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EDITORIAL

Many new oils and juices have entered the market and some of them are being called Cold Pressed. This is a new word for an old product that was there decades ago. Cold pressed oils are different from solvent extracted oils. In the production of latter, solvent hexane may be used to dissolve the oil from oil seeds or pulp and then the solvent is removed by distillation leaving behind the oil. This is a more efficient process of removal of oil but as the solvent is being removed the natural flavour or aroma of oil is also removed from solvent extracted oil. This process with refining removes all odours, colours and any materials that are not triglycerides leaving the oil which is undistinguishable from any other oil unless it is analysed.

There is a criticism that refined solvent extracted oils lose their naturally present vitamins and phytosterols and other good unsaponifiable materials which are now known to have beneficial health effects. But then why do people still buy solvent extracted oils?

There are some advantages to that. When not refined, they have the characteristic odour e.g. coconut, soybean, mustard, groundnut and other oils have smell which is cherished by those who are used to them but not by those who may find odour objectionable. Since refined oils are odourless, there is no problem.

There is also another indirect advantage of refining. During refining a lot of undesirable substances such as free fatty acids and more importantly the pesticide residues are also removed.

Decades ago, expeller was used for removing oils from seeds and then they would be filtered. Earlier animal driven ghani in India was later improved in design and mechanised to improve efficiency as well as capacity. The modern cold press equipments are similar in principle but are temperature controlled so while crushing and expelling, the heat generated is quickly dissipated. These are filtered and packed. Since they are not refined, they retain most of the natural constituents including colour, odour, substances that may be desirable or even undesirable. Some of the oils for examples palm oil would be unacceptable to most due to intense red colour of carotenoids.

Fruits and vegetables are also nowadays cold-pressed to get as much as possible juices without any heat induced changes which may lead to loss of vitamins and flavours. Whereas the oils do not need much protection from microbes for their shelf life, juices may spoil quickly due to fermentation so they need to be protected further. So there is one more process that is needed, a second cold-press or high-pressure processing.

When juices are subjected to very high pressure processing which destroys microbes that cause spoilage and/or diseases. Since heat is not used in preparation and processing of juice, it may retain many natural attributes such as colour, flavour, and vitamins.

Cold pressed products are very expensive probably because the process does not give better yields of oils or juices as other processes; also possibly because the market is still small. However, it is growing rapidly. With more people preferring to buy natural even by paying more as they believe it is healthier, the future is certainly promising. High pressure processing equipments are becoming less expensive as the market improves and technology is developed. This will further enhance the market when these products become less expensive.

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BENEFITS OF DIETARY FIBRE IN CARDIOVASCULAR HEALTH AND DIABETES

The World Health Organisation (WHO) has set 9 voluntary global non-communicable diseases targets for 2025, which include 0% increase in diabetes and obesity, 25% reduction in raised blood pressure and 30% reduction in salt / sodium intake, among other things.

According to WHO, the number of cases of diabetes is estimated to be around 150 million, worldwide. This number is predicted to double by 2025, with the greatest number of cases being expected in China and India. Previously a disease of the middle-aged and elderly, type 2 diabetes has recently escalated in all age groups and is now being identified in younger and younger age groups, including adolescents and children, especially in high-risk populations.

Cardiovascular diseases are the number one cause of death globally: more people die annually from cardiovascular diseases than from any other cause. An estimated 17.7 million people died from cardiovascular diseases in 2015, representing 31% of all global deaths. Of these, an estimated 7.4 million were due to coronary heart disease and 6.7 million were due to stroke.

Many dietary factors are involved in increasing or decreasing the risk of diabetes and cardiovascular diseases. One among them is dietary fibre.

Reduced intake of dietary fibre increases the risk of disease and vice versa. There's a gradual shift from benefit to harm, with the intake of fruits, nuts, fish, vegetables, whole grains and pulses at the beneficial end, and the intake of refined foods, sugars, processed meats, high sodium foods and industrial trans fats at the harmful end of the spectrum.

From Hippocrates to modern day researchers and scientists, everyone has extolled fibre. Dr Denis P Burkitt in 1973 wrote in BMJ that many diseases of the western civilisation are rare or unknown in communities that did not deviate from their traditional way of life. One of the dietary factors that helped in preventing non-communicable diseases in such communities was fibre. Dietary fibre improves bowel function, reduces constipation, reduces diverticular disease, improves cardiovascular health, improves



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blood glucose control, helps in weight management, slows down cholesterol absorption, and acts as substrate for gut bacteria.

More than 10 g of fibre is found in wheat, jowar, bajra, ragi, maize, pulses, some dals, curry leaves, dry spices like fenugreek seeds, cumin seeds, cloves, pepper, and seeds like sesame, mustard, flax. The recommended intake of fibre for Indians is 40 g per day in a 2000 calorie diet. The current intake is estimated at 35 g in rural population and 20 to 25 g in urban population in India.

Globally, the recommendations for fibre vary from one country to another, with 25 g per day at the lower end and 38 g per day at the upper end. In the year 2002, the Academy of Nutrition and Dietetics (formerly known as the American Dietetic Association) issued a position statement on fibre.



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The position statement says – It is the position of the American Dietetic Association (ADA) that the public should consume adequate amounts of dietary fibre from a variety of plant foods.

Modest increases in intakes of fruits, vegetables, legumes, and whole- and high-fibre grain products would bring the majority of the North American adult population close to the recommended range of dietary fibre intake of 20-35 g/day. Many of the diseases of public health significance—obesity, cardiovascular disease, type 2 diabetes—as well as the less prevalent, but no less significant diseases of colonic diverticulosis and constipation, can be prevented or treated by increasing the amounts and varieties of fibre-containing foods.

Fibre consists of NSP (non-starch polysaccharides) such as cellulose, hemicellulose, lignin, gums, mucilages, pectin. There are 2 types of fibre – soluble and insoluble.

- Soluble – dissolves in water. Found in pulses, dals, nuts, apples, carrots, potato, etc.
- Insoluble – doesn't dissolve in water. Found in whole grains (especially bran), seeds, vegetables

In its document 'Recommendations for Preventing Diabetes', WHO says that the evidence that saturated fatty acids increase risk of type 2

diabetes and that non-starch polysaccharides (NSP) are protective is more convincing than the evidence for several other nutrients which have been implicated.

Three cohort studies (the Health Professionals Follow-up Study of men aged 40-75 years, the Nurses' Health Study of women aged 40-65 years, and the Iowa Women's Health Study in women aged 55-69 years) have shown a protective effect of NSP (dietary fibre) which was independent of age, BMI, smoking and physical activity. In many controlled experimental studies, high intakes of NSP have repeatedly been shown to result in reduced blood glucose and insulin levels in people with type 2 diabetes and impaired glucose tolerance. Moreover, an increased intake of wholegrain cereals, vegetables and fruits (all rich in NSP) was a feature of the diets associated with a reduced risk of progression of impaired glucose tolerance to type 2 diabetes in two randomized controlled trials. Thus, the evidence for a potential protective effect of NSP appears strong.

Similarly, in its 'Recommendations for Preventing Cardiovascular Diseases', WHO says that most fibres reduce plasma total and LDL cholesterol, as reported by several trials. Several large cohort

studies carried out in different countries have reported that a high fibre diet as well as a diet high in wholegrain cereals lowers the risk of coronary heart disease. Fibre is protective against coronary heart disease and has also been used in diets to lower blood pressure. Adequate intake may be achieved through fruits, vegetables and wholegrain cereals.

A meta-analysis of eleven clinical trials that examined the effects of pulses (excluding soya beans) on serum lipoproteins found that the intake of pulses decreased LDL-C by 7 % and serum triacylglycerols by more than 10 %. Pulses did not significantly affect serum HDL-C values. The hypocholesterolaemic effects of pulses appear related to these factors: soluble dietary fibre, vegetable protein, oligosaccharides, isoflavones, phospholipids and fatty acids, saponins and other factors. Intake of pulses may also reduce risk for CVD by favourable effects on blood pressure, glycaemia and risk for diabetes, and risk for obesity. Pulse seed coats are rich in water-insoluble fibres and polyphenols (having high antioxidant activities), while cotyledons contain higher soluble fibres, oligosaccharides, and resistant starch content. Pulse fibres, resistant starch and oligosaccharides function as probiotics and possess several other health benefits such as anti-inflammatory, anti-tumour, and reduce glucose as well as lipid levels.



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Nutrela Soya Rajma

Ingredients:

- 1 cup red kidney beans, 4 cup water, 2 cups soaked Nutrela Soya Mini Chunks. (Soaked, boiled and squeezed dry), 2 cup fresh tomato puree.
- 1 teaspoon cumin seeds, crushed black peppercorns, Kashmiri red chilli powder, garam masala powder and ½ teaspoon amchur.
- 1 tablespoon coriander powder, 2 tablespoon ginger garlic paste, 3 tablespoon oil.
- chopped 2 green chillies, 2 medium onions.
- 1 pcs tej patta, 1 inch ginger, cut into thin strips, Salt to taste.

Method:

- Soak red kidney beans overnight and boil them with water, salt and tej patta.
- Heat oil, add cumin seeds and let it splutter
- Add onions and saute till onions become golden brown and start to caramelize.
- Add ginger paste, garlic paste, chopped green chilly and saute it.
- Add tomato puree and sauté for 4-5 minutes.
- Add red chilli powder, turmeric powder, pepper powder coriander powder, amchur powder, garam masala powder and saute for 2 minutes.
- Add Rajma, Nutrela Soya Mini Chunks, salt and mix well.
- Add the balance water in which the rajma was boiled, mash a few of the rajma into a paste to slightly to thicken the gravy and allow it to cook.
- Add the remaining garam masala powder and ginger strips and mix well
- Transfer into a serving bowl and serve hot



A study published in 2013, found that insoluble fibre and fibre from cereal and vegetable sources were inversely associated with risk of coronary heart disease and cardiovascular disease. Fruit fibre intake was inversely associated with risk of cardiovascular disease.

Several other studies, meta analyses and systemic reviews have found that dietary fibre (both soluble and insoluble) from whole grain cereals, pulses, vegetables and fruits have a protective effect, and help to reduce the risk of diabetes and cardiovascular diseases. Some dietary fibres are fermentable, and the gastro intestinal tract catabolism leads to the generation of various

bioactive materials, such as short-chain fatty acids that can markedly change the composition of the gastro intestinal tract flora. By modulating food ingestion, digestion, absorption and metabolism, dietary fibres reduce the risk of hyperlipidemia,

hypercholesterolemia and hyperglycemia.

Emerging research has begun to investigate the role of dietary fibres in immunomodulation. If substantiated, dietary fibres could facilitate many biological processes, including infection prevention and improvement of mood and memory. It might be good to explore the benefits of fibre beyond diabetes and cardiovascular diseases, in future.

For now, it's safe to say that foods rich in dietary fibre (most plant foods) should be consumed on a daily basis in the required quantities for better health.

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WEIGHT MANAGEMENT THE HEALTHY WAY



By **Karuna Jayakrishna,**
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Weight management is a key step for a healthy lifestyle. Developing healthy eating habits while monitoring the intake of essential nutrients helps in keeping us fuller for longer. These can be useful tools in weight management and that's where food ingredients like protein and dietary fiber play an important role.

According to the World Health Organization (WHO), obesity is one of the most common, yet among the most neglected, public health problems in both developed and developing countries. According to the WHO World Health Statistics Report 2012, globally one in six adults are obese and nearly 2.8 million individuals die each year due to overweight or obesity. Additionally, obesity is strongly associated with other metabolic disorders including diabetes, hypertension and cardiovascular disease. Individuals with obesity have higher rates of mortality and morbidity compared to non-obese individuals.

India, with 1.2 billion people, is the second most populous country in the world and is currently experiencing rapid epidemiological transition. Obesity which is associated with affluence is becoming as prevalent as under-nutrition which exists due to poverty. Overweight and obesity are

the result of several factors. For each individual, body weight is determined by a combination of genetic, metabolic, behavioral, environmental, cultural and socioeconomic influences. For the vast majority of individuals, however, overweight and obesity are the result of excess calorie consumption and/or inadequate physical activity.

Global food manufacturers have an important role to play with food products that help consumers control their calorie intake more easily and consistently.

Appetite control is a relatively new focus area for the food industry. As a result, a new category of food and beverage products is emerging, positioned to minimize hunger between meals, reducing the desire to eat and resulting in lower energy intake.

Protein and Fiber in Weight Management

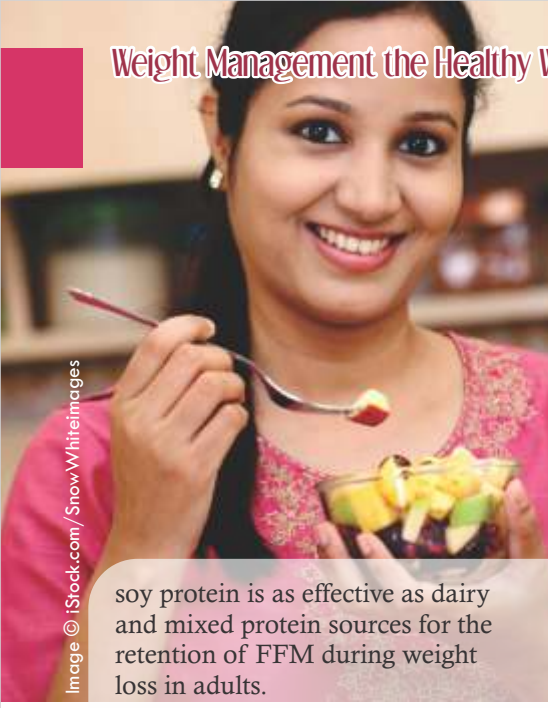
Clearly a decrease in total caloric intake is required for weight management, but recently researchers have turned their attention to the unique role that protein consumption can play in weight control and weight loss efforts. Several recent literature reviews have concluded that, during weight loss, increasing the percent calories derived from dietary protein can bring benefits beyond those of simple caloric restriction. Specifically, energy-restricted diets

that provide protein in the range of 25-35% of total energy were found to be effective in a number of ways, when compared to lower-protein diets. Researchers have concluded that replacing carbohydrates—especially refined carbohydrates—with protein sources low in saturated fat increases satiety, increases loss of body fat while reducing loss of lean tissue, and results in greater weight loss and possibly improved body composition.

Soy protein is a complete protein and eating a diet rich in soy protein may help with weight management by enhancing satiety and reducing hunger. Soy protein, as a plant-based protein, is associated with health benefits and does not contain saturated fat or cholesterol as does protein from animal sources. Additionally, inclusion of soy protein in the diet can enhance cholesterol lowering compared to animal protein-based diets.

Soy protein has been found to have a similar effect on satiety compared to commonly consumed high-quality proteins. Animal studies have shown that soy protein suppresses appetite, in part, by stimulating the release of cholecystokinin (CCK), which regulates satiety and gastric emptying. There is also clear evidence that higher-protein diets, especially those containing high quality protein, such as that provided by soy, help to preserve fat free mass (FFM) during weight loss. This, in turn, improves the metabolic profile of dieters. Several studies have demonstrated that

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soy protein is as effective as dairy and mixed protein sources for the retention of FFM during weight loss in adults.

Many studies support the premise that increased dietary fibre intake promotes satiety, decreases hunger, and thus helps provide a feeling of fullness. Foods rich in dietary fibre tend to have a high volume and a low energy density, and should promote satiation and satiety, and play a role in the control of energy balance.

Polydextrose is one such fibre attracting increasing interest. It is a low-calorie highly branched-chain glucose polymer that is poorly digested in the upper gastrointestinal tract and therefore demonstrates fibre-like properties. The consistent results from the meta-analysis study are a strong indication that, as a soluble fibre, Polydextrose enhances satiety and reduces energy intake, potentially contributing to weight loss. Unlike many other dietary fibers, it offers the additional advantage of a neutral sensory impact, enabling fibre addition to foods and beverages without altering taste or texture.

Among nutrition scientists, there is a general belief that fibre intake is able to reduce short-term energy intake by adding bulk and viscosity. The additional bulk is responsible for lowering the energy density of food products, while viscous soluble fibers are thought to prolong the

phase of nutrient digestion and absorption in the intestine. As the body generates satiety signals both before and after absorption, this may explain why consumers experience a longer lasting sense of fullness.

Other mechanisms that link fibre to reduced energy intake include prolonged gastric emptying, prolonged mastication, low glycemic response and influences on gut satiety hormones. The next level of weight management

Despite cutting the calories in their diet and increasing physical exercise, for some consumers the battle with excess kilos still seems unwinnable. One new avenue of research indicates that gut microbiota may play a more important role in obesity and metabolic syndrome than previously thought. A series of animal studies has shown that gut microbiota may actually give individuals a predisposal to obesity.

Working alongside leading scientists, DuPont is now exploring possibilities to use probiotics or probiotic-prebiotic combinations to encourage the growth of alternative gut microbiota that are less likely to result in obesity or help maintain a healthy weight. Early research in this area shows real promise – a hint that probiotic and prebiotic ingredients could be the ingredients that take weight management claims to a new level in the future.

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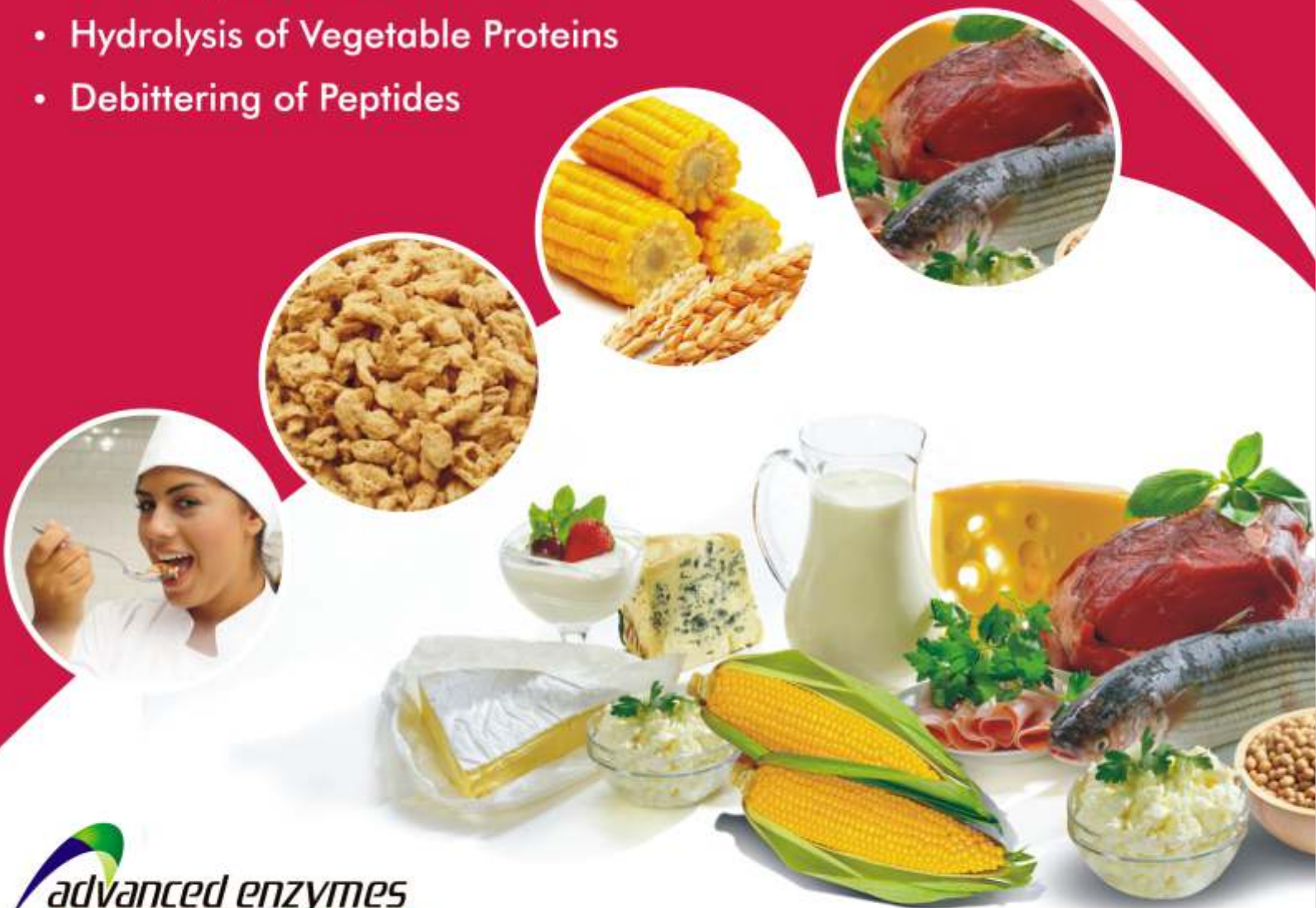
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COCONUT OIL



By
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In Ayurveda, narikela or coconut (*Cocosnucifera*) is considered to be 'mahamedhya' i.e. nourishing for 'medhya' or the mind, having the property of 'santarpan' or providing fatty lubrication. Ayurved has the precept of 'swarupguna' that means the shape or form and function are connected.

From this perspective, the whole coconut somewhat resembles the skull and so nourishes the skull or in other words what the skull houses i.e. the brain.

Pacific Islanders consider coconut to be a panacea for all illnesses and the coconut

tree is called 'The Tree of Life'.

Despite this, coconut oil has been discouraged in India in the last four to five decades because it is a saturated fat. In the 1950's and 1960's, saturated fats were regarded as unhealthy based on scientific investigations that had shown a positive correlation between saturated fatty acids and risk for cardiovascular disease. Dietary guidelines the world over, therefore, recommended that intake of saturated fat be reduced especially fat in meat and dairy products and to substitute the saturated fats with polyunsaturated fats (PUFA).

Table 1: Content of Selected Constituents of Fresh and Dried Coconut Kernel

Constituent (g/100 gm edible portion)	Fresh kernel	Dried kernel
Water	36.14	3.97
Protein	3.84	7.27
Total fat	41.38	63.26
Fibre	10.42	15.88
Insoluble fibre	9.43	14.55
Soluble fibre	0.99	1.33
Energy (KJ/100gm)	1711	2611

Overall, the broad guideline for the need to reduce saturated fat intake and replace it with PUFA still holds true, but in the light of emerging data, it appears that all saturated fats are not the same. This article summarizes the findings of some recent studies and presents the current knowledge regarding coconut oil.

The inside of the stony coconut layer is lined with a fairly thick coating of soft, milky-white flesh. The content of selected constituents in fresh and dried coconut kernel is given in **Tables 1** and **2**.



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AAK KAMANI



The fresh kernel has considerable amount of fibre, most of which is insoluble fibre. Coconut oil is obtained by pressing this white 'meat'. As seen in **Table 2**, saturated fatty acids constitute most of the fatty acids in coconut.

Those whose cuisines are coconut-based tend to feel deprived of the

flavour of coconut. Industrially since coconut oil is solid at room temperature, people are experimenting with substituting butter or vegetable shortening with coconut oil in baked foods that require solid fat. So can we go back to our old ways and start consuming as much coconut and coconut fat as we would like to? We

Based on this and recommendations made in the past, one would be tempted to exclude coconut oil or even coconut from the diet, because it contains saturated fat which has an undesirable effect in terms of raising LDL cholesterol. However, recent studies suggest that all is not 'unhealthy' as far as coconut is concerned.

need to remember that the energy provided by coconut oil and coconut both fresh and dry is quite high as shown in Table 1.

Coconut oil contains 90.08 percent saturated fat, which is higher than butter or beef fat or lard. The percentage is about 64% in beef fat and lard contains about 40 percent fat.

We need to take a close look at saturated fats per se. Saturated fats are comprised of a number of fatty acids that differ in the number of carbon atoms. In coconut oil, about half of the saturated fatty acids have 12 or less carbon atoms. In fact, lauric acid with 12 carbon atoms is the major saturated fatty acid followed by a considerable amount of short-chain fatty acids such as capric, caproic, and caprylic acids. Lauric acid does not have very unhealthy effects in terms of raising LDL as much as the longer chain saturated fatty acids do. Fat in our diet tends to raise our HDL levels and coconut oil seems to be quite potent in terms of this effect. Let us examine what recent studies show us.

Table 1: Fatty Acid Composition of Fresh and Dried Coconut Kernel

Fatty acid (mg/100g edible portion)	Coconut fresh	Coconut dry
Capric (C10)	1699	2674
Lauric (C 12)	15442	24525
Myristic (C 14)	6736	10243
Palmitic (C16)	3067	4322
Stearic© 18)	1043	1373
Arachidic (C20)	32.77	0
Behenic (C 22)	10.93	0
Lignoceric (C 24)	17.37	0
Myristoleic (C 14:1)	-	-
Palmitoleic (C 16:1)	-	-
Oleic (C 18:1 n9)	2434	3710
Linoleic	639	929
α -Linolenic	-	-
Arachidonic	-	-
Total saturated	28048	43138
Total monounsaturated	2449	3710
Total Polyunsaturated	639	929

Source: Longhvah T, Ananthan R, Bhaskarachary K, Venkaiah K. (2017) Indian Food Composition Tables. National Institute of Nutrition, Hyderabad

Coconut oil is more hydrophilic than other vegetable oils containing long chain fatty acids and is more rapidly hydrolysed by lipase. In human volunteers fed coconut oil, chylomicrons collected 6 hours after feeding contain 68% less medium chain fatty acids (C8 to C12) as compared to when long chain fatty acids containing 14 or more carbon atoms. Also, the metabolic properties of triglycerides containing 6–12 carbon atoms differ from triglycerides containing longer chain fatty acids.



Image © iStock.com/terun011

Serum Cholesterol, Coronary Heart Disease and Cardiovascular Health:

When unprocessed coconut oil was added to an otherwise normal diet, either there was no change in total cholesterol or there was a decrease. Much of the focus has been on lauric acid since it is the major fatty acid in coconut oil.

What are the advantages of lauric acid? Lauric acid is a medium chain fatty acid which is easily absorbed and transported directly to the liver where it is directly rapidly and directly metabolized rather than being stored as fat.

In an experiment, when normal weight men were fed different labelled fatty acids as part of their meal for one week (40% of the energy was provided by fat), oxidation of the fatty acids was as follows: 13% for stearic acid and 41% for lauric acid, with PUFA giving intermediate values. This suggests lauric acid is oxidized to a greater extent in the human body as compared to other fatty acids and

may contribute the least to fat accumulation and obesity.

The metabolites of medium chain fatty acids like lauric acid include ketone bodies which can be used for energy by extrahepatic tissues, e.g. the brain and heart. Among the saturated fatty acids, lauric acid has been shown to contribute much less to fat accumulation than the other SFA. Also, ketone bodies in the blood stream induce insulin secretion.

Among the saturated fatty acids with chain lengths C8 to C16, it is C14 i.e. myristic acid that has been found to be most potent in increasing serum cholesterol. Lauric acid may not affect or raise serum cholesterol. Also, it appears that medium chain fatty acids are not stored very readily in adipose tissue.

In animal studies, diets containing 10 percent coconut fat were compared with diets containing 10 percent sunflower oil. The coconut oil fed group had significantly lower VLDL and higher HDL. When coconut oil was compared with safflower or soybean oil, total tissue cholesterol accumulation in the animals was six times more among

animals fed safflower oil as compared to the animals fed coconut oil.

Overall, animal studies suggest that animals fed coconut oil had lower liver cholesterol content as well as in other organs. It has been suggested that probably coconut oil does not drive cholesterol into the tissues in contrast to more polyunsaturated fats.

In human feeding studies, use of a medium chain triglyceride containing C6-C12 saturated fatty acids, only transiently increased serum cholesterol. A meta analysis of the effects of fatty acids indicated that although there was a rise in serum total cholesterol (TC), there was an increase in HDL-cholesterol, the overall effect being a decrease in the ratio of TC to HDL which is associated with desirable cardiovascular outcomes.

Further, population level data from regular consumers of coconut oil such as Polynesians, Bicolanos from Philippines, indicate no correlation with coronary heart disease, suggesting that coconut oil does not have a negative impact.



It is possible that the short chain fatty acids in coconut oil (and in dairy fat) can influence gene expression via which they may effect hormonal responses including those of leptin and insulin which are involved in regulation of overall energy metabolism.

In a study on spontaneously hypertensive rats fed coconut oil for 30 days, there was reduction in oxidative stress as well as blood pressure. In mice, comparison of four isocaloric diets was undertaken wherein comparisons were made between saturated and unsaturated fat and fructose. Coconut oil was compared with soybean oil with the oil providing 40 percent of the dietary energy.

Mice who were fed fructose+coconut oil exhibited significantly more weight gain, adiposity, diabetes, glucose intolerance and insulin resistance compared to the group given a high fat diet with coconut oil as the source of fat.

The high soybean oil diet was associated with upregulation of some genes associated with obesity diabetes, inflammation and cancer,

suggesting that soybean oil may be more detrimental (more obesogenic and diabetogenic) than is coconut oil. The less harmful effect of coconut oil may be because the oil contains medium chain triglycerides.

The lipid profile and antioxidant enzymes of normal and diabetic persons who used either coconut oil or sunflower oil as the cooking medium were compared for their lipid profile and antioxidant enzymes. In the diabetic persons, total glutathione and glutathione peroxidase were seen to significantly decrease as compared to sunflower oil users and with coconut oil, there was no pronounced changes in the lipid profile and markers of oxidative stress.

Several studies have been undertaken on virgin coconut oil (VCO). Virgin coconut oil is naturally processed, free from chemicals and additives, obtained from fresh coconut meat or milk or coconut milk residue that have not been subjected to any chemical processing after extraction.

White in colour, VCO contains

vitamin E, and has a mild coconut odour. It contains medium chain triglycerides with lauric acid comprising 45-56% of the VCO.

VCO has recently been receiving attention because various beneficial health effects have been attributed to it such as antioxidant, antimicrobial, antiviral, anti-hypercholesterolemic, anti-ulcerogenic, anti-nociceptive, anti-inflammatory and antithrombotic

activities.

One reason that has been given for these is that because VCO is obtained by cold process extraction, the functional components of coconut such as tocopherols, sterol and squalene are conserved, besides maintaining the fatty acids without any polymerization. Thus the natural antioxidant properties of coconut kernel are preserved.

Anti microbial effects:

Among the saturated fatty acids, lauric acid and monolaurin, lauryl esters, carbohydrate derivatives of lauric acid as well as peptides conjugated with lauric acid have been found to be very active against gram positive bacteria and a number of viruses and fungi, including *Helicobacter pylori*, *Streptococcus mutans*.

This antimicrobial activity has been attributed to (i) destruction of the cell membrane of bacteria and lipid-coated viruses (ii) they interfere with cell processes like signal transduction and transcription and (iii) they stabilize the cell membranes of the host cells.



Cancer

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Hepatoprotective effect:

In rats, the hepatoprotective effect of VCOs prepared by dried or fermented processing methods were studied. Liver damage as indicated by the presence of inflammation and necrosis was examined and it was observed that pretreatment of the rats with 10 ml VCO per kg reduced the liver damage along with reduction in the levels of the enzymes aspartate transaminase, alanine transaminase and alkaline phosphatase. This was accompanied by an increase in body weight and liver weight to normal values. In the VCO treated group structural integrity of the hepatocyte membrane was better and the lobular architecture of the hepatic lobules was better preserved. The normalization of serum enzymes and liver histological architecture in the VCO treated group was similar

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to that observed with silymarin a known hepatoprotective compound. The researchers who conducted this study attributed the possibly promising hepatoprotective activity to the medium chain (C6 to C12) fatty acids present i.e. caproic acid, caprylic acid, capric acid, and lauric acid.

Cancer

Animal studies suggest that coconut oil has a non-promotional effect and in a colon tumour model, coconut oil was found to be more inhibitory than medium chain triglycerides. Both olive oil and coconut oil-fed animals developed less number of tumours with coconut oil showing more favourable effect. The non-inhibitory effect has also been seen in breast cancer models.

According to current recommendations total fat intake should be at least 15% of total energy intake to ensure an adequate intake of essential fatty acids and energy and to facilitate the absorption of lipid soluble vitamins. However, total fat should not exceed 30% of total energy intake and the total intake of saturated fatty acids should not exceed 10% of energy intake and PUFA should supply 6–11%.

One concern expressed by some experts is that most of the studies on coconut oil and heart health are short term and there have been few long term studies that have closely examined the effect of coconut oil. It is important to remember this and that one tablespoon of coconut oil will give about 13.6 grams of fat and 117 calories. It is always wise to remember that too much of anything can be harmful and that it is better and important to have a healthy, well – rounded diet.

Consuming too much of this will give more calories and could increase the risk of weight gain, because the calories from coconut oil could contribute to an energy intake in excess of expenditure. Also, even moderate coconut oil intake may not contribute to weight loss. There is a need to wait for more studies in this regard.



REGULATORY ROUND UP



By
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Not a very eventful July from the regulatory point of view. GST implementation hogged the limelight. Nevertheless, a few regulations, both draft and final, were published in July and the summary is given below.

General
 FSSAI has published the [list of food laboratories](#) authorized to undertake analysis under Section 47 of the Food Safety and Standards Act, 2006.

If a food business operator exercises the option of sending the 4th sample (during sampling by a food safety officer), ensure it is sent to one of the laboratories listed.

[An amendment is proposed to Food Safety Rules, 2011](#), stating that Manual of Methods of Analysis, published by FSSAI, must be the one to be adopted while analysing samples drawn by the food safety officers.

If no method is available in these manuals, then a validated method prescribed by any internationally recognised analytical agency or regulatory body will be acceptable.

Licensing
[Amendments](#) are proposed in the documents required during and registration. Stakeholders to send in their comments within 60 days [in prescribed format](#).

Standards
[Draft standards](#) on cocoa -sugar blend (commonly known as drinking chocolate), a new honey standard replacing the existing one have been published. Stakeholders are given a 60 day period for sending in comments and suggestions in a [prescribed format](#).

[Draft standard](#) proposing amendments and new oils like Palm Stearin; Palm Kernel Olein, Palm Kernel Stearin, Superolein and Avocado Oil. These oils were not included previously. The draft also permits the use of all listed edible oils in standards in the manufacture of Vanaspati. It is also proposed to include peroxide value in standards of all vegetable oils.

[Draft standard](#) making modification in 'Boudouin test' requirement in case of blended vegetable oils. The same draft proposes to permit all the listed oils in Vanaspati, margarine, industrial margarine and

fat spreads.

The above two are very important regulations for the edible vegetable oil industry. Please send in your comments and suggestions within 60 days.

[A draft regulation](#) fixing aflatoxin levels in arecanut

Compliance
[FSSAI has issued an advisory banning the use of staple pins in tea bags](#). The order states that no food business operator can manufacture, store or sell tea bags closed with staple pins from 1st January 2018.

Imports
 Since the introduction of Food Safety and Standards Act 2006 and the regulations thereunder, FSSAI has been issuing many advisories, orders, guidelines, etc to facilitate import. [In a recent notification, FSSAI has issued a list of cancelled advisories and orders](#).

[FSSAI has issued a warning](#) to all the Authorized officers at the ports regarding pepper from Vietnam, containing pesticide beyond permissible limit, is being brought into India through Srilanka.



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Can we learn to love our greens? UK school kids may have found the answer

Medical News Today 31 January 2017

As part of BBC Learning's Terrific Scientific campaign - and with the guidance of Coventry University - young scientists have been eating kale every day in an effort to prove that there may be a genetic reason as to why some people don't enjoy their green vegetables.

The collaboration between BBC Learning and the university's Centre for Technology-Enabled Health Research (CTEHR) saw school children aged 9-11 take part in an 'exposure test' and use blue food dye, a piece of card, a magnifying glass and bags of kale to find out what affects our ability to learn to love vegetables.

Children were separated into two groups; half were asked to eat a piece of kale every day over a 15 day period, whilst the other half ate raisins. The study found that, overall, children who ate kale every day showed an improvement in liking kale over that time, whereas those who ate the raisins did not.

Some children in the kale group showed big improvements in their liking, whilst others disliked it as much as before. When delving deeper

into this, the young scientists found that someone who has more 'fungiform papillae' (which carry our 'taste buds') on their tongue did not increase their liking of kale. These children were identified as 'supertasters'.

Approximately 25% of the UK population may be supertasters and this makes them a lot more sensitive to strong tasting food such as olives, bitter coffee and grapefruits. If this is the case you may need to persevere for longer with strong tasting green vegetables such as kale before you start to enjoy them.

50% of the population are 'tasters', meaning they are likely to try most food - but may have a few they dislike - whilst the remaining 25% are non-tasters and may require more salt, spice and condiments than others to prevent food from tasting bland.

This exposure test is part of Terrific Scientific, BBC Learning's 18 month, UK-wide campaign to bring practical science into the classroom and into our homes. Focusing on ten investigations over the next two years, the campaign will work in partnership with organisations from the world of science, as well as a few famous faces.

Aimed at upper primary school level, Terrific Scientific will help deliver the objectives of the science curricula for 9-11 year olds across

the UK. So far over 8,000 classes and almost 4,000 schools have signed up to take part in the campaign.

Coventry is one of only four universities - including Oxford - chosen to partner with the BBC on its Terrific Scientific campaign. Jackie Blissett, professor of childhood eating behaviour at Coventry University, said: "It's been wonderful to work with these young scientists, and they've helped shed some light on one of the great mysteries: why some of us might not like our Brussels sprouts! BBC Learning's Terrific Scientific campaign is a fantastic way to engage youngsters in an interactive experiment which makes the learning experience much more fun."

Helen Foulkes, creative director of BBC Learning, said: "Terrific Scientific is already helping children, parents and teachers to get excited about science. It's great to see our young scientists already making an impact on the scientific world and with the help of our partners we have been able to show school children that their work and participation matters."

It wasn't just school children who were put through their paces in the taste test, either - earlier in January Professor Blissett and the BBC tasked British band The Vamps with taking part in the experiment.

Anti-inflammatory diet reduces bone loss, hip fracture risk in women

By Ana Sandoiu

Medical News Today 30 January 2017

With age, people tend to lose bone mass, and postmenopausal women in particular are at a higher risk of osteoporosis and bone fracture. However, there are things we can do to prevent this. A new study suggests that a diet rich in anti-inflammatory nutrients may reduce bone loss in some women.

A new study suggests that an anti-inflammatory diet - which tends to be rich in healthy fats, plants, and whole grains - benefits bone density among postmenopausal women. The National Institutes of Health (NIH) estimate that in the United States, more than 53 million people have osteoporosis already or are at an increased risk of developing it because they have low bone density.

Osteoporosis is a condition in which the bone strength is reduced, leading to a higher risk of bone fractures - in fact, the disease is the leading cause of bone fractures in postmenopausal women and the elderly. Most bone fractures occur in the hip, wrist, and spine. Of these, hip fractures tend to be the most serious, as they require hospitalization and surgery.

It used to be believed that osteoporosis was a natural part of aging, but most medical experts now agree that the condition can and should be prevented. New research from the Ohio State University found a link between nutrition and osteoporosis. The study was led by Tonya Orchard, an assistant professor of human nutrition at the Ohio State University, and the findings were published in the *Journal of Bone and Mineral Density*.

Analyzing the link between diet and bone loss

Orchard and team investigated data from the Women's Health Initiative (WHI) study and compared levels of inflammatory nutrients in the diet with bone mineral density (BMD) levels and fracture incidence. The WHI is the largest health study of postmenopausal women ever conducted in the U.S. Women were enrolled in the study between 1993 and 1998. The researchers used the dietary inflammatory index (DII) and correlated the measurements with the risk of hip, lower-arm and total fracture using data from the longitudinal study.

They then assessed the changes in BMD and DII scores. The researchers distributed food frequency questionnaires to 160,191 women aged 63 on average, who had not reported a history of hip fracture at the beginning of the study. Researchers used BMD data from 10,290 of these women and collected fracture data from the entire group. The women were clinically followed for 6 years. Orchard and team used Cox models to calculate fracture hazard ratios and adjust for age, race, ethnicity, and other variables.

Low-inflammatory diets benefit younger white Caucasian women

The scientists found an association between highly inflammatory diets and fracture - but only in younger Caucasian women. Specifically, higher scores on the DII correlated with an almost 50 percent higher risk of hip fracture in white women younger than 63 years old. By contrast, women with the least inflammatory diets lost less bone density during the 6-year period than their high DII counterparts, even though they had overall lower bone mass when they enrolled in the study.

As the authors note, these findings suggest that a high-quality, anti-inflammatory diet - which is typically rich in fruit, vegetables,

fish, whole grains, and nuts - may be especially important for younger white women.

"[Our study] suggests that as women age, healthy diets are impacting their bones. I think this gives us yet another reason to support the recommendations for a healthy diet in the Dietary Guidelines for Americans." Tonya Orchard

Rebecca Jackson, the study's senior author and director of Ohio State's Center for Clinical and Translational Science, adds that their findings confirm previous studies, which have shown inflammatory factors to increase osteoporosis risk. "By looking at the full diet rather than individual nutrients, these data provide a foundation for studying how components of the diet might interact to provide benefit and better inform women's health and lifestyle choices," Jackson says.

However, it is worth noting that the study did not associate a more inflammatory diet with a higher risk of fracture overall. On the contrary, lower-arm and total fracture risk were found to be slightly lower among women with higher DII scores. Although the study was observational and could not establish causality, a possible explanation ventured by the authors is that women with lower inflammatory diets may exercise more and have a higher risk of falls as a consequence.



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Feed a cold, starve a fever? Not so fast, according to Salk research

Medical News Today 30 January
2017

The last time you had a stomach bug, you probably didn't feel much like eating. This loss of appetite is part of your body's normal response to an illness but is not well understood. Sometimes eating less during illness promotes a faster recovery, but other times - such as when cancer patients experience wasting - the loss of appetite can be deadly.

Now, research from the Salk Institute shows how bacteria block the appetite loss response in their host to both make the host healthier and also promote the bacteria's transmission to other hosts. This surprising discovery, published in the journal *Cell*, reveals a link between appetite and infection and could have implications in treating infectious diseases, infection transmission and appetite loss associated with illness, aging, inflammation or medical interventions (like chemotherapy).

"It's long been known that infections cause loss of appetite but the function of that, if any, is only beginning to be understood," says Janelle Ayres, assistant professor at Salk Institute's Nomis Foundation Laboratories for Immunobiology and Microbial Pathogenesis.

Mice orally infected with the bacteria

Salmonella Typhimurium typically experience appetite loss and eventually become much sicker as the bacteria become more virulent - spreading from the intestines to other tissues in the body. Ayres' team tested different conditions in the infected mice and found that sick mice that consumed extra calories despite their appetite loss actually survived longer. It turns out this survival wasn't due to a more active immune response by well-fed animals (as measured by levels of the bacteria in the host). Instead, it was because the *Salmonella* weren't spreading outside of the intestines and throughout the body when the mice ate more, which enabled the animals to stay healthy despite infection. Even more surprising, the *Salmonella* were acting on the intestine to try to suppress the appetite loss in the host.

The finding was initially puzzling: why would the bacteria become less virulent and not spread to other areas in the body when nutrients were more plentiful? And why would *Salmonella* actively promote this condition? It turns out the bacteria were making a trade-off between virulence, which is the ability of a microbe to cause disease within one host, and transmission, which is its ability to spread and establish infections between multiple hosts.

"What we found was that appetite loss makes the *Salmonella* more virulent, perhaps because it needs to go beyond the intestines to find nutrients for itself. This increased virulence kills its host too fast, which compromises the bacteria's ability to spread to new hosts," explains Sheila Rao, a Salk research associate and the first author on the study. "The trade-off between transmission and virulence has not been appreciated before - it was previously thought that virulence and transmission were coupled."

When the host ate more and survived longer during infection, the *Salmonella* benefitted: bacteria in those mice were able to spread via feces to other animals and increase its transmission between hosts, as compared to bacteria in mice who didn't eat and died sooner due to heightened bacterial virulence.

The researchers discovered that, to halt the appetite-loss response and boost transmission between hosts, *Salmonella* produces a molecule called SlrP, which blocks activation of an immune protein (cytokine) in the intestines. This cytokine typically communicates with the brain's appetite centre, called the hypothalamus, to prompt the host to lose its appetite during infection. The team found that mice infected with *Salmonella* that couldn't make SlrP ate less food while infected, lost more weight and died faster than control mice.

Though the same gut-brain pathway tied to appetite loss exists in the human as in mice, Ayres cautions that infection responses are dependent on many factors and that whether eating - or fasting - during illness can improve one's health will depend in large part on what the causative agent of the infection is. Her team is planning to search the human microbiome (the collection of bacteria that live in people's bodies) to find other microbes that might have a similar effect on this pathway and explore those for new therapies tied to appetite loss and treating disease. The lab also wants to investigate whether drugs could be used to turn up or down the sickness-induced appetite-loss pathway that SlrP targets.

"Now that we'd identified this mechanism that regulates appetite, we want to turn it on the flip side and see if we can decrease appetite via this mechanism to help in cases of metabolic disease," says Ayres.

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The discovery also points to the tantalizing possibility of treating infectious diseases with approaches other than antibiotics, such as nutritional intervention. "Finding alternatives to antibiotics is incredibly important as these drugs have already encouraged the evolution of deadly antibiotic-resistant strains," says Ayres. In the United States alone, two million people annually become infected with bacteria that are resistant to antibiotics and at least 23,000 people die each year as a direct result of these infections, according to the U.S. Centers for Disease Control.

The work and the researchers involved were supported by grants from the National Institutes of Health, the Nomis Foundation, the Searle Scholar Foundation and the Ray Thomas Edward Foundation.

Gut bacteria mediate link between diet and colorectal cancer

By Honor Whiteman, Medical News Today 27 January 2017

New research provides further evidence that what we eat alters gut bacteria to affect colorectal cancer risk, after linking a high-fibre diet to a reduced risk of colorectal cancer containing *Fusobacterium nucleatum*. Researchers have found that a high-fibre diet could reduce the risk of colorectal cancer containing the bacterium *F. nucleatum*.

Study leader Dr. Shuji Ogino - from the Dana-Farber Cancer Institute of the Harvard T.H. Chan School of Public Health in Boston, MA - and colleagues report their findings in JAMA Oncology. Colorectal cancer, which is a cancer that begins in the colon or rectum, is the third most common cancer among men and women in the United States. In 2017, it is estimated that there will be

95,520 new cases of colon cancer and 39,910 new cases of rectal cancer diagnosed in the U.S. Studies have shown that a diet high in red and processed meats may increase the risk of colorectal cancer, while a high-fibre diet - rich in fruits, vegetables, and whole grains - has been associated with a lower risk of the disease.

Previous research has suggested that one way by which diet influences the risk of colorectal cancer is through the changes it makes to the gut microbiome (the population of microorganisms that live in the intestine). The new study from Dr. Ogino and team supports this association, after finding that individuals who followed a high-fibre diet were at a lower risk of developing colorectal cancer tumours containing the bacterium *F. nucleatum*.

F. nucleatum and colorectal cancer According to Dr. Ogino, recent research has shown that *F. nucleatum* may play a role in the development of colorectal cancer. "One study showed that *F. nucleatum* in the stool increased markedly after participants switched from a prudent to a Western-style, low-fibre diet," he added. "We theorized that the link between a prudent diet and reduced colorectal cancer risk would be more evident for tumours enriched with *F. nucleatum* than for those without it."

To test their theory, the researchers analyzed the data of 137,217 individuals who were a part of either the Nurses' Health Study or the Health Professionals Follow-Up Study. Over an average 26-32 years of follow-up, there were 1,019 cases of colorectal cancer identified among the participants. Between

March 2015 and August 2016, the team analyzed tumour tissue samples from all patients with colorectal cancer, focusing on whether the samples contained *F. nucleatum*.

Dietary data for each participant was gathered using food frequency questionnaires completed at 2-4-year intervals between 1980 and 2010. These data were used to calculate total nutrient intake and total fibre intake.

Gut bacteria 'act in concert with diet' to affect colorectal cancer risk The team found that participants who followed a prudent diet - defined as a high intake of vegetables, fruits, whole grains, and legumes - were at a significantly lower risk of colorectal cancer containing *F. nucleatum*, compared with subjects who followed a Western-style diet.

However, participants who had a prudent dietary pattern did not show a reduced risk of colorectal cancer that was free of *F. nucleatum*.

Dr. Ogino says that these findings provide "compelling evidence" that diet influences the likelihood of developing specific forms of colorectal cancer by altering the gut microbiome. "Though our research dealt with only one type of bacteria, it points to a much broader phenomenon - that intestinal bacteria can act in concert with diet to reduce or increase the risk of certain types of colorectal cancer."

Dr. Shuji Ogino

The researchers conclude that further studies are needed to confirm their findings, and larger-scale studies should delve into the complex relationship between diet, gut bacteria, and cancer.



GUT BACTERIA

Red meat: Good or bad for health?

By Honor Whiteman
Medical News Today 25 January 2017

Red meat contains numerous vitamins and minerals that are essential for a healthful, balanced diet. In recent years, however, its reputation has been severely blemished, with studies suggesting that red meat intake can increase the risk of cancer and other diseases. But is it really that bad for us? We investigate.

Intake of red meat in the U.S. has fallen dramatically over the past 4 decades.

Red meat is defined as any meat that comes from mammalian muscle. This includes beef, lamb, pork, goat, veal, and mutton. For many households, red meat is considered a food staple, with some of us consuming beef, lamb, and pork in different variations on a daily basis. Last year, the average person in the United States is estimated to have consumed around 106.6 pounds of red meat. Although this might appear a high intake, it is a significant reduction from the average 145.8 pounds consumed per capita in 1970. Over the past 10 years alone, red meat consumption has fallen by around 10 pounds per person, with 2014 seeing the lowest intake of red meat since 1960, at just 101.7 pounds per person. But why are so many of us cutting down on red meat?

A shift toward plant-based foods According to a 2016 Harris Poll, approximately 8 million adults in the U.S. are vegetarian or vegan, with concerns about animal welfare being the driving factor. However, it seems that millions more of us are opting for plant-based foods over meat-based products because we believe that they are more healthful. The 2016 Harris Poll found that 37 percent of U.S. adults "always" or "sometimes" eat vegetarian meals when eating out, with 36 percent of these citing health reasons for their choice.

A number of studies have suggested that when it comes to health, a plant-based diet is the way to go. In December 2016, a position paper from the Academy of Nutrition and Dietetics claimed that a plant-based diet can lower the risk of type 2 diabetes by 62 percent, as well as reduce the risk of heart attack and stroke.

"If you could bottle up a plant-based prescription, it would become a blockbuster drug overnight," commented paper co-author Susan Levin, of the Physicians Committee for Responsible Medicine in Washington, D.C. It is not only the health benefits associated with plant-based diets that are steering us away from red meat, however, but the health risks that might arise from eating red meat. We take a look at what some of these risks are. Cancer

When it comes to red meat intake, cancer is perhaps the most well-established health implication. In October 2015, the World Health Organization (WHO) published a report concluding that red meat is "probably carcinogenic to humans," meaning that there is some evidence that it can increase the risk of cancer. Additionally, the WHO concluded that processed meats - defined as "meat that has been transformed through salting, curing, fermentation, smoking, or other processes to enhance flavor or improve preservation" - is "carcinogenic to humans," meaning that there is sufficient evidence that processed meat intake increases cancer risk.

A high intake of processed meat is associated with a greater risk of colorectal cancer, according to the WHO. To reach these conclusions, the WHO's International Agency for Research on Cancer (IARC) Working Group reviewed more than 800 studies assessing the effects of red and processed meats on various types of cancer. They found that

each 50-gram portion of processed meat - which primarily includes pork or beef - consumed daily increases the risk of colorectal cancer by 18 percent.

The IARC also uncovered evidence of a link between red meat intake and increased risk of colorectal, pancreatic, and prostate cancers. It is thought that cooking red meats at high temperatures - through frying or barbecuing, for example - is what contributes to an increased cancer risk. According to the National Cancer Institute - a part of the National Institutes of Health (NIH) - cooking meats at high temperatures can lead to the production of heterocyclic amines (HCAs) and polycyclic aromatic hydrocarbons (PAHs), which are chemicals that have been shown to increase cancer risk in animal models. However, the report from WHO concluded that the role of HCAs and PAHs in human cancer risk is not fully understood, and from their review, there was not enough data to determine whether the way meat is cooked influences cancer risk.

Kidney failure

Kidney failure - whereby the kidneys are no longer able to filter waste products and water from the blood - is estimated to affect more than 661,000 people in the U.S. Diabetes and high blood pressure are among the most common causes of kidney failure, but in July 2016, one study suggested that red meat intake might be a risk factor. Published in the Journal of the American Society of Nephrology, the study reported a dose-dependent link between red meat consumption and risk of kidney failure.

Image © iStock.com/bm4221

For example, participants who were in the highest 25 percent of red meat intake were found to have a 40 percent increased risk of kidney failure, compared with those in the lowest 25 percent.

"Our findings suggest that these individuals can still maintain protein intake but consider switching to plant-based sources; however, if they still choose to eat meat, fish/shellfish and poultry are better alternatives to red meat," says study co-author Dr. Woon-Puay Koh, of the Duke-NUS Medical School in Singapore.

Heart disease

Heart disease remains the number one killer in the U.S., responsible for the deaths of around 610,000 people in the country every year. An unhealthy diet, high in saturated fat and cholesterol, is a well-known risk factor for heart disease. A number of studies have suggested that red meat falls into that category, raising the risk of heart disease and other cardiovascular conditions.

A 2014 study of more than 37,000 men from Sweden, for example, found that men who consumed more than 75 grams of processed red meat per day were at a 1.28 times greater risk of heart failure than those who consumed under 25 grams daily. Another study, published in 2013, reported an association between red meat intake and increased risk of heart disease, but this link was not attributed to the high saturated fat and cholesterol content of red meat.

The researchers, from Columbia University in New York, found that gut bacteria digest a compound in red meat called L-carnitine, converting it into a compound called trimethylamine-N-oxide (TMAO). In mice, the researchers found that TMAO led to the development of atherosclerosis - a condition characterized by the build-up of fatty substances in the arteries, which can lead to heart attack and stroke.

Although there are numerous studies linking red meat intake to poor heart health, other research challenges this association. A recent study by researchers from Purdue University in West Lafayette, IN, for example, found that eating 3 ounces of red meat three times weekly did not lead to an increase in risk factors for cardiovascular disease.

Diverticulitis

Diverticulitis is a condition whereby inflammation occurs in one or more of the sacs that line the wall of the colon, which are called diverticula. This inflammation can lead to a number of severe complications, including abscesses, perforation of the colon, and peritonitis (infection and swelling in the lining of the abdomen). While the specific causes of diverticulitis are unclear, it has been suggested that a high-fiber diet can raise the risk of developing the condition.

Earlier this month, a study published in the journal *Gut* suggested that eating high amounts of red meat may also increase the likelihood of developing diverticulitis. Compared with men who reported eating low quantities of red meat, those who reported eating the highest quantities were found to have a 58 percent greater risk of developing diverticulitis. The risk was strongest with a high intake of unprocessed red meat, the researchers found.

How much red meat should we eat? Despite overwhelming evidence of the potential health risks of red meat intake, it is important to note that red meat is full of nutrients. As an example, a 100-gram portion of raw ground beef contains around 25 percent of the recommended daily allowance of vitamin B-3, and 32 percent of the recommended daily allowance of zinc. Red meat is also high in heme-iron - which is absorbed better than plant-derived iron - vitamin B-6, selenium, and other vitamins and minerals. Still,

based on the evidence to date, public health guidelines recommend limiting red meat consumption.

The American Institute for Cancer Research, for example, recommend eating no more than 18 ounces of cooked red meats each week to reduce cancer risk, while processed meats should be avoided completely. However, while the 2015-2020 Dietary Guidelines for Americans recommend cutting back on red meat intake, they do not specify a daily limit. According to Dr. Christopher Wild, director of the IARC, the 2015 report linking red meat intake to increased cancer risk supports public health recommendations to limit the consumption of red meat.

However, he notes that red meat has nutritional value, and that this should be considered in future research "in order to balance the risks and benefits of eating red meat and processed meat and to provide the best possible dietary recommendations."

Chicory fibre may support digestive health in adults, children

IFT Weekly February 15, 2017

Two scientific studies published in the *International Journal of Food Sciences and Nutrition* suggest that prebiotic chicory root inulin may support digestive health by improving bowel regularity and softening stools.

The first study was a randomized, double-blind, placebo-controlled, cross-over design trial of 44 healthy, slightly constipated subjects (self-reported constipation defined as 2-3 stools per week).



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a child's **brain development,**
immune health and
physical growth



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Carbohydrates	55%-75%	56%-57%
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*Mead Johnson & Company claim based in part on data reported by Nielsen for the Children's Nutrition Milk Formula category across measured off-premise retail channels in 28 countries for the 12 months ending June 2015. This product is not an infant milk substitute or infant food for less than 2 years old.

1. World Health Organization and Food and Agriculture Organization of the United Nations. Diet, nutrition and the prevention of chronic diseases. Report of a Joint WHO/FAO Expert Consultation. World Health Organization, Geneva, 2003.
2. Food and Agriculture Organization of the United Nations. Fats and fatty acids in human nutrition. Report of an expert consultation. Food and Agriculture Organization of the United Nations, Rome, 2010.



The participants were supplemented with 4 g of chicory root fibre three times a day or a placebo (maltodextrin). The supplements were delivered in a drink form that was consumed together with breakfast, lunch, and dinner over a four-week period and after a two-week run-in phase.

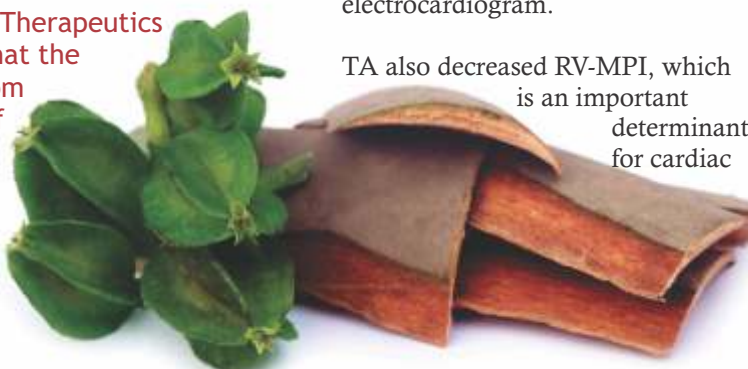
The researchers found that the prebiotic chicory inulin significantly improved stool frequency per week without resulting in gastrointestinal discomfort. Chicory root inulin also contributed to improved overall wellbeing and satisfaction, evaluated by a validated quality of life questionnaire for constipated people.

The second study was a randomized, double-blind, placebo-controlled parallel group design focused on children, aged 2–5. The children received 2 g of inulin and oligofructose twice daily or a placebo (maltodextrin), incorporated into yogurt or fresh cheese, for a six-week period. The researchers found that the chicory root fibres softened the stools of the constipated children and were as well tolerated as the fully digestible placebo.

The researchers suspect that the physiological mechanisms underlying this digestive support by chicory root fibres are related to their prebiotic effect. The fibres selectively stimulate the growth of bacteria promoting saccharolytic fermentation, in particular Bifidobacteria and Lactobacilli.

Indian tree bark extract may improve athletic performance
IFT Weekly February 15, 2017

A study published in the American Journal of Therapeutics suggests that the extract from the bark of the tree Terminalia



arjuna (TA) may increase cardiovascular efficiency and improve the cardiac conditioning in young healthy male adults.

The researchers hypothesized that TA, which has a history of cardiovascular benefits, could be used to improve the cardiac performance and safely allow people to exercise for longer time periods with less fatigue.

In the double-blind, placebo-controlled, randomized clinical trial, 32 healthy male subjects were given either 400 mg of TA extract (Oxyjun) or a placebo for 56 days. The effect of the product was evaluated by electrocardiogram and graded exercise protocol. The exercise protocol involved a one-minute warm up at three miles per hour followed by 2% increase in gradient and one mile per hour increment in speed every three minutes until the subjects volunteered that the exercise was too difficult to continue.

The researchers also assessed the left ventricular ejection fraction, right ventricular myocardial performance index (RV-MPI), and Borg Rated Perceived Exertion (RPE) at baseline, day 28, and day 56. They also assessed the cardiac biomarkers creatine kinase and troponin-T, which are considered as gold standard for cardiomyocyte insult.

The researchers found that on day 56, the TA extract group reported that the exercise conducted was easier and less stressful than the placebo group. In addition, the group receiving the extract exhibited significant improvement in cardiac conditioning as evident by electrocardiogram.

TA also decreased RV-MPI, which is an important determinant for cardiac

musculature size. With the increase in the cardiac output as well as a reduction in myocardial perfusion imaging (MPI), it is expected that VO₂ (maximum volume of oxygen that an athlete can use) would also be increased. Additional cardiac biomarkers assessment showed normal levels throughout the study, indicating safety of the product.



Whole grains may lead to a healthier gut, better immune responses
By Honor Whiteman Medical News Today 9 February 2017

A new study highlights the benefits of eating whole grains over refined grains, after finding that the former may lead to a healthier gut and better immune responses.

Researchers say that a diet rich in whole grains may benefit the gut and immune system. Senior study author Simin Nikbin Meydani, Ph.D., of the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University in Boston, MA, and colleagues report their findings in the American Journal of Clinical Nutrition.

There are three components that make up a grain - the bran, germ, and endosperm. A whole grain contains all three components, whereas a refined grain is processed so that the bran and germ are removed.

Whole wheat, oats, rye, barley, brown rice, and quinoa are all examples of whole-grain products, while refined-grain products include wheat flour, white rice, and enriched bread. Whole grains are considered a key part of a healthful diet. According to the American Heart Association, they can help to improve cholesterol levels, as well as reduce the risk of obesity, heart disease, stroke, and type 2 diabetes. Previous studies have suggested that whole grains reduce inflammation to produce such benefits. Meydani and colleagues set out to investigate this association further with their new study, noting that research comparing the effects of whole grains and refined grains on immune responses and inflammation has not controlled the diets of participants.

Whole-grain vs. refined-grain diet

The 8-week study involved 81 healthy adults, all of whom consumed a Western-style diet high in refined grains for the first 2 weeks. For the remaining 6 weeks, 40 of the study participants continued with the Western-style diet that was rich in refined grains, while the remaining 41 participants were placed on a Western-style diet that was rich in whole grains. Importantly, the team notes that the total energy, total fat, and total servings of fruits, vegetables, and proteins were comparable in each diet, meaning that the only difference between the two diets was the type of grains consumed.

All meals were pre-prepared by trained staff in line with the Dietary Guidelines for Americans, and they were designed for weight maintenance. The team explains that this was because previous studies had shown that increasing whole grain intake caused subjects to lose weight, which made it hard to determine whether reduced inflammation was a result of whole-grain consumption or weight loss. Subjects were required to complete a food checklist with each meal, enabling the researchers to determine how much food each

participant ate. Furthermore, each participant was asked to continue with their usual physical activity, record the occurrence and severity of gastrointestinal symptoms, and refrain from using any anti-inflammatory drugs (such as aspirin) in the 72 hours prior to blood samples being taken.

Whole-grain diet led to increase in memory T cells

To evaluate how each diet influenced the gut microbiota - the population of microorganisms in the intestines - the researchers analyzed participants' stool samples. Blood samples were also collected, which the team used to assess immune responses. Compared with participants who consumed the diet rich in refined grains, those who consumed the diet rich in whole grains showed an increase in a type of bacteria called *Lachnospira*, which is known to produce short-chain fatty acids. The team explains that short-chain fatty acids are important for a healthy immune system.

Furthermore, subjects who consumed the whole-grain diet showed a reduction *Enterobacteriaceae* - bacteria that trigger inflammation. The researchers hypothesize that the decrease in *Enterobacteriaceae* is down to the higher concentration of acetate identified in the stool samples of subjects who consumed the diet rich in whole grains. On assessing the blood samples of both diet groups, the team found that subjects who consumed the whole-grain diet showed an increase in memory T cells - types of white blood cells that stave off infection. When immune cells were stimulated with foreign compounds, however, participants who consumed the diet rich in refined grains, showed a reduction in the production of TNF-alpha - a cell signalling protein involved in the first phase of an immune response.

Further studies needed

The researchers stress that the differences in gut microbiota and immune responses were modest, but that their findings shed some light on how whole grains influence inflammation. "The strength of the study is that we found modest effects of whole grain on gut microbiota and measures of immune function in the context of a controlled energy and macronutrient diet where all food was provided to participants, allowing them to maintain their body weight constant, thus eliminating the confounding effect of weight loss associated with increasing fibre consumption on immune and inflammatory markers," says Meydani.

"Additionally, our study incorporated markers of diet adherence and whole grain consumption, allowing us to more confidently determine the effect whole grains have on the gut microbiota and inflammatory responses." The researchers say that future studies should incorporate more soluble whole-grain products, which may give a clearer picture of how whole grains impact gut microbiota and immune responses.

Gluten-free diet may increase arsenic, mercury levels

IFT Weekly February 22, 2017

A study published in *Epidemiology* suggests that a gluten-free diet may increase blood levels of arsenic and mercury.

Arsenic and mercury are widely distributed throughout the environment, and everyone has some amount in their blood.

Image © iStock.com/marekulasz



Gluten-free products often contain rice flour as a substitute for wheat. Rice is known to bio-accumulate certain toxic metals, including arsenic and mercury from fertilizers, soil, or water, but little is known about the health effects of diets high in rice content.

The researchers examined data from the National Health and Nutrition Examination Survey searching for a link between gluten-free diet and biomarkers of toxic metals in blood and urine. They found 73 participants who reported eating a gluten-free diet among the 7,471 who completed the survey, between 2009 and 2014. Participants ranged in age from 6 to 80 years old.

The researchers found that the people who reported eating gluten-free had higher concentrations of arsenic in their urine, and mercury in their blood, than those who did not. The arsenic levels were almost twice as high for people eating a gluten-free diet, and mercury levels were 70% higher.

“These results indicate that there could be unintended consequences of eating a gluten-free diet,” said study author Maria Argos, assistant professor of epidemiology in the University of Illinois at Chicago’s School of Public Health. “But until we perform the studies to determine if there are corresponding health consequences that could be related to higher levels of exposure to arsenic and mercury by eating gluten-free, more research is needed before we can determine whether this diet poses a significant health risk.”

Raising dietary potassium to sodium ratio may reduce heart, kidney disease

IFT Weekly February 22, 2017

A study published in

the American Journal of Physiology—Endocrinology and Metabolism shows that increasing dietary potassium may be as important to improving the risk factors for cardiovascular and kidney disease as limiting dietary sodium.

The research team reviewed more than 70 studies related to dietary approaches to regulating high blood pressure and found that the interaction of sodium and potassium is integral to maintaining healthy blood pressure levels. The ratio of sodium to potassium excreted as urine is an indication of how much of these minerals is consumed. When dietary potassium intake is elevated, the kidneys—composed of millions of small tubes working together—shift fluid to the area near the end of the tubes where potassium secretes into the urine. This shift reduces the amount of sodium and water that’s reabsorbed into the body. In this way, high potassium diet signals the body to reduce the amount of sodium that is retained. This circular pattern regulates the levels of both minerals in the body, which in turn helps lower blood pressure. Higher intake and excretion of potassium has also been found to slow the progression of kidney and heart disease.

“Consuming [an abundance] of [potassium] is a good strategy since our physiology evolved and was optimized to deal with high [potassium] low [sodium] intake, often referred to a Paleolithic diet,” wrote the researchers. In other words, the human body functions best with a balance of the two nutrients.



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Vitamin B-3 successfully prevents glaucoma in mice

By Ana Sandoiu Published Friday 17 February 2017

There is currently no cure for the group of eye diseases that make up glaucoma. However, new research points to a way of preventing the disease, as vitamin B-3 has been proven effective as a treatment in mice.

New mouse study shows that treatment with vitamin B-3 is effective against glaucoma. The research - led by Jackson Laboratory professor and Howard Hughes medical investigator Simon W.M. John - investigates the effect of vitamin B-3 on mice that had been genetically modified to be prone to developing glaucoma. The findings were published in the journal Science.

Glaucoma is the name given to a group of neurodegenerative diseases that affect the optic nerve and may lead to visual impairment and blindness. In the so-called open-angle glaucoma, a build-up of fluid inside the eye raises the intraocular pressure to a point where it damages the optic nerve, eventually causing the loss of retinal ganglion cells. These are neuronal cells that connect the eye to the brain through the optic nerve. The condition reportedly affects more than 60 million people worldwide, with 3 million cases of glaucoma suspected in adults in the United States. Advanced age is a risk factor for glaucoma, as its prevalence increases with age and the optical nerve, along with the neuronal cells, become more vulnerable to the harmful effects of intraocular pressure.

Vitamin B-3 prevents the onset of glaucoma in genetically prone mice

Prof. John and colleagues carried out a set of genetic, metabolic, and neurobiological tests in a group of mice that were genetically predisposed to developing glaucoma, as well as in a healthy control group. The researchers found that the nicotinamide adenine dinucleotide (NAD) molecule decreases with age. NAD is a coenzyme that plays a key role in the oxidation of a cell. A healthy body produces its own reduced NAD with the help of vitamin B-3. When ingested, vitamin B-3 eventually converts into NAD. The decline in NAD weakens the metabolism of the brain cells, and intraocular pressure is particularly dangerous in the context of a NAD-deprived body.

Prof. John explains the mechanism using an analogy: "There is an analogy with an old motorbike. It runs just fine, but little things get less reliable with age. One day you stress it: you drive it up a steep hill or you go on a really long journey, and you get in trouble. It is less reliable than a new bike, and it is going to fail with a higher frequency than that new bike. Like taking that big hill on your old bike, some things are going to fail more often. The amount of failure will increase over time, resulting in more damage and disease progression."

The researchers added B-3 to the drinking water of glaucoma-predisposed mice. This cancelled most molecular changes usually associated with advancing age and protected against the onset of glaucoma. According to the authors, this suggests that treatments with vitamin B-3 - also known as niacin, or nicotinamide - improves the metabolism of aging retinal ganglion cells, keeping them healthy. The fact that they are healthier and more robust for a longer period of time makes them

more resilient to the pressure-induced damage.

Gene therapy could be effective in treating glaucoma

Additionally, the scientists found that an insertion of the *Nmnat1* gene into the body of genetically predisposed mice stopped glaucoma from developing. The *Nmnat1* gene is responsible for the enzyme that forms NAD from vitamin B-3. Gene therapy refers to a range of experimental techniques, including replacing mutated genes with healthy replicas, knocking out disease-causing genes, and inserting new genes into the body in order to stop a disease.

Postdoctoral associate at the Jackson Laboratory and first author of the study, Pete Williams, explains the benefits of using gene therapy in treating glaucoma: "It can be a problem for patients, especially the elderly, to take their drugs every day and in the correct dose," Williams says "So gene therapy could be a one-shot, protective treatment."

Williams also points out that gene therapy has been previously used to treat very rare genetic eye disorders. However, he hopes that the focus on age-related factors brought about by their study would make gene therapy available for common eye diseases. Prof. John and his team are currently working on closing clinical partnerships to test how effective a B-3 treatment would be in other neurodegenerative diseases.

All Dietary Protein Contributes to Good Muscle Health, study suggests

By Will Chu, Food Navigator 14-Feb-2017

A high protein intake from any protein dense food regardless of its source - plant or animal - can improve muscle health,

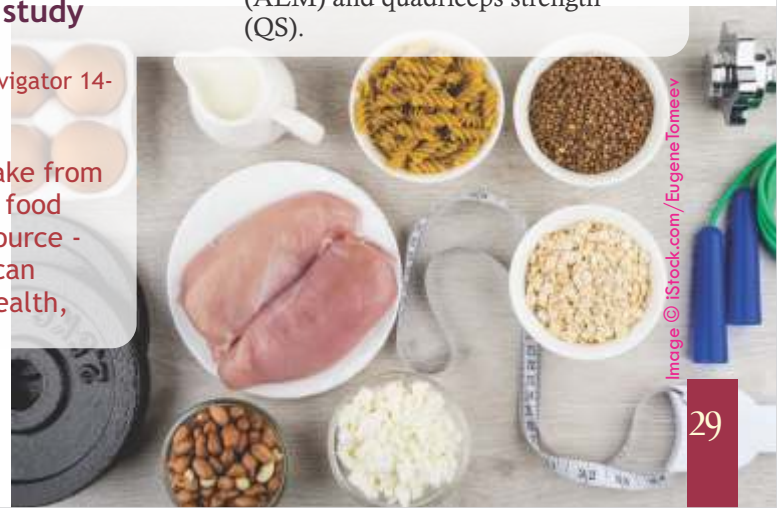
according to US researchers.

In both men and women, a higher muscle strength and muscle mass occurred when subjects consumed animal or plant-derived protein. However, the intake of these protein sources did not appear to affect bone mineral density (BMD) — a major age-related health consideration that can lead to physical disability and increased mortality. "We know that dietary protein can improve muscle mass and strength. However, until now, we did not know if one protein food source was better than another in accomplishing optimal results," said Dr Kelsey Mangano, assistant professor of Nutritional Sciences at University of Massachusetts Lowell. "This study is significant as it suggest that higher protein intake from any food source will benefit muscle mass and strength in adults."

The study also stressed the need to establish a link between dietary protein and muscle health, irrespective of its source as a determinant of future guidelines for dietary patterns.

Protein types

Total protein intake was estimated using a food-frequency questionnaire (FFQ) given to 2,986 men and women, aged 19–72 years in 2002–2005. The following dietary protein food clusters were identified: fast food and full-fat dairy, fish, red meat, chicken, low-fat milk, and legumes. A model was then used to estimate the association between protein intake, BMD, appendicular lean mass (ALM) and quadriceps strength (QS).



From these findings the outcomes across quartiles of protein (grams per day) and protein food clusters could then be calculated. The research team found 82% of participants met the Recommended Daily Allowance (0.8 grams per kg body weight per day). BMD did not change across different quartiles of protein intake but significant positive trends were observed for ALM, ALM normalised for height ((ALM/ht²), and QS.

Subjects with the lowest quartile of total protein intake had significantly lower ALM, ALM/ht², and QS compared to those in the higher quartiles of intake. "Dietary protein may maximally benefit bone health in older, more frail, or protein insufficient populations," the study commented. "The lack of differences in either muscle mass or strength across protein food clusters is important because future health messages that encourage older adults to meet required protein intakes do not need to provide complicated recommendations about specific protein-containing foods."

Animal vs. plant

The question of whether on protein source is better than another has particular ramifications not only in the elderly but also for athletes who require a specific amount of protein to fuel optimum performance. According to one study, individual protein food sources may be beneficial to the musculoskeletal system because a specific food source may differ in its amino acid composition, digestibility and non-protein nutrient composition.

Studies that have separated protein foods by animal protein compared with plant protein have had conflicting results regarding their associations with bone and muscle. The influence of dietary protein on the musculoskeletal system is dependent on many other dietary factors, the study added, such as

other non-protein nutrients (i.e. calcium, magnesium, and vitamin D) and the acidity of the diet.

Astaxanthin may protect skin from within: Study

By Stephen Daniells,
NutraIngredients USA 13-
Feb-2017

Dietary supplementation with the pinkish-red pigment astaxanthin may protect skin from the harmful effects of UV radiation, says a new study from Japan. Astaxanthin may reduce water loss from the skin and the formation of wrinkles, according to data from experiments with hairless mice published in PLoS One.

"To our knowledge, this is one of the first in vivo studies evaluating the protective effect of dietary astaxanthin against skin photo-aging induced by UVA radiation," wrote researchers from Kyoto University. "In this study, we found that dietary supplementation with astaxanthin effectively prevented features of photo-aging, such as the increase of TEWL [trans-epidermal water loss] and wrinkle formation, in the dorsal skin of mice exposed to UVA irradiation."

Red hot!

Astaxanthin already had a dedicated following among the long-distance runner and tri-athlete communities, based on the cardiovascular and joint health benefits of the ingredient, long before the ingredient exploded onto the national conscience in 2011. Dr Joseph Mercola described the potent red antioxidant on the Dr Oz show as the "number one supplement you've never heard of that you should be taking". Sales of products containing the carotenoid subsequently "skyrocketed", and interest has remained high, as can

be seen from the Google Trends data below.



Image Source: PFNDAI

Natural astaxanthin is obtained from *Haematococcus pluvialis* microalgae, which can be grown in a variety of ways, either in open ponds or closed bioreactors.

Hairless mice were divided into four groups: One group was fed a normal diet and was not exposed to any UVA (normal group), one group ate the normal diet and was exposed to UVA (control group), and two groups ate the normal diet supplemented with 0.01% or 0.1% astaxanthin and were exposed to UVA (low and high dose astaxanthin groups).

"Based on the body weight, the calculated astaxanthin intake in the condition of this study was 20–200 mg per day for human. However, it seems that lower dose is enough to be effective for human, because the absorption of carotenoids in mice is generally smaller than in human," explained the researchers.

Results showed that UVA exposure significantly increased TEWL and wrinkle formation in the control animals, but astaxanthin significantly suppressed these effects. Additional analysis showed that astaxanthin reached both the dermis and the epidermis of the animals. "Our study indicates the protective effects of dietary astaxanthin against features of photo-aging induced by UVA radiation, such as impaired barrier function and wrinkling in the skin," wrote the researchers. "Our results underscore the potential for astaxanthin to be further developed as a nutraceutical against photo-aging."



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Carbs 'better than antioxidants' to boost immunity and recovery after exercise: Australia review

By Gary Scattergood, NutraIngredients Asia 20-Feb-2017

Consuming carb-heavy bars or gels either during or

immediately after intense exercise helps cut immune disturbances and can aid the body's recovery, but there is insufficient evidence to support the use of 'immunity boosting' supplements such as antioxidants, researchers in Australia claim.

They found the best way to avoid unfavourable changes in the immune system during a post-workout recovery was consuming carbs during or immediately after the exercise. In a paper published in the Journal of Applied Physiology, academics from Queensland University of Technology said there was intense interest in what athletes can do to recover faster from exercise. "Among various nutritional strategies to counteract immune depression during exercise recovery, carbohydrates have proven the most effective. Ingesting carbohydrates during vigorous exercise may help, because carbohydrates maintain blood sugar levels," stated Dr Jonathan Peake

The paper adds that carbohydrate supplementation during prolonged, intense exercise consistently reduces circulating cytokines, and the re-distribution of neutrophils,

monocytes, natural killer cells and lymphocytes. The researchers advise that most people only need carbohydrates during high-intensity or prolonged exercise of 90 minutes or more.

"Between 30 and 60 grams of carbohydrates, every hour during exercise, help to support normal immune function. Examples of carbohydrates that could be consumed during exercise include carbohydrate-containing fluids, gels and bars consisting of different carbohydrates such as glucose and fructose," said co-author Oliver Neubauer.

Timely supplementation The researchers also pointed to findings suggest that carbohydrates may help to diminish immune disturbances over consecutive days of exercise. "These findings suggest beneficial effects of a timely carbohydrate supplementation (i.e., shortly before and/or during exercise) on immune responses to exercise. This may be particularly relevant with more prolonged and/or intense exercise protocols, and when the recovery duration between two consecutive exercise-bouts is short," states the paper.

However, evidence of other effective nutritional countermeasures to exercise-induced immune alterations is limited, they argue. They accept that some data point towards the beneficial effects of quercetin supplementation on immune health after intense exercise, while they add other findings suggest an increased need for antioxidants during the first 24 hours of recovery from intense exercise lasting several hours. "However, taken together, the present literature is not sufficiently robust to recommend supplementation with phytochemicals

or antioxidants to prevent immune suppression and illness in athletes and exercising individuals," they wrote.

"Athletes often take high doses of antioxidant/phytochemical supplements in the belief that this will reduce their risk of illness. However, high doses of antioxidant/phytochemical supplements can interfere with training adaptations. A natural diet rich in fruits, vegetables, whole grains and nuts delivers antioxidants and phytochemicals in physiologically effective-amounts that are most likely sufficient to help maintain immune function following exercise and during exercise training," they add.

Ethnicity not found to affect GI beverage response in Asia

By Gary Scattergood, Food Navigator Asia 09Feb2017

The glycaemic response (GR) to beverages does not vary depending on Asian ethnicity, with Chinese, Indian and Malay displaying similar responses, a first of its kind study has established.

This mirrors the findings of a previous study, which compared the glycaemic responses to solid foods among various Asian ethnic groups. Writing in the European Journal of Nutrition, researchers in Singapore said a number of studies have compared the glycaemic index (GI) and GR to solid foods between Caucasians and Asians.



Image © iStock.com/kzenon

These studies have demonstrated that Asians have greater GI and GR values for solid foods than Caucasians. However, no study has compared the GI and GR to liquids among various Asian ethnic groups. "Since glucose tolerance has been shown to differ between ethnic groups, it is possible that they also respond differently to the nutrition formulas," wrote the researchers. "Therefore, the objective of this study was to compare the GR to three liquid nutritional supplements with different composition between Chinese, Indians, and Malay. These three ethnic groups represent over 60% of the world's population."

Forty eight people (16 Chinese, 16 Indians, and 16 Malay) took part in the randomised, crossover study. The GR to the reference liquid (glucose beverage) was measured on three occasions, and GR to three oral nutritional supplements were measured on one occasion each. Liquids with different micronutrient ratios and carbohydrate types were chosen to be able to evaluate the response to products with different GIs. And while there were statistically significant differences in GI and GR between the three liquids, there were no statistically significant differences in GI and GR for the liquids between the ethnic groups.

"Our study shows that the GR to the test beverages were not influenced by the ethnicity, which is in line with our previous study comparing the glycaemic responses to solid foods (i.e. Jasmine rice and Basmati rice) among various Asian ethnic groups," the paper states. "Further to this, we found that gender of the participants did not affect GI and GR to the test beverages. It appears that the nutrient composition of the test beverages (e.g. type and relative amount of protein and carbohydrate as well as dietary fibre and the type of starch), rather than

the ethnicity or gender of the participants, plays an important role in determining glycaemic responses."

The researchers concluded that future studies should examine whether this finding can be generalised to other foods and also whether the finding derived from healthy Southeast Asians can be extrapolated to other Asian populations.

Fibre supplement boosts weight loss and lowers blood sugar in obese adults: Study

By Millette Burgos, Food Navigator Asia 07Feb2017

Fibre supplementation helped to boost weight loss and lower blood sugar in overweight and obese adults, according to a new Australian study.

"Higher fibre intake are correlated with lower body weight, body mass index (BMI) and waste circumference, and even helped improve plasma lipid profiles, glycaemia and insulinaemia," wrote researchers from Curtin University, in Perth, Australia. However, many people find increasing fruit and vegetable consumption to meet recommended fibre requirements difficult, said researchers, who suggested fibre supplementation as a means to increase intake without major diet changes.

Image © iStock.com/bowie15



They conducted a study on fibre supplementation's effects on weight management – with randomised trials in three, six and 12 months durations involving three groups of overweight and obese individuals, ages 19-68 years old. Each group had 53 participants. Rice flour was the control group supplementation. Polyglycoplex (PGX), a fibre complex made up of natural and highly viscous polysaccharides, was the second group's fibre supply and the third got psyllium (PSY), a form of fibre made from the husks of the Plantago ovata plant's seed.

The participants followed their usual lifestyles, but consumed 5g of their assigned fibre supplement before meals. Participants' body weights, heights, waist and hip circumferences were measured at baseline (three, six, and 12 months). They completed threeday food and drink diaries at baseline, three, six and 12 months to monitor for changes in food intake. Fasting blood samples were taken after every trial. After three months, 127 participants completed the trial, and were included in the analysis (45 in control, 43 in PSY and 39 in PGX). In six months, 108 participants (38 in Control, 39 in PSY and 31 in PGX) completed the trial, and after 12 months, 93 participants (32 in Control, 36 in PSY and 25 in PGX) were analysed.

Lower cholesterol levels Findings revealed that total cholesterol levels were "significantly lower in the PGX group at after the three and six months compared to baseline records." The cholesterol levels were also lower in the PSY group at three and six months compared to the participants' baseline measurements. "Total cholesterol was significantly lower at three months in the PGX (8.2%, $p < 0.001$) and PSY (7%, $p = 0.001$) groups and at six months in the PGX (5.5%, $p = 0.047$) and PSY (5.3%, $p = 0.042$) groups compared to control.

There were no significant differences in total cholesterol between PSY and PGX groups at three, six or 12 months,” wrote the researchers.

High-density lipoprotein (HDL) cholesterol – also known as the ‘good cholesterol’ were lower in the PSY group at three months compared to baseline, but higher in the PGX group after 12 months of supplementation compared to that of the control group. As for LDL or ‘bad’ cholesterol, both PGX and PSY groups’ levels reduced at three, six and, to a lesser extent, 12 months.

The study reported no significant differences between PSY and PGX groups’ LDL levels during the third, sixth and twelfth month of supplementation. As for glucose, researchers noted that the PGX group showed consistently lower levels at three, six and 12 months of supplementation, compared to both PSY and control groups.

While both PGX and PSY groups showed healthier lipids profiles and lower blood sugar levels compared to the control group after the supplementation trials, the study found that the PGX group had increased HDL cholesterol and decreased fasting blood glucose levels compared to PSY.

“The PGX group performed better overall than the PSY group and elicited more health benefits over the 12 months intervention period,” they said. Researchers think that the high viscosity of PGX might have caused participants to decrease their

food intake, which then lead to significant weight loss, lipid, insulin, and glucose reductions. “Regular consumption of a polyglycoplex or a psyllium supplement is a simple and effective method to improve blood lipids, insulin and glucose control in overweight or obese people and may lead to risk reduction for metabolic syndrome, CVD and type 2 diabetes,” researchers concluded.

Prebiotics and probiotics show potential in dermatitis treatment

By Will Chu, NutraIngredients
01Feb2017

Could altering the gut microbiome help prevent or treat Atopic Dermatitis (AD)? Japanese researchers seem to think so as they make a case for this approach in a recently published review.

While probiotics and prebiotics have a greater potential than that already explored, the team emphasised the need for more knowledge on the factors determining their efficacy. Up until now, their effect on AD has only been observed when administered prenatally and post-natally. Less convincing evidence has been presented when supporting their effectiveness in AD prevention or treatment. This has been mainly due to inconsistent results.

AD, food allergy, allergic rhinitis, and asthma are a range of allergic conditions that are observed

sequentially. They may progress from AD during childhood years progressively developing as they get older. AD affects 10%–20% of children in developed countries, with 60% of the cases starting during the first year of life.

Synbiotic slant

The team, from the University of Chiba in Japan, go on to make a case for the use of synbiotics as a treatment. “As some studies have demonstrated, probiotics may be transient colonisers, which makes it even more important to identify the ideal compositions and conditions for their administration,” the researchers said. To this effect, the strain-specific effect of the probiotic bacteria could be enhanced by facilitating colonisation using ‘strain-specific’ prebiotics, thus making their combination an ideal symbiotic.”

Principal team members Dr Eishika Dissanayake and Dr Naoki Shimojo concluded that it was vital to fully understand the disease mechanisms and host factors that effected efficacy of prebiotics and probiotics. This included individual reactions to their interventions.

In addition, characterising probiotics to strain level and to select strains with documented properties was paramount to ensure optimal benefits to individuals. “By doing so, it may be possible to match the clinical needs with the suitable probiotic and/or prebiotic treatment option. This may be a step further in the direction of personalised medicine.”

FOOD SCIENCE & INDUSTRY NEWS

Developing a 'healthier' chocolate using prebiotics, goji berries

IFT Weekly February 15, 2017

A study published in the *Journal of Food Science* proposes that prebiotics and antioxidants may be added to chocolate and still be acceptable to consumers.

The researchers set out to evaluate the descriptive sensory profile and consumers' acceptance of prebiotic white chocolates with and without the addition of an antioxidant source (goji berry) and sucrose replacement.

They determined the descriptive sensory profile by quantitative descriptive analysis (QDA) with 12 trained assessors, and the acceptance test was performed with 120 consumers. The correlation of descriptive and hedonic data was determined by partial least squares (PLS). The results of QDA indicated that goji berry reduces the perception of most aroma and flavour attributes, and enhances the bitter taste, bitter aftertaste, astringency, and most of the texture attributes.

The researchers found that the consumers' acceptance of the chocolates was positive for all sensory characteristics, with acceptance scores above six on a nine-point scale. According to the PLS regression analysis, the descriptors cream colour and cocoa butter flavour contributed positively to the acceptance of functional white chocolates. Therefore, the researchers concluded that "prebiotic white chocolate with or

without the addition of goji berry is innovative and can attract consumers, due to its functional properties, being a promising alternative for the food industry."

'Chewy' ice cream from Lezzetli stretches Americans' imaginations and palates

By Elizabeth Crawford, Food Navigator USA 15-Feb-2017

Typically considered smooth and creamy, the idea for most Americans that ice cream also could be chewy might seem like a stretch - and it is.

Literally. New York start-up Lezzetli Mediterranean Ice Cream recently launched into select grocery stores on the East Coast a "first-to-market" stretchy, "chewy" ice cream that also melts slower than traditional American ice cream and has less sugar and cholesterol.

"It is a thick, creamy style premium ice cream, but it also has a resistance to it. It literally has chew," Roberto Escobar, cofounder and COO of Lezzetli, told FoodNavigator-USA. "The closest thing I have heard people compare it to is almost the feeling of biting into an almost frozen marshmallow" that then melts in your mouth.

He explains that the ice cream is inspired by a traditional take on the frozen dessert that is found across

Turkey and Lavant called *dondurma*, which gets its elasticity from *salep* - an ingredient harvested from the root of a wild orchid. "In Turkey you can find ice cream that is so stretchy people jump rope with it, which is amazing," Escobar said. "We wanted to create an ice cream that has that experience of chewiness," but which also would appeal to Americans who want something rich and creamy.

To strike this balance, Escobar says Lezzetli swapped out the *salep*, which cannot be imported into the US because the orchids from which it comes are nearing extinction, with other natural gums and fibres that are slightly less stretchy. The result is an unexpected and intriguing texture that consumers either love or hate, Escobar says.

He explains that even though marketing materials promote the ice cream as "chewy" most Americans are not prepared for the texture because they can't reconcile the concept with their nostalgic memories of silky smooth ice cream on hot days. "Most people are usually taken aback at first ... but usually end up liking it" because it offers a new experience, which consumers increasingly seek from the foods and beverages they buy, Escobar said.

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A healthier alternative?

Lezzetli also is unique in that it has lower cholesterol, fewer calories and far less sugar than typical American-style ice cream, Escobar said. He explained that because the ice cream uses natural gums and fibres as stabilizers, it does not have any eggs in it – which are a source of high cholesterol in other traditional ice creams. This also lowers the fat content – and by extension shaves off a few calories from the total amount per serving.

In addition, most of the flavors in the company's line up are savory – meaning they have less sugar than the decadent, sweet options that typically crowd store shelves. The company's best-selling option is a limited special edition – mastiha, which is an herbal flavor akin to pine or evergreen trees. Recognizing that this might be a bit of an acquired taste that is too much for some Americans, the company also offers Chios Vanilla which blends a hint of mastiha with the vanilla to create a clean taste and makes mastiha more approachable.

The other options include spiced date, tart cherry and chocolate orange blossom, all of which have “purposefully reduced sugar,” Escobar said. He explained that the company founders reduced the sugar not because it is a rising concern of many consumers, but because they did not want to feel guilty about “eating a bowl of sugar” when they polished off a pint of their product.

Despite these healthier attributes, Escobar says the ice cream is not promoted as better-for-you because it is still a premium decadent dessert that is calorie dense. Also, he said, better-for-you products also sometimes are perceived by consumers to either not taste as good or as filled with low- or zero-calorie sweeteners and artificial ingredients. And, Escobar said, the company wanted to maintain and play-up the ice creams natural

status. However, he cautioned, it is still marketed as a treat and not as a better-for-you alternative.

Ready to scale While Lezzetli's ice cream currently is only available in a few stores in New York; it will expand throughout the tri-state area and Northeast through the spring and summer of 2017 with help from McMahons Farms. It also sells the pints online through its website with limited distribution on the East Coast, and soon nationwide through Gold Belly, Escoba said. He also noted that the company has a co-packer and is ready to scale – it just needs retailers across the country to ask their distributors for the product.

Asian consumers more interested in nutrition and healthy eating than westerners

By Gary Scattergood, Food Navigator Asia 17-Feb-2017

Asian consumers are far more likely to be interested in healthy eating than those in the West, according to a new survey of attitudes to diet and nutrition.

Researchers asked 600 consumers in Asia and 700 in the western hemisphere, plus Australia and New Zealand, about their views on a range of nutrition issues.

Nearly seven in ten of the Asian consumers surveyed (68%), said they were ‘very interested’ in nutrition and healthy eating, compared with just 38% of the westerners. Levels of interest in nutrition were highest in India, where 82% said they were very interested in healthy eating, and in the Philippines (71%). But in some western countries interest in healthy diet was very low. Only 36%

of respondents in the UK and 26% in Australia said they were very interested in nutrition and healthy eating, although in the US the figure was as high as 71%.

Vegan health claims

They say they findings highlight the extent to which views about diet and health differ between East and West. For example, two in five (39%) respondents in Asia considered eating less meat to be important to achieving a healthy diet. But only 25% of westerners felt the same way. Accordingly, a vegetarian or vegan health claim is nearly three times more likely to influence a consumer to buy a product in Asia than it is a consumer in the west (28% vs 10%, respectively).

Richard Clarke, director of Ingredient Communications, said: “When it comes to healthy eating, East and West are worlds apart, even in this era of globalization. This emphasizes the important of ‘globalization’. Nutrition businesses need a clear strategy that taps into worldwide mega-trends, but must remain agile enough to adapt their approach in individual markets as required.”

Neil Cary, Founder of Asia Opinions, added: “Asian consumers are well known for their knowledge of and passion for food, and this research shows just how much they care about nutrition and healthy eating. Food tends to play a more central role in Asian culture than in the west, and this is reflected in attitudes to diet and nutrition.”

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Beverages inspire bakery applications at ProSweets

By Gill Hyslop, Bakery & Snacks
01Feb2017

One ingredients provider has extended its multisensory expertise into bakery, a relatively new area for a company known for its innovations for the beverage industry. The company has taken many of the ideas behind trendsetting drinks and reformulated them to be used, for instance, to create cola-flavoured biscuits.

At ProSweets (currently running in Kolnmesse in Cologne until 1 February), the German-based company is showcasing ingredients offering multisensory experiences and is focussing on “healthy nutrition” for the bakery industry.

We’ll drink to that Beverage-inspired natural flavours, natural colour bases (from plants like beets and black carrots grown in Turkey for an intense red tint) and savoury clays (a range of toppings for bagels and donuts) are among the company’s latest innovations on display. Drawing on its expertise in the beverage industry, the company has revised its portfolio of plant-derived colours and flavours, juice concentrates, purees and fruit pieces to for the bakery industry.

However, Oliver Hoffman, head of Group Marketing told BakeryAndSnacks that, although consumers are demanding more ‘healthy’ snacks and indulgences,

they won’t remain loyal if they don’t enjoy the taste and mouth-feel of a product. ‘We’ve had to come up with alternatives for our clients that will produce the same satisfying taste and mouth-feel that other ingredients, like sugar for example, provide. It’s been a big challenge to come up with something new,” he said.

Masking and enhancing However, he did confirm the company has developed a range of multisensory flavours – all natural and plant-based – that are able to either enhance or mask flavours to intensify attributes like sweetness and mouth-feel. For example, through the process of gentle freeze drying, the shape and colour of the raw materials are retained to provide the aesthetic and organoleptic qualities that consumers are looking for.

The company has also produced a spectrum of natural colours – ranging from white, yellow, orange, red, brown and purple to green and blue in bright to subtle shades – that add to the sensory experience, characterised by different tastes and crunchy mouth-feel. The whole experience is furthermore enhanced by perceived healthy aspect, that is, by incorporating fruits and vegetables in combinations that create cooling effect flavours.

Drinkers on the pulse: Australia gets its first lentil craft beer

By RJ Whitehead, Food Navigator Asia
13-Feb-2017

A craft brewery in the Adelaide Hills has released Australia’s first beer made with lentils. Lobethal Bierhaus’ Lentil Pale Ale was launched this week following an

approach by pulse processor AGT Foods. The brewery uses whole and diamond-cut red lentils with grey seed-coats as an adjunct. These are milled with the grain at the rate of 30% lentils and 70% barley.

Only about 3,500 bottles and two kegs are part of the first run, though the brewery sees it as a first step towards producing a gluten-free craft beer. According to owner and head brewer Alistair Turnbull, though the lentils do not produce fermentable sugars, they add mouthfeel, head retention and flavour to the beer.

“I would describe it as a fairly earthy flavour that we’ve balanced with local hops that matches with it. But we’ve also tried to make sure that we haven’t made it overly bitter or hoppy so it hides the lentil flavour,” Turnbull said. The brew follows a collaboration between AGT’s Canadian parent company and Rebellion Brewing Company in Regina, Saskatchewan, to brew a “lentil cream ale”.

“They put me in touch with the Canadian brewery to pass on some of their research and the beer we released was the result of that,” Turnbull said. “I’m already really impressed with how it behaves. What it does for the beer is fantastic. The guys from the Rebellion Brewing Company in Canada came here as well and they were quite impressed with it, they said it tasted great.”



Image © iStock.com/nitrub

Lobethal Bierhaus opened in 2007 in the town of Lobethal, about 40km east of Adelaide. It includes a bespoke malt-house—one of the very first of its kind in Australia—an all-grain microbrewery with a brew length of 1,200 litres, a cellar door and a restaurant.

Turnbull said the brewery's ability to malt its own grain meant a further collaboration with AGT to source sorghum or a similar grain to produce a full-flavoured gluten free product was a real possibility. "There's a lot of people out there who are coeliacs and they'd like to drink craft beer but they can't," he said. "A lot of the beers that are gluten free tend to be more mainstream as opposed to full flavour so there's a bit of a window there and it's something that I've always wanted to do. I'm getting a huge amount of interest from that perspective."

AGT's regional business manager, Hayden Battle, said as far as he was aware, the Lentil Pale Ale was the first beer in Australia to use lentils. He said the company approached Lobethal Bierhaus because they wanted to use the product as a marketing tool for AGT and the broader Australian pulse industry. "Most people like beer so it was a good opportunity to use that to our advantage," he said.

"The majority of pulses produced in Australia are exported to be consumed overseas so if we can place the spotlight on pulses in some small way then it's probably a good project that's a bit of fun. We've had discussions around creating a gluten free beer and we're trying to source some white sorghum out of our New South Wales plant that Alistair can play around with. Perhaps we can also look at doing something with fava beans or chick peas in the future."



Image © iStock.com/bhofack2

Cereal makers looking for sugar reduction plans

By Matt Atherton, Food Manufacture UK 08-Feb-2017

Cereal manufacturers are trying to cut sugar, claims the Association of Cereal Food Manufacturers (ACFM), after pressure groups claimed some breakfast cereals contained "shocking levels of sugar".

Sugar content in some cereals has been "steadily high" since 1992, an Action on Sugar and Consensus Action on Salt & Health (CASH) joint report claimed. There was no technical reason cereals should contain such high levels of sugar, it said.

But, AFCM – a division of the Food and Drink Federation – claimed sugars were added for a variety of reasons, and that there were areas of bigger concern for sugar reduction. "There are a huge variety of breakfast cereals on sale in the UK today, with a range of sugar levels, including those with low levels of sugars, and with no added sugar" said an AFCM spokesman. "Sugars are added for a variety of roles including flavour, texture, appearance, and to improve the palatability of fibre and grains.

'Improving diet'

"The country's leading cereal manufacturers are actively looking for opportunities to support government's aims of improving diets including through recipe change. The latest UK government data show that breakfast cereals

contribute just 5% of added sugars and less than 2% of salt to the national diet."

The pressure groups' report claimed that some cereals like Crunchy Nut and Honey Nut Corn Flakes contained 35g and 32g of sugar per 100g, respectively. A typical serving (30g) of children's breakfast cereals contained a third of four to six-year-old's maximum daily recommendation for sugar, the report said. Sugar reduction targets must be set, following in the footsteps of the "successful" salt reduction programme, Action on Sugar claimed.

'Steadily high since 1992' Action on Sugar registered nutritionist Kawther Hashem said: "Our study shows that the sugars content in breakfast cereals has been steadily high since 1992, despite the ever-increasing evidence linking sugars with dental caries, obesity and type-2 diabetes. There has been no national sugar reduction programme, as there has been for salt, which is imperative if we want to see real and measurable improvements.

"Public Health England is due to announce a major national sugar reduction programme, as part of the government's Childhood Obesity Plan, in March 2017. All manufacturers must support the programme and start reducing sugar now."

Technological Innovation to predict the shelf life of food

Food News LATAM 09 FEBRUARY 2017

The ACCELERA project is supported by IVACE and FEDER Funds, within the Strategic Development Program of aid directed to the Technological

Image © iStock.com/Olezzo



Institutes of the Generalitat Valenciana. AINIA is developing new tools to carry out life-predictive studies that will speed up the launching of such perishable products as cookies, snacks and beverages to the market. AINIA Technological Center, within the framework of the ACCELERA project, is working on the development of new methodologies, which will make it possible to predict the useful life of the perishable foods and validate their stability over time in a more efficient way. This project has the support of the IVACE and FEDER Funds, within the Program of strategic development of aid directed to the Technological Institutes of the Valencian Community.

The useful life of a food is the period of time from the production or packaging of the product, until it begins to lose its organoleptic (smell, taste, texture ...), microbiological, biochemical and physical qualities. It is established by each food company, so it is essential for the industry to know the behaviour of the food it produces and how raw materials, processes and storage conditions influence its useful life, among other variables.

In the case of foods that are short-lived or long-lived, such as cookies, snacks, frozen foods, juices, preserves, etc., it is difficult for companies to determine commercial life effectively. The variety of raw materials, changes in production processes and the different storage and distribution conditions of foods can modify both their characteristics and their stability. In this sense, predictive studies are very useful for food companies to establish the commercial useful life of a food, internal quality control of companies, rapid validation of the stability of raw materials, as well as to know the behaviour of food in

different conditions of storage and distribution and in its validation prior to export.

According to Marta Gisbert, AINIA's new product and process technician, "accelerated life studies allow companies to gain time and anticipate competition. Further, In the two years that have passed, the most adequate parameters and analytical methods for the monitoring of product degradation have been identified and the most adequate methodology for the study of both real-time product evolution and forced conditions Degradation of the different food matrices.

Currently, the project, which lasts for three years, is in its second phase of research in which the evolution of food quality is being monitored to deepen the knowledge of its behaviour, under standard conditions and in circumstances other than the usual. In the third phase, specific models will be developed for the prediction of the useful life of the contemplated food matrices.

Healthy reformulation: how products measure-up

By Michelle Knott, 26Jan2017

Reformulation of regular products, rather than better-for-you alternatives, is helping food firms meet ever-tougher targets.

Offering consumers more information or better-for-you alternatives to regular products has little impact on population-wide consumption of target nutrients, suggests research. Take salt reduction, for example. The Institute for Fiscal Studies published a report in 2014, comparing the importance of

product reformulation with consumer choice in improving diet quality.

The report found that the preceding population-wide reduction in salt consumption (5.1% between 2005–2011) was “entirely attributable to product reformulation by firms”. In contrast, consumers switching between products had, in fact, moved in the opposite direction and led to a slight increase in the salt intensity of groceries purchased.

What's more, the researchers also suggested that a similar focus on reformulation is likely to be effective at tackling other targeted nutrients, such as sugar and saturated fats. The pressure on industry to reformulate. In spite of the progress made so far, the pressure on industry is increasing. The European Council of Health Ministers demanded in June that Member States draw up national plans by the end of this year to improve the composition of food. In the UK, the government's 2017 salt targets aim to squeeze consumption from the current average of around 8g per day to 6g for adults. And with obesity also high on its list of priorities, there is also, of course, the tax on sugary soft drinks due in 2018.

With no one ready to rule out further interventions, the trend among food companies to reformulate products is gathering momentum. “The main driver for the recent attention towards reformulation is the regulations



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that different countries introduce to push or force the industry towards lowering salt and sugar content and the use of healthier fats,” says Ronald Visschers, principal advisor for food and beverage at Dutch research institute TNO.

Projects aimed at healthier reformulation.

The institute carries out projects aimed at healthier reformulation. Earlier this year, it joined forces with the University of Wageningen and six food and ingredient firms – Quorn, Zeelandia, Givaudan, Mondelez, Bakkersland and Alpina – with the aim of improving the composition of a range of processed foods. “The project is ongoing, so we cannot disclose results yet,” says Visschers. “We focus on a number of difficult challenges, and together with the involved industrial partners, develop technology and find solutions for products such as meat analogues, ice cream, soft cheese and bread.” Visschers believes it’s important to change formulations gradually. He points to a number of scientific studies that show a gradual decrease in salt and sugar allows consumers to adapt to the changed taste without resorting to different products. “This is the main driver behind national salt reduction policies in, for instance, the Netherlands. The industry here has joined forces to slowly reduce the salt content of all bread products,” he says.

Why bakery is a key sector

While the expectation among most observers is that saturated fats will become an increasing focus in future, salt and sugar are the main targets for now – and bakery is a key sector for both. With salt, ingredient company British Bakels says the approach taken by its customers shows there’s no “one size fits all” solution. Yeast-raised products rely on salt for controlling fermentation, dough rheology and, crucially, enhancing the flavour. “Salt reduction from 1g per 100g in Food Standards Agency

[FSA] 2012 salt guidelines to 0.9g per 100g in the 2017 guidelines can be achieved using various technologies, including enzyme technology, to control dough rheology and yeast extracts to provide flavour enhancement where required,” says Greg Stone, product development manager at Bakels.

“Chemically-raised bakery products historically relied on sodium bicarbonate and sodium-based acidulants such as sodium acid pyrophosphate. Reformulation has also been successful here to achieve the targets in the FSA 2017 guidelines, where potassium bicarbonate and alternative acidulants such as calcium acid pyrophosphate and monocalcium phosphate are used. “Key to reformulation here is matching the rate of reaction of these ingredients to provide the right level of carbon dioxide production or ‘gasing’ in the product, and at the right time during baking,” he adds.

The cost challenge.

With technically successful solutions available in the form of established ingredients such as polyols and fibres, Stone suggests that cost is a bigger challenge than function. “The focus on sugar reduction still remains and reformulation options are present that can provide partial added sugar replacement of added sugar. “However, even in the light of increasing raw material sugar costs, alternative ingredients such as inulin, polydextrose or oligofructose, remain significantly more expensive,” he says. “This, along with the dislike of some of the ingredient declarations by retailers and consumers, is seen as contributing reasons that delay product reformulation.”

Labelling is a critical factor for consumer and retailer acceptance of reformulated products, agrees Adrian Short, director at Ulrick & Short. “Consumers want to find

ingredients that sound as close as possible to what you’d find in a homemade product,” he says. Ulrick & Short provides starches, fibres, flours and proteins that appear on labels as recognisable ingredients, some of which offer positive health benefits as well as functional attributes that can enable a partial substitution of sugar and fats.

Post-Brexit implications

Like Stone, Short recognises the importance of cost. In fact, he sees cost reduction driving a lot of reformulation work, especially in the aftermath of the Brexit vote. “Reducing the unit cost will become an acute issue over the next six to nine months because of raw material price hikes. “Our customers are looking at how to cost-engineer their products because manufacturers don’t have a lot of wiggle room,” he says.

In these circumstances, the emphasis is likely to shift to functional issues, such as adjusting recipes to incorporate more water. In the longer term, however, delivering a healthier diet to people not necessarily interested in seeking out better-for-you products is set to remain the key driver.

Health & wellness chocolate to outpace regular category: Euromonitor

By Douglas Yu, Food Navigator
USA 15-Feb-2017

Functional, organic and reduced-sugar chocolate are set for higher volume and value growth than regular chocolate up to 2021, says Euromonitor.



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PFNDI Apr 2017

The healthy chocolate confectionery category, including fortified functional, organic, reduced fat and sugar, is set to grow by almost double the rate in retail value and volume consumption as regular chocolate confectionery by 2021, according to the market research firm. Euromonitor's data shows that between 2016 and 2021 global retail sales volumes of health and wellness chocolate will grow at a compound annual growth rate (CAGR) of +2.6%, compared to a +1.3% CAGR for regular chocolate confectionery over the same period.

Total retail value growth of health and wellness chocolate confectionery globally is forecast to rise 3.5% during the same period, versus 2.3% for regular chocolate confectionery. Health and wellness chocolate growth resonates with packaged food. The data rhymes with the rise of the overall health and wellness packaged food category. At the beginning of 2017, health and wellness packaged food has outgrown its regular counterpart, and the trend is expected to continue until 2021.

"Growth in organic and free-from food sales has boomed in 2016 as consumers are reading labels more carefully than ever, seeking natural ingredients and looking for foods that represents a 'guilt-free' purchase," head of health and wellness at Euromonitor, Ewa Hudson, said. "Organic is also in sync with the natural and clean label trend, and so unlikely to fall out of favour with consumers in the foreseeable future," she added.

Euromonitor predicted free-from and organic foods and beverages will continue to contribute to the global health and wellness industry, which is on its way to hitting a record high of \$833bn by 2021.

Fortifying dark chocolate with nutrients
Multiple studies have suggested

health benefits from polyphenol-rich dark chocolate, include cognition improvement and heart health. Some chocolate firms have begun fortifying products. Earlier this year, chocolate start-up Blue Planet began mass producing probiotic chocolate squares in order to keep up with the gut health trend, and Theo Chocolate introduced quinoa cocoa flavanol clusters for heart health-conscious consumers in 2016.

Chocolate and real fruit

However, the vice president of Welch's Global Ingredients Group, Wayne Lutomski, believed there is room for a healthy indulgence which fruit-added chocolate may best provide. Before joining the Welch's team, Lutomski worked as vice president of international and director customer development at Peep's maker, Just Born, according to his LinkedIn account.

"Healthy indulgence snacks allow consumers to get the great tasting product they seek, but also feel good about consuming it," he told ConfectioneryNews. "Chocolate can meet this need. However, there is an opportunity to increase the health and wellness profile for chocolate," Lutomski added.

A Welch's-backed survey conducted this January in the US found 80% of Millennial snackers are looking for a better taste, compared to 52% of them focusing on health and nutrition. The research also found 66% of Millennials consumers are more likely to buy a snack containing fruit if it is made with real fruit. Consumers also prefer to buy fruit when they know the origin. The Massachusetts-based company currently offers a 100% fruit bite made from the Concord grape, called FruitWorx, through its ingredients arm. It says the ingredient can be enrobed in chocolate to provide a double dose of polyphenols.

India predicted to attract more than \$30bn in investment

By Richard Whitehead, Food Navigator Asia 28-Feb-2017

Indian food processors are on track to tempt US\$33bn in investment and generate employment for almost 10m in the next seven years.

That's according to a joint research paper by Assocham, the apex industry body, and management consultant Grant Thornton, which assessed the direction of the food processing industry until 2024. Already a key job contributor in India, policymakers have now identified food processing as central to their goal of moving workers from agriculture to manufacturing as part of the government's flagship "Make in India" policy.

According to Grant Thornton, the segment is currently worth US\$120bn-US\$130bn, out of an overall food retail market worth nearly US\$260bn in 2015, and predicted to reach US\$480m by 2020. Yet despite being the world's biggest producer of milk, pulses, sugarcane and tea, and the second largest harvester of wheat, rice, fruits and vegetables, India's proportion of processed foods is low, ranging between 2% and 35% depending on produce category.

This indicates an extensive opportunity in the food processing sector, the paper assesses, with globalisation and growing cross-border trade amounting to some 460m tons annually. The share of processed food shipments, compared to total exports, has been around 12% over the last few years, though its value has been growing at an annual rate of 23.3%. The unorganised sector accounts for 42% of India's food processing

industry, the Assocham study found, suggesting that a sizeable presence of small-scale industries pinpoints the sector's role in employment generation. Food and grocery is the largest segment in India's retail sector, with a share of more than 60% in India's total retail market in 2014. Moreover, it accounts for a massive 31% of India's overall consumption basket—contrasting with Americans spending just 9% of their income on groceries, 17% among Brazilians and 25% in China.

Much of the segment's US\$30bn in new investment by 2024 will come as a result of various measures the government has introduced to boost its attractiveness. While food processing has enjoyed loose FDI regulations for some time, food

retail was recently brought into the fold for foreign companies, as long as they work with locally produced ingredients. Assocham also pointed out that such investment will provide much-needed strengthening to India's crumbling supply chain, as will the launch of infrastructure development schemes by the government.

Protein powder mixes for porridge and pancakes

By Noli Dinkovski, Food Manufacture UK 26Jan2017

A new range of protein powder mixes for pancakes, porridge and rice pudding has been unveiled by an ingredients company. Containing 60% protein, the slightly sweetened pancake

formula is based on a blend of whey protein, lacto-proteins and oatmeal.

The porridge variant contains 30% protein, and is made from gluten-

free oat flakes, lacto-protein and apple powder seasoned with cinnamon. The whey protein is particularly beneficial, because it is rich in the branched-chain amino acids leucine, Isoleucine and valine, the company said.



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British Biologicals Bagged "ASIA's Most Trusted Brand 2016" Award in Medical Nutrition

British Biologicals, India's largest Nutraceutical Company, bagged the prestigious "ASIA's Most Trusted Brand 2016" award in medical nutrition segment on April 16th, 2017 at Hotel Grand Hyatt, Erawan, Bangkok, Thailand. The award and certificate has been presented by Mr Hemant Kaushik, President of ASIA'S MOST TRUSTED BRAND AWARDS Council.

IBC InfoMedia, a division of International Brand Consulting Corporation, New Jersey, USA conducted a physical survey in around 10 major countries of Asia and an online survey with MRG through consumersurveyonline.org, among more than 100 thousand

respondents. British Biologicals has been selected as one of the top 50 brands of 2016 by ASIA'S MOST TRUSTED BRAND AWARDS Council. This award proves that British Biologicals has won the trust of millions in Medical Nutrition division and it is the most radiant platform which showcased the company's achievements, contributions and network.

Mr V S Reddy, MD at British Biologicals said, "We are overwhelmed to receive this prestigious award. Being recognized as one of the top 50 brands amongst so many companies is a great accomplishment for us. We have worked hard to bring the best possible and quality rich nutritional products to the consumers. The award is a motivation and recognition of our brand dedication, leadership and entrepreneurship. We share this success with all our medical fraternity and partners"



'Demand is steadily growing' "These new breakfast products serve a sector for which demand is steadily growing, and will allow our clients to place their brand on the breakfast table," said sales director. Also available is a new protein bread baking mix that caters to consumers who prefer a traditional continental breakfast range, but would like it enriched with protein. The baking mix consists of linseed flour, rice and pea protein, sunflower seeds and psyllium (plantago). Psyllium seeds come from a plant known for its medicinal properties, and it traditionally has been used mostly for its positive effect on the intestines.

Helps maintain a balanced diet The protein baking mix helps maintain a balanced diet and appeals to a wide target audience—including people who want to follow a low-carb regime, company suggested. The protein bread contains little carbohydrate and is also vegan. Moreover, the label is clean and clear, having only a short list of ingredients.



Image © iStock.com/murphyne

Meanwhile, protein is the focus of one of the top 10 food trends in 2017, identified by Innova Market Insights. With its 'Beyond the athlete' trend, the market research company pointed to the steadily expanding range of protein products that are no longer marketed only to athletes and people with weight problems.

Yogurt makers cut sugar but add fat and convenience to meet consumer demands

By Elizabeth Crawford, Food Navigator USA 15-Feb-2017

Yogurt manufacturers continue to expand and evolve their portfolios with healthier and more convenient options that meet consumers' growing demand for products that are lower in sugar, high in flavour and easy to eat.

"While consumers want less sugar in their products, they don't want the taste to change," which can pose a significant challenge from a formulation perspective, Lisa Hammer, product development manager at Stonyfield, told FoodNavigator- USA. However, she said, Stonyfield was up to the task and worked for more than two years to balance these potentially conflicting consumer demands. "With our proprietary library of culture strains, we worked to achieve a formula to reduce tartness and balance the sweetness of yogurt, allowing for sugar reduction without sacrificing taste," she said.

With this formulation, the company plans to remove added sugar from its YoBaby line, beyond the existing

plain unsweetened formula, by the end of fall 2017. This will build on its existing offering of YoKids yogurt that already features at least 40% less sugar than leading low-fat children's yogurt, according to the company. The company also plans to cut at least 25% of sugar from its Smooth & Creamy varieties in cups and quarts and low-fat Smoothies, which are in addition to the existing plain, unsweetened options also already available in its Greek and core lines. These changes should help the company reach its goal of purchasing 25% less sugar this year, the manufacturer adds.

From reduced sugar to high fat

The changes will bring Stonyfield products closer in line with the sugar levels of those offered by competitor siggi's, which was created 10 years ago in part to bring consumers yogurt made with simple ingredients and "not a lot of sugar."

"Today more than ever, consumers are more conscious of what they are putting in their bodies. Many people in the United States are consuming over the recommended sugar intake, and a lot of them are not even aware of it, falling victim to hidden sources of sugar in their everyday diets," Siggi Hilmarsson, founder of siggi's, told FoodNavigator-USA.

With this in mind, he noted, "there is definitely a trend away from

added sugar, and siggi's is proud to have been at the forefront of this trend" with products that have at least 25% less sugar than the leading brands' flavored yogurts. At the same time that sugar is out for many consumers, fat is back, and siggi's also is out front of this trend with the Feb. 13 launch of a decadent triple cream yogurt made with 9 percent milk fat and triple the cream.

The inspiration for the new product came from a favourite snack that Hilmarsson said his mother made him growing up that combined plain skyr with rich, creamy whipped cream and fruit. The 4-ounce cups will be available in raspberry, vanilla and lemon. This launch follows last month's launch of whole-milk drinkable yogurts that give consumers a convenient way to consume 8 grams of protein and 10 billion probiotic cultures per serving. "Knowing consumers are always looking for a healthy snack when they are on the go, it was a natural move for us to provide consumers with a single-serve, convenient and nourishing choice," he said. Made with only five ingredients, the drinkable yogurts are "satisfyingly creamy" and available in vanilla, strawberry and blueberry, he said.



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REGULATORY NEWS

India fortification plans: Regulator FSSAI releases consultation paper

By Millette Burgos, Food Navigator Asia 07Feb2017

The Food Safety and Standards Authority of India (FSSAI) has pledged to 'close the gap' in micronutrient malnutrition after releasing a consultation paper on food fortification.

The FSSAI paper concerns the fortification of meals served on government supported food programmes and the public and other stakeholders have been asked to give their comments and suggestions on the proposal within the next six weeks.

"Fortification is a cost-effective and reliable means of reducing micronutrient malnutrition," said FSSAI. "The goal is not to provide 100% daily requirements of micronutrients but rather 'fill the gap' between intake from other sources and daily micronutrients needs."

Programmes named in the proposal are the Integrated Child Development Services (ICDS) scheme and MidDayMeal (MDM). FSSAI and the Ministry of Women and Child Development proposed fortifying three main staples found in most Indian diets – wheat flour, oil and salt. Wheat flour will be fortified with iron, folic acid, and vitamin B12. Oil will have vitamin A and D fortification, while salt gets iron and iodine. Double fortified salt will season food served at ICDS and MDM centres by December 2018. Food using fortified oil and wheat flour served by December 2019.

In the proposal, FSSAI said it decided to roll out in phases because it needs to firm up supply and distribution sources of the staples as well as conduct information campaigns to create awareness of the benefits of consuming fortified food. "Global experience has shown that more than a single approach, a combination of several strategies is required to significantly reduce

micronutrient deficiencies," said FSSAI. "Among these, staple food fortification offers a promising opportunity to deliver micronutrient rich foods to large populations."

FSSAI will also encourage the commercial availability of fortified products on the open market, said the paper. Earlier this month FSSAI said manufacturers of fortified flour, oil, milk and salt would require a government certificate to verify nutrient claims. The circular set new guidelines for foods fortified with vitamins, iodine, folic acid and other nutrients, including minimum and maximum levels.

Manufacturers will now have to give an "undertaking" on quality assurance and "submit evidence" of the food safety steps taken. Product testing must be done at approved government laboratories. Pawan Agarwal, chief executive officer of FSSAI, said the regulation will initially cover wheat flour, rice, oil and milk, while all other food items would be gradually brought under a comprehensive regulation.



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Exercise labels are more effective than standard nutrition info for healthy eating, say researchers consultation paper

By Niamh Michail, Food Navigator
30Jan2017

'Exercise labels' that say how much physical activity is needed to burn off the calories in food are significantly more effective in encouraging healthy eating than standard nutrition information, according to a new study.

According to the researchers, consumers spend an average of six seconds looking at a food product before making a purchase decision creating a clear need for easy-to-interpret, meaningful information. But previous research suggests that current front-of-pack information, such as the UK's voluntary traffic light logo, may be too detailed and therefore confusing. This means the information is often ignored, particularly in low socioeconomic status groups and in those with poor nutrition knowledge. Exercise labels are one way of applying nutrition information to real-life situations, according to University of Liverpool researchers.

A promising avenue

They showed 458 participants images of five different food types (breakfast bar, café muffin, biscuits,

chocolate bar and crisps) and five different beverage types (cola, sports drink, milkshake, café coffee and fruit juice). For each food or beverage type, individuals were shown a higher and lower calorie version, with

options matched for type and brand to ensure brand preference did not influence choice.

Subjects were shown either the calorie content or the calorie content and amount of walk that would be required to burn off the calories, and then selected which of the products they would buy. The physical activity label group resulted in "significantly lower" energy snack and beverage choices than the calorie label group, say the researchers.

Moreover, the exercise labels were the most effective for all participants, regardless of individual factors such as sex, weight (as measured by Body Mass Index, or BMI), diet status, calorie literacy, numerical literacy and general physical activity levels. "To our knowledge, this is the first study to show such effects for physical activity labels and provides tentative evidence of a promising avenue for public health research and policy in this area," the authors write. "Physical activity labelling should be considered as a public health policy initiative that, in the context of an obesity epidemic, could make it simpler for consumers to make lower energy, informed food choices." Despite some limitations, such as the hypothetical nature of the food choices being made which may not translate to real-life situations, the effects of the exercise labels were "robust".

FDF: 'It's certainly worth exploring'

A spokesperson for the UK's industry association Food and Drink Federation told Food Navigator: "Weight gain occurs when more calories are consumed than are burned during physical activity. For this reason, initiatives which reinforce the well understood calorie message and encourage people to be more active are to be encouraged. Activity equivalent information is an interesting concept and the role it could play in driving meaningful behaviour change is certainly worth exploring.

The potential effectiveness of these types of measures needs to be studied. EU rules which dictate what companies can and cannot put on their food labels would need to be considered in any proposals to add to on-pack information"

Make it meaningful

The independent charity, Royal Society for Public Health (RSPH), has been campaigning for exercise labels on food and drink in the UK. It commissioned a survey of over 2,000 adults last year which found that 63% supported exercise labels while 53% said it would help them make "positive behavioural changes".

Its CEO Shirley Cramer said: "Activity equivalent calorie labelling provides a simple means of making the calories contained within food and drink more relatable to people's everyday lives, while also gently reminding consumers of the need to maintain active lifestyles and a healthy weight."

"Given the responsibility of the food industry in tackling the obesity epidemic, we believe activity equivalent calorie labelling could provide the nudge many people need to be more active and support their customers to make healthier choices." In 2014, more than 60% of UK adults were overweight or obese.



Image © iStock.com/GeorgeRudy

Expert panel established to drive forward India's national fortification plan

By Millette Burgos, Food Navigator Asia 13-Feb-2017

The Food Safety and Standards Authority of India (FSSAI) has set up a panel of doctors and research scientists to prepare the final version of its food fortification laws - a move that would facilitate the inclusion of micronutrients to several food staples. Under the rules, salt will be fortified with iodine and iron, vegetable oil and milk with vitamins A and D, and wheat flour and rice with iron, folic acid, zinc, vitamins B12 and A.

FSSAI introduced the draft rules in October last year, and sought more comments from stakeholders when it released a consultation paper recently. It also conducted region-wide consultations in the cities of Delhi, Bhopal, Bhubaneswar, Bengaluru and Guwahati.

The five-city regional consultation is reportedly concluding this week. FSSAI has set up the panel to identify crucial nutrition gaps as well as target specific groups based on credible diet surveys and other related scientific data. "Fortification is a cost-effective and reliable means of reducing micronutrient malnutrition," said FSSAI. "The goal is not to provide 100% daily

requirements of micronutrients but rather 'fill the gap' between intake from other sources and daily micronutrient needs."

Panel members are from institutions such as Medanta Medicity, All India Institute of Medical Science (AIIMS), St John's Medical College, Council of Scientific & Industrial Research, Sita Ram Bharatia Institute of Science and Research, National Institute of Nutrition (NIN), Nutrition Foundation of India, the National Dairy Research Institute (NDRI), MS University, Baroda, and Bharati Vidyapeeth University.

Joining this panel are members of scientific committees working on food fortifying vehicles such as wheat flour, refined flour, rice, milk, edible oil and salt.

FSSAI lab staff trained to test mycotoxins, pesticide and residues

By Richard Whitehead, Food Navigator Asia 28-Feb-2017

India's food regulator will continue to work with the the Global Food Safety Partnership to train lab staff to test mycotoxins, pesticides and veterinary drug residues (Joe Whitworth writes).

The FSSAI had previously run a programme with the GFSP to teach 10 trainers about pesticide residues

and mycotoxins in Singapore last year. Those attendees will now train the food testing personnel in India.

The next sessions will take place in Hyderabad, Mysore, Kolkata and Nashi, for which the GFSP, a global initiative to improve food safety in middle-income countries, will provide training to master trainers on veterinary drug residues at the University of Maryland.

A meeting of members of the governing council of the GFSP, represented by World Bank, UNIDO, FAO, FDA, FIA, USAID and Waters Corporation, took place recently in New Delhi. There's representatives also met with FSSAI and other food safety stakeholders, including the CEOs of Hindustan Unilever, Nestlé, Tata, and industry bodies.

Ashish Bahuguna, chairman of FSSAI, said the authority was relatively new and there was an opportunity to learn from global best practices. Pawan Agarwal, its chief executive, said he hoped that collaboration with GFSP would grow in coming years. The FSSAI has other food-safety partnerships with authorities in Germany, France, Netherlands and New Zealand. The authority is also working with agencies in other countries, including America, Canada and Singapore, to benchmark the food-safety regulatory system in India.

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Plant Based Foods Association to FDA: Plant-based 'milks' are properly labelled

By Elaine Watson,
Food Navigator USA
02Feb2017

It is both lawful and pragmatic to describe plant-based beverages as 'milks,' and the courts agree, the Plant Based Foods Association (PBFA) has told the FDA, in the wake of pressure from lawmakers to crack down on the use of dairy-related terms for products made from nuts, seeds and legumes.

In a letter to Dr Susan Mayne, director of the FDA's Center for Food Safety and Applied Nutrition, the association told the agency: "We respectfully maintain that such products are properly labelled with their 'common or usual name' or 'appropriately descriptive term,' per 21 C.F.R. 101.3(b)(2) and (3), and we note that courts have agreed with this position."

The letter was sent following the introduction of The Dairy Pride Act – a bill urging the FDA to prohibit terms such as 'almond milk,' and 'vegan cheese' – and a letter from lawmakers sent to the FDA before Christmas urging it to enforce standards of identity for 'milk,' which restrict it to the



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'lacteal secretions' of cows.

Our members seek consistency in their labelling

The PBFA's letter added: "Our members seek consistency in their labelling, especially for emerging food varieties. To help address this, we have begun to: 1. Create a formal standards committee in our association to address labelling and related issues 2. Engage experts with experience in these matters to guide our process 3. Invite all relevant companies in the plant-based foods industry to participate. Out of this process we hope to gain important information from industry members, along with other experts, on how to best standardize labelling terminology for many plant-based foods."

Consumers choose plant-based foods for multiple reasons. In separate letters to Senator Tammy Baldwin and Representative Peter Welch, who introduced the Dairy Pride Act to the Senate and the House respectively, the PBFA said its members were "eager to

achieve consistency in how they label their products," and that its mission "is simply to ensure a fair and competitive marketplace, a concept we hope you support."

It added: "Millions of US consumers have already made plantbased foods the functional equivalent of dairybased products (including milks, cheeses, and

yogurts) in their diet, and are actively seeking them out for a variety of reasons including taste, health, allergies, lactose intolerance, environment, and animal welfare. We welcome a conversation with you to get your input on how we might be able to reach a solution that works for all food industry sectors."

IDFA: Milk should be milk

The National Milk Producers Federation and the International Dairy Foods Association, however, argue that they simply want the FDA to enforce standards of identity already enshrined in law that limit the use of dairy terms (milk, cheese, yogurt) to dairy products. "These plantbased products are imitations, but they are not substitutes for the comprehensive nutrient package offered by real milk," said Michael Dykes, president and CEO of IDFA. The reason we have food standards is to preserve the integrity and consistency of what's inside the packages. Milk should be milk."

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