creating awareness among consumers but to either sensationalise the issue for greater ratings or to malign competitors' products. This would not only be unethical but at times it unnecessarily creates suspicion about the already maligned food industry. Big brands are easy targets of this. We are not implying that everything in the market is of high quality, but if someone wants to have generic information about certain products or ingredients, it is very difficult to authentic information. Thus consumers can easily fall prey to some false campaigns. mage @ Block / Samendhaltahna

Some efforts for providing authentic information will be valuable. There are many professional organisations which could provide such a platform which can take up queries when such a campaign starts making rounds. It requires some efforts, personnel and cost to provide such a platform but it is possible.

Of course, we should also ask the question that whether consumers want to spend efforts to find out authentic information or just believe some sensational news that happens to come so easily. It is amazing to know how easily sensational news gets circulated so rapidly without verification. It is not always about some harmful effects of products. Sometimes some amazing benefits or cures are also circulated. People have digested all these without verification.

There is a need to have a platform for such authentic information and also to create awareness about the food science & nutrition and their effects on health.

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

PFNDAI Mar 2018

ANTIBIOTICS POULTRY



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By Dr. Javeed Mulani, Manager - Supply chain / QA (Protein) Vista Processed Foods Pvt. Ltd., Mumbai (An OSI Group Company)

India is the third-largest egg producer in the world after China and the USA and the fourthlargest chicken producer in the world after China, Brazil and the USA.

In India, the per capita consumption of eggs has gone up from 30 eggs per annum to 68 eggs per annum, and that of chicken from 400 gms per annum, to 3.2 kg per annum in the last 5 years. India is the world's second largest emerging economy with large and rapidly expanding poultry sector at annual growth rate of 10-12 percent for broilerproduction (Kotaiah, 2016). The consumer demand for processed poultry products like chilled or frozen chicken has also been increased.

India's livestock sector is largest in the world which holds 11.6% of world livestock population and contribution 4.1 % to the national economy in terms of Gross Domestic Product (GDP). India has 1.23 billion people and the number is growing every year. The focus is on "Development", meaning good food, better health & living conditions for everyone. People spend more money on food when they earn more. Healthy food at attractive price will therefore be the issue in focus. Eggs and chicken are accepted by almost all communities and is available across the country at reasonable prices.

The process of traditional poultry supply chain to vertical integration has developed way for poultry meat availability and better value creation of poultrymeat products. Judicious use of inputs like balanced feed, water, sanitation and use of antimicrobials along with biosecurity measures to protect the birds from diseases have been practiced in most of the wellorganized poultry farms which helped poultry industry to achieve high growth rate in poultry sector.

AMR is emerging as a major global public health concern and an important food safety issue. According to WHO (World Health Organization AMR has already reached alarming levels in many parts of the world. It is only recently that the issue of AMR and its implications has been widely addressed nationally and internationally, and the regulatory agencies are trying to deal with the issue holistically. The presences of antimicrobial residues in meat have several impacts on health aspects to the consumer like possible hypersensitivity reaction and contribution to the development of antibiotic resistance bacteria. Antibiotic residues in meat have been a rising issue in the recent years in India.

Estimates of global antibiotic use in animal sector in 2010 indicate that India accounts for 3 percent of global consumption and is among the top consumers worldwide, along with China, the United States, Brazil and Germany. Although India has no major concern of antibiotics compare with other counties but defiantly it will impact the future generation hence we need to make the sustainable food and protect our future generation.

Antibiotics have been used in poultry for two purposes **1**. **Therapeutic:** Use of antimicrobial in animals with diagnosed disease. **2. Non-therapeutic:** a)

Prophylactic: Use of antimicrobial in healthy animals in advance of expected exposure or after an exposure to an infectious agent, before laboratory diagnosis.



B) Use as growth promoter: Supplementing animal feed with antimicrobials to enhance growth. However, the indiscriminate use of antimicrobials in food-producing animals may result in the presence of residues in foodstuffs of animal origin. Major route of administration of antibiotics in poultry are through water and feed i.e. mass treatment, in mass treatment antibiotics are given to health birds also which increase the antibiotic resistance in birds. Common antibiotic used in the poultry are Ouinolones: e.g. Enrofloxacillin, Aminoglycosides: e.g. Neomycin, Tetracycline: e.g. Chlortetracycline, Macrolides: e.g. Tylosin, Penicillin: e.g. Amoxicillin, Polypeptide e.g. Polymyxin, Ionophores: e.g. Salinomycin. As per WHO list of Critically Important Antimicrobials for Human Medicine (WHO CIA list) few antibiotic are "Highest Priority Critical Important to Human ".

Protection of public health against possible harmful effects of antibiotic residues is a relatively recent preoccupation. Lack of regulation and monitoring of antimicrobials contribute to their overuse, and the subsequent development of antibiotic-resistant infections in animals, which can be passed from animals to humans.

The dept. of Animal husbandry, Dairying & fisheries under that Ministry has issued circular to all Directors/ Commissioners of state & UTs vide their letter no.102-74/2014-trade dated 3rdJune 2014 on use of antibiotics for treatment of food producing animals and in animal feeding and GSR 28 (E) dated 17th June 2012 of the Ministry of Health and Family Welfare The

Gazette of India: Extraordinary. It includes 1) Label on drug: Drug Controller General of India have issued a notification under the Drugs and Cosmetics Act, 1940 wherein the drug manufactures has been directed that the container of medicine for treatment of food producing animals shall be labeled with a specific withdrawal period of the drug for the species on which it is intended to be used. 2) Withdrawal period: If the specific withdrawal period has not been validated, the withdrawal period shall not be less than 7 days for eggs and 28 days for meat from poultry. 3) Antibiotics in feed: Antibiotic s/b discouraged and farmers, industries and feed manufactures s/b advised/educated on not to use antibiotics for animal feeding.4) Hormones: Hormones use as growth promoter in food producing animals s/b stopped.

FSSAI issued draft notification on residue of poultry meat dated 19thJan 2015. They were restricting the antibiotics, growth promoters, blood meal/bone meal, internal organs of poultry/animal, and tissues of the poultry/animal in the feed. Presence of veterinary drugs including antibiotics & growth promoters in food producing animals and animal/ bird feed. Withdrawal period of poultry meat and labeling on the medicine with specified withdrawal period and Compliance of the Notification No. GSR 28(E) dated 17th June/Jan 2012 of the Ministry of Health &

Family Welfare as well as advisories issued vise No.: 102-74/2014 -Trade dated 03.06.2014 & 2.12.2014 by the DAHD.

OIE is given comprehensive classification of antibiotics use in animals. The following criteria were selected to determine the degree of importance for classes of veterinary antimicrobial agents.

Criterion 1. Response rate to the questionnaire regarding Veterinary Important Antimicrobial Agents **Criterion 2.** Treatment of serious animal disease and availability of alternative antimicrobial agents.

On the basis of these criteria, the following categories were established:1) Veterinary Critically Important Antimicrobial Agents (VCIA): are those that meet BOTH criteria 1 AND 2) Veterinary Highly Important Antimicrobial Agents (VHIA): are those that meet criteria 1 OR 2 3)Veterinary Important Antimicrobial Agents (VIA): are those that meet NEITHER criteria 1 OR 2.

Following are the key highlights of OIE antibiotics classification. 1. Antimicrobial class/sub class used only in human medicine is not included in OIE List. 2. Specific antimicrobial class/sub class may be considered as critically important for the treatment of a specific disease in a specific species. 3. There are no or few alternatives for the treatment of some specified disease in identified target species as it is indicated in the specific comments in the OIE List. 4. Based on expert scientific opinion and will be regularly updated when new information becomes available.

OIE is given following recommendation on Dual Purpose Antibiotics which are used both for human and animal. 1. Not to be used as preventive

treatment applied by feed or water





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

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



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





in the absence of clinical signs.
2. Not to be used as a first line treatment and when used as a second line treatment, it should ideally be based on the results of bacteriological tests.
3. Extra-label/off label use should be limited and reserved for instances where no alternatives are available. Such use should be in agreement with the national legislation in force.

WHO Advisory Group on Integrated Surveillance of Antimicrobial Resistance (AGISAR) has defined Critically Important Antimicrobials for Human Medicine (3rd revision 2011) and updated in 2017. The list of Critically Important Antimicrobials should be used as a reference to help formulate and prioritize risk assessment and risk management strategies for containing antimicrobial resistance due to human and non-human antimicrobial use. Some examples of appropriate use of the document include:

1. Prioritizing for most urgent development of risk management strategies those antimicrobials characterized as critically important in order to preserve their effectiveness in human medicine.

2. Ensuring that critically important antimicrobials are included in antimicrobial susceptibility monitoring programmes.

3. Refining and prioritizing risk profile and hazard analysis activities for interventions by species or by region.

4. Developing risk management options such as restricted use, labeling, limiting or prohibiting extra-label use, and making Protein Foods & Nutrition Development Association of India

antimicrobial agents available by prescription only.

5. For the development of prudent use and treatment guidelines in humans and animals.

6. To direct special research projects to address prevalence data gaps on existing or potential future CIAs.7. Communicating risks to the public

Based on below two criteria WHO classify the antibiotics into critically important, highly important and important antibiotics for human.

Criterion 1: An antimicrobial agent which is the sole, or one of limited available therapy, to treat serious human disease.

Criterion 2: Antimicrobial agent is used to treat diseases caused by either: (1) organisms that may be transmitted to humans from nonhuman sources or, (2) human diseases causes by organisms that may acquire resistance genes from non-human sources. **Important:** Those antimicrobials those which meet neither Criterion 1 nor Criterion 2 are termed: important for human medicine.

WHO has given the mandate to prioritize agents within the Critically Important category i.e. Highest Priority Critically Important Antimicrobial (HPCIA) and Highly Priority Important Antimicrobial for human.

P1: High absolute number of people, or high proportion of use in patients with serious infections in health care settings affected by bacterial diseases for which the antimicrobial class is the sole or one of few alternatives to treat serious infections in humans.

P2: High frequency of use of the antimicrobial class for any indication in human medicine, or else high proportion of use in patients with serious infections in health care settings, since use may favour selection of resistance in

WHO list of Critically Important Antimicrobials for Human Medicine (WHO CIA list)

Since 2005, WHO has produced a regularly updated list of all antimicrobials currently used for human medicine (mostly also used in veterinary medicine), grouped into 3 categories based on their importance to human medicine. The list is intended to assist in managing antimicrobial resistance, ensuring that all antimicrobials, especially critically important antimicrobials, are used prudently both in human and veterinary medicine.



Interpretation of categorization Critically Important: Those antimicrobials which meet both Criterion 1 and Criterion 2 are termed: critically important for human medicine.

Highly Important: Those antimicrobials which meet either Criterion 1 or Criterion 2 are termed: highly important for human medicine. both settings P3: The antimicrobial class is used to treat infections in people for which there is evidence of transmission of resistant bacteria or resistance genes from non-human sources. Highest Priority Critically Important Antimicrobial are the classes of drugs that met all three priorities Fluoroquinolones, 3rd and 4th generation cephalosporin's, Macrolides & ketolides, Polymyxin and Glycopeptides. We need to stop the use of Highest Priority Critically Important Antimicrobial (HPCIA) to protect human health and avoid the resistance of these antibiotics in human. Key Benefits to Use of WHO Classification.

1. To formulate and prioritize risk assessment and risk management strategies for antimicrobial resistance mainly due to nonhuman antimicrobial use.

2. Supports strategies to mitigate the human health risk associated with antimicrobial use in food animal and has been used by both public and private sector organizations. 3. Help regulators and stakeholders know which type of antimicrobial used in animals present potentially higher risks to human population. 4. Use of this list in conjunction with the OIE list of antimicrobial of veterinary importance and WHO model allow prioritization of risk management strategies in the human, animal and in agriculture sector through a coordinated One Health approach.

In India, EIC has given EIC Sampling Plan of poultry meat and meat products for Residue Monitoring 2017-18 which included banned and approved antimicrobial with residue limits. FSSAI has issued draft regulation on antibiotics dated 23rd Nov 2015 and Feb 2018. FSSAI categorize antibiotics into two groups and other veterinary drugs in separate groups. a. Antimicrobials Including Antibiotics: (i) Used in both humans and animals (ii)

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Exclusively used in animals: b. Other veterinary Drugs. It has following gaps and same communicated to FSSAI for their review.

1. It does not define the antibiotics on the basis of critically important to human.

2. It included few antibiotics which are critically important (HPCIA) to human by WHO with residue limits.

 FSSAI draft regulation missed few antibiotics which are currently used in Indian poultry and approved by OIE for veterinary use.
 There is no list of approved and banned antibiotic in the draft standard and antibiotics allowed with specific tolerance limit.
 Tolerance limit is not specified with species because most of the antibiotics and veterinary drugs are not used poultry.

6. Indian NABL & FSSAI approved lab don't have

capabilities for testing of these antibiotics and veterinary drugs residue and they are unable to test all antibiotics and veterinary drugs.

We need to take following action to avoid the indiscriminate use of antibiotics in poultry, avoid the antibiotic resistance in human being and formulate the FSSAI regulation on antibiotics to protect human health and our future generation

1. We need to create awareness & educate farmers/consumers about antibiotic uses, current best practices & challenges.

COVER STORY

2. Poultry supply chain should be transparent from farm to fork to avoid misuses of antibiotics & find out exact root cause of antibiotic residue.

3. There is need for specific rules and regulation on the use of antibiotics after thorough discussion with the industry, poultry integrators/farmers and academic experts/scientists.

4. FSSAI has to use WHO and OIE antibiotics classification to formalize the antibiotics regulation 5. Follow the best practices at the farms to reduce or eliminate the antibiotics from poultry & there is scope to use herbs as an alternative source of feed antibiotics & make antibiotic free chicken meat.

6. Antibiotics are important to treat sick birds for maintaining health & welfare of birds and it can be used under the supervision of veterinary

doctor.

7. There is need to increase the antibiotics testing capabilities of laboratory.

NON- ADDITION CLAIMS AND CLAIMS RELATED TO DIETARY GUIDELINES OR HEALTHY DIETS



^{By} Mr Kiran Desai, Sr. Regulatory Affairs Manager, Reckitt Benckiser (India)

With rising awareness, consumer

interest in healthier foods has been growing. This increased interest in healthy eating necessitates industry players to relook in to their product propositions.

Health conscious consumers are greatly influenced by label claims particularly nutrition claims. The use of certain claims do indeed impact consumer's perceptions and purchase decisions. These consumers are also paying a great deal of attention to brand names. The brands who clearly communicate product related claims can win shopper's trust.

FSSAI has notified the draft regulation on claims and advertisements by food business operators (FBOs) in respect of their food products. This regulation aims to protect consumers from being misled, by controlling nutrition and health related claims. The regulation categorizes different types of claims and lays down conditions for making certain claims. The draft regulation has a section on Non-addition claims and Claims related to Dietary Guidelines or Healthy Diets. These type of claims have potential to contribute to the achievement of public health objectives and assist

consumers in planning of their diets to manage certain health related concerns.

Non- Addition Claims

Non-addition claim means any claim that an ingredient has not been added to a food, either directly or indirectly. The ingredient is one whose presence or addition is permitted in the food and which consumers would normally expect to find in the food;

Conditions for making a Non-addition claim

1. The ingredient or substance claimed as not added, must not have been added directly or indirectly to the food or to any of its ingredients.

2. Ingredient or substance claimed as not added, should either be totally absent or present at level that is physiologically insignificant.

These type of claims are suggestive of absence of specific ingredients that are undesirable to consumer (e.g. No preservatives added, No colour added) or absence of some constituents which are of concern to the health of some consumers(e.g. Non-dairy Lactose free). The information that a substance is absent in a food may be beneficial information to individuals who wish to avoid certain substances. Disclaimer statements can be used with nonaddition claims to assist consumer understanding of the claims. Disclaimer statements should appear in close proximity to, on the same side and in the same prominence as the claim.

Non addition Claims should not create a false impression that the product is uniquely different from other similar products. For example, when a class of foods is inherently free of a substance or where it is not permitted by Regulation to contain the substance, this must be made clear. A claim that the substance is absent will be considered misleading unless it is appropriately qualified by a statement to the effect that the claim is not unique to the food but is common to all foods of the same class. For example, beverages that are not permitted by Regulation to contain added caffeine, such as juice, should not be labelled or advertised as "caffeinefree", unless the claim is accompanied by a statement to the effect that "all juices are caffeinefree", or that a juice is "a caffeinefree food".

Conversely, when there is nothing in Regulation that prohibits the addition of colour to cookies, it would be acceptable for product to carry a "no colour added" claim without the claim being accompanied by a statement such as "all cookies have no colour added", provided that no colour was added,



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When placed on a package of cookies, this claim does not suggest a false uniqueness to the cookies, as some cookies do contain added colour.

FSSAI in its draft has specified Conditions for making Nonaddition of sugars and Non-Addition of Sodium Salts. Excessive intake of sugar for long periods of time can cause serious health problems. High levels of sugar in the blood can increase the risk of heart disease and stroke,

kidney disease, vision problems, and nerve problems in people with diabetes. Excessive sodium intake for long periods can lead to hypertension, a major risk factor for heart disease and stroke. Diets low in sodium may re

low in sodium may reduce the risk of high blood pressure; a disease associated with many factors.

Non-addition of sugars-

Claims regarding the non-addition of sugars to a food may be made provided the following conditions are met:

a) No sugars of any type have been added to the food (Examples: sucrose, glucose, honey, molasses, corn syrup, etc.);

b) The food contains no ingredients that contain sugars as an ingredient (Examples: jams, jellies, sweetened chocolate, sweetened fruit pieces, etc.);

c) The food contains no ingredients containing sugars that substitute for added sugars (Examples: nonreconstituted concentrated fruit juice, dried fruit paste, etc.); and d) The sugars content of the food itself has not been increased above the amount contributed by the ingredients by some other means (Example: the use of enzymes to hydrolyse starches to release sugars).

Where no added sugar claim is made product should not contain any added mono-or disaccharides or any other food used for its sweetening properties. If sugars are naturally present in the food, the following statementcan be made on the label: 'CONTAINS NATURALLY OCCURRING SUGARS'. A limit of 0.5 g sugar per 100 g or 100 ml of the product has been specified for making Sugar free claim.

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Non-Addition of Sodium Salts-Claims regarding the non-addition of sodium salts to a food, including "no added salt", may be made provided the following conditions are met:

a) The food contains no added sodium salts, including but not limited to sodium chloride, sodium tripolyphosphate;

b) The food contains no ingredients that contain added sodium salts, including but not limited to sauces, pickles, pepperoni, soya sauce, salted fish, fish sauce; andc) The food contains no ingredients

that contain sodium salts that are used to substitute for added salt. A limit of0.005g of sodium, or 0.0125 g of salt, per 100g of the product has been specified for making Sodium free claim. Claims related to Dietary Guidelines or Healthy Diets The quantities of foods needed to meet the nutrient requirements vary with age, gender, physiological status and physical activity. Nutritional needs should be met primarily from foods. Individuals should aim to meet their nutrient needs through healthy eating patterns that include nutrient-dense foods. Foods in nutrient-dense forms contain essential vitamins and minerals and also dietary fibre and other naturally occurring substances that may have positive

health effects. In some cases, fortified foods and dietary supplements may be useful in providing one or more nutrients that otherwise may be consumed in less than recommended amounts. The main objective of Claims related to Dietary Guidelines or Healthy Diets should be to consider the overall nutritional value of the product and how it should fit into a balanced diet.

FSSAI in its draft has specified Conditions for making claims that relate to dietary guidelines or "healthy diets". The Claims related to healthy diet are proposed to be permitted subject to the following conditions:

(1) Claims related to a "healthy diet" or any synonymous term referring to the pattern of eating as per ICMR dietary guidelines for Indians shall carry a statement relating the food to the pattern of eating described thereof on its label.

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(2) Foods, which are described as part of a healthy diet, balanced diet, shall not be based on selective consideration of one or more aspects of the food. They shall also satisfy the criteria for other major nutrients related to the dietary guidelines, based on scientific evidence.

(3) Foods shall not be described as "healthy" or be represented in a manner that implies that a food in and of itself will impart health. These type of claims emphasize relative importance of a single product in the context of the total diet. Dietary components of an eating pattern can have interactive. synergistic, and potentially cumulative relationships, such that the eating pattern may be more predictive of overall health status and disease risk than individual foods or nutrients. However, each identified component of an eating pattern does not necessarily have the same independent relationship to health outcomes as the total

eating pattern, and each identified component may not equally contribute to the associated health outcome.

An eating pattern represents the totality of all foods and beverages consumed. Healthy eating patterns are adaptable. Individuals have more than one way to achieve a healthy eating pattern. Any eating pattern can be tailored to the individual's socio-cultural and personal preferences. Evidence shows that healthy eating patterns, as outlined in the Dietary Guidelines are associated with positive health outcomes. Dietary Guidelines for Indians suggest a balanced diet which can provide around 50-60% of total calories from carbohydrates, preferably from complex carbohydrates, about 10-15% from proteins and 20-30% from both visible and invisible fat. In addition, a balanced diet should provide other non-nutrients substances such as



dietary fibre, antioxidants and phytochemicals which render positive health benefits. The intake of polyunsaturated fatty acids should be 8-10% of energy intake. Saturated fatty acids intake should not exceed 8-10% of total energy. The tables of balanced diet suggested in the Dietary Guidelines offers a simpler way to plan meals to fit one's nutrient and energy requirements for a day.

COMING EVENTS

Nutraceutical and Functional Food Asia Pacific

June 6-8, 2018 Singapore Novotel Singapore Clarke Quay T: +86 21 5580 0330 Ext: 8033 E: mia.shen@nutraceutical-food.com

IFT 18 A Matter of Science + Food July 15-18, 2018

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JUIY 15-18, 2018 Chicago, IL, USA W: Iftevent.org

21 st World Congress on Nutrition & Food Sciences

July 09-10, 2018 Sydney, Australia E: worldnutrition@ conferencesworld.org

15th India Hospitality F&B Pro Expo, Goa August 2-4, 2018

Dr Shyama Prasad Mukherjee AC Stadium, Panaji, Goa T: +91 9769555657 E: cmd@trinityworld.biz W: www.trinityworld.biz

Conference on Recent Advances in Food Processing Technology

August 16-18, 2018 Indian Institute of Food Processing Technology Thanjavur, Tamil Nadu E: icrafpt@iifpt.edu.in

Conference on Recent Advances in Food Processing Technology

August 16-18, 2018 Indian Institute of Food Processing Technology Thanjavur, Tamil Nadu

E: icrafpt@iifpt.edu.in

Aahar: International Food & Hospitality Fair

August 23-25, 2018 Chennai Trade Centre, Chennai Thanjavur, Tamil Nadu T: +91 87440 88116 E: maurya@aifpa.net

National Seminar on Indian Dairy & Food Industry September 14-15, 2018

NDRI Grad. Association National Dairy Research Institute, Karnal T: +91 9812077005 E: ndri.grads@gmail.com W: www.ndrigrads.com

Annapoorna World of Food India 2018

Sept 27-29, 2018 Bombay Exhibition Centre, Goregaon, Mumbai T: +91 22 2496 8000, E: narendra.naik@ficci.com W: www.ficci.com

IDACON 2018

Annual National Conference of Indian Dietetic Association

Sept 30- Oct 2, 2018 Brilliant Convention Centre, Indore (MP) T: 09977600104, 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

PFNDAI Mar 2018

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Protein Foods & Nutrition Development Association of India

REGULATORY ROUND UP

VRIFood Tech Private Limited n.ram@vrfoodtech.com

N. Ramasubramanian,

I am sure all of you must be busy with assessing the impact of the draft regulation on "Labelling and Display".

The stakeholders have been given time till 11th July 2018 to send in the comments in the prescribed format. This can be done by the individual organization and also through the Industry associations. Let us have a look at the regulations since the last round up.

Standards

Final Gazette notification on Sorghum Flour, Soybean, Soy Protein Products, Whole Maize (Corn) Flour, Wheat Protein Products including Wheat Gluten, Durum Wheat Semolina and Whole durum wheat semolina, Durum Wheat, Finger Millet (Ragi) and Amaranth. The point of interest is specifications for Soy Protein Isolate and concentrate though they are in use for more than three decades.

Final Gazette Notification to

revision of Cane Jaggery or Cane Gur and Sodium Saccharin (food grade) and standards for Calcium Saccharin (food grade).

Latest list of FSSAI notified NABL accredited laboratories and the validity status.

Draft Notice amending standards for Refined Vegetable oil, Partially Hydrogenated Soybean oil, Table Margarine, Fat spread. Enzymes have been permitted in the refining process. A maximum limit of 5% Trans Fat has been introduced for Table Margarine and Fat Spread and this level would be reduced to 2%. This limit may be applied to Vanaspati and Industrial Margarine, which is presently 5%. Draft standard has been drawn for Chia oil.

<u>Draft Notice</u> restricting the use of diacetyl as a flavouring substance in oils and fats. Wish to warn the reader here that the draft seems to be incomplete.

<u>Draft Notice</u> revising the standards for Coffee – Chicory Mix, Calcium and Magnesium levels in Packaged Drinking Water. New standards for Decaffeinated roasted – ground and soluble coffee powder

Draft Notice related to revised standards for Goat/Sheep milk, Sodium content milk and milk powders and new standards for Medium Fat Channa/Paneer, Whey Cheeses and Cheeses in Brine.

<u>Operationalization</u> of the Regulation which permits Authorized Officer to issue a provisional "No Objection Certificate" to imported retail products under certain conditions. This is likely to hasten the clearance of imported retail pre-packaged foods

<u>A new FSSAI order to differentiate</u> <u>edible ice from non-edible ice.</u>

Edible ice is the one which comes in contact with the food. The order requires that non-edible ice to contain food grade Brilliant Blue or Indigo Carmine to a maximum level of 10 ppm. This order Is effective from 1st June 2018.

Report on List of imported food consignments rejected for the month of March, 2018.



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Protein Foods & Nutrition Development Association of India

RESEARCH IN HEALTH & NUTRITION

Cruciferous vegetables and probiotic combination: New allies in fight against bowel cancer 15 Jan 2018 Nutrition Insight

A team of researchers in the National University Singapore (NUS) Medicine lab of Associate Professor Matthew Chang have found a way to turn a mix of bacteria and vegetables into a targeted system that seeks out and kills colorectal cancer cells.

According to the researchers, this combination could be used in the prevention of colorectal cancer – one of the most common cancers in the world – and to clean up the cancer cells remaining after surgical removal of tumours, through a sustainable, low-cost therapeutic regimen. At the heart of this cancer-targeting system is an engineered form of E. coli Nissle, a type of bacteria found in the gut. Using genetic techniques, the team engineered the bacteria into a probiotic that attached to the surface of colorectal cancer cells and secreted an enzyme to convert a substance found in cruciferous vegetables into a "potent anticancer agent." The idea was for the cancer cells in the vicinity to take up this anticancer agent and be killed. Normal cells cannot do this conversion, nor are they affected by the toxin. Thus the system should be targeted only to colorectal cancer cells, NUS reports.

Orally administered engineered microbes bind to the surfaces of

colorectal cancer cells, allowing microbes to secrete myrosinase, which converts dietary glucosinolate found in cruciferous vegetables. When the cancer cells are cleared, the microbes are released from the surface of the intestinal wall. The mixture of engineered probiotics with a broccoli extract or water containing the dietary substance killed more than 95 percent of colorectal cancer cells in a dish. Moreover, the mixture did not affect cells from other types of cancer such as breast and stomach cancer. Strikingly, the probiotics-veggie combination reduced tumour numbers by 75 percent in mice with colorectal cancer. Also, the tumours that were detected in these mice were three times smaller than those in control mice which were not fed with the mixture.

The study, which was led by Dr. Chun-Loong Ho, was published online on Wednesday and in the

current issue of Nature Biomedical Engineering. Dr. Ho and Associate Professor Chang, along with colorectal cancer specialist Dr. Yong Wei Peng at the National University Hospital, envision that



these probiotics could be used in two ways: 1) as prevention, and 2) to clean up the cancer cells remaining after surgical removal of tumours. One day, colorectal cancer patients may be able to take the probiotics as a dietary supplement along with their broccoli to prevent colorectal cancer or to reduce recurrence after cancer surgery.

"The use of broccoli is beneficial as it contains high levels of natural compounds that the human body does not utilize nor absorb. Using an enzymatic conversion, we can unlock the compounds' latent anticancer properties that include stopping cancer cell proliferation and causing the cells to self-destruct (apoptosis). Generally, any form of vegetables that are rich in these latent anticancer compounds are suitable such as broccoli and other cruciferous plants (e.g., Brussels sprouts, bok choy and rocket). Other vegetables and roots (e.g.,

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turnip, radish and daikon) also contains such compounds but at a lower content," Dr. Ho tells NutritionInsight. "One exciting aspect of our strategy is that it just capitalizes on our lifestyle, potentially transforming our normal diet into a sustainable, low-cost therapeutic regimen. We hope that our strategy can be a useful complement to current cancer therapies," notes Associate Professor Chang.

"We typically hope that these microbes can be used as a form of supplement drink or a pill that could be taken on a weekly basis for adults (>35 years of age) as the process of tumour development might take as long as a decade. Ingested microbes will screen the gut for any abnormal cells and naturally clear them off with the help of a vegetable diet. Another application is to have these cells be in a post-operative care, where patients can take these

Researchers at the University of Pennsylvania in the US, said parents should consider simply changing the diets of youngsters rather than imploring them to go to bed. Previous studies have shown that the omega-3 fatty acids found in fish can improve intelligence and sleep, and that better sleep improves IQ. But it is the first time all three have been linked together. The scientists believe that it may be that the improved sleep produced by omega-3s is what is boosting IQ rather than the fatty acids themselves.

"Doing that could be a lot easier than nudging children about going to bed," said Professor Adrian Raine. "If the fish improves sleep, great. If it also improves cognitive performance, like we've seen here, even better. It's a double hit." For the study, the researchers asked 541 school children aged between nine and 11 to fill in surveys about how much fish they ate, and then measure their IQ. Their parents were then asked about the quality of sleep. The team, found that children who reported eating fish weekly scored 4.8 points higher on the IO exams than those who said they seldom or never consumed fish. Those whose meals sometimes included fish scored 3.3 points higher. In addition, increased fish consumption was associated with fewer disturbances of sleep, which the researchers say indicates better overall sleep quality. The researchers recommend starting children on fish by at least the age of two then incrementally adding more fish into the diet over time.

Dr Jennifer Pinto-Martin added: "It adds to the growing body of evidence showing that fish consumption has really positive health benefits and should be something more heavily advertised and promoted. "Children should be introduced to it early on. Introducing the taste early makes it more palatable. "It really has to be a concerted effort, especially in a culture where fish is not as commonly served or smelled. Children are sensitive to smell. If they're not used to it, they may shy away from it." The research was published in the journal Scientific Reports.

The nutrient mix that could boost women's energy levels

Medical News Today 23 January 2018By Maria Cohut

Some specialists say that young women are more prone than men to nutritional deficiencies, which can impact their energy levels and keep them from fulfilling their athletic potential. A study claims to have found the right supplement mix to address that issue.

Much research lately has

been dedicated to showing how changing our dietary habits and doing regular aerobic exercise such as running or biking — can improve our physical and mental health. Still, some nutritionists say that, despite efforts to lead healthier lifestyles, women's energy metabolism, in particular — their ability to produce energy out of the nutrients they consume — may be impaired, and through no fault of their own.

Robert DiSilvestro — a nutritionist and researcher at the Ohio State University in Columbus, OH — in collaboration with other researchers, may now have pinpointed the supplementary "shake" of minerals and essential nutrients that could give women the daily energy boost they need. "We know that young women, in particular, often have micro-deficiencies in nutrients and that those nutrients play a role in how cells work during exercise. They tend to eat less meat than men, and menstruation also plays an important role in mineral loss."Robert DiSilvestro. The recipe for success that the researchers tested consists of three minerals --iron, zinc, and copper — and two essential nutrients — carnitine and phosphatidylserine — which, they say, women tend not to absorb enough of. Their results were published in the Journal of the International Society of Sports Nutrition.



The mix that makes us faster runners

DiSilvestro and team conducted two consecutive experiments, over a period of 1 month each. The participants' athletic performance was, in each case, measured once at the start, and once at the end of the study period. For the first experiment, the researchers recruited 28 female participants aged between 18 and 30; half of these were assigned to take the supplement, while the other half were given a placebo and acted as the control group. The women who were given the supplement would take it by stirring it twice daily into a drink of their choice. "I decided to start with minerals that are commonly low — or thought to be low in many diets — and brought in some of the supporting cast," explains DiSilvestro. "These two nutrients [carnitine and phosphatidylserine], which are needed for cell function, are made by our bodies but also come from food we eat," he notes.

As part of the experiment, the women were asked to engage in a range of aerobic activities: first a 3mile run, then stationary biking for 25 minutes, and, finally, a test involving stepping on and off a bench. While all the women were amateur athletes and regularly engaged in running, they did not normally perform the other two exercises they were asked to do during the study. The researchers explain that this requirement was added on purpose, to understand whether the energy benefits potentially derived from the supplement would extend to a wider range of physical activities, beyond just running. Following this first experiment, DiSilvestro and team found that the 14 women who drank their nutritionally packed "shake" ran significantly faster than before, and also compared with their counterparts in the control group. They covered the 3 miles in 25.6

minutes on average, compared with their previous performance of 26.5 minutes on average. Their performance was also improved in the other two types of exercises. In 25 minutes on the stationary bike, the supplement-takers increased their calculated distance from an average of 6 miles — measured at the beginning of the experiment to 6.5 miles per average. They also increased the number of steps in the step test to about 44 from approximately 40 steps in 90 seconds.

Dosage is important In the follow-up experiment, the researchers were interested in seeing if they could reproduce this effect with a slightly modified version of their dietary supplement, which contained a lower dose of carnitine. This time, the researchers recruited a new group of women — 36 in total — who were split in the same way and asked to engage in the same exercises. Also, the nutritional supplement was administered in capsule form on this occasion. In this experiment, the researchers noted a mean decrease of 41 seconds in running time.

These differences are particularly interesting to DiSilvestro, who aims to eventually produce a reliable supplement that could help women to correct their nutritional deficiencies and thus improve their athletic performance. The researchers note that the dosage of each of the nutrients used in all versions of the supplement were well below dangerous levels, capable of causing undesirable side effects. They also add that, indeed, no side effects were observed at any stage. DiSilvestro claims that men do not usually experience the same nutritional deficiencies noted in women, but he says that future studies might focus on testing the benefits of such a supplement in the case of vegetarian men, or as an energy-booster for long-distance runners.

Can Muesli help against arthritis?

Science Daily January 12, 2018

It is well known that healthy eating increases our general sense of wellbeing. Researchers at Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU) have now discovered that a fibre-rich diet can have a positive influence on chronic inflammatory joint diseases, leading to stronger bones.

The key to the effect our diet has on our health are intestinal bacteria: healthy intestinal flora consists of a multitude of different species of bacteria. Every adult carries approximately two kilogrammes of benign bacteria in their intestines. They help our digestion by breaking fibre down into its individual components, which can then be absorbed by the body.

A by-product of this process are short-chained fatty acids which are important for the body, providing energy, stimulating intestinal movement and having an antiinflammatory effect. The intestinal bacteria also fight against pathogens which have found their way into the gastrointestinal tract. It is known that intestinal flora can either protect against illness or cause illness, depending on its composition. If the various bacteria coexist harmoniously, they can protect the intestinal wall and prevent it from letting pathogens pass through.

Image © iStock.com/ JohnnyGreig In the latest article published in Nature Communications, FAU researchers show that it is not the intestinal bacteria themselves, but rather their metabolites which affect the immune system and therefore have a knock-on effect on autoimmune diseases such as rheumatoid arthritis.

How intestinal bacteria and the immune system communicate is still unclear, and scientists are still unsure about what may be done to have a positive effect on the bacteria. The researchers focussed on the shortchain fatty acids propionate and butyrate, which are formed during the fermentation processes caused by intestinal bacteria. These fatty acids can be found, for example, in the joint fluid and it is assumed that they have an important effect on the functionality of joints.

The FAU scientists under the leadership of Dr. Mario Zaiss from Department of Medicine 3 --Rheumatology and Immunology at Universitätsklinikum Erlangen were able to show that a healthy diet rich in fibre is capable of changing intestinal bacteria in such a way that more short-chained fatty acids, in particular propionate, are formed.

They were able to prove a higher concentration of short-chained fatty acids, for example in bone marrow, where propionate caused a reduction in the number of bone-degrading cells, slowing bone degradation down considerably.

Propionate, one of the better known short-chained fatty acids, has been in use as a preservative in the baking industry since the 1950s and has been checked and approved as a food additive according to EU guidelines.

'We were able to show that a bacteriafriendly diet has an anti-inflammatory effect, as well as a positive effect on bone density' explains Dr. Mario Zaiss, who is leading the team behind the study. 'Our findings offer a promising approach for developing innovative therapies for inflammatory joint diseases as well as for treating osteoporosis, which is often suffered by women after the menopause. We are not able to give any specific recommendations for a bacteria-friendly diet at the moment, but eating muesli every morning as well as enough fruit and vegetables throughout the day helps to maintain a rich variety of bacterial species.'

Children who eat fish once a week sleep better and have higher IQs, study finds Sarah Knapton, SCIENCE EDITOR, Telegraph (UK) 21

EDITOR, Telegraph (UK) 2 DECEMBER 2017

Children who eat fish once a week sleep better and have higher IQ scores, a new study suggests.

Researchers at the University of Pennsylvania in the US, said parents should consider simply changing the diets of youngsters rather than imploring them to go to bed. Previous studies have shown that the omega-3 fatty acids found in fish can improve intelligence and sleep, and that better sleep improves IQ. But it is the first time all three have been linked together.

The scientists believe that it may be that the improved sleep produced by omega-3s is what is boosting IQ rather than the fatty acids themselves. "Doing that could be a lot easier than nudging children about going to bed," said Professor Adrian Raine. "If the fish improves sleep, great. If it also improves cognitive performance, like we've seen here, even better. It's a double hit."

For the study, the researchers asked 541 school children aged between

nine and 11 to fill in surveys about how much fish they ate, and then measure their IQ. Their parents were then asked about the quality of sleep. The team, found that children who reported eating fish weekly scored 4.8 points higher on the IQ exams than those who said they seldom or never consumed fish. Those whose meals sometimes included fish scored 3.3 points higher. In addition, increased fish consumption was associated with fewer disturbances of sleep, which



the researchers say indicates better overall sleep quality.

The researchers recommend starting children on fish by at least the age of two then incrementally adding more fish into the diet over time. Dr Jennifer Pinto-Martin added: "It adds to the growing body of evidence showing that fish consumption has really positive health benefits and should be something more heavily advertised and promoted.

"Children should be introduced to it early on. Introducing the taste early makes it more palatable. "It really has to be a concerted effort, especially in a culture where fish is not as commonly served or smelled. Children are sensitive to smell. If they're not used to it, they may shy away from it."

The research was published in the journal Scientific Reports.

Protein Foods & Nutrition Development Association of India



What too much salt can do to your brain

Medical News Today 16 January 2018 By Ana Sandoiu

Too much salt can cause cognitive deficits, according to a new study published in the journal Nature Neuroscience. Luckily, these negative effects may be reversed, and the new study shows how.

It's a well-known fact that too much salt in our diet raises the risk of cardiovascular disease and high blood pressure. But it is less known that brain-related problems, such as cerebrovascular disease, stroke, and cognitive impairment, have all been linked to dietary salt. As the authors of the new research explain, it was suggested that one possible mechanism behind these negative effects involves the so-called endothelial cells inside the cerebral blood vessels. Endothelial cells line our blood vessels and are responsible for regulating the vascular tone — but a high dietary intake of salt has been associated with dysfunction of these cells.

Although it is known that epithelial dysfunction can bring a plethora of chronic illnesses, it remains unclear exactly how salt-induced endothelial dysfunction may affect the brain in the long run. This is particularly important given that the brain is heavily reliant on a steady and smooth flow of oxygen to function properly, explain the study authors, who were led in their research efforts by Costantino Iadecola, from Weill Cornell Medicine in New York City, NY. In their paper, Iadecola and colleagues show how excessive dietary salt affects our gut, immune system, and, ultimately, our brain.

How excessive salt affects the gut-brain axis

Iadecola and team fed a group of mice the equivalent of a human diet high in salt for a period of 12 weeks. After the first few weeks, endothelial dysfunction, as well as a reduction in the blood flow to the brain, could be noticed in the mice. Additionally, behavioural tests revealed cognitive decline in the rodents.

Their blood pressure, however, remained unchanged.

An important discovery was the increase in the gut's so-called TH17 white blood cells. In turn, the high number of TH17 cells led to an increase in the levels of a proinflammatory molecule called plasma interleukin-17 (IL-17). The researchers were also able to identify the molecular pathway through which higher levels of IL-17 in the blood led to the negative cognitive and cerebrovascular effects.

The researchers wanted to see whether or not their findings would replicate in human cells. So, they treated human endothelial cells with IL-17 and obtained similar results. As Iadecola and his colleagues explain:"The findings unveil a gut-brain axis by which environmental factors linked to the diet lead to an adaptive immune response in the gut, promoting neurovascular dysregulation and cognitive impairment."

Dietary changes can reverse negative effects

The good news is that the negative effects of the high-salt diet seem to be reversible. The mice were returned to a normal diet after the 12 weeks, and the results were encouraging. "The harmful effects of [a high-salt diet] were abrogated by returning the mice to a normal diet, pointing to [the] reversibility of the vascular dysfunction and cognitive impairment," write the authors. Additionally, they experimented with a drug that also reversed the effects of excessive salt. The amino acid L-arginine had the same beneficial effect on the mice as returning them to a normal diet. The findings suggest that lifestyle changes — or a new class of drugs — may help to offset the negative effects of a high-salt diet.

0.6% soy isoflavone in the diet decrease muscle atrophy

Science Daily January 18, 2018

Scientists at Tokyo Institute of Technology (Tokyo Tech) have discovered a means of reducing muscle atrophy by the addition of the soy-derived isoflavone aglycone (AglyMax) to the diet of mice.

This attenuation by soy isoflavone is attributable to block the apoptosisdependent pathway in muscle fibre. The AglyMax supplement also anticipates to attenuate age-related muscle loss, sarcopenia. Healthy muscles are integral to overall good health, as muscle mass is important for appropriate metabolism and mobility. Unfortunately, as the population of ageing individuals increases worldwide, and people adopt a more sedentary lifestyle, healthy muscles can be deprived of activity and gradually waste away.



Such a process can also occur in individuals with long term injuries. This condition, called atrophy, can result in a myriad of constraints in an individual's life. Although adequate exercise and nutrition normally help maintain healthy muscle mass, hormone therapy and dietary supplements have also been shown to be effective. In particular, isoflavones found in soy products are known to possess marked anti-oxidant potential. Studies have also shown the beneficial effects of isoflavones on muscle mass in mice and other rodents

Kunihiro Sakuma and colleagues expanded on this knowledge and sought to investigate whether a dietary isoflavone aglycone (AglyMax) could inhibit muscle atrophy? They used a mouse model to address this question. In order to induce a muscle atrophy condition, they removed the sciatic nerve connection to the calf muscle of mice. Consequently, the muscle was deprived of nerve stimulations, leading to gradual atrophy of the muscle and catastrophic loss of muscle mass.

Two groups of mice with severed sciatic nerves of the left leg were fed either a normal diet or a diet supplemented with AglyMax. After 2 weeks, the muscles from these mice were compared. The mice on the AglyMax diet were found to have substantially thicker muscle fibres in the affected muscle, compared to those on a normal diet. The scientists also sought to determine the way in which isoflavones reduced muscle atrophy. In doing so, they found that isoflavone-based diet inhibited muscle cell death (apoptosis).

Despite such crucial insights, the scientists evaluated the effect of the soy supplementation in denervated muscles only; therefore, it remains to be seen whether soy-supplementation plays a similar therapeutic role for other conditions, like ageing related atrophy. There is hope that future studies will clarify both the role that isoflavones play in modulating muscle atrophy, as well as its possible therapeutic application in individuals with muscle atrophy due to ageing or illness.

Choose Omega-3s from fish over flax for cancer prevention, study finds Science Daily January 26, 2018

Omega-3s from fish pack a stronger punch than flaxseed and other oils when it comes to cancer prevention, according to a first-ever University of Guelph study.

Prof. David Ma has discovered that marine-based omega-3s are eight times more effective at inhibiting tumour development and growth. "This study is the first to compare the cancer-fighting potency of plantversus marine-derived omega-3s on breast tumour development," said the professor in the Department of Human Health and Nutritional Sciences. "There is evidence that both omega-3s from plants and marine sources are protective against cancer and we wanted to determine which form is more effective "

There are three types of omega-3 fatty acids: a-linolenic acid (ALA), eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). ALA is plant-based and found in such edible seeds as flaxseed and in oils, such as soy, canola and hemp oil. EPA and DHA are found in marine life, such as fish, algae and phytoplankton. Published in the Journal of Nutritional Biochemistry, the study involved feeding the



different types of omega-3s to mice with a highly aggressive form of human breast cancer called HER-2. HER-2 affects 25per cent of women and has a poor prognosis. Ma exposed the mice to either the plantbased or the marine-based omega-3s, beginning in utero.

"The mice were exposed to the different omega-3s even before tumours developed, which allowed us to compare how effective the fatty acids are at prevention." said Ma. "It's known that EPA and DHA can inhibit breast tumour growth, but no one has looked directly at how effective these omega-3s are compared to ALA." Ma found overall exposure to marine-based omega-3s reduced the size of the tumours by 60 to 70 per cent and the number of tumours by 30 per cent. However, higher doses of the plant-based fatty acid were required to deliver the same impact as the marine-based omega-3s.

Omega-3s prevent and fight cancer by turning on genes associated with the immune system and blocking tumour growth pathways, said Ma. "It seems EPA and DHA are more effective at this. In North America, we don't get enough omega-3s from seafood, so there lies an opportunity to improve our diet and help prevent the risk of breast cancer." Based on the doses given in the study, Ma said humans should consume two to three servings of fish a week to have the same effect.

Besides certain foods containing EPA and DHA, supplements and functional foods, such as omega-3 eggs or DHA milk, can offer similar cancer prevention effects, he added. The next step is to investigate the effects of omega-3s on other forms of breast cancer. "Seeing the significant benefits omega-3s can have in combating a highly aggressive form of breast cancer means omega-3s will likely be beneficial for other types of cancer." Researchers suggest starting with simple approaches like repeated exposure -- or caregivers and siblings modphasized.

Nutritionallyspeaking, soy milk is best plant-based milk Closest to cow's milk in range of nutrients it offers Science Daily January 29, 2018

How healthy is your almond milk really? It may taste good and may not

cause you any of the unpleasant reactions caused by cow's milk. But though plant-based milk beverages of this kind have been on the market for a couple of decades and are advertised as being healthy and wholesome for those who are lactoseintolerant, little research has been done to compare the benefits and drawbacks of the various kinds of plant-based milk.

A new study from McGill University looks at the four mostcommonly consumed types of milk beverages from plant sources around the world -- almond milk, soy milk, rice milk and coconut milk -- and compares their nutritional values with those of cow's milk. After cow's milk, which is still the most nutritious, soy milk comes out a clear winner.

The researchers compared the unsweetened versions of the various plant-based milks in all cases and the figures below are based on a 240 ml serving.

Soy milk -- the most balanced

nutritional profile

<u> Olene lebomberba</u>

• Soy milk is widely consumed for its health benefits linked to the anticarcinogenic properties of phytonutrients present in the milk

known as isoflavones.

Has been a substitute for cow's milk for 4 decades.
Concerns, however, are the 'beany flavor' and the presence of anti-nutrients (substances that reduce nutrient intake and digestion).

Rice milk -- sweet taste and relatively little nutrition • Lactose free and can act as an alternative for patients with allergy issues caused by soybeans and almonds. • Concerns, apart from the

high carbohydrate count, is that consumption of rice milk without proper care can result in malnutrition, especially in infants.

Coconut milk -- no protein and few calories, but most of them from fat • Widely consumed in Asia and South America

• Consumption can help reduce levels of harmful low-density lipoproteins (bad cholesterol) that are associated with cardiovascular diseases.

• Nutritional values are reduced if stored for over 2 months.

Almond milk -- need for complementary sources of food to provide essential nutrients • Almonds have a high content of monounsaturated fatty acids (MUFA) that are considered helpful in weight loss and weight management. MUFA also helps in reduction of low-density lipoprotein (bad cholesterol).

Cow's milk benefits & drawbacks • A wholesome, complete food, providing all major nutrients like fat, carbohydrates and proteins. • Can help humans by providing a wide range of host-defence proteins because various beneficial antimicrobial effects are found in both human and bovine milks. (E.g., a study shows that in the case of infants, consumption of cow's milk has considerably reduced risk of fever and respiratory infections.)

• But the presence of various pathogens like Salmonella spp and Escherichia coli O157:H7 in milk have been associated with disease outbreaks around the world. Cow's milk allergy & lactose intolerance

• One of the most common allergies among infants and children affecting 2.2-3.5% of children (a greater percentage than those who are affected by peanuts and tree nut allergies). As many as 35 % of these infants outgrow being allergic to milk by the age of 5-6, and this may increase to 80% by age 16.

• Lactose intolerance, due to the absence or deficiency of the enzyme lactase in the digestive tract, affects somewhere between 15-75 % of all adults depending on race, food habits and gut health.

• Some studies have suggested that 80 % of people of African origin and 100 % of those of Asian and Indigenous American origin are lactose intolerant.

The researchers add that more work will need to be done to understand the effects of various conventional and novel processing methods on the nutritional profile, flavour and texture of these alternative milks.

Repeated exposure helps boost healthy food consumption in children IFT Weekly January 3, 2018

A study published in Obesity Reviews suggests that varied diets and persistence in exposing infants and children to healthy



Research in Health & Nutrition

foods, even when they don't like them at first, are key to promoting healthy eating behaviours.

The researchers based their recommendations on data gathered from more than 40 peer-reviewed studies on how infants and young children develop preferences for healthy foods, especially vegetables and fruits.

Healthy eating starts during pregnancy, the authors explain. "Flavours of mom's diet reach the child in uterus, so if she's eating a healthy diet, the fetus does get exposed to those flavours, getting the child used to them," said lead author Stephanie Anzman-Frasca, PhD, assistant professor in the Department of Pediatrics in the Jacobs School of Medicine and Biomedical Sciences at the University at Buffalo.

After birth, if the mother breastfeeds, the baby also benefits from exposure to flavours from her healthy diet through the breast milk. These early exposures familiarize the baby with specific flavours as well as the experience of variety and set the stage for later acceptance of healthy flavours in solid foods.

The researchers discovered that even after infancy, repeatedly exposing children to foods that they previously rejected can help them to accept and like the food. "This method of simply repeating the child's exposure to healthy foods has a robust evidence base behind it," said Anzman-Frasca. "There are many studies with preschoolers who start out not liking red peppers or squash, for example, but after five to six sessions where these foods are repeatedly offered, they end up liking them."

The authors concluded that largerscale changes to make healthy choices easy choices in children's everyday environments may help caregivers to use recommended strategies to increase acceptance of healthier foods successfully. For example, making healthy side dishes and beverages the default accompaniments in kids' meals in restaurants can increase children's exposure to these items.

High doses of vitamin D rapidly reduce arterial stiffness: US study 05 Jan 2018 Nutrition Insight

High-doses of vitamin D reduce arterial stiffness in young, overweight/obese, vitamindeficient, but otherwise still healthy African-Americans, with results identifiable within just four months, according to researchers at the Medical College of Georgia at Augusta University.

Rigid artery walls are an independent predictor of cardiovascular-related disease and death, and vitamin D deficiency appears to be a contributor, says Dr. Yanbin Dong, geneticist and cardiologist at the Georgia Prevention Institute at the Medical College of Georgia at Augusta University. With this in mind, the researchers looked at baseline and again 16 weeks later in 70 African-Americans ages 13-45 – all of whom had some degree of arterial stiffness - taking varying doses of the vitamin best known for its role in bone health. The researchers found that arterial stiffness was improved by vitamin D supplementation in a dose-response manner in this population, they write in the journal PLOS ONE.

Participants taking 4,000 international units – more than six times the daily 600 IUs the Institute of Medicine currently recommends for most adults and children – received the most benefit, says Dr. Anas Raed, research resident in the MCG Department of Medicine and the study's first author. The dose, now considered the highest, safe upper dose of the vitamin by the



Institute of Medicine, reduced arterial stiffness the most and the fastest: 10.4 percent in four months. "It significantly and rapidly reduced stiffness," Raed says.

Two thousand IUs decreased stiffness by 2 percent in that timeframe. At 600 IUs, arterial stiffness actually increased slightly -.1 percent – and the placebo group experienced a 2.3 percent increase in arterial stiffness over the timeframe. They used the noninvasive, gold standard pulse wave velocity to assess arterial stiffness. Reported measures were from the carotid artery in the neck to the femoral artery, a major blood vessel. which supplies the lower body with blood. The American Heart Association considers this the primary outcome measurement of arterial stiffness.

When the heart beats, it generates a waveform, and with a healthy heart and vasculature there are fewer and smaller waves. The test essentially measures the speed at which the blood is moving, and in this case, fast is not good, Raed says. "When your arteries are more stiff, you have higher pulse wave velocity, which increases your risk of cardiometabolic disease in the future," says Raed. Dong was also corresponding author on a study published in 2015 in the journal BioMed Central Obesity that showed, in this same group of individuals, both 2,000 and 4,000 IUs restored more desirable vitamin D blood levels of 30 nanograms per milliliter.

The 4,000 upper-limit dose restored healthy blood level quicker - by eight weeks - and was also better at suppressing parathyroid hormone, which works against vitamin D's efforts to improve bone health by absorbing calcium, they reported. While heart disease is the leading cause of death in the US. according to the Centers for Disease Control and Prevention, blacks have higher rates of cardiovascular disease and death than whites and the disease tends to occur earlier in life. The authors write that arterial stiffness and vitamin D deficiency might be potential contributors.

While just how vitamin D is good for our arteries isn't completely understood, it appears to impact blood vessel health in many ways. Laboratory studies have shown that mice missing a vitamin D receptor have higher activation of the reninangiotensin-aldosterone system, says Raed. Activation of this system increases blood vessel constriction. which can contribute to arterial stiffness. Vitamin D also can suppress vascular smooth muscle cell proliferation, activation of garbageeating macrophages and calcification formation, all of which can thicken blood vessel walls and hinder flexibility. Vitamin D also reduces inflammation, an underlying mechanism for obesity related development of coronary artery disease, says Raed.

Dong notes that pulse wave velocity and blood pressure measures are complimentary but not interchangeable. "We think maybe in the future, when you go to your physician, he or she might check your arterial stiffness as another indicator of how healthy you are," Raed says. The Institute of Medicine currently recommends a daily intake of 800 IUs of vitamin D for those aged 70 and older. For adolescents and adults, they recommend 4,000 IUs as the upper daily limit; 2,000 was a previous upper limit. Foods like milk, milk products like cheese and yogurt, fatty

fish like mackerel and sardines, some greens like kale and collards and fortified cereals also are good sources. The researchers say a vitamin D supplement is an inexpensive and safe option for most of us.

Choline: Pregnant women may require twice the current recommendations 08 Jan 2018 Nutrition Insight

New research recently published in the Journal of the Federation of American Societies for Experimental Biology (The FASEB Journal) provides compelling evidence that significantly higher choline intakes during pregnancy, particularly in the last trimester, may result in faster information processing for their babies.

The research, "Maternal choline supplementation during the third trimester of pregnancy improves infant information processing speed: a randomized, double-blind controlled feeding study," was conducted at Cornell University by Marie A. Caudill and team. The feeding study included 26 women who were entering their third trimester of pregnancy and continued for 12 weeks or through delivery. Subjects all followed the same 2,100-calorie diet and were randomly split into a control group, who received 480mg of choline daily or an experimental group who received 930mg of choline, using supplemental choline provided by Balchem. The study also controlled for intake of nutrients like vitamin B12, folic acid and vitamin B6, nutrients which can play complementary roles to choline in metabolism. As a result, researchers

have stronger evidence to link the study outcomes directly to choline intake.

The authors used well-established cognitive tests to evaluate the newborns' memory, information processing speed, and visual attention span at four, seven, 10 and 13 months of age. By measuring infant saccade reaction time (RT), a key predictor of childhood IQ, the study authors were able to compare



the processing speeds for infants in both groups. The infants whose mothers consumed the 930mg choline dose experienced higher information processing speeds at all ages, significantly faster than the control group. Interestingly, the control group also showed a linear effect of exposure duration, which suggests that even moderate increases in consistent choline intake may support improved cognitive development. "In animal models using rodents, there's widespread agreement that supplementing the maternal diet with additional amounts of this single nutrient has lifelong benefits on offspring cognitive function," said Marie Caudill, professor of nutritional sciences and the study's first author. "Our study provides some evidence that a similar result is found in humans." The finding is important because choline is in high demand during pregnancy yet most women consume less than the recommended 450 mg per day.

"Part of that is due to current dietary trends and practices," said Richard Canfield, a developmental psychologist in the Division of Nutritional Sciences and the senior author of the study. "There are a lot of choline-rich foods that have a bad reputation these days," he said. Eggs, for example, are high in cholesterol, and health professionals, including those in the government, have raised caution about pregnant women consuming undercooked eggs, which may deter women from eating them altogether, even though such risks are low for pasteurized or cooked eggs, Canfield said. Red meats are often avoided for their high saturated fat content, and liver is not commonly eaten, he added. Two previous studies by other research teams had mixed results after examining cognitive effects of maternal choline supplementation, perhaps due to study designs that were not tightly controlled, Caudill said.

Choline is essential to proper fetal development and is particularly critical during pregnancy. Babies need choline in vast quantities as it is a necessary structural element of the phospholipid membranes of all brain cells, along with docosahexaenoic acid (DHA). Although the Adequate Intake (AI) of choline during pregnancy is 450mg per day, recent research shows that less than 10% of pregnant women achieve this amount (Wallace TC, Fulgoni VL, 2017). On average, pregnant women actually consume 319mg of choline per day, which is just 70% of the AI and less than two-thirds of the control group's 480mg daily intake in the Cornell FASEB study. These findings are consistent with other research that supports the important role choline plays for pregnant women and newborns. In fact, the American Medical Association (AMA) recently recommended that choline be included in all prenatal multivitamins as a result of the clear science and demonstrated benefits.

"The growing body of science, along

with the newly established Reference Daily Intake (RDI) of 550mg and the recent AMA endorsement, make it clear that increasing awareness of and access to choline for pregnant women is a priority," said Tom Druke, Director of VitaCholine Brand Development, Balchem Human Nutrition and Pharma. "We are proud to have provided VitaCholine as the supplemental choline source for this important study and we continue to invest in clinical research showing how important choline is to good health, particularly during the first 1000 days of life when the demand is so high and the benefits so substantial."

Though the study has a small sample, it suggests that current recommendations for daily choline intake may not be enough to produce optimal cognitive abilities in offspring, Canfield said. Current choline intake recommendations are based on amounts required to prevent liver dysfunction and were extrapolated from studies done in men in part because no studies had investigated requirements during pregnancy. "A prudent approach would be to increase dietary choline intake by consuming more animal source foods during pregnancy – egg yolks, lean red meats, fish and poultry," said Caudill. "For women who restrict animal-sourced foods, consuming a choline supplement that provides choline at a level comparable to 450 mg/day may be needed."

This study focuses on choline's importance during fetal development because the nutrient plays key roles in cell membrane structure and function, DNA methylation and gene expression, and is a precursor to the neurotransmitter acetylcholine. Co-authors include Barbara Strupp. professor, and Julie Nevins, postdoctoral associate, in

the Division of Nutritional Sciences. The study was funded by the Egg Nutrition Center, the Beef Checkoff, the US Department of Agriculture, The Institute for the Social Sciences, the Bronfenbrenner Life Course Center, and the National Institute of Food and Agriculture.

Cognitive health: High-salt diet linked to dementia. finds mouse study 17 Jan 2018 Nutrition Insight

Excessive consumption of salt is known to affect heart health and blood pressure, but research by scientists at Weill Cornell Medicine has now underlined its negative effect on cognitive health.

According to their study, a high-salt diet reduces resting blood flow to the brain and causes dementia in mice. The study, published on Monday in Nature Neuroscience, is the first to unveil a gut-brain connection linking high dietary salt intake to neurovascular and cognitive impairment. The findings illuminate a potential future target for countering harmful effects to the brain caused by excess salt consumption. "We discovered that mice fed a high-salt diet developed dementia even when blood pressure did not rise," says senior author Dr. Costantino Iadecola, Director of the Feil Family Brain and Mind Research Institute (BMRI) and the Anne Parrish Titzell Professor of Neurology at Weill Cornell Medicine. "This was surprising since, in humans, the deleterious effects of salt on cognition were attributed to hypertension."





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A vast majority, about 90 percent of American adults, consume more dietary sodium than the recommended 2,300 mg per day. The mice were given food containing 4 percent or 8 percent salt, representing an 8- to 16-fold increase in salt compared to a normal mouse diet. The higher level was comparable to the high end of human salt consumption. After eight weeks, the scientists examined the mice using magnetic resonance imaging. The mice showed marked reductions in resting cerebral blood flow in two areas of the brain involved in learning and memory: 28 percent decrease in the cortex and 25 percent in the hippocampus.

The scientists discovered that an impaired ability of cells lining blood vessels, called endothelial cells, reduced the production of nitric oxide, a gas normally produced by the endothelial cells to relax blood vessels and increase blood flow. To see if the biological effects of a high-salt diet could be reversed, Dr. Iadecola and colleagues returned some mice to a regular diet for four weeks and found that cerebral blood flow and endothelial function returned to normal.

Rodents that only ate the high-salt diet developed dementia, performing significantly worse on an object recognition test, a maze test and nest building – a typical activity of daily living for mice, spending less time building nests and using much less nesting material than normal mice. White blood cells that produce a protein called IL-17 (green) accumulate in the small intestine of mice fed a high-salt diet (right), compared with mice fed a normal diet. This image shows cells in a part of the intestinal layer that absorbs digested food and protects against infection.

Next, the scientists performed several experiments to understand the biological mechanisms connecting high salt intake with dementia. They discovered that the mice developed an adaptive immune response in their guts, with increased activity of a subset of white blood cells that play an important role in the activity of



other immune cells. The increase in those white blood cells, T helper lymphocytes called TH17, boosted the production of a protein called interleukin 17 (IL-17) that regulates immune and inflammatory responses, causing a reduction in the production of nitric oxide in endothelial cells.

In a final experiment, the scientists treated the mice with a drug known to prevent the suppression of nitric oxide activity, called ROCK inhibitor Y27632. The drug reduced circulating levels of IL-17 and the mice showed improved behavioral and cognitive functions, said Dr. Iadecola, who is on the strategic advisory board and receives a consulting fee from Broadview Ventures Inc. Broadview Ventures Inc. was created by the board of the Foundation Leducq Trust, the supporting trust of Foundation Leducq. "The IL-17-ROCK pathway is an exciting target for future research in the causes of cognitive impairment," says Dr. Giuseppe Faraco, assistant professor of research in neuroscience in the BMRI and first author of the study. "It appears to counteract the cerebrovascular and cognitive effects of a high-salt diet, and it also may benefit people with diseases and conditions associated with elevated IL-17 levels, such as multiple sclerosis, rheumatoid arthritis, inflammatory bowel disease and other autoimmune diseases."

Intermittent fasting: The diet to watch in 2018? 17 Jan 2018 Nutrition Insight

Protein Foods & Nutrition Development Association of India

With rates of obesity continuing to skyrocket, the weight loss market is seeing persistent growth, experiencing an explosion in sales especially around the New Year. In this

space, intermittent fasting (IF) is becoming increasingly popular, with organizations such as Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) touting its benefits.

IF is an umbrella term encompassing a range of diets where the pattern of calorie restriction and timing of food intake are altered so that individuals undergo frequently repeated periods of fasting or modified fasting (allowing a low calorie intake of approximately 500-600 calories per day). What is the science behind this range of diets, and what sort of opportunities do they offer the food industry?

In general, most science-based diets build in a form of calorie-restriction and/or focus on macronutrient distribution. "The latest diets and trends that are growing quickly are based upon variations of Intermittent Fasting (IF)," says Dr. Rona Antoni, Registered Dietitian and Research Fellow in Nutrition Metabolism at the University of Surrey. "These are highly popular today. Proponents of IF claim that it can improve blood sugar levels, decrease the risk of heart disease. stroke and cancer, prevent or delay the onset of neurodegenerative diseases and even improve memory, mood and depression," adds Dr. Roy McGroarty, an Infectious

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Disease Specialist and Humanitarian relief, recovery and development Program Manager.

Popular examples of diets based on IF include the 5:2 diet and alternate day fasting. In May, CSIRO launched a new "flexi" diet that includes intermittent fasting three days a week. The weight loss program is based on research carried out by CSIRO scientists who found that fasting can be an effective way to lose weight and stav healthy. According to the organization, participants in the 16 week trial lost an average of 11kg and saw improvements in cholesterol, insulin, glucose and blood pressure. "This was the largest study exploring the effects of an intermittent fasting style of diet on weight loss, health and nutrient status," says CSIRO Research Dietitian Dr. Jane Bowen. "In addition to improvement in weight loss and overall health, we also observed psychological improvements, with participants indicating better control over eating habits."

The reason that fasting can have a positive effect on harmful processes in the body is that during all kinds of fasting periods, various biochemical and molecular changes take place in the body. These include an increase in certain protective proteins, antioxidant enzymes, vitamin E and coenzyme Q10; all of which have a protective effect and prevent inflammation and oxidative stress. "The idea behind the IF diet is threefold: The first is glycogen depletion as a result of fasting," explains Dr. Samefko Ludidi, food researcher at the Gastronomy Research Center of the Hotel Management School Maastricht. "Depending on your level of physical activity glycogen stores are depleted after a period of about 8-12 hours fast. Second, following glycogen depletion, the body starts utilizing fat stores as an energy source. Third, fasting results in an average energy deficiency compared to the normal situation. The combination of these

three aspects could result in weight loss."

"There are some suggestions that this dieting approach may result in greater improvements in some markers of insulin sensitivity," Antoni says. "New insights revealed that people with diabetes mellitus Type 2 might even benefit from an IF way of eating," Ludidi adds. Anyone who eats according to intermittent fasting becomes more sensitive to insulin, which increases the growth hormone production again. Scientists have known for years that there is a strong link between insulin sensitivity and growth hormone production, because increased insulin resistance results in a decrease in growth hormone production. Intermittent fasting is good for cholesterol and triglyceride levels. Studies have shown that the ratio between the LDL level (the "bad cholesterol") and the HDL level improves with intermittent fasting.

One drawback of IF is that the initial transition is quite difficult. How difficult depends on the individual, as the body only requires 1-2 weeks to adjust to the new eating schedule. Some argue that you could eat anything when on an IF diet, as long as you stay in the negative energy balance. "But it is not only about calories. You cannot expect to lose weight healthily by getting that energy deficit from drinking a bottle of soda each day," stresses Ludidi. McGroarty adds: "The food industry can, therefore, help by lowering the production of highly processed foods, agreeing to better nutrition labelling and by stopping the 'Bliss Point' food testing method. In almost every case it involves adding sugar far beyond what the body requires." Antoni concludes: "The modern-day food environment makes sustainable, healthy eating behaviours difficult. The industry has the responsibility to do their bit and make it easier for the consumers."



Prebiotics in infant formula could improve learning and memory, says new study 18 Jan 2018 Nutrition Insight

New mothers often hear the slogan "breast milk is best" and are encouraged to offer breast milk to their newborn babies and that's because it contains natural sources of prebiotics, the small indigestible fibre molecules that promote the growth of good bacteria in the infant's gut.

However, many families find breastfeeding or completely impossible in some cases and turn to infant formulas. And now, thanks to research from the University of Illinois, infant formulas are getting even closer to the real thing. In a recent study, scientists found that prebiotics included in infant formula may enhance memory and exploratory behaviour. Speaking on their study conducted on piglets, Ryan Dilger, associate professor in the Department of Animal Sciences, Division of Nutritional Sciences, and Neuroscience Program at the university, explains: "When we provide prebiotics in formula, our results confirm that we can not only benefit gut health, which is known, but we can also influence brain development. We can actually change the way piglets learn and remember by influencing bacteria in the colon."

Piglets are widely considered a more informative model for human infants than mice and rats: their digestive systems, behavioural responses, and brain development are remarkably similar to human infants. Therefore, researchers are increasingly turning to piglets to test hypotheses in pre-clinical trials related to human health, especially in the context of gut microbes and brain development. "There hasn't been a lot of work looking at the gut-brain axis in humans, but a lot of rodent work is showing those connections. This is taking it to an animal model that is a lot closer to human infants and asking if that connection still exists and if we can tease out possible mechanisms," says Stephen Fleming, lead author of the study and a doctoral student in the Neuroscience Program at the university.

The effects of prebiotics on piglets In early 2016, Dilger and his colleagues worked with piglets to show that a combination of innovative formula components, including prebiotics, may play a role in brain development and behaviour. In their new study, the team concentrated solely on the effects of prebiotics. Starting on the second day of life, piglets were given a cow's milk-based infant formula supplemented with polydextrose (PDX), a synthetic carbohydrate with prebiotic activity, and galacto-oligosaccharide (GOS), a naturally occurring prebiotic. When the piglets were 25 days old, Fleming took them through several learning, memory, and stress tests. After 33 days, blood, brain, and intestinal tissues were collected for analysis.

The test for learning and memory gave piglets a chance to play with dog toys: one they'd seen before and one brand-new toy. If they spent more time with the new toy, that was an indication that the piglet recognized it as new and preferred it. This "novel object recognition"

test improves on classic maze tests commonly used in rodent studies. "If you're trying to test for memory, this test is closer to what we'd do with an infant. After all, we don't generally train infants on mazes," Fleming says. "We know from previous research this test works for pigs, but this is the first published example of using it in a nutrition context." Pigs fed PDX and GOS spent more time playing with new objects than pigs who didn't receive the prebiotic supplements. The preference for novel objects, an indication of natural curiosity, is a sign of healthy brain development and points towards positive development of learning and memory.

When prebiotics are working the way they should, good bacteria increase in abundance. One way to tell is by looking at metabolic endproducts - volatile fatty acids (VFAs) - excreted by bacteria during digestion of prebiotic fibres. "Volatile fatty acids are a global indicator for whether prebiotics had an effect on the overall population of bacteria. For example, we might want to see an increase in Lactobacillus and other beneficial bacteria that produce butyrate," Dilger explains. Volatile fatty acid (VFA) concentrations in the colon, blood, and brain were changed in pigs receiving PDX and GOS compared with control pigs." Recent evidence suggests that bacterial VFAs could be getting into the blood and travelling to the brain, where they could potentially affect mood and behaviour. "We found that, yes, VFAs are absorbed in the blood of pigs that were fed PDX/GOS. And, yes, they do get into the brain," Fleming explains. "But when we looked at the relationship between these VFAs and the results of our behaviour tests, there did not appear to be a clear connection."

Another surprise was a decrease in serotonin in brains of pigs fed the

prebiotic. "When you hear less serotonin, there's an immediate reaction to say, 'Well, that's bad,"" Fleming says. Not necessarily; those pigs didn't show greater anxiety than control pigs during a stress test or poorer performance when given a learning and memory test." The researchers hypothesize that the prebiotics may alter levels of tryptophan, serotonin's amino acid precursor, but it's too early to say. Although more work is needed to tackle remaining questions, the study adds to the growing body of research suggesting a strong and potentially modifiable link between the gut and the brain: a link that makers of infant formula should strongly consider. "There are so many ways we can alter the composition of the microbiota and they can have very strong benefits. Promoting good 'gut health' remains a strong focus in the field of nutrition," Dilger says.

Drinking 100 percent fruit juice has no effect on blood sugar levels, news research finds 19 Jan 2018 Nutrition Insight

One hundred percent juice does not have a significant effect on

fasting blood glucose, fasting blood insulin, or insulin resistance, according to new research.

The findings are consistent with previous research indicating that 100 percent fruit juice is not associated with an increased risk of developing Type 2 Diabetes and support a growing body of evidence that 100 percent fruit juice has no significant effect on glycemic control.



The study was conducted on behalf of the Juice Products Association and published in the Journal of Nutritional Science, A comprehensive data analysis quantitatively assessed the relationship between drinking 100 percent juice and blood glucose control. Using fasting blood glucose and fasting blood insulin levels as biomarkers for diabetes risk, the systematic review and meta-analysis included 18 randomized controlled trials (RCT) to evaluate the impact of 100 percent juice from fruits, such as apple, berry, citrus, grape and pomegranate.

According to The American Diabetes Association, about 90 percent of the 29 million cases of diabetes in adults and children in the US are considered Type 2. Type 2 Diabetes is a metabolic disorder where the body is unable to respond to insulin. The first line of defence for preventing and treating Type 2 Diabetes is following a healthy lifestyle. Eating right, exercising regularly and staying at a healthy weight are encouraged. Currently, US Dietary Guidelines recommend consumption of a healthy eating pattern which includes fruits, vegetables, grains, low-fat or fat-free dairy and a variety of protein foods. A 4-oz. glass of 100 percent juice counts as one serving (1/2 cup) of fruit, and can complement whole fruit to help individuals add more produce to their diets.

Female athletic performance boosted by newly developed mineral supplement, study finds 19 Jan 2018 Nutrition Insight

A small-scale study has found that women who took a specially prepared blend of minerals and nutrients for a month saw their 3-mile run times drop by almost a minute.

The minerals in the study included

forms of iron, copper and zinc along with two other nutrients carnitine (derived from an amino acid) and phosphatidylserine (made up of fatty acids and amino acids). The women who took the supplement also saw improvements in distance covered in 25 minutes on a stationary bike and a third test in which they stepped on and off a bench, according to research from Ohio State University. The study of young women, published in the Journal of the International Society of Sports Nutrition, compared the performance of those who took the supplement with a control group that took a placebo.

In an initial experiment including 28 women, half of whom took the supplement, researchers found that those in the study group saw their 3mile run times drop from 26.5 minutes on average to 25.6 minutes. Stationary bike distance covered in 25 minutes increased to an average of 6.5 miles, compared to 6 miles at the start of the study. Steps in the step test increased to almost 44 from about 40. All of the changes were statistically significant and were not seen in the placebo group. A second follow-up experiment designed to see if the first was reproducible and test a lower dose of one of the nutrients - included 36 women and found a 41-second average decrease in run times.

"We know that young women, in particular, often have microdeficiencies in nutrients and that those nutrients play a role in how cells work during exercise," says Robert DiSilvestro, lead author of the study and a professor of human nutrition at Ohio State. "They tend



to eat less meat than men, and menstruation also plays an important role in mineral loss." DiSilvestro is working toward developing and selling a supplement, based on this and previous research. It's expected to cost between US\$35 and US\$40 for a month's supply. The study was supported by the Gatorade Sports Science Institute, but the company is not involved in the commercialization efforts.

"I decided to start with minerals that are commonly low - or thought to be low in many diets - and brought in some of the supporting cast. These two nutrients, which are needed for cell function. are made by our bodies but also come from food we eat," DiSilvestro says. In the study, those who took the supplement combo were asked to sprinkle it into a beverage of their choice twice a day. (In the second round of study, DiSilvestro's team delivered the combo in capsule form.) The amount of nutrients in the supplements was well below a level that could cause harmful side effects, he says, and none was observed in this study.

Participants were recreational athletes 18 to 30 years old who had regularly done aerobic exercise at least two to three hours a week for six months. They also had to be runners. "We wanted people who could already run three miles without it being a terrible burden," DiSilvestro says. He and his collaborators compared the women's athletic performance at the start of the study to performance at the end of a 30-day study period. "The run-time drops in people at this stage of life were pretty large when they took the supplement. And in the placebo group, we saw little change," DiSilvestro says.

Stationary biking and the step tests were included because the women didn't typically perform these activities. These measures also gauged whether there might be benefits that extended beyond the running, when the women were more physically tired. (They ran first, then biked, then performed the step test.) Though it's less common for men to have mild deficiencies in these nutrients, except for copper, DiSilvestro says he's interested in whether he might see benefits in vegetarian men. Another potential area for study is in longer-distance running.



Malnutrition in India: Report reveals a financial as well as humanitarian crisis By Cheryl Tay 23-Jan-2018 NutraIngredients Asia

India's forthcoming union budget needs to better address the persistent problem of malnutrition in India, with an Associated Chambers of Commerce & Industry of India (ASSOCHAM) report claiming it causes the country to lose at least 4% of GDP.

Furthermore, women and children make up the majority of malnourished individuals in India, leading the authors to write that they "deserve a better deal in expenditure outlay". In fact, the country is home to half the world's under-nourished children, and according to the report, "only about 10% of the country's total children...are receiving (an) adequate diet". Citing the National Family Health Survey – 4, the report's authors said nearly 60% of children aged six months to five years old are anaemic. They added that the same was true for approximately 55% of non-pregnant women and 58% of

pregnant women aged 15 to 49, despite flagship programmes having been launched by the country's National Democratic Alliance (NDA) government to tackle this issue.

ASSOCHAM secretary-general DS Rawat said it was necessary for the government to implement policies that "focus on removing health and social inequities", adding that

"programmes and policies that aim to address the nutrition burden present a double-win situation". As micronutrient deficiency is a major component of India's malnutrition problem, the report said it was "imperative to focus on production diversity as well as food fortification at a macro level". It continued: "For instance, millets are three to five times more nutritious than rice and wheat in terms of proteins, minerals and vitamins. "They are costeffective crops as well, yet considered poor people's crops while rice and wheat are preferred over them "

"Millets are rich in vitamin B, calcium, iron, potassium, magnesium, zinc, and are glutenfree. They are suitable for people with gluten allergies or those with high blood sugar levels." Indeed, malnutrition has been a longstanding problem for India. Vitamin D and calcium deficiency is prevalent across all age groups, and malnutrition is particularly severe in rural India. Because of this, children in such areas have experienced suboptimal mental development, and according to an earlier ASSOCHAM study, 38% of them are underweight. Food fortification has been implemented as a solution, but has been slow to take effect, due in part to company concerns over possible regulatory changes and the differences in laws among states. More recently, we reported that many Indian companies had been ignoring reminders from the Food Safety and Standards Authority

of India (FSSAI) to fortify their milk and edible oils.

Food waste-fighting app launched to tackle Japan's six-million-tonne burden By Lester Wan 24-Jan-2018 Food Navigator Asia

Tokyo is trialling a project to stamp out food waste by rewarding shoppers who use a new app while buying foods that are close to their best-before or consume-by dates.

The EcoBuy app awards benefits in the form of rewards points to consumers who use the app after they have bought items coming to the end of their shelf-life. The app was designed by NTT Docomo Inc., Japan's largest mobile carrier, while the Tokyo metropolitan government is spearheading the trial. The project was launched at a Mini Piago supermarket in the city and could eventually be rolled-out nationwide. In the store, there are about 30 designated food items — including everyday staple foods such as bread, sashimi and milk — with stickers stating "Item for EcoBuy", together with the expiration date. To participate in the anti-waste project, customers use the EcoBuy app to take photos of the receipts of purchase of the eligible products and the expiration dates, and upload them. Once the designated centre confirms the purchase, and that it has met the required conditions, the customer will receive points equal to about 20% of the purchase value to be used with Docomo, as well as smartcard credits for e-commerce giant Rakuten.



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Aside from registering points, the EcoBuy app can show users the latest information about the food items included in the project, alert them of best-before dates and consume-by dates of the items they purchased that are approaching, and even provide recipes for the food items purchased. "We will aim to continuously resolve the problem of food loss by improving consumer awareness about food loss problem and encouraging reduction of waste volume," said NTT Docomo. The app can be used until the end of February, whereupon the project will be evaluated. Japan's Ministry of Agriculture, Fishery and Forestry (MAFF) estimates food waste in Japan to be about 6.21 million tonnes a year. Of this amount, less than half is thrown out from homes. The EcoBuy project is part of an ongoing effort by Japan to reduce the huge amount of food being disposed of by food companies and retailers.

Terushi Ito, president of 99Ichiba Co., which runs the Mini Piago store, added: "By using the smartphone application and by giving points to consumers who purchased foods with the bestbefore and expiration dates, it is possible to reduce food loss." "If we can reduce the volume of food waste, the labour cost for disposing of it will also be decreased." Last year, Japan retail giant Aeon Co. announced its goal to slash food waste by half, by 2025. As part of this move, the company said it planned to change the best-before date on processed food items to have the year and the month, but not to state the exact day. Other countries have also been getting in on apps to counter food waste, such as in Singapore. Last September, the Treatsure app was launched with 10 merchant partners, mainly bakeries and confectionery stores. At the end of the day, surplus food may be offered online at a discount of 20% to 30%. Users can reserve these items with the app, then head to the

store and pay within 25 minutes to collect the items.

Pomegranate extract and inulin may make for superior cholesterol-lowering combination By Cheryl Tay 02-Jan-2018 NutraIngredients Asia

A combination of pomegranate extract and inulin treatment could maximise their individual cholesterol lowering effects, according to researchers.

Animal studies have shown that both polyphenol-rich pomegranate extract (PomX) and the polysaccharide inulin help alleviate metabolic alterations caused by a high-fat diet, but the impact they have when combined has not been discovered. Therefore, researchers conducted a study to determine the effect of PomX and inulin on cholesterol and lipid metabolism in mice, both individually and together. They divided six- to sevenweek old male mice into four groups, all placed on a high-fat, high-sucrose diet: the first (control group) was fed the diet with no supplementation, the second was supplemented with PomX, the third with inulin, and the last with both PomX and inulin.

Superior combination After four weeks, the researchers observed that supplementation with both Pom and inulin lowered hepatic and serum total cholesterol, more so than supplementation with either the extract or the polysaccharide individually. Individually, PomX increased the gene expression of two key regulators of bile acid synthesis pathways and lowered liver triglyceride levels, while inulin had no significant impact on either liver or serum triglyceride levels. Instead, inulin on its own decreased the gene



expression of key regulators of cholesterol de novo synthesis and increased faecal elimination of total bile acids and neutral sterols. Only the mice supplemented with the PomX-inulin combination saw their liver and lipid weight lowered. In addition, the researchers wrote: "When inulin and PomX were combined, PomX-induced stimulation of main bile acid synthesis pathway remained, inulininduced inhibition of cholesterol synthesis (was) reduced, but the faecal neutral sterol excretion further increased compared to (in supplementation with) inulin alone "

The researchers wrote that this was the first study to investigate and report in detail on the enhanced cholesterol-lowering effects of PomX and inulin supplementation combined. They concluded: "Individually, PomX lowered cholesterol by increasing bile acid synthesis and slightly increasing faecal cholesterol and bile acid excretion, while inulin mainly targeted hepatic cholesterol de novo synthesis, and faecal cholesterol and bile acid excretion involving changes in the metabolism of the intestinal microbiome. "Detailed analysis cholesterol reabsorption and intestinal cholesterol synthesis, as well as the gut microbiota in future studies, will increase our knowledge of how PomX and inulin regulate whole-body cholesterol homeostasis".

FOOD SCIENCE INDUSTRY NEWS

Huge potential for glutenfree food products for manufacturers in India By Lester Wan 15-Jan-2018 Food

Navigator Asia

India has a severe shortage of gluten-free food despite an urgent need for it.

Researchers from India and the US say that India has the largest population of celiac disease sufferers in the world numbering in the millions but the amount of gluten-free food available to them and other health-conscious consumers falls far short of the need. Currently the only treatment for celiac disease is a strict, 100% gluten-free diet. Gluten is commonly used in baking as a binder within flour. Celiac disease is a systemic autoimmune syndrome activated by a reaction to gluten a type of protein in grain such as wheat, barley and rye. Symptoms include chronic inflammation of the small intestine, with extensive consequences if untreated ranging from diarrhoea to gastro-intestinal cancer.

According to the report published by the Institute of Agri-Business Management (IABM), India produced 7.55 kilo tonnes of glutenfree food in 2016, compared to the potential for 2,347 kilo tonnes. Some of the reasons for this include the lack of celiac disease diagnosis or gluten-free products, the difference in taste preferences in products offered by Western countries and the low quality of local products. India has only fulfilled about 10% of its potential for gluten-free food, and manufacturers could tap into the market potential and fill the gap. Furthermore, India's market share for 2016 to 2020 is expected to grow at a rate of 8.7%. For Asia-Pacific, it is expected to grow at a CAGR of 10.7%, from 2015 to 2020.

-RL

A foreseeable increase in the rate of diagnosis and awareness about quality gluten-free foods in the future are among contributing factors. Coming five years would provide ample of sic opportunities to global brands of gluten-free products to make their steps in Indian markets through existing channels, especially in big cities where people have already started demanding for better products," said the researchers. In India, rising disposable income and healthconsciousness have been driving the increasing demand for better processed food. Likewise, the demand for gluten-free processed food products such as crackers, breads, biscuits and cookies has risen in recent years.

"In big cities like Delhi,

Chandigarh, Jaipur and Bangalore, people are also demanding glutenfree pizza, pasta and noodles. Few exclusive gluten-free restaurants also opened in big cities of India. Northern India is majorly wheatconsuming belt, thus potential of gluten-free food is maximum here." stated Jolly Masih, researcher from IABM and main author of the report. In India, mainly our and mixes lead the market segment of gluten-free foods but, along with increasing awareness, people are getting attracted towards other food categories like snacks, pizza, pasta, fast foods and desserts," she said. The report also said that bakeries in India now offer customised snacks,

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The Value Adding Partnership The Co-Development Company Nonetheless, high product prices, the lack of awareness about the products and an inefficient value chain for gluten-free products could be inhibitors. The report cites The Packaged acts that 53% of consumers of gluten-free foods thought they were overpriced, and 41% said they would buy more such products if they were more affordable.

The researchers suggested offering attractive product combos at reasonable prices, smaller-sized packaging for our, cookies, biscuits and noodles, as well as using online promotions and e-commerce to reach those in cities further out which has so far has been effective.

Fortifying food with ironrich micronutrient powders may alleviate paediatric anaemia

By Cheryl Tay 09-Jan-2018 NutraIngredients Asia

Powdered vitamins and minerals added to food at the point of use can reduce anaemia and iron deficiency in young children according to researchers.

Globally, about 600 million children of pre-school and school-going age (two to 12 years old) are anaemic, with an estimated 50% of such cases attributed to iron deficiency. To lower the incidence of paediatric anaemia, point-of-use fortification of food with micronutrient powders (MNPs) has been recommended.

Iron alone or in combination with other vitamins and minerals in

Image © iStock.com

Muralinath

powder form can be added to energy-rich solid foods either during or after cooking, or immediately before consumption.

To assess the effectiveness of doing so, researchers at the Micronutrient Initiative in Canada, Centers for Disease Control and Prevention in the US, as well as at the WHO, conducted a review of RCTs and quasi-RCT trials. The trials sample sizes ranged from as little as 90 subjects to as many as 2,193 subjects.

Six of the studies exclusively involved participants below five years of age, four focused on children above the age of five, and the remaining three included children both below and above five years of age. They reviewed 13 studies involving 5,810 subjects from Asia, Latin America and Africa the MNPs used in said studies contained anywhere from two to 18 vitamins and minerals, and the iron doses in the different MNPs ranged from 2.5mg to 30mg.

Subsequently, researchers found that children who had been supplemented with MNPs containing iron ad point-of-use food fortification experienced a lower risk of anaemia and had higher haemoglobin levels, compared to those who had received a placebo or no intervention at all.

The researchers also observed, however, that information on mortality rates, morbidity, developmental outcomes and adverse effects was scant. Of all the studies they reviewed, only one trial involving 115 children had reported on all-cause mortality none of the children studied were affected.

They wrote: "We did not find any positive or negative effect on diarrhoea or mortality; but the data on these two outcomes were very limited."

The researchers said that point-ofuse food fortification using MNPs containing iron had been shown to alleviate anaemia and iron deficiency in children aged two to 12 years old. They then concluded that "future research should aim increase the body of evidence on mortality, morbidity, developmental outcomes and adverse effects. "Due to the lack of trials, we were unable to determine at this time intervention has comparable effects to those observed with iron supplements (provided as drops, tablets or syrup)."



Fast food in Asia, health & wellness in the West fuels global sesame demand: "The open sesame moment is coming," says Olam

By Niamh Michail 08-Jan-2018 Food Navigator

Global demand for sesame seeds is set to explode thanks to two very different macro-trends - the rise of fast food in Asia and healthy food in the West. Agrifood giant Olam is doubling capacity in its plants to meet that demand. It may be a small seed the but Singapore-headquartered supplier Olam is banking on big growth in the global sesame seed market, which is already worth \$8bn (€6.8bn). The rise of fast food outlets in Asia – primarily India and China – will be the biggest driver over the coming years. And while a sprinkling of sesame on a burger bun may not seem much, the sheer size of Asia's burgeoning middleclass populations means large volumes.

Parallel to this is the growth of health and wellness foods hitting Western shelves, and sesame is wellpositioned to tap into this trend too. The hummus section in supermarkets offers an increasing number of flavours while tahini is used as a healthy alternative to mayonnaise in salads or to replace or reduce dairy fats in ice cream. Whole sesame seeds are added to breads, muesli or used in gomasio, a Japanese condiment that blends crushed sesame seeds, sea salt and seaweed flakes to replace table-top salt.

Speaking to FoodNavigator at the company's processing plant on the Black Sea coast in Turkey, general manager Swaroopanand Joshi said: "There has been a complete change in perception. Five years ago, I don't think anyone would have guessed sesame would be such a big culinary trend." "Going forward, the most important thing we are seeing is the corporate entry into [products containing sesame]. In the past three to ve years, Nestle and PepsiCo have entered the hummus market and Unilever is marketing an ice cream with tahini. That's why it makes sense for Olam to have tahini in its portfolio. We don't want to compete with small tahini processors to serve the local market here [in Turkey] but the big giants." "The open sesame moment is coming," he added.

In fact, demand is growing at such a

pace that suppliers are struggling to keep up. Olam is currently doubling the capacity of its processing plants in Samsun, Turkey and around Lagos in Nigeria but further expansion may be necessary, Joshi said. "Logically it would probably make sense to expand here [in Turkey] and add one more line to the existing plant but we don't have a presence yet on the other side of the Atlantic and that region is growing so that would also make sense."

Different needs, different seeds Depending on the variety, sesame seeds contain around 50% oil, 25% protein and 10% fibre. There are around 40 varieties, each with a distinct flavour profile, and Olam trades numerous varieties. This mixed portfolio sourced from various countries means it can answer customer demand around the world. For instance, fast food outlets such as McDonalds and KFC want at sesame seeds that stick to the buns while manufacturers of simit, a Turkish bagel eaten for breakfast, want seeds to be as small as possible to cover more surface area. Chinese manufacturers tend to prefer Nigerian sesame because of the high oil content - sesame oil is used in Chinese cooking for shallow frying - while Turkish customers prefer Ethiopian seeds because the higher protein content gives a sweeter taste, Joshi said.

A presence in Africa and the Mediterranean

China and India used to provide the world's sesame seeds but, in the past ten years, both countries have been encouraging farmers to switch to higher value crops such as cotton or staple food crops such as corn and soy. Previously a net exporter, China now imports sesame to meet its needs while Indian output has fallen from around 900,000 to 200,000 tonnes. Today seven of the top ten producer countries are in Africa.

Food Science & Industry News



According to FAOSTAT data, the top ten producer countries in 2014 were Tanzania, India, Sudan, China, Myanmar, Nigeria, Burkina Faso, Ethiopia, Chad and South Sudan. Each year Olam buys around 250,000 MT of sesame from one million farmers and intermediary sellers. The location of its two processing factories give the supplier a proximity to sesame's sourcing and to the end market. "Africa is where sesame is grown but not where it is eaten. Turkey gives us quick, easy access to the market - Turkey, Greece, Lebanon, Israel, North Africa. They all use tahini in traditional foods."

Price volatility

By buying sesame from producers based in many different countries, Olam can weather the supply disruptions that come with "any supply chain concentrated in Africa", Joshi said. Sesame has an annual price volatility of around 25 to 30%, and this is mainly due to "sovereign" supply issues rather than crop failures. Recent problems include a road closure blocking access to Nigeria's port and a currency crisis in Sudan meaning farmers are withholding stocks. However, this price volatility tends not to affect manufacturers of baked products so much as they use seeds in such small quantities, Joshi said.

The move to mechanisation

Sesame seeds have a dark outer shell and must be dehulled before use. The traditional method is to soak the seeds in water until the skin is loosened, and then rub them to remove the skin. It's a water intensive method that uses around 3000 litres of water per metric tonne.

The mechanised process used by Olam in its Nigerian and Turkish factories, known as aqua hulling, sprays the seeds with high-pressure water jets to remove the skin and uses just 150 litres per metric tonne.

"The problem is that most of the processing is happening in developing nations where sensitivity to water usage is still not there. [Mechanised] processes make much more sense," Joshi said, adding that the organoleptic properties suffer.

"With soaking, water is absorbed to the inner core so when you dry and roast it, the taste is slightly different – the aroma is much better due to the conversion of fats to proteins and protein to sugar, which is much better."

"With mechanical hulling the taste might not be that good but for bakery or hummus – where it is only a tiny percentage of the total product – it doesn't matter." Some customers do specify they want tahini made from traditionally hulled sesame seeds for a richer taste profile but this is falling. "Slowly the world is understanding that mechanical processing is more sustainable and this trend will follow."

2018 and beyond: Five mega-trends set to shape the food industry

By Katy Askew 03-Jan-2018 Food Navigator

If you thought 2017 was a turbulent year, 2018 is likely to

herald further food sector shake-ups.

From the growing influence of disruptive start-ups to rising concern over big-picture issues such as food security and noncommunicable diseases, companies that adopt business-as-usual approaches will come under pressure.

Start-up self-starters

According to Pinar Hosafci, head of packaged food at Euromonitor International, smaller local players, and start-up business are likely to set the pace of innovation over the next 12 months - stealing share from established brands in the process. "2018 promises to be the year of disruption in packaged food and we expect a lot of disruptive innovation coming from local players in the start-up community. particularly around the areas of plant-based protein, personalised nutrition, E&S commerce and food technology.

These new start-up companies and local players will create new revenue streams and increasingly steal share from big foot players, so the big foot players need to come up with innovative ways of finding more sophisticated partnerships with niche players," Hosafci predicted.

Chris Thoen chief technology innovation officer at Givaudan, suggested start-up businesses are able to adopt a more adventurous approach when it comes to delivering innovation – and they have been using this to their advantage to gain global market share.

"If I look at bigger companies... they have an existing business to support and defend and that makes you a little more conservative as you do innovation and you check things out a little more than you might as a start-up with nothing to defend but everything to gain," he told FoodNavigator.

Speaking on the sidelines of a European Institute of Innovation and Technology (EIT) event, Thoen suggested that smaller more nimble food makers are able to focus in on specific solutions or targets. "The bigger companies look at the bigger problems but by doing that you average out the problem. Start-ups drill down into a specific pain and provide a painkiller, a solution." Like Hosafci. Thoen believes that this dynamic will lead to an increase in collaboration between big business, agile start-ups and academia. "All three stakeholders are really necessary for the holistic innovation that is going to be needed in food."

Food as medicine

Thoen believes future food innovation will be driven by the need to find solutions to some of the big picture issues facing the industry. Food producers will have to meet the dual challenge of feeding the growing and ageing population – expected to rise to 9.8bn people by 2050 - while also responding to escalating rates of non-communicable diseases, such as obesity and type2 diabetes. This perfect storm is sparking an evergreater awareness of the link between health, aging and diet. With consumer and regulatory pressure mounting, the food sector is likely to respond by concentrating its innovation might on delivering products that keep people healthier for longer. "Food is your medicine in a sense; it helps people to perform at their peak,"

Food Science & Industry News

Thoen observed. "Food is really the centre of nutrition and health and wellness. One of the social challenges is healthcare – the cost of healthcare. It is much better to prevent and keep people at the optimum of their quality of life versus letting it slip and having to start treating the disease. We want to provide solutions before the diseases start."

Less is more, more is more

Supporting improved population health and spurred by mounting regulatory pressure, the food sector is likely to continue expanding its reformulation efforts. While sugar reduction currently sits firmly in the spotlight, the cyclical nature of public opinion would suggest efforts to cut other baddies - sodium or trans fats for example - will remain important moving forward. Reformulation is not just about what you take out of foods. Improving access to information on nutrition and the functionality of foods is also prompting forwardthinking companies to look at what can be added to support health. High-protein products supporting healthy aging, for example, are will continue to be an important growth area. The real challenge in reformulating products is that this must be achieved while maintaining product quality. Taste cannot be sacrificed at the altar of reformulation. In the coming year, it looks likely that the food industry will continue to develop new and innovative ingredients that deliver an exciting sensory experience.

Meat reduction and more

Largely driven by consumer's desire to live healthier, more sustainable lives we can expect meat reduction trends to continue to gain steam in 2018. 2017 saw a significant jump in the number of 'flexitarians' – people who consume reduced levels of animal products. Interestingly, data suggests that consumers are also making the more challenging transition to vegan diets. According to research firm GlobalData, in the first quarter of 2017 3% of the British population described themselves as vegan, compared with just 0.8% in 2014.

"The rising number of vegans and how fashionable the

cuisine now seems to be, big companies are taking notice: the number of vegan options will increase in both supermarkets and restaurants," GlobalData consumer analyst, Ronan Stafford commented. Mintel's new product database shows that vegan and vegetarian product launches are strong in European markets like Germany, the UK and France. Germany accounted for 18% of global vegan product launches in 2016 - and foods making vegan claims rose from 1% of the country's new products in 2012 to 13%. "Veganism is now seen as a trendy lifestyle," Mintel food and drink analyst Katya Witham noted. "Today, vegan products attract attention from a much wider audience, namely health and ethically driven, flexi-vegan consumers."

Transformative tech

Technological advances are likely to disrupt the vertical food chain and boost transparency, EIT director of innovation Dr Thorsten Koenig predicts. "We need to find ways to bring more of the supply chain into your kitchen," he told FoodNavigator. "A vertical food chain is a classical model the food industry has employed over 50-60 years and it worked well. We need to reinvent our value chain." Developments like blockchain, which started life in the financial services industry, are gaining resonance in the food sector due to rising expectations around transparency. Consumers want processors to be able to tell food



stories. A product's narrative is important and – in a world that is increasingly skeptical – being able to support that story with data will be crucial.

Digitalisation means consumers expect to have detail on ingredients sourcing and manufacturing processes at their fingertips. They want to know what is in their food, where it comes from, who made it and how it was produced. Technological progress and digitalisation are also likely to reinvent the way that consumers interact with the food they consume through the delivery of more personal experiences. This offers food makers a unique opportunity to place the individual consumer at the heart of their innovation efforts. Currently, the food sector is largely using personalisation to segment consumer groups. The disruptive potential of personalised technology goes way beyond this, Koenig suggested.

Mintel's product launch tracker shows Germany, UK and France alongside US for share of vegan product launches

"There will be more tailor-made nutrition. There will be products for sports people, but the [food sector] is working towards more individual nutrition. And there is a step in between that: you look for subgroups – women, pregnant women, men working at a desk compared with men working in a factory and so on," he predicted. Technology will also play a key role in making food production more sustainable. From the need to produce more food using fewer resources to tackling issues like climate change, emerging technologies are likely to become a key part of the solution.



Nitrite-free bacon set for UK launch

By Noli Dinkovski 02-Jan-2018 Food Manufacture

A bacon product free of cancercausing nitrites is to launch in the UK following a £14M investment by Northern Irish meat processor Finnebrogue.

Completely free of nitrites, preservatives, E numbers and allergens, Naked Bacon will be available in supermarkets from January 10. Finnebrogue worked with Spanish flavourings firm Prosur to develop a way of flavouring traditional British bacon without nitrites – something it claimed had never been achieved before. The natural flavour is produced from natural Mediterranean fruit and spice extracts, following a decade's worth of research and development. The flavour is currently being used in continental-style hams in the EU, but this will be the first time the technology has been applied to British bacon and available to UK consumers, according to Finnebrogue. In addition to Naked

Bacon, Finnebrogue will also be bringing Naked Ham to market on January 15. Furthermore, it is producing nitrite-free own-label bacon for Marks & Spencer, which

will go on sale this month.

Travelling the world Finnebrogue chairman Denis Lynn claimed he had travelled the world to find a way to make bacon without nitrite, "and up to now we'd never made a single rasher of bacon because we couldn't work out how to do

it". "For more than a

decade I have insisted we not touch bacon until such time as we can make it better and safer – and now we have," he explained. "Our Naked Bacon is not only safer than any other bacon on the market, it also tops the charts in blind taste tests. This really is the biggest revolution to the British breakfast for a generation."

The product has received the support of Professor Chris Elliott, who ran the government's investigation into the 2013 horsemeat scandal. Elliott, who now chairs the Institute for Global Food Security at Queen's University Belfast, said: "Many forms of processed foods have come under the spotlight over recent years for their unhealthy attributes. Processed red meat in particular has been a focal point. "To have a bacon produced naturally, that doesn't require such chemicals to be added or formed during processing, is a very welcome development." Finnebrogue's innovation won further backing from Neil Parish MP. the chairman of the House of Commons Environment, Food and Rural Affairs (EFRA) select committee.

Characteristic pink colour

The purpose of adding nitrites is to give cured meat its characteristic pink colour, texture, some flavour and also to help as a preservative. While Finnebrogue claimed its technology to be a first, nitrate-free bacon has been available in the UK for a number of years. Emmett's, based in Peasenhall. Suolk. said its 100% Blythburgh Free Range drycured pork has been free of nitrates, allergens, water and E numbers since 2012. O'Doherty's Fine Meats in Fermanagh. Northern Ireland. meanwhile. launched its own nitrite-free bacon in 2000 following a five-year development process.

The World Health Organization (WHO) has said bacon cured with nitrites is as dangerous as asbestos and smoking, as nitrites produce carcinogenic nitrosamines when ingested. It warned that eating two rashers of nitrite-cured bacon a day increased the risk of contracting bowel cancer by 18%. However, in light of the WHO work, European Food Safety Authority (EFSA) opinion published in June last year concluded that current safety levels for sources of nitrites in diet and not just bacon, were "sufficiently protective for consumers".

Andrew Kuyk, director general of the Provision Trade Federation, said his organisation's view on any risk associated with nitrites in bacon was in-line with the ESFA opinion. He said: "We are aware of products that aim to produce the effect of 'curing' bacon (essential to protect against risks such as Clostridium botulinum) by using non-traditional methods involving various other additives or natural substances. "Some of these do not contain any nitrites at all, while others may do so. It is important, therefore, that any such products are properly labelled and tested to ensure that they meet claimed food safety and shelf-life standards. "That said, any innovations in food technology that can be proven to reduce risk to consumers are to be welcomed."

REGUILATORY NEWS

Import duties on special diets 'restricting lifesaving nutrition' for Indian children By Cheryl Tay 16-Jan-2018 NutraIngredients Asia

The Indian government should cut or waive import duties on lifesaving diets for children with metabolic errors and rare diseases.

That's the recommendation from the country's Metabolic Errors and Rare Disease (MERD) organisation, a parents association concerned about the cost of the special diets such children require. Currently, import duties of 30% to 40% are imposed on these diets, even as statistics show that almost 50,000 newborns have Inborn Errors of Metabolism (IEM), whereby the body is unable to effectively convert food to energy.

Parents of children with IEM have to fork out an annual average of US 3,940 on each child's treatment, which includes Food for Special Medical Purposes (FSMP).

We reported last year that FSMP diets are typically imported into India from major companies such as Abbott, Danone, Mead Johnson and Nestle. However, India's import duties on these diets are far higher than those in most developing nations, where they attract a mere 5% to 10% import duty. MERD said it had appealed to different government authorities like union health minister JP Nadda to reduce the import duties on FSMP diets, but had been unsuccessful so far.

In a letter to the Special Director General of Health Services (DGS) BD Athani, the organisation wrote: In view of the importance of these diets for our future generation, we would request you to exempt the import duties levied on these lifesaving diets in view of the nonexistence of these products in the country.

MERD member Vikas Bhatia told Indian media: "Through this support group, we have been campaigning about I and special diets required for the survival of children with the

problem.Screening is very much required so that the problem can be diagnosed for many newborns, which helps give them a normal life. There is a need to reduce or exempt the import duty on such special diets, as this will help the survival of the children.

Last year, the Food Safety and Standards Authority of India (FSSAI) teamed up with several organisations to launch Diet4Life, a scheme that allows FSMP diets to be imported into India for children suffering from IEM. This has made special diets more accessible in India, where they were not widely or readily available until 201, and parents of IEM patients had to resort to filling out paperwork in order to gain permission to import them. However, the high import duties continue to affect affordability and therefore, overall accessibility.





Foods containing GM golden rice can be sold in Australia and New

Zealand

By Gary Scattergood 03-Jan-2018 Food Navigator Asia

Products containing traces of golden rice, which is genetically modified to produce betacarotene, should be able to be sold in Australia and New Zealand, regulators have ruled.

It follows an application to Food Standards Australia New Zealand (FSANZ) from the humanitarian organisation International Rice Research Institute, which cultivated the GR2E rice line to mitigate vitamin A deficiency in developing 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 Golden Rice to be grown in developing countries. Permitting Golden Rice 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.

What this means

This means that there would be no cost involved in having to exclude GR2E 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. In approving the application,

FSANZ stated that food derived from Golden Rice would have to be labelled as 'genetically modified' because it would contain novel DNA and novel protein.

"FSANZ has determined that Golden Rice would contain novel DNA and novel protein, as well as an altered nutritional profile (contains beta-carotene), and would be required to carry the mandatory statement 'genetically modified' on the package label," it stated. "This requirement would apply to rice sold as a single ingredient food (e.g. a package of rice) and when the rice is used as an ingredient in another food (e.g. rice our, rice milk).

Another product from the rice is rice bran oil. Under the labelling provisions, rice bran oil derived from Golden Rice would be unlikely to require labelling because it would not contain novel DNA or novel protein, or have an altered nutritional profile because betacarotene would not be present.

The need for functional food The Institute wants the GR2E rice to be cultivated for humanitarian purposes in developing countries including Bangladesh, Indonesia and the Philippines which are at high risk of vitamin A deficiency (VAD) and where 30–70% of energy intake is derived from rice.

While acknowledging that GR2E rice will not solve the issue of population-based VAD for these countries, it believes it can be a major part of an overarching strategy to reduce deficiency. Countries wishing to adopt the Golden Rice technology are free to introduce the GR2E event into preferred varieties that suit the local environment and meet certain criteria outlined in a Humanitarian Use Licence Agreement, subject to local regulatory arrangements.

In 2013 Australia imported 145,370 tonnes of milled rice (representing around 45% of the rice consumed). The main suppliers were Thailand (49%), India (19%) and Pakistan (13%) (FAOSTAT 2017). In the same year, New Zealand imported 42,381 tonnes of milled rice with the main suppliers being Australia (39%), Thailand (26%), and the US (13%).

The Australia and New Zealand Ministerial Forum on Food Regulation has been notified of FSANZ's decision. Similar applications are currently under review in the USA, Canada and the Philippines.

Dutch supermarket app will recommend healthier products over unhealthy ones By Niamh Michail 04-Jan-2018 Food Navigator

The Netherlands' governmentbacked Nutrition Centre has



launched an app that consumers can use to compare brands in store and find the healthiest one. "We hope to unleash a revolution in the supermarket," it says.

Launched this week, the app will help people navigate the information on a product's small print as well as allowing the possibility to focus on particular nutrients, such as calories, carbohydrates or salt, the Nutrition Centre (VoedingsCentrum) said. Consumers use the smartphone app, which is freely available for download, to directly scan a product barcode, manually type in a brand name or browse through product categories to find information.

The product comparison tool allows consumers to compare the nutritional profile of up to three chosen products, thus choosing the healthiest one available. Product data on the app are updated daily and users can indicate which supermarkets they shop at so that private label brands from other retailers do not appear. Most products on Dutch supermarkets shelves can be scanned with the app and the Nutrition Centre said it is

eat healthier". "In the supermarket or at the breakfast table you can quickly and simply see with your mobile whether a product is the right choice for you and the people around you. Making healthy choices is one step closer for everyone," he added. The app will also say if a product is part of the Netherlands' healthy eating programme 'Schijf van Vijf', or Disc of Five. Similar to the Scandinavian region's Keyhole scheme, the Schiif van Viif is a form of positive nutritional profiling that rewards products with a positive effect on health.

Foods and drinks with too much salt, sugar, trans fat or saturated fat or too little fibre are not included. The inclusion criteria are tailored to each different food category. This means that tinned vegetables are not included because the salt content is high and fresh vegetables are widely available. Tinned pulses, such as chickpeas or kidney beans, however, are included provided the salt content is below a given threshold. Certain categories, such as sweets, biscuits, sugary drinks, alcoholic beverages and processed meats, are never included because the Health Council advises people to consume as little as possible of such products



The Nutrition Centre is mandated and fully funded by the Dutch government to promote healthy, safe and sustainable food choices without any commercial interest. Dutch state secretary for health, welfare and sport Paul Blokhuis said the app was "a wonderful asset for everyone who wants to



Comparison to average values of products in the same category

Sardines in tomato sauce (59 products)

Canned sardines (467 products)

or for consumers to replace them completely.

If a consumer scans a product that is not within the Schijf van Vijf, the app will automatically recommend healthier alternatives or provide a link to a healthy recipe, although this function can be deactivated by the user. "The app makes reading labels much easier and more fun. We hope to unleash a revolution in the supermarket," said food safety expert at the Nutrition Centre Wieke van der Vossen. "Research shows that reading labels can contribute to a healthier diet."

A distraction manoeuvre?

However, consumer group Consumentenbond has opposed the app as a "distraction manoeuvre" because, unlike on-pack labelling, it requires consumers to actively search for the information. When plans for the app were announced in 2016, a spokesperson for industry watchdog FoodWatch said: "Surely most consumers will never use the app. [They won't] have the right phone, like elderly people, or the group which could use the information the most, poorly informed people."

A spokesperson for the Nutrition Centre told FoodNavigator: "The app can be used by anyone, it doesn't matter if you are young or old." However she added: "Our expectation is that the app will be primarily used by people who are already interested in food. We deliberately introduced this app in the first week of January, because a lot of people have a positive intention to healthy eating." Similar apps already exist in other countries. Open Food Facts is a universal database with an accompanying smartphone app that collates nutrition information on product labels. It uses France's official nutrition logo, NutriScore, to award products a colour.

In the UK, for instance, the FoodSwitch app contains nutrition information for over 100,000 packaged food and drinks sold across major UK supermarkets. Consumers scan the barcode of a product and instantly receive colour-coded nutritional information based on the UK's 'traffic light' logo. The app then recommends similar, yet healthier, alternatives and users – there were 4.381 as of December 2016 – can filter results to home in on specific nutrients. FoodSwitch is also regularly used by healthy eating campaign group Action on Sugar and Consensus Action on Salt (CASH), which were involved in its creation, to raise awareness over the often significant disparities in salt and sugar levels within a single category, such as pesto sauces or biscuits.

TINE using Facebook to ask public to vote on new best-before labelling to

reduce waste

By Jim Cornall 04-Jan-2018 Dairy Reporter

Norwegian dairy company TINE is taking to social media to ask for the advice of its customers in how to label its products to reduce waste.

The company is holding a poll on Facebook where consumers can vote on which of three sentences they want to see on TINE's products in addition to the "best before" date. The goal is for consumers to also increase their understanding that "best before" does not necessarily mean that the products cannot be eaten, with the end result being less food waste. The phrases consumers can choose from are: Best before 01.01.18, After: see - smell - taste Best before 01.01.18, and often good after Best before 01.01.18, but not bad after.

Increasing awareness

The Facebook post has already received more than 170,000 views and responses. Biørn Malm, head of corporate social responsibility at TINE said by involving the whole of Norway's population, everyone gets more ownership of the messaging, and becomes aware of checking the food before it is thrown away. In Norwegian homes, around 217,000 tons of food is discarded every year and TINE said as a food producer, it has a responsibility to help the consumer throw less food away, by having optimal packaging, increasing shelf life, and now by changing the labeling.

Consumer information site

Anne Marie Schrøder, from Norwegian group Matvett, is pleased that TINE will be carrying additional information on all products. Matvett is a Norwegian food and catering industry initiative to prevent and reduce food waste in Norway, and is a collaboration between business, government and research communities. "It's great that TINE wants to focus on the fact that all dairy products are labeled" best before "and often last long after the expiry date, provided proper storage." Schrøder said. "Our research shows that sour cream and

yogurt are often unopened in people's trash cans, just because the date has passed. Best before is just a quality guarantee date," she added, saying consumers should smell and taste food after the expiration date.

The group's website (in Norwegian) includes news, tips and advice on best before dates, how to reduce food waste, recipes, and other useful information for consumers. The poll ends on Friday, January 5, after which TINE will start to mark the products with the most popular choice; the company said the first products bearing the revised marking will most likely be in stores the following week. Malm said initially, milk, sour milk, cream, juice, yogurt packs and school milk will have the revised wording, with other products following throughout the year.



India's FSSAI chief slams auditor's report reiterates commitment to food safety By R J Whitehead 0-Jan-2018 Food Navigator Asia

India's food regulator has strongly rebutted a report by the Comptroller and Auditor General (CAG) that has been highly critical of its licencing, standards and testing processes.

Seeking to assure consumers that they can trust food sold in India, the chief of the Food Safety and Standards Authority of India



Regulatory News

(FSSAI) stressed the regulator's commitment to its remit to ensure food safety, and pointed out that it is currently investing Rs4.8b (about US \$75m) in upgrading its laboratories.

The Report's Criticism Alleged: • The shoddy state of food-testing labs under the FSSAI.

• A lack of standards for regulating some food items.

• Poor infrastructure for the collection of samples.

• Lapses in issuing licences and clearances

• Financial lapses within the FSSAI.

The auditor said it had found "systemic inefficiencies, delays and deficiencies in the framing of various regulations and standards, amendments to regulations in violation of the Act and the specific direction of the Supreme Court. Countering the CAG's findings point by point, Pawan Agarwal, the FSSAI's chief executive, said the auditor's office had ignored the work the regulator has been doing recently, and had only assessed years up to 2016. He also highlighted the FSSAI's request to the government for 600 more staff and its review of the Food Safety and Standards Act. from which it will make recommendations later this year. In his response, Agarwal insisted: The report should be seen in the context of the huge and complex task at hand. The fact is that the FSSAI is a new and evolving organisation and it faces severe constraints of manpower and resources.

"We assure citizens that they can trust food they get. The FSSAI is confident that the country's food safety ecosystem is well on the way to become more robust and globally bench-marked in the years to come," he told reporters. Answering questions about the standards of the FSSAI's central and state food labs, he said that the authority has been upgrading its facilities and will soon set up two new testing centres. The regulator is also due to finalise reference labs to deal with any inconsistencies between the centres, Agarwal added, to address a key criticism by the CAG.

Smartphone app to help switch to healthier foods By Rick Pendrous 02-Jan-2018 Food Manufacture

People who are overweight and identified as being at higher risk of cardiovascular disease could soon have access to a smartphone app that provides them with advice about swapping to healthier foods, thanks to a collaborative research project involving public health researchers and an unnamed K supermarket chain.

The study makes use of the nutrient profile of shoppers' baskets to identify when they contain large numbers of products with red frontof-pack traffic light nutritional labels for saturated fat, sugar and salt. By using the app, they would be re-directed to healthier versions of similar products in-store. "We are just about to embark on two new trials where we motivate and support individuals to make changes in their diet," said Susan Jebb, professor of diet and population health at the University of Oxford. Jebb was giving the British Nutrition Foundation's Annual Lecture in London last November.

Build a partnership

"What we are trying to do in these two studies is to build a partnership between health professionals and some digital and technological tools in order to provide people with personalised support to change their diet." A new generation of the FoodSwitch app on smartphones is being developed to give people the personalised dietary information they need, reported Jebb. Shoppers



use the app to scan the barcode of products. It provides the nutrient profile of the foods and offers a swap to a healthier alternative. "It will allow people to set goals and monitor their intake and then provide feedback," said Jebb. At the same time, in other projects, practice nurses in GP surgeries will work with patients with high blood pressure and raised cholesterol levels to motivate them about the importance of dietary change.

Nutritional feedback

"We have partnered with one retailer," said Jebb. "What we will be doing is providing people with nutritional feedback based on their lovalty card data. This will tell you about the nutritional content of your basket and provide tailored swaps and, hopefully, improve the nutritional profile of your basket." While Jebb did not name the supermarket involved, Tesco is known to have conducted studies to assess the overall nutrient profile of its shoppers' baskets of food. This had clearly identified where some were over-indexing on purchases unhealthy products.

"These are both feasibility studies," said Jebb. If they show any signs of effectiveness, we will obviously take them forward into bigger more definitive trials." Jebb was previously chair of the Public Health Responsibility Deal Food and Drink network, which worked closely with the industry to reformulate products to reduce levels of fat, sugar and salt.

Meanwhile, children's snack consumption should be limited to two 100-calorie products a day; Public Health England has urged parents, as part of a new campaign to promote healthier eating.

Cost-cutting sparks rise in food and drink recalls By James Ridler 02-Jan-2018 Food Manufacture

Cost-cutting by food and drink manufacturers has sparked a rise in product recalls over the past six years as the number of foods recalled for being contaminated with foreign bodies has more than tripled claimed insurance broker Lockton.

In a survey of 200 food industry employees and executives, two in five (42%) believed cost-cutting in the production process was to blame for the increase in number of recalls. A further 41% believed costcutting as a result of downward pricing pressures from retailers and consumers was to blame.

Lockton's head of product recall Ian Harrison said: The correlation we're seeing between increasing pricing pressures within the food and beverage sector and the instances of product recalls is one the industry cannot afford to overlook.

"Our research has found that as pricing pressures increase, manufacturers have to cut more corners and look for cheaper ways to produce their products. An unintended victim of this is oversight and quality control, leading to foreign bodies finding their way into food and beverages on our shelves."

More at risk in the long term While manufacturers might see cost-cutting as a quick remedy in the face of price pressure, it puts the company more at risk in the long term, said Harrison. He added: For some of the UK's smaller manufacturers the cost of a recall may even be terminal.

Manufacturers should ensure they have the right cover in place, to minimise the financial impact should they face a recall."

Lockton's Research into recalls announced by the Food Standards Agency found that the number of cases of foreign bodies in products had jumped by 350% between 2012 and 201.

Food recalls have also doubled over the past three years, with nearly a quarter (25%) caused by contamination by objects such as glass, metal or plastic. "Only two recalls in first half of 2012 were due to the presence of choking hazards," said Lockton. "In 2017, this number had more than tripled to nine cases."

"Comparing all recalls in 2012 and those in 2017 so far, the number of recalls due to choking hazards has more than doubled – from seven to 15 – with scope for the total number to rise even further by the year's end."

Second most common cause for recalls

The second most common cause for recalls was bacterial contamination, with salmonella accounting for 14% of cases in the past six years.

Listeria was found to be the cause of 10% of UK food and drink recalls. As recalls continue to rise, so have the costs that they create for affected companies. Mars's recall last year alone cost the firm tens of millions of pounds. "Not only do businesses face the logistical cost of removing and replacing goods but they can also face severe reputational and even legal damage as a result," said Lockton.

"Recalls can be an expensive mistake to make. Globally, insurers received claims worth almost £240M for 2017 alone for food and beverage product recalls, with the average large case in Europe costing businesses more than £7M, according to recent industry data."

Lockton found that 26% of businesses it asked said it would take up to six months to fully recover from a product recall. About two-thirds (67%) said the recall of a key product would cost more than £30,000.

HEALTHRITFS

All you need to know about egg yolk

Medical News Today 27 December 2017 By Jennifer Huizen

Egg yolks used to have a bad reputation because of their highcholesterol content. Doctors and health authorities once recommended that people limit egg yolk consumption, especially individuals with high cholesterol, blood pressure, or heart conditions.

But more focused research indicates that high blood levels of cholesterol are less influenced by cholesterolcontaining foods, such as eggs, than individual factors, such as ethnicity, gender, hormonal functioning, and overall nutrition. Like egg whites, egg yolks have a high protein content and contain many essential vitamins, minerals, fats, and healthy calories.

Fast facts on egg yolk nutrition:

• Nutrients vary between eggs naturally.

• Most research shows that egg yolks contain most of the nutrition found in eggs.

• Like most animal-sourced foods, eggs carry some potential health risks.

What are the benefits

Studies suggest that eggs may play a role in healthy eating patterns. Eggs are a low-cost, nutrient-filled, easy to access and prepare food, making them an excellent dietary staple for many people worldwide. Eggs are also a very versatile food. And the consumption of eggs does not usually conflict with most religious or moral guidelines. Eating egg whites and yolks together in a whole egg also contains the right balance of protein, fat, and calories that allows most people to feel fuller and more satisfied at meals.

A 2015 study found that obese Mexican-American women who ate eggs regularly after pregnancy got higher overall scores on the Healthy Eating Index than those who did not, suggesting eggs might play a role in healthy eating patterns. Possible further health benefits associated with egg yolks include: • increasing immune function,

including antioxidant, antimicrobial, and anti-cancer action

• increasing eye health, including lowering the risk of macular degeneration, and age-related cataracts

• improving bone density and resilience

• maintaining a healthy blood

production and composition,

- especially iron content and clotting factors
- maintaining a healthy, regulated metabolism
- improving fat and protein metabolism
- improving cellular growth and repair
- improving cardiovascular health
- maintaining a healthy blood pressure
- increasing skin and hair health
- improving bowel and bladder health

• increasing nutritional absorption during digestion

- production and health of neurotransmitters
- improved brain development and health
- reducing the risk of bowel obstruction and kidney stones
 reducing overall body inflammation

More recently researchers have begun to explore the potential of various immune-stimulating compounds found in egg yolks called immunoglobulins. A 2017 study found that female mice that consumed the egg yolk nutrient anti-VacA IgY were less likely to get become infected by Helicobacter pylori, a bacteria that commonly causes intestinal infection.





• 4.51 g fat: 1.624 g saturated fat, 1.995 g monounsaturated fat, and 0.715 g of polyunsaturated fat • 184 milligrams (mg) of cholesterol • 0.61 g of carbohydrate • 0.10 g of sugar • 0 g dietary fiber

Egg yolks contain at least seven

essential minerals, including:

- 22 mg calcium
- 0.46 mg iron
- 1 mg magnesium
- 66 mg phosphorus • 19 mg potassium
- 8 mg sodium
- 0.39 mg zinc

Egg yolks are high in many vitamins, especially fat and watersoluble vitamins

Egg yolks are also high in many compounds, vitamins, and other nutrients known to have health benefits, including the prevention of several long-term and infectious diseases. Per unit size, duck, quail, and free-range heritage hen eggs are considered to contain higher amounts of most of the important nutrients than conventional chicken eggs.

Yolk vs. egg white

Egg yolks contain an average of 43 percent of the total protein content of the egg. And nearly all the watersoluble and fat-soluble vitamins and minerals in eggs are found in the volk. Several studies have concluded that consuming whole eggs has far more significant benefits than eating egg whites alone.

For example, a 2017 study found that young men who ate whole eggs immediately after resistance exercises had higher rates of muscular metabolism than those who only consumed egg whites.

The fact that most of an egg's nutrition is found in its yolk should not be surprising. Biologically, egg yolks are designed to be the primary source of nutrients for a growing embryo.

Eating egg yolks safely

The most common health concern associated with eggs is food poisoning from the bacteria Salmonella. Poultry naturally carry Salmonella and can contaminate their eggs with the bacteria.

Salmonella infections can be very serious, especially for young children, people with immune conditions, and those over the age of 65. But following a few basic safety precautions when purchasing, storing, handling, and cooking eggs significantly reduces the risk of Salmonella poisoning.

Tips for safely dealing with eggs include:

• purchasing eggs from a reputable, licensed source or a trusted local farmer

• making sure eggs are not cracked, have holes, or are dirty before purchasing

• always storing eggs in the refrigerator at 40°F (4°C) and making sure they are refrigerated before purchase

• washing hands and all exposed surfaces with soap and water immediately after coming into contact with raw eggs

• eating or refrigerate eggs shortly after cooking them, no more than 2 hours

• cooking eggs until at least the whites are firm — for high-risk individuals, cook eggs until both the whites and yolk are firm

• cooking egg dishes, such as casseroles or quiches, to an internal temperature of at least 160°F $(71^{\circ}C)$ — if unsure about egg temperatures while cooking, use a cooking thermometer

• cooking scrambled eggs until firm

Nutrition

The amount of nutrition in each egg yolk depends on the size of the egg, how it was raised and processed, and what species it is. And the final dietary value of egg yolks varies greatly depending on how they are prepared. For example, cooking whole eggs in oil may double, even triple, the fat and cholesterol content of an egg dish.

According to the United States Department of Agriculture (USDA), a raw egg yolk from one standard, large (17 gram) egg in the United States has: • 55 calories

• 2.7 grams(g) protein

The table below outlines the vitamin content of one large (17 g) egg yolk.

Thiamin	0.030 mg
Riboflavin	0.090 mg
Niacin	0.004 mg
Vitamin B-6	0.059 mg
Vitamin B-9 (folate)	25 microgram (µg)
Vitamin B-12	0.33 µg
Vitamin A, RAE	65 µg
Vitamin A, IU	245 international units (IU)
Vitamin E	0.44 mg
Vitamin D (D2 and D3)	0.9 µg
Vitamin D	37 IU
Vitamin K	0.1 µg

Protein Foods & Nutrition Development Association of India

Health Bites

• throwing away broken, dirty, or cracked eggs

• throwing away expired eggs and egg products

avoiding eggs that have an odd consistency, appearance, or smell
keeping raw eggs away from other foods, especially those consumed raw

• using pasteurized eggs for dressings and condiments that require soft-boiled eggs, such as Hollandaise sauce, mayonnaise, and Cesar salad dressing

In general, the link between egg yolks and chronic conditions, such as cardiovascular disease, highcholesterol, high-blood pressure, and disorders that influence circulation, such as diabetes, remains unclear.

What are the best foods for weight loss?

Last reviewed Medical News Today 15 January 2018 By Megan Metropulos, MS, RD, LDN, and Megan Ware, RDN

Research by scientists has revealed that some foods may have an impact on appetite. These could be beneficial for weight loss when incorporated into a healthful diet and lifestyle. Read on to learn more about seven foods that may be helpful for weight loss.

People should buy nutrient-dense foods if they are trying to lose weight. Foods that provide protein and fiber could be especially helpful for weight management. One study found that some foods including fruits, vegetables, nuts, whole grains, and yogurt --- were connected with weight loss. In the same study, potato chips, sugary beverages, red meats, and processed meats were associated with weight gain. Based on these findings, it may be best to limit fried foods, foods with added sugar, highfat meats, and processed foods when trying to shift the pounds.



Though the right foods may help, physical activity is essential for losing weight and keeping the pounds off. It is important to check with a doctor before starting any physical activity program.

1. Eggs

Eggs are a popular food, particularly for breakfasts, that may help promote weight loss. In a small study of 21 men, researchers compared the effects of eating eggs or eating a bagel for breakfast on food intake, hunger, and satisfaction. They also looked at levels of blood sugar, insulin, and ghrelin, which is also known as the hunger hormone. They found that men who had eaten the egg breakfast ate significantly less at their next meal, and in the following 24 hours, than those who had eaten the bagel breakfast. Those who had eaten the eggs also reported feeling less hungry and more satisfied 3 hours after breakfast than those who had eaten the bagel. After breakfast, the egg group also had less of a change in their blood sugar and insulin levels, as well as lower ghrelin levels than the bagel group.

2. Oatmeal

Starting the day with a bowl of oatmeal could also result in a lower number on the scales. A study involving 47 adults looked at differences in appetite, fullness, and next meal intake after participants ate oatmeal, as opposed to an oatbased ready-to-eat breakfast cereal. After eating oatmeal, participants felt significantly fuller and less hungry than after eating the cereal. Also, their calorie intake at lunch was lower after eating oatmeal than after eating breakfast cereal.

While both breakfasts contained the same amount of calories, the oatmeal provided more protein, more fiber, and less sugar than the cereal. The authors concluded that the difference in fiber, specifically a type of soluble fiber called betaglucan, was probably responsible for the results.

3. Beans, chickpeas, lentils, and peas

As a group, beans, chickpeas, lentils, and peas are known as pulses. They may influence weight loss due to their effect on fullness. as well as their protein and fiber content. Similarly to oatmeal. pulses contain soluble fiber that may slow down digestion and absorption. Eating protein leads to the release of hormones that signal fullness. Researchers analyzed studies that had looked at the effect of the consumption of pulses on weight loss. Weight loss diets that included pulses resulted in significantly greater weight loss than those that did not. Weight maintenance diets that included pulses also resulted in weight loss compared with those that did not.

4. Nuts

A study involving overweight and obese women compared a weight loss diet supplemented with 50 grams (g) of almonds a day with a weight loss diet that did not include nuts. After 3 months, women in the almond group lost significantly more weight than women in the nut-free group. Women in the almond group also had much greater reductions in their waist size, body mass index (BMI), total cholesterol, triglycerides, and blood sugar.

Nuts contain protein and fiber, which may help explain their influence on body weight. They also contain heart-healthy fats and other beneficial nutrients. While nuts can be included as part of a healthful diet, moderation is still essential since they are an energy-dense food. Weight regain is often a concern for individuals after they have lost weight. In a large study in Europe, researchers found that people who consumed the most nuts gained less weight during a 5-year period than people who did not eat nuts. They also had less risk of becoming overweight or obese.

5. Avocados

Avocados are a fruit that provides fiber and beneficial fats, as well as many other nutrients. They may also help promote weight management. A study of American adults found that people who consumed avocado weighed significantly less and had a lower BMI than those who did not. People who ate avocado tended to eat more fruits, vegetables, and fiber than people who did not, as well. The people who ate avocado had an overall healthier diet and consumed significantly less added sugar than those who did not. Similarly, their risk for metabolic syndrome was lower than for those who did not consume avocado.

6. Berries

Fiber has been linked with weight management, and berries tend to be some of the highest-fiber fruits. One cup of raspberries or blackberries provides 8 g of fiber. Berries can be added to many foods, such as oatmeal, yogurt, or salads.

7. Cruciferous vegetables

Cruciferous vegetables, including broccoli, cauliflower, cabbage, and Brussels sprouts also contain fiber that may be helpful for weight loss. One cup of cooked Brussels sprouts provides 6 g of fiber, which is 24 percent of the daily value for fiber.

Things to look for when choosing foods for weight loss

Instead of fried foods, people should choose foods that have been baked, broiled, or grilled. Lean proteins, including beans, chicken, eggs, fish, and turkey are good alternatives to high-fat meats. When choosing foods for weight loss, it is also important to be mindful of portion sizes, even for healthful foods.

Sugar-sweetened beverages can provide a significant amount of calories but do not result in the same sense of fullness as solid foods. Choose calorie-free beverages instead of juice and soda, such as water or unsweetened tea.

Other useful weight loss tips

• Exercise is a key part of weight loss. The American College of Sports Medicine recommend adults get 150 minutes of moderate intensity exercise per week, which equals 30 minutes 5 days a week. People should speak with a doctor before starting a new workout routine.

Concentrate on making healthful changes instead of concentrating only on the number on the scales. Mini goals may feel less overwhelming than one large goal.
Avoid labeling foods as "good" and "bad." Forbidden foods can lead to cravings and then guilt when those foods are eaten. Choose nutritious foods most of the time and enjoy treats in moderation.
Avoid getting overly hungry. Waiting to eat until starving can make it harder to have mindful of

make it harder to be mindful of healthful choices.

• Planning meals ahead of time can help ensure healthful choices are available, especially since many restaurant meals tend to be higher in calories, fat, and salt.

• Enlist friends and family members to help support health goals and behavior changes.

• Consult a registered dietitian who is a food and nutrition expert and can provide individualized information to help with weight loss.

• Work on getting adequate sleep and managing stress levels in addition to choosing healthful foods and staying active, as sleep and stress affect health.





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