JUNE 2016

PFNDAI Bulletin

FOOD, NUTRITION & SAFETY MAGAZINE

PULSES: NUTRITIOUS AND SUSTAINABLE FOODS OF FUTURE

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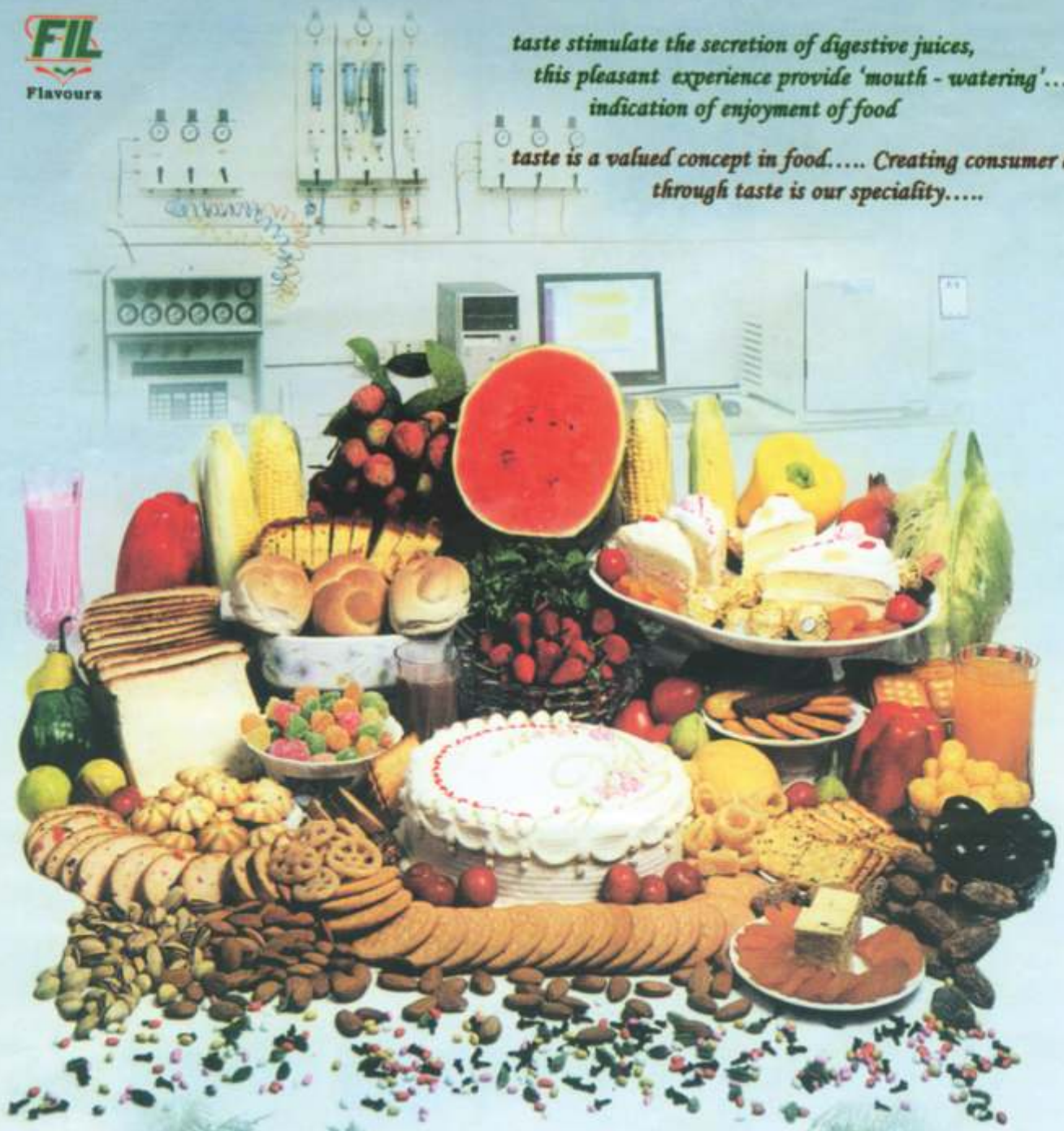

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EDITORIAL

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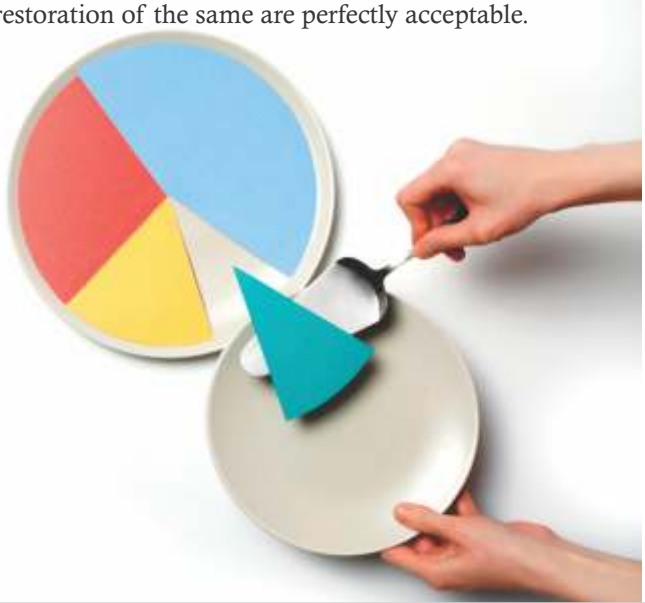
Long time ago there was a story told that there was a temple of Lord Shiva and in the inner chamber the king ordered on a particularly auspicious day, people should pour milk so the whole chamber will be full of milk as a tribute to Lord Shiva. One smart businessman thought that everyone is going to pour milk, so if I pour water instead it will not make any difference. He went early when it was pitch dark and poured water so no one could see. Next day the king decided to check if people had filled the chamber with milk. To his surprise, although the chamber was filled, but with water and not with milk. Everyone had gone just like that smart businessman and poured water thinking that it will not be noticed.

Food industry has a bit of trust problem with people, and should strive to take care of this. This was perhaps aggravated due to safety issues that erupted some time ago. An apparent view of the Food industry was painted as that of taking good wholesome agricultural produce, taking nutrients out of it by processing and then adding them back, claiming them to be fortified and selling at exorbitant prices.

Although some products may appear to be so , most agri-produce are processed (value addition) to reduce the burden of home cooking or preparing several tasty products, or reduce spoilage or the unprocessed form. Processing is done in order to preserve not just the food product but also its nutritive and sensory qualities and more importantly it makes the product safe for consumption. Reductions in nutrients during processing are adventitious and not designed and replenishments or restoration of the same are perfectly acceptable.



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The Food Industry needs to get in touch with consumers more closely on issues that they may not easily understand –lest erroneous messaging takes root and creates or sustains a bias. The task is large and needs to spread out to cover several aspects of processing, packaging, fortification, health, safety, supplements and enjoyment of choice in food products. A good question to reflect upon is – how much public service messaging the Food Industry does, or rather how little. Do company marketing set aside budgets for public service in food safety and health where the entire Industry benefits? Is there a perspective building effort on what consumers should know regarding their food habits rather than being exposed the health problems of alien diets, notably western. When no one does anything about creating awareness about the good aspects of processing and food habits, there is a vacuum that will be filled by a lot of misinformation.

Some companies abroad have taken group pledges for producing safe and nutritious products and also not to use media for promoting their products to children. However, we have yet to see such action. Thus government steps in and creates rules and regulations, which then put constraints that industry does not like. It is better to take initiative and create awareness about the food products among all stakeholders including consumers, health professionals, and government officials and even among industry professionals. "Companies must look at ways to play a ' food industry' role, apart from their own individual necessities, otherwise given the imbalance in good scientific information, unfounded biases will continue to be the basis of consumer education. . We sincerely hope that industry would work together and start creating awareness about the food, nutrition and safety of food products.

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PULSES: NUTRITIOUS AND SUSTAINABLE FOODS OF FUTURE

By Dr. Vilas Ramrao Shirhatti,
Advisor New Business Development, Tata Chemicals Limited, Mumbai

Amongst all the edible seeds available for mass consumption, undoubtedly pulses are the best, most whole some, nutritionally rich and balanced seeds nature has to offer. One can justify the 'Superfood' tag for pulses considering that they are rich in proteins and peptides, high in dietary fibres, have low glycemic index, low in fat , zero cholesterol, rich in minerals, vitamins and antioxidants, gluten free and containing many other bioactive phytonutrients whose role we still need to understand. Pulses with a power pack of macro and micronutrients are good for the health of people; planet and economy. They are now globally being recognised as the foods and food ingredients of the future. In December 2013, the General assembly of the United Nations in New York voted to proclaim 2016 as the International Year of Pulses (IYP) in order to increase the level of awareness and consumption of pulses globally and the important role pulses can play in advancing health and nutrition, food and nutrition security and environmental sustainability. This also means we have a major challenge in enhancing global production and consumption of pulses.

What are Pulses:

The word pulse is derived from the Latin word Puls meaning "thick gruel, porridge, mush". Pulses are members of the Fabaceae or Leguminosas family, originated some 90 million years ago and are the third largest family of flowering plants. This family has a very high biodiversity consisting of almost 1800 different species. Pulses are defined by the Food and Agricultural organisation of United Nations as annual leguminous crops yielding from one to twelve grains or seeds of variable size, shape and colour within a pod.

The biodiversity of the pulses is not just restricted to the colour, shape and size of the seeds but is deeper in terms of the chemistry, composition and properties with respect to macro, micro and phytonutrients present in them. The benefit potential of this huge diversity is yet to be fully explored.

The term pulses is reserved for crops harvested solely for dry grain and thus excludes green beans and green peas which are considered vegetable crops and also crops mainly grown for oil extraction like soybean and peanuts. The term pulse includes various dry beans, lupines, dry peas, pigeon peas, chick pea, cowpea and lentils.

Pulses have been part of daily diet throughout the world from as early as 6000 B.C. Pulses are also used as animal feed globally. They are consumed in many forms including


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whole, split, and dehusked, polished, ground in to flours and separated in to fractions such as protein, fiber and starch. Pulses come with varying chemical composition, unique flavour and taste and cooking characteristics. Pulses have the highest level of protein for a plant based food, often referred to as the poor man's meat. They are the main source of proteins and dietary fibres for especially all the vegetarians around the world.

The chemistry of pulses:

The three major components of dry pulse seeds are seed coat, cotyledons and embryo axis and these contribute to 5 to 15: 80 to 95 and 1 to 2% by weight respectively. On dry weight basis pulses contain 15 to 30% protein, 5 to 20% dietary fibres, 49 to 68% complex carbohydrates as major constituents. The dry pulse grains stored all year around contain around 10% moisture. Pulses also contain a variety of physiologically active and nutritionally important enzymes, peptides, oligosaccharides, minerals, vitamins, poly phenols, phenolic acids, tannins and many more phytonutrients.

Proteins: Pulses proteins contain high amounts of amino acids like lysine, leucine, aspartic, glutamic, and arginine and provide a well-balanced essential amino acid profile when consumed with cereals which are rich in sulphur-containing amino acids. Major proteins found in pulses are globulins and albumins. The water soluble albumin have a molecular mass range of 5000 to 8000 and consist of mainly enzymatic proteins, protease inhibitors, amylase inhibitors and Lectins. The storage proteins globulins mainly consist of legumin, vicilin and some convicilin and have molecular masses in the range of 40,000 to 290,000.

Other minor proteins but nutritionally important proteins are Prolamins rich in proline, glutamin and glutelins rich in cysteine and methionine. The molecular masses, the ratio of these various proteins markedly varies between different pulses and also between different varieties of the same pulse. It is always advisable to eat a variety of pulses along with cereals and millets to get the full spectrum of all amino acids. The protein digestibility scores for pulse proteins vary between low of 50 to a high of 90 and can be significantly improved by soaking, cooking, sprouting and autoclaving. The variations in nutrient composition of different pulses are due to environmental factors, geographic location and growing seasons.

The analytical techniques used can also result in some variations. Such variations also pose challenges in developing processing technologies that are flexible to accommodate such variations. Proteins in pulses are consumed using whole pulses, split pulses, split and dehusked, protein flours and protein isolates. Protein structure and confirmation vary based on the processing conditions and also other parameters such as pH, temperature and interactions that occur between proteins and other food components like carbohydrates, fats, salts etc. The PDCAAS values of most pulse proteins are in the range of 0.52 to 0.65. For isolated pulse proteins this value goes up to 0.88. All protein from animal sources are complete proteins, while as pulse protein are not complete by themselves and need to be complemented by proteins from multiple pulses and cereals.

Recent findings have shown that pulse proteins are not only a source of constructive and energetic compounds such as amino acids but also play bioactive role themselves. Apart from large quantities of protein pulses also contain varying levels of enzymes and active proteins like trypsin and chymotrypsin inhibitors, α-amylase inhibitor, protease inhibitors, lectins, γ conglutin and ACE inhibitors. Some of these active proteins are classified as antinutrients. However, lately their potential health benefits and use as nutraceuticals are being explored. After a decade of intensive research and clinical trials now one of the α-amylase isolated from beans has been approved as an ingredient in foods to slow down the starch digestion thus reducing the total calories and glycemic load.

Carbohydrates: The major macronutrient in pulses is the carbohydrates and is a complex mixture of storage and structural carbs. We still need to understand a lot more about this complexity and how it changes with the biodiversity as well as processing conditions. The storage carbohydrate starch mainly consists of amylose and amylopectin. The amylose content in pulses is usually higher as compared to cereals and tubers and varies between 25 to 88 %. Presence of high amylose can also lead to formation more resistant starch by retrogradation during various processing and cooking conditions. The non-storage carbs include several soluble dietary fibres like raffinose, verbascose, stachyose and galactooligosaccharides and structural carbs like cellulose, hemicellulose and pectic polysaccharides which collectively make up the total dietary fibres.


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TATA sampann

Dal

क्या आप अपने परिवार को हाइ प्रोटीन वाली दाल खिला रही हैं?

अपने परिवार के लिए आपकी आदत है सबसे अच्छा चुनना.

इसलिए, अपनाइए टाटा सम्पन्न हाइ प्रोटीन दाल. यह है अनपॉलिश्ड और हाइ प्रोटीन, ठीक वैसे जैसे कुदरत ने बनाया. तो अब रोज़ की दाल होगी और भी स्वाद और प्रोटीन से मालामाल.

Total dietary fiber concentration in pulses varies from 8 to 25% on dry weight basis. This also includes the resistant starch present in pulses which is high between 5 to 15% as compared to the maximum of 1% in cereals. A lot of health benefits of pulses are attributed to high proteins as well as this very diverse mixture of carbohydrates present in them which also make them an ideal low Glycemic index food.

Other minor components: Pulses will also have minerals consisting of calcium, iron, copper, Manganese, potassium, Magnesium, Phosphorus, and Zinc resulting in an ash content of 2 to 3%. Pulses are rich in essential vitamins and their levels increase significantly when pulses are germinated. They also contain many phytochemicals like tannins, polyphenols, and phenolic acids.

Antinutrient compounds in pulses: Pulses are known to contain combination of different antinutrient factors. The presence and level of these is probably due to the evolutionary adaptation of the plant in order to survive and complete life cycle under stressful conditions. We still need to understand their role fully. These include proteins like protease inhibitors, hemagglutinins, favism factors like vinvine and covincine, toxic amino acids like dihydroxy phenylalanine (DOPA) and non-proteins like glycosides, phytic acid, phytoids, oligosaccharides, Saponins, cyanogens and many phenolic compounds.

Many of these antinutrients have complimentary and overlapping mechanisms of action that result in unique health benefits. Pulses are now seen as a source of new nutraceuticals. The mechanism of action includes modulation of detoxifying enzymes, stimulation of immune system, regulation of lipid and hormone metabolism, antioxidant, antimutagenic, and antiangiogenic effects, reduction of tumor initiation, promotion and induction of apoptosis. Various commonly used treatments like soaking in water cooking, various thermal treatments, processing conditions, germination and fermentation significantly reduce the level of antinutrients in pulses.

Allergy: Pulses are not included in the priority global list of allergy causing foods that requires labelling. Globally the pulse related allergy reactions have been very limited. In fact inclusion of pulses in diets will help alleviate the allergy problems of dairy products, peanut and gluten.

Pulses are fun:

Proteins and carbohydrates present in pulses and their variations give rise to properties of most interest to food processing and formulation like water solubility, water binding, fat binding, emulsification, foaming, gelation, thickening and flavour binding. The addition of pulses to foods not only enriches the food nutritionally with proteins, dietary fibres, minerals and other active phytonutrients but, enables one to create desirable texture and sensorials.

In addition to this the various processing and cooking methods like fermentation, dry roasting, puffing, thermal treatments, flaking, extrusion etc., modify both proteins and the carbohydrates present in pulses giving rise to various ways of making interesting food products having unique textural properties taste and desirable sensorials. Pulses also provide a good base for both spicy as well as sweet preparations. A wide range of biodiversity combined with these special properties and the ability to vary them by various processing conditions make working with pulses fun and create a whole range of new functional and innovative foods.

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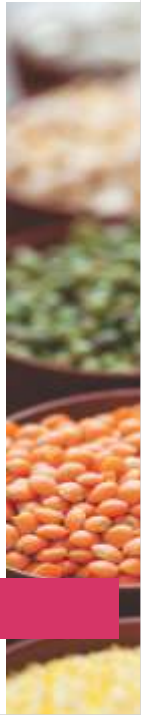
Pulses are good for health of planet:

Pulse crops have the ability to fix atmospheric nitrogen, due to the rhizobium bacteria found in root nodules of these plants. Traditionally pulse crops have been used in rotation with cereals and other crops to increase the nitrogen content and quality of soil reducing the need for use of chemical fertilizers. Nitrogen fertilisers are required in large quantity, have energy foot print that is 7.5 times higher than phosphate and potash. Soil organisms convert nitrogen of some of the residual nitrogen fertilisers to nitrous oxide, which escape to the atmosphere having a 300 times higher global warming potential than carbon dioxide. Another benefit of growing pulses is improved possibilities for using reduced tillage techniques and greater diversification of the crop rotation which helps reduce problems caused by weeds and pathogens and thus use of pesticides to keep them under check. All of this results in reduced greenhouse gases and global warming potential, Ozone formation and acidification as well as eco- and human toxicity resulting in low carbon foot print. Pulses can utilise limited soil moisture and nutrients more efficiently than cereals and for that reason farmers have chosen to grow them under highly adverse conditions. Pulse species have a broad genetic diversity from which climate resilient varieties can be selected.

Pulses can very well be adapted to dry land production systems, needing and using relatively less water than some other crops.



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Producing one kg pulse needs 70 to 150 litres of water. This is very low as compared to many main crops like wheat, rice, apple, soybean requiring between 500 to 4000, 2500 to 5000, 800 to 900, 600 to 800 litres respectively. As a comparison we need 5000 to 20000 litres of water for producing one kg of meat. The rainfall requirement for pulses, sugar and rice would be 300, 2000 and 1200 respectively. Pulses can be stored under ambient conditions for months without losing their high nutritional value. The pulse crop residues are also a good source of animal fodder. Increased pulse consumption will help decrease the overall consumption of fat and sugar and thus help in reducing the burden of increasing lifestyle diseases. The nutritional security provided by pulses results in improving public health enabling countries to reduce their overall carbon foot print.

Overall pulses foster sustainable agriculture and contribute to climate change mitigation and adaptation, while promoting biodiversity.

Pulses are good for health of people:

Pulses with their high level of protein, dietary fibres, and minerals, vitamins and phytonutrients offer many health benefits. Pulses especially when blended with cereal proteins and millets offer a promising alternative source for nutritive, functional and economical proteins and fibers. Pulses with their high biodiversity offer a wide range of proteins and dietary fibres. Diets rich in pulses are associated with health benefits such as reduced calorific content and low GI for weight management, and improved sugar control in diabetics and reducing the risk of developing type2 diabetes. Diets with pulses are also shown to reduce LDL and total cholesterol resulting in reduced risk of CVD.

The presence of high level of both soluble and insoluble dietary fibres promote increased microbiota in the colon leading to production of short chain fatty acids and increased mineral absorption. Pulses have also been associated with reduced risk of various forms of cancer. Since pulse proteins do not contain gluten at all, they will be an ideal ingredient for all gluten free food preparations.

Natural presence of high level of resistant starch and other fibers and possibility of further converting high level of amylose present in pulses to resistant starch by choosing right processing conditions makes pulses prebiotic and butyrogenic food ingredients for making many new functional foods. Recent studies have also shown that protein antinutritional compounds like Lectins, protease inhibitors as well as the non-antinutritional components like angiotensin I-converting enzyme (ACE) inhibitor may also have many health benefits.

Recently ACE inhibitors have been shown to have bioactive properties that reduce hypertension, the onset of heart failure, the risk of myocardial infraction and diabetic nephropathy apart from having antioxidant properties. Lectins have been associated with reducing certain forms of cancer, activating innate defence mechanisms and managing obesity.

Protease inhibitors such as trypsin and chymotrypsin inhibitors have been demonstrated to reduce the incidence of certain cancers and demonstrate potent anti-inflammatory properties. Most pulses have low glycemic index ranging from 25 to 55 which can be further reduced by roasting. Thus an easy way to lower the overall GI of your diet is by eating legumes and pulses more often with your meals or as a snack.

Pulses are good for economy:

For both large and small farmers, pulses represent important economic opportunities to boost income and reduce the risk by diversifying their crop income stream portfolio. The impact pulses will have on ensuring food and nutrition security, helping elevate the protein malnutrition, provide the world deficient on dietary fibres and ensure gut health are all becoming clear. Even though the environmental benefits, their role in reduction of carbon foot print and reduction in the burden of life style diseases is getting well understood there is less documentation and quantification of the overall social and economic benefits of pulse production and consumption. Taking the value addition technologies to the farmer's level and ensuring better returns to them will encourage growth of pulses. Canada has made significant progress in increasing cultivation, yield as well as consumption of pulses. In US growing pulses is appearing to be more lucrative than growing corn and one may see a rise in pulse production in US.

Indian scenario:

India is a source of biodiversity for several pulse crop species. The main pulses include chickpea, pigeon pea, pea, lentil, cowpea, urad bean, Moong bean, Moth bean, Rajma bean, faba bean and grass pea along with horse gram and hyacinth bean.

India is the world's oldest and largest producer and consumer of pulses. Since the demand for pulses far outweighs the domestic production, India also happens to be the largest importer of pulses. Despite the awareness of pulse benefits and a variety of traditional foods and snacks using pulses, pulse consumption per capita is unfortunately declining. This declining consumption permeates across all socio-economic strata. This is accompanied by a decline in pulse production; largely due to the economic disadvantage of pulses vis-à-vis more lucrative crops. Pulses self-sufficiency is essential for food and nutritional security of India especially, in preventing a large population in the country suffering from protein malnutrition. The increasing pulse import will also be a huge burden on India's forex reserve. We had a record production of pulses in 2013-14 which still could not meet up with the demand. There has been a decline of almost 12% in the production of pulses for the year 2014-15. In any case imports are not long term solution and besides there is not enough pulses available around the world in any case.

Nutritional science is establishing the positive role several specific foods, their components, phytochemicals are playing in improving our health leading to proliferation of several new generation dietary supplements and nutraceuticals. India is also fast catching up with this trend and there has seen a rapid increase in demand and consumption of such products. However, a point to remember is that these are supplements and are to be consumed over and above a good healthy diet, only to make up for some deficiencies. Pulses are very much an integral part of a healthy daily diet especially, for the vegetarians and 30 to 40% reduction in per capita consumption of pulses across all sections of the society in the last two decades is a great cause for concern. This is not stemming from only the increasing prices of pulses as the trend is same in economically well off sections of the society as well. Choice of many other protein sources like eggs and dairy products has also impacted pulse consumption. Despite of the prevailing high prices pulses are still the most cost effective sources of proteins, fibers and many micronutrients. The longer cooking time and pre-soaking time needed for pulses combined with increasing westernisation of our diet has led to reduced consumption of pulses and millets. This will not only further compound the already existing protein malnutrition and hidden hunger but will also worsen the dietary fiber deficiency leading to many gut health issues.

The first green revolution in India had a major impact on increasing the yields of cereals and making the country self-sufficient in rice and wheat. However, it completely missed out the pulses and today the gap in supply and demand is widening every year and unfortunately not enough is being done to bridge this gap other than importing the pulses. The green revolution also led to consistent reduction in soil fertility and loss of essential soil nutrients on account of exhaustive cropping systems being followed after green revolution. The green revolution in fact pushed pulses and other crops to harsher rain fed environments which led to their poor productivity, besides leading to an imbalance in soil micronutrients. Lack of supply of good quality of seeds has forced the farmers to use the same seeds for many years resulting in poor quality crops. A balanced approach including judicious use of natural resources, protecting soil micriflora and lesser application of chemical pesticides and fertilisers are needed to sustain ecosystem.

Pulses improve soil health by enriching nitrogen status, long term fertility and sustainability of cropping systems. There is a great scope to produce pulses in the rain fed areas using resource conservation and water harvesting techniques. Due to high protein content in pulses, the crop is highly vulnerable to pests and diseases. It is estimated that about 30% of the crop is lost on account of pest attacks and diseases every year. In India apart from consuming the whole seeds a large quantity of pulses are consumed after splitting and dehulling them. This form is popularly referred to as dal. Dals have better cooking characteristics than whole pulses as they absorb water quickly. This is by far the only value addition that is being done on an industrial scale in the country.

Majority of the dal mills in the country are not very technologically advanced and are very inefficient resulting in a loss of 20 to 25 % yield. Since dal is the most important value added product In India it is very important to get pulses split properly, have smooth edges and have shiny surface and uniform grain size. The excessive polishing done to get the shine is only for aesthetic reasons and does add value to nutrition of dals and thus lately unpolished dals are becoming popular in the market. However in NA and Europe pulses are converted to flour and converted to RTE products like bakery, pasta, noodles, muffins, cakes and meat analogues. So the research focus in post-harvest processes of pulses for these two markets is different.

The vision 2050 document recently published by the Indian Institute of Pulse Research has identified the main issues pertaining to increasing the pulse production in India and where the focus has to be in finding the solutions.

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Enduring Value

Sunfeast

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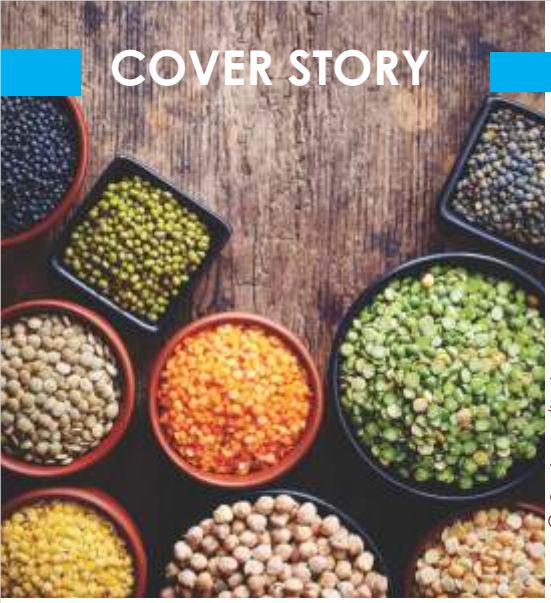

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The average yield of 780 kg pulses per hectare in India is far less than the global average of 890 kg per hectare. Some of the best yields around the world are France, USA, Canada, China having an average yield of 4200, 1800, 2000 and 1500 kg per hectare respectively. At present almost 92 percent of the area of the pulses is confined to unirrigated areas and in future also it appears the bulk of the pulse production will continue to come from unirrigated areas. Pulses in India have always been a secondary crop and are grown in between the main cereal crops. The price fluctuations in the pulse prices are very high.

Irrespective of the rising pulse prices in the market the value realisation to a farmer has remained the same. For any plan to increase production to succeed on a long term basis we need to move the pulse crop under rain fed farming conditions. The low productivity of pulses is due to the low input conditions associated with the complex socio-economic and agro climatic problems of rain fed agriculture and lack of good seed supplies. To meet the projected demand of 39 million tonnes by 2025 the pulse production in the country we need a growth rate of at least 2.14%. Indian council of medical research recommends per capita consumption of pulses of 52 gm per person per day on dry weight basis. The current per capita availability is only 37 per person per day. The major R&D issues identified for pulses are low genetic yield potential, poor and unstable yield, huge post-harvest losses during milling and storage. There is an urgent need to integrate conventional approaches with cutting edge technologies such as genomics; molecular marker assisted breeding, transgenetics, molecular approaches to stress management, high input use efficiency, quality improvement, bio fortification, resource conservation technologies. Value addition of pulses has to go beyond only splitting and dehusking to make dals.

Nutritional value of pulses can be increased and antinutrient levels can be minimized by choosing appropriate processing technologies, which can be further enhanced by using a combination of different pulses along with cereals and millets. This is the basis of thousands of traditional food recipes that have been used in India's daily diet for centuries. Many of these recipes are used at home and have not been commercialized or at best have been made by small-scale local industries. These recipes use a combination of different processing methods like soaking for different durations, wet grinding, fermentation, dry roasting, roasting in presence of fat, puffing, flaking etc., to obtain the desired texture and behavioural properties. The exact chemical changes are not understood, but they do result in sensorial experiences that give pleasure to taste buds. While the West focuses on pulse flour usage, the Indian tradition has focused on whole pulse or dal usage in daily diet. Understanding the science of traditional Indian pulse-based dishes and developing methods to commercialize some of these will create new market opportunities with global relevance and help increase the global consumption.

To increase pulse supply and demand globally, there is an urgent need for technologies that commercially produce a variety of competitive pulse-based products. There is an equally urgent need to reinvent value addition combining the physical and commercial aspects of the product with its significance in people's minds as consumers and/or producers. Increasing the consumer awareness of the health benefits of pulses even for meat eating people is necessary to increase the global demand and consumption.

Research in the West, especially in Canada, looks at incorporating pulses at different levels in the most popularly used value-added daily foods like bread, cakes, pasta, etc., to increase daily pulse intake, relying on pulse flour. Yet, the latest food processing technology developments focus mainly on wheat, corn and rice, not pulses. Understanding the processing behaviour of pulse flours will fill this gap.

Despite of their ancient use for food and the many years of research, more research is necessary to increase their production, come up with better breeds to meet the increasing global demand of pulses. A lot more research is needed to fully understand the physiological role and the health benefits offered by various components in pulses including the easily removable antinutrient factors. Their relative inexpensiveness, biodiversity, high quality protein and fibres and modifiable functional properties and non-allergenic responses make them the foods and food ingredients of future and the most important tool for food and nutritional security.

In a global survey conducted as part of the IYP related activity through the Global Pulse confederation some common themes have emerged. Interestingly the visions for the pulse crop research did not vary a great deal between developed and developing countries.

There is a strong desire across all nations, global research and funding agencies to develop genomic tools for breeding programmes, to conduct state of the art breeding programmes for improvement in genetic gain, pest resistance, and quality, to improve crop production and crop protection practices for farmers, to produce food in a sustainable manner and help make pulse farming profitable.

Developing new resilience in crops to meet challenges of climate change, largely including drought and heat was also a common goal for all countries indicating the global warming and water shortage as two emerging threats globally. The global funding for pulse crop productivity and sustainability is estimated to be at least USD 175 million per year which does not include the domestic funding of some individual countries for their national programme on pulses.

India with its rich pulse and legume biodiversity needs to fully exploit the true potential of pulses as food and nutritional security tools and presenting it to the world as a model. For this India must invest heavily in terms of research, time, talent and right policies. Pulses which are being identified as foods and food ingredients of future globally today should be a matter of national pride for us. We had very successful green and milk revolution that made the country self-sufficient in cereals and milk respectively and may be it is time now for a 'Pulse revolution' which also addresses the sustainability issues.

For this to happen on a scale that will have a desired impact on ensuring nutritional security, all the partners namely government, policy makers, universities, research institutes, the various associations that deal with farmers, NGO's, innovators, entrepreneurs, private companies will have to come together for this common cause. In the last 10 years or so world has seen the rise of a relatively unknown minor grain from South America called Quinoa gain the position of "World's healthiest grain". The research that has gone in to understanding this grain, technology to get rid of antinutrients, product innovations and ability to grow in many parts of the world including India along with huge consumer awareness building have made this possible. In India we have also seen the power of such collaboration as well in promoting edible rice bran oil (RBO). Thirty years back we could barely use 5% of the potential availability of the healthiest edible rice bran oil and that too for making low cost laundry soap. And today with the power of a combined effort we are using around 60% the available potential as edible oil, an appropriate use of this valuable natural resource. Time we do this for Pulses through a revolution. The critical elements of such plan could be as follows.

a) Mapping the pulse biodiversity: Map out all pulses in India, the popular ones, the tribal ones and minor ones along with the traditional ways of cooking them and consuming them. Fundamental research in understanding the chemistry of these pulses and the role of various components not only as macronutrients but also the physiologically active ingredients, coupled with the understanding of the changes in chemistry of various components during processing conditions used traditionally. Map out the best verities suited for different regions of the country and suitability for rain fed areas.

b) Increase farm productivity and make growing pulses economically viable: This is a complex task but not an impossible one. We need to use all the biotechnology tools the modern science has to offer including the genetic engineering to develop breeds that are not only high yielding but also have the right chemistry in terms increased levels of nutritional components and better quality of proteins. Better genetic verities, bio fortified varieties, new varieties that grow in different season like the summer Moong etc., better integration of pulses in to rice and rice wheat systems also need to be explored and standardised. Develop systems in the country to ensure best quality of seeds produced by using all these technological approaches are made available to framers. Apart from supply of seeds the complete technology package and information to farmers in terms of use of micronutrients like zinc, boron, use of adequate use of rhizobium mass etc., and their supply also needs to be ensured. With their high protein levels pulses are very susceptible to infestation during growing as well as post-harvest storage. This needs to be addressed while coming up with new breeds and building appropriate storage facilities. All this of course has to be combined with right policy and business models that ensure better returns to farmers. The only major value addition done today to pulses post harvesting is splitting and dehusking to make dal. Major investments and technology up gradation of dal making to improve the current poor yields are also the need of the hour. Develop robust small scale technologies for value addition which can be implemented at farm level enabling small and medium farmers to realise more value for their produce.

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Pulse procurement distribution through PDS, introducing pulses in mid-day meals, are some of the other opportunities. About 25% dals are broken during milling and polishing. Nutritionally these are the same as that of whole dal and should be marketed at a different price point as is being done in case of rice. Not doing so is a waste of a valuable food like pulse.

c) Innovation for value added products: There is huge biodiversity in pulses and their processing options like fermentation, germination, roasting, puffing, flaking etc., offering unlimited possibilities for innovation of food formats that will have global appeal and are very contemporary in the presentation like the pulse pasta, pulse pan cake, pulse chips, pulse biscuits. Long cooking and processing time like overnight soaking, germination could be responsible for disappearance of pulses from the Indian daily diet and lower per capita consumption. New technologies are needed to have innovative pulse based food products that can be incorporated in daily diet. We should also explore all the possibilities of incorporating pulse flour in several daily used and highly penetrated items like bread, roti, noodles and snacks. A large amount of pulse flour is also used for making snacks which are one of the fastest growing packaged food categories. All these are however, deep fried and contain very high level of fat and also trans fats formed during frying. Not much is known about what this deep frying does to the entire chemistry of the macronutrients and the physiologically active components of pulses. Innovative concepts to this growing segment with healthier options using a variety of pulses in combination with cereals and millets would drive the consumption as their taste and convenience appeals to consumers.

d) Consumer awareness of the health benefits of Pulses: Pulses as sources of proteins is well known to consumers. However, pulses as sources of dietary fiber, minerals, vitamins and many other phytonutrients are not known to many. Because of their chemistry they are also the low GI foods, they are free of cholesterol, free of gluten, good for reducing cholesterol, good for weight management, sugar management are not well communicated. Pulses when combined with cereals, millets and vegetables offer a complete meal and optimum nutrition and this combined with consumer appealing pulse based product innovations will give a big boost to pulse consumption to ensure nutritional security. This should take in to regional preferences for pulses that exist in India. India is going through nutrition transition where in with rising income there will be rising calorie consumption and more of these calories will come from fat and sugar. This combined with our genetic disposition will increase the burden of life style diseases. Pluses can play a significant role in reducing this burden. We should increase the per capita consumption of pulses by increasing consumer awareness of the health benefits of pulses and by offering innovative products.

The international year of pulses 2016 will hopefully lead to a new beginning for the Pulse revolution. We have identified and have been discussing the issues of the pulse production in India for the past 30 years and very little has been done to address these issues. This has led to stagnation of pulse production in the country. The IYP initiatives globally as well as in India hopefully will lead to a new beginning and help increase both production and consumption of Pulses enabling us to fully exploit the true potential of Pulses to provide India the much needed nutritional security.

Key messages of the International Year of Pulses 2016

- Pulses are highly nutritious.
- Pulses are economically accessible and contribute to food security at all levels.
- Pulses have important health benefits.
- Pulses foster sustainable agriculture and contribute to climate change mitigation and adaptation.
- Pulses promote biodiversity.

Objectives of the International Year of Pulses 2016

- Promote the value and utilization of pulses throughout the food system
- Raise awareness about the benefits of pulses, including sustainable agriculture and nutrition
- Encourage connections to further global production
- Foster enhanced research
- Advocate for better utilization of pulses in crop rotations
- Address the challenges in the trade of pulses

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FLAWS IN LAWS and the Executive Overreach

By **Mr. Mohan V.,**
Partner, Inttl Advocare
Chairman, PFNDAI Regulatory Affairs Committee

Background

One of the many hurdles a litigant faces in India is not only the inordinate delays in our courts but also the way the laws are enacted and worded. Many a times the wordings in the Act, Rules and Regulations are not only vague and confusing and at times practically impossible to implement. This necessitates clarifications by way of notifications which further add to the confusion. Added to that is the frequent changes that are brought about in the Rules and Regulations for extraneous reasons- due to pressure from vested interests abetted and aided by pliable officials. All these have left the law abiding citizens, the litigants and the judiciary confused and confounded.

Words, Sentences and their Interpretation

Often one gets caught between what is mandatory and what is discretionary. Classic case is the use of the word "may" in legislation. While in general parlance the word "may" connotes a possibility / discretionary phrase, in law at times it is interpreted as "shall" and hence seen as mandatory. The same logic is applied when one drafts a contract as well. However, in some countries "shall" is now interpreted as "may" (US Federal Aviation). Similarly one has to be careful when he comes across the words "means", "includes" etc. While "means" is definitive, "includes" means indicative / not exhaustive.

If one reads Section 22 of the Food Safety and Standards Act 2006,

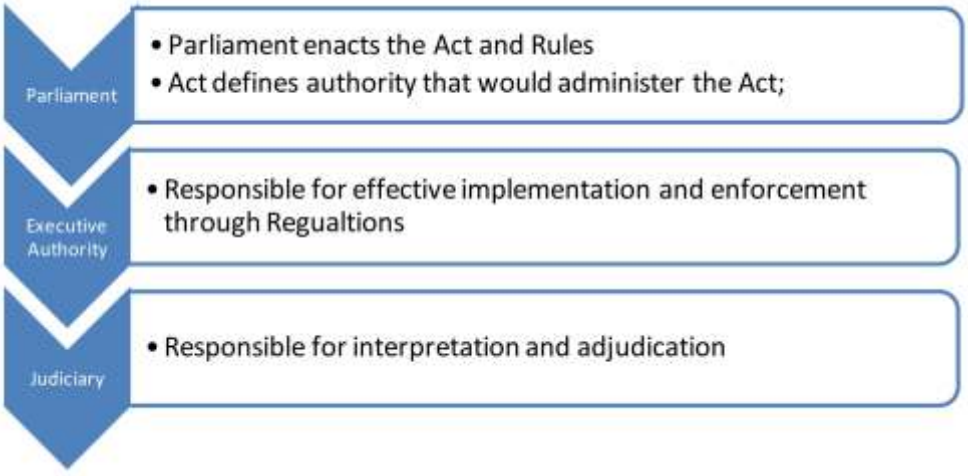
*"Save as otherwise provided under this Act and regulations made thereunder, no person **shall** manufacture, distribute, sell or import any novel food, genetically modified articles of food, irradiated food, organic foods, foods for special dietary uses, functional foods, nutraceuticals, health supplements, proprietary foods and such other articles of food which the Central Government **may** notify in this behalf."*

Though the words "shall" and "may" have been used here, both have the same meaning – i.e. "mandatory".

Construction of sentences

Another problem one face is the construction of the sentences. For instance in the same section 22 referred above, **proprietary and novel food** have been defined to *"mean an article of food for which standards have not been specified **but is not unsafe**"*. While the section mandates obtaining Govt. prior approval if one wants to manufacture,

Role of Parliament, Executive and Judiciary

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sell, store, distribute or deal in such foods for the reason that they may not be safe, the Act has already labeled them as not unsafe. In that situation then where is the need for Govt. prior approval?

"Nominee" responsible for compliance of Legal Metrology

49. (I) Where an offence under this Act has been committed by a company,-- (a) (i) the person, if any, who has been nominated under sub-section (2) to be in charge of, and responsible to, the company for the conduct of the business of the company (hereinafter in this section referred to as a person responsible); or

(2) Any company may, by order in writing, authorise any of its directors to exercise all such powers and take all such steps as may be necessary or expedient to prevent the commission by the company of any offence under this Act and may give notice to the Director or the concerned Controller or any legal metrology officer authorised in this behalf by such Controller (hereinafter in this section referred to as the authorised officer) in such form and in such manner as may be prescribed, that it has nominated such director as the person responsible, along with the written consent of such director for being so nominated. ,*

Explanation.-Where a company has different establishments or branches or different, units in any establishment or branch, different persons may be nominated under this subsection in relation to different establishments or branches or units and the person nominated in relation to any establishment, branch or unit shall be deemed to be the person responsible in respect of such establishment, branch or unit".

One cannot be blamed if one gets confused as regards who are the directors mentioned here and whether it is mandatory that only a "director" of a Company should be appointed as the Nominee for compliance of this legislation.

But what is more hilarious is the below proviso to Rule….. of the Legal Metrology (Packaged Commodity) Rules 2011.

"Provided that no such declarations on the inner package is required if the inner package does not contain any declaration on its outer cover."

Knowing the long and steep the Govt. hierarchy is, one would wonder how the above proviso was included.

Are "Food additives" food?

This issue was examined by the Delhi High Court, (Divn. Bench) in April 2015 in Union of India – FSSAI vs Danisco India Pvt. Ltd & United Distributors Inc. where the Court gave a solid lesson to the Food Authority and its counsel a lesson on legislative intent and how one should interpret the law. The questions before the Court were:-

- Is "food additive" a food?
- Does the (Packaging and Labelling) Regulation issued under section 23 apply to Food additives?
- Who is the business operator in respect of imported food?
- Whose responsibility it is to label imported food? Can one make mfg. of imported food to label as per Indian laws?
- How much of Vegetable fat permitted in chocolate fillings instead of coca butter?
- Does the permission given earlier to M/s. Mars and M/s. Ferrero be a ground for similar relaxation?

"(j) "food" means any substance, whether processed, partially processed or unprocessed, which is intended for human consumption and includes primary food, or……..food containing such ingredients,……, and includes any substance, including water used into the food during its manufacture, preparation or treatment but does not include ……

(k) "food additive" means any substance not normally consumed as a food by itself or used as a typical ingredient of the food, whether or not it has nutritive value, the intentional addition of which to food for a technological (including organoleptic) purpose in the manufacture, processing……

So are food additives a food or not?

"Thus, a substance which is not normally consumed as a food by itself or used as a typical ingredient of a food and which may be a food additive, cannot be a food as only those substances which are intended for human consumption can be food. Merely because a food additive may fall within the expression "...and includes any substance.....used into the food during its manufacture, preparation or treatment" within the inclusive part of the definition of food will not make a food additive food because a food additive fails to satisfy the crucial part of the definition of food i.e. "intended for human consumption". Similarly, because a food additive is added for technological purpose in the manufacture, processing, packaging etc. of food and becomes a component of or affects the characteristics of such food would also not make it a food because a food additive by itself is normally not consumed as a food."

Is the labelling Regulations for Food applicable to food additives as well?

It is not as if the appellant authority is prohibited from making any other Regulations qua food additives as the one with which we are concerned, in the present case, if

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the need to provide any other restriction / limit, with respect to the same is felt. As aforesaid, Section 16 of the FSS Act vests wide powers in the appellant authority to make Regulations to ensure safe and wholesome food.

If the appellant authority feels that to ensure safe and wholesome food, any Regulations qua packaging and labelling of food additives are also required to be made, the appellant authority under Section 16 read with Section 92(2)(e) would be entitled to do so. Not only so, Section 19read with Section 92(2)(h) also enables the appellant authority to make Regulations qua additives to be used in the manufacturing of food. However the appellant authority cannot be permitted to apply to food additives, Packaging and Labelling Regulations made under Section 23--for food, and application whereof to food additives would lead to ridiculous results.

Bickering over "stickering"- different High Courts, differing orders

For a food product both the Legal Metrology Act and the Food Safety and Standards Act and the Rules and Regulations formed thereunder would be relevant.

(z) "label" means any tag, brand, mark, pictorial or other descriptive matter, written, printed, stencilled, marked, embossed, graphic, perforated, stamped or impressed on or attached to container, cover, lid or crown of any food package and includes a product insert; **(as per FSS Act, 2006)**

(j) "label" means any written, marked, stamped, printed or graphic matter affixed to, or appearing upon any pre-packaged commodity; **(per Legal Metrology)**

- Label shall be applied in such a manner that they will not become separated from the container;
- Contents on the label shall be clear, prominent, indelible and readily legible by the consumer under normal conditions of purchase and use;
- It **shall not be permissible to affix individual stickers** on the package for altering or making declaration required under these rules:
- **It shall be permissible to use stickers** for making declarations **other than the declarations required to be made under these Rules ….**

Despite such detailed definition, dispute arose when the Food Safety Officers refused to take samples for inspection (as statutorily required) in respect of imported consignment of chocolates on the ground that the consignment was not properly labelled. He refused to permit stickers on the ground that it is not permitted.

The Delhi High Court looked at the legislative intention and took a pragmatic view of the matter and ordered the importer to rectify the omissions by affixing stickers with appropriate declarations, The Court stated that -

"While, it is mandatory that the goods are labelled in a manner as specified by the Labelling Regulations, the purpose of providing labels should not be lost sight of. The object of labelling the packaged products is to ensure that relevant information regarding the product is available on the package for the benefit of the consumers.

Such information includes the name of the food item, the ingredients, the date of manufacture, expiry date, best before use date, the name of the manufacture, the name of the importer as well as the nature of the product i.e. whether it is a meat or a vegetable product. Since the idea is to ensure that the consumer is duly informed of the product being purchased / consumed by him, ***a non-detachable sticker providing all information would sufficiently meet this object.****"*

The Madras and Calcutta High Courts went strictly by letter of the law and the potential harm to the consumer in the event the products are released without adequate labels and thus ordered that the imported consignment be retuned / exported back. While it is difficult to fathom what the outcome would have been had the matter been taken to the Supreme Court, it is sure that the chocolates would have melted beyond use by that time.

Executive Overreach- Bombay High Court in the matter of Nestle vs FSSAI

This is a matter where more than Rs.300 crores worth of packed food was destroyed in a nation when more than 300 million citizens goes to bed without one full square meal a day. Where under the guise of public safety order was passed for the stoppage of sale and manufacture of a product without undertaking any study on the impact of a product (held to be unsafe) on the health of the people who had already consumed the same.

The brief facts are- Maggi, a Nestle product was inspected by the FSSAI, and was allegedly found to contain for high levels of monosodium glutamate ("MSG") and lead in the noodles. The FSSAI and the Maharashtra FDA based on reports from various analytical lab and on a complaint from a Food Safety Officer asked Nestle to stop

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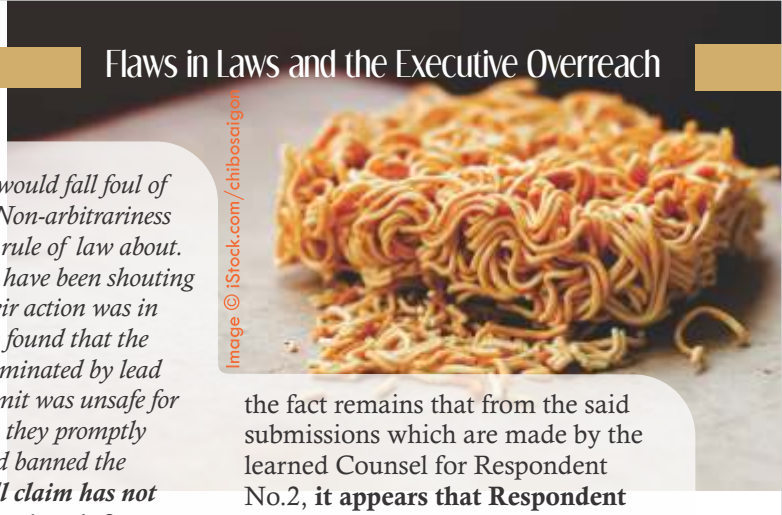

selling different variants of Maggi noodles forthwith and also stop producing one variant oats noodles for which Product Approval was not yet granted. Nestle filed a writ petition before the Bombay High Court challenging the order.
The issues before the court were -
• Should Nestle's writ petition be admitted under Article 226?
• Did Nestle suppressed any information on receipt of lab reports?
• Did Nestle destroy Maggi noodles to suppress evidence?
• What should be the permissible minimum of lead – one as prescribed by law or one as claimed by Nestle in its Product Approval application?
• Does the FSSAI have unfettered right to prescribe limits for additives / contaminants etc. irrespective of what is stated in the Regulations?
• Does section 22 enforce a complete ban on proprietary foods without prior permission of FSSAI?
• Under which exact section was the ban imposed by FSSAI and FDA Maharashtra? "Emergency prohibition notice"), sec.34.

It is incumbent on all of us to read this exhaustive order of the Bombay High Court and understand how a legislation has to be read, understood and interpreted.

Rule of law and Public Interest

In this context it is important to emphasize that the absence of arbitrary power is the first essential of the rule of law upon which our whole constitutional system is based. In a system governed by rule of law, discretion, when conferred upon executive authorities, must be confined within clearly defined limits. *The rule of law from this point of view means that decisions should be made by the application of known principles and rules and, in general, such decisions should be predictable and the citizen should know where he is. If a decision is taken without any principle or without any rule it is unpredictable and such a decision is the antithesis of a decision taken in accordance with the Rule of law. (Equality and arbitrariness were thus, declared "sworn enemies" and it was held that an arbitrary act would fall foul of the right to equality. Non-arbitrariness was equated with the rule of law about. Though Respondents have been shouting from roof top that their action was in public interest as they found that the food which was contaminated by lead beyond permissible limit was unsafe for human consumption, they promptly swung into action and banned the product.* ***The said tall claim has not been substantiated by them before us.***

Merely stating that the food was unsafe or that the action was in public interest is not sufficient as is observed by the Apex Court in Godawat Pan Masala Products I.P. Ltd vs. Union of India and Others1. The Apex Court in the said case has observed in para 61, 68 and 77.5 as under:-
"61. ***We are unable to accept that the words "in the interest of public health" used in Clause (iv) of Section 7 of the Act can operate as an incantation or mantra to get over all the constitutional difficulties posited.*** *In any event, the collocation of the words in the statutory scheme suggests not a matter of policy, but a matter of implementation of policy. For this reason also, we are of the view that the impugned notification must fail."*
*The Court also observed that "****audi alteram partem*** *(accused should be given opportunity of being heard). From the conspectus of these cases, it can be seen that there is no straight-jacket formula which can be used in each and every case to decide a question as to whether the affected party has to be given hearing or not and that would depend upon facts and circumstances of each case.*

Arbitrariness and for extraneous reasons

In his written arguments, (counsel for the CEO, FSSAI) has given various links in which similar allegations have been made against the Petitioner. We do not wish to say anything about correctness or otherwise of the said allegations since no opportunity was given to the Petitioner to refute the same but the fact remains that from the said submissions which are made by the learned Counsel for Respondent No.2, **it appears that Respondent No.2 is also influenced by extraneous considerations such as the material which has been placed before us which is not reflected in the reasons which are given in the impugned order.** The order at Exhibit-A therefore will have to be quashed on this ground also.

106. For the same reasons the order passed by Respondent No.4 which is at Exhibit-B also will have to be held to be arbitrary and capricious and violative of Article 14 and 19 of the Constitution of India.

107. What is most shocking is that though the samples of only three variants of the Maggi Noodles were taken all 9 variants of Maggi Noodles have been banned. Remaining six therefore have been banned only because lead was alleged to be found in excess of the permissible limit in other three and even without testing the said six Maggi variants, the order of ban has been imposed. This is one other incident of highhandedness and arbitrariness and there was no plausible explanation given in the impugned orders or even before us for such an action.

We find that in number of cases which have come before us, this is a standard argument which has been advanced on behalf of the Food Authority, though we find that in support of the orders which are passed banning any food article or restraining the manufacturer from importing consignment after it has reached the customs warehouse, some other reason is given for not clearing the goods.

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However, in the Court reliance is placed on section 22 and this is the argument which is sought to be advanced in support of the action of the Food Authority. In our view, there is something fundamentally wrong in the approach of the Food Authority and in the interpretation which is sought to be given by it to several provisions of the Act, including section 22 of the Act.

• Since the ban preceded the show cause notice Nestle is well within its rights to file the writ.
• There was no suppression by Nestle. In fact the Counsel for FSSAI was mislead by FSSAI
• Destruction of Noodles by nestle was not to suppress evidence. It was as agreed with FSSAI.
• The court was astonished, surprised and found it fallacious with the argument of FSSAI counsel who contended that limits prescribed in Regulation for additives , contaminants etc. do not apply to Proprietary Food and that FSSAI has unfettered right to prescribe any limit;
• Prohibition of any food by virtue of the Act cannot be imposed by administrative advisories.
• The answer to Issue No (VII) is that the source of power under which the impugned orders were passed is traceable to either section 30 or section 34 of the Act and, in any case, the impugned orders could not have been passed under sections 10(5), 16(1), 16(5), 18, 22, 26, 28 and 29 of the Act. Issue No. (VII) therefore is answered accordingly.

Conclusion:

As can be seen from this article extreme care should be taken as regards the need for legislation, clarity of thoughts and legislative intention need to be reflected in the choice of words and sentences used in the legislation and last but not the least, objective and rational enforcement and interpretation of the same by the authority and the judiciary. Such an approach would go a long way in reducing the burgeoning list of pending cases, help improve ease of doing business in India and the "Make In India" program a great success.

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E: jimesh.patel@ubm.com

National Seminar on Nutritional Perspectives in Bone Health
Recent Advances
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College of Home Science, Nirmala Niketan, New Marine Lines, Mumbai
T: 022-2207 6503
E: bonehealth16@gmail.com

Dairy Tech India 2016
August 26-27-28, 2016
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T: 011-65655264
E: dairytechindiamtpl@gmail.com
W: www.dairytechindia.in

Food Hospitality Expo 2016
September 9-11, 2016
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T: +91 9814419230
E: rajan.suri@ifhexpo.com
W: www.ifhexpo.com

AAHAR Chennai 2016 -
The Food & Hospitality Fair 2016
September 15 - 17, 2016
Hall No.1 of Chennai Trade Centre
T: 044-2858 7297
E: narayanv@itpo.gov.in

International FoodTec India
September 22-24, 2016
Hall 1& 5, Bombay Exhibition Centre, Mumbai
T: 040-65594411
E: m.pathan@koelmesse-india.com

40th Annual National Conference of Indian Dietetic Association
IDACON 2016
September 23-25, 2016
Hotel Sahara Star, Mumbai
IDA Mumbai Chapter
E: idacon2016@gmail.com
W: www.idacon2016.com

Indian Ice Cream Congress & Expo 2016
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T: +91-11-2348 7547
E: amandeep.singh@ficci.com

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TAILORING FOOD PRODUCTS FOR SENIOR CITIZENS

By Dr. Shobha A. Udipi,
Senior Nutritionist, PFNDAI

Globally, human longevity is increasing (life expectancy increased by 5 hours/ day over the past 200 years) and almost all nations face one of the most challenging demographic events. By the 2050s, in countries like Spain, Germany, Japan, Italy and Russia, more than one-third of the population will be above 60 years of age. Aging of the population is also affecting demographics of countries like Mexico, Brazil, Saudi Arabia, Egypt, Malaysia and India. Thus senior citizens constitute an increasingly important consumer group, world-wide. Yet this segment of the population cannot be thought of as having similar needs, problems and expectations.

Seniors are one of the most heterogeneous groups. Unlike young adults, they are less influenced by peer pressure / trends and they have had a wide range of unique life experiences. Studies in western countries show that consumer behaviour, abilities and lifestyles differ considerably between 65 year olds and 80 year olds. What makes seniors so heterogeneous is: their individual physiology differs, some may be healthy and very active whereas others may have chronic diseases like hypertension, arthritis, osteoporosis, heart disease, diabetes mellitus among other problems. Some may experience neurological changes and cognitive decline. Thus functional abilities and physical and mental health vary widely. Some experts have suggested that those between the ages of 65 and 80 could be referred to as younger seniors whereas those aged above 80 years could be referred to as older seniors. Lifestyles of younger and older seniors may be different and their health, well-being and quality of life may be influenced by physical and physiological aspects, as well as cultural, social and economic factors.

One important area where seniors differ from younger adults is in their nutritional requirements. As adults age, their bodies become less efficient at absorbing and metabolising nutrients. They need less energy but more protein and micronutrients. This is especially so in case of frail seniors. Medications for health problems could lead to loss of appetite or interfere with normal metabolism and sometimes increase nutrient requirements. Medications can also nausea, diarrhoea, constipation and dry mouth, all of which can reduce food intake.

Between the ages of 20 and 80 years, on average, energy intake decreases by approximately 30%. When the decline in energy intake is more than the decrease in energy expenditure/utilization that is generally seen with ageing, the person will lose weight. The problem is that only unwanted adipose tissue is not lost, but he/she also loses skeletal muscle mass. This loss of lean tissue is associated with reduced muscle function, bone mass and cognitive function, anaemia, dysfunction of the immune system, slow wound healing and recovery from surgery, and consequently an increase in both morbidity and mortality. Whereas, younger people can regain lean muscle, this is often not the case for elderly persons. This means that being underweight becomes a health problem in older age, as is being overweight.

Aging is accompanied by many physiological changes. Changes in the oral cavity and gastro-intestinal tract influence their food intake. As a person becomes older, the sense of taste and smell diminishes, food textures are perceived differently and this could result in lower food intakes (because food does not taste as good as it did before).Some may have problems with eyesight and joints, which may affect the ability to prepare and eat food.

Appetite and food intake often decline with ageing. Older people tend to be consistently less hungry than younger people, eat smaller meals, have fewer snacks between meals and also eat more slowly. Increasing age has several effects on gastrointestinal function. Secretion of gastric acid, intrinsic factor and pepsin is decreased, which then reduces the absorption of vitamin B6, B12, folate, iron and calcium. Other gastrointestinal problems such as gastritis and gastrointestinal cancers can adversely affect nutritional status. In addition to the "anorexia of ageing", there are physical, social, cultural, environmental and financial reasons for an inadequate diet.

Thus, nutrition of the elderly deserves special attention, so that they can have optimal health and maintain good quality of life. This can also reduce health care costs. However, this is a challenge because many seniors live alone, and most would like to be independent, although some may find it troublesome to buy foods and prepare meals due to changes in mobility and dexterity. In most cases, seniors who show interest in food and have retained a good appetite, are more mobile, free-living and have the ability to live relatively independently, all of which are qualities associated with successful ageing.

Tailored interventions may be needed to combat chronic diseases and age-related changes, such as vitamin D and calcium supplements for bone health, low GI foods to manage glucose levels in type 2 diabetes and appropriate protein quality and quantity to manage muscle loss.

Providing the necessary nutrients and perhaps functional ingredients in food preparations poses a challenge because the elderly may eat smaller amounts as they age. Simply motivating seniors to consume more food is not likely to be a very successful strategy. Across the world, manufacture of nutrient-enriched foods is being viewed as a promising approach. Since, enriched foods are relatively nutrient – dense, they can help ensure that the elderly obtain the required nutrients. In one study, enriched foods were found to be a more acceptable source of nutrients than the more traditional food supplements. With technological advancements, enrichment of foods is certainly possible, wherein a well-liked food may be enriched with a functional ingredient.

Pleasure is an integral part of an adequate diet. While developing products, it is important that the elderly to have a gratifying eating experience. Eating can become a large portion of enjoyable life for elderly people because other activities such as sports, other activities including travel become less compared to those of young people. The need for good, beautiful, inexpensive, nutritious, easily eatable, safe, and easily obtainable food will increase as the number of seniors increases.

Studies in western countries suggest that older adults with a poor appetite may have a higher preference for variation in foods compared to those with a good appetite. Also older adults with poor appetite preferred non-dairy food products than older adults with good appetite. This indicates that meals need to be adapted, incorporating variations. Among these, variations in colour may be important, in order to make the food more attractive. Similarly, it was observed that older individuals preferred foods with solid texture particularly those with containing more carbohydrate.

Colour plays an important role in food choices. It influences taste thresholds, perceptions of sweetness, pleasantness. Colour has been shown to be able to replace sugar, interfere with judgements of identify flavours and their intensity and thus can determine whether a food is acceptable or not. A study on appeal of flavours to young adults and seniors by the University of Wageningen, showed that emotional association may be more important influences in seniors' food choices that that of young adults. When researchers studied the appeal of ginger and mint, young adults associated strong ginger flavour with emotions such as 'disgusted'

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Texture modification has become very relevant given the problems that seniors may have dysphagia/swallowing impairment. Swallowing dysfunction is not at all uncommon, affecting at least one-tenth of the total population aged 65 years and older. It is more common among older patients with neurological diseases, increases with increasing age and frailty. Texture modification of normal foods is required the food should be thin enough to swallow safely. Thin liquids are a problem because the bolus may flow too quickly from the mouth to the pharynx and may get into the airway. Solid foods require chewing and hence are a challenge for persons with dental problems or weakness in masticatory muscles. Solids and very thick liquids may need more strength in terms of tongue propulsive forces to ensure that the material goes through the oropharynx. For persons with reduced tongue or pharyngeal muscle strength, this may be a risk as food residues may remain behind in the recesses of the pharynx.

Therefore thickened liquids are often recommended, so that flow of the liquid is slow enough to allow time for airway closure and that food will not enter the respiratory tract (reducing aspiration). Very thick liquids and solid foods may require greater strength in terms of the tongue propulsive forces to drive the food. Texture modifications are highly relevant for all those who require great effort in oral processing and swallowing e.g. stroke – related dysphagia, Parkinson's disease, radiation therapy for nasopharyngeal carcinoma.

Older persons find it difficult to eat foods that are crunchy, rough, hard, crispy or dry but find it easier to manage pulpy, wet, smooth and slimy textures. Foods that need to be chewed for a longer time may also be a problem. However, what is easier to swallow may not be necessarily what older persons like. One study showed that older persons find slimy, smooth and wet textures easier but boring as they lack textural variety and interest.

Modifying texture is not difficult or very expensive and may be an effective means of ensuring acceptability and consumption of foods. Improved texture can improve food mastication which means that the full flavour of the food can be perceived and it may not be necessary to overly enhance the flavour of a food.

In Japan, support food for weakened mastication and swallowing was started from the 1980's. In 1994, the Japanese government laid down requirements related to stiffness, stickiness, and coagulation of food.

Researchers are working on ways by which texturisers like potato powder, mashed potato, egg white, tapioca, gelatin, pea starch, soya granulate, hyrocolloids like agar, gellan, xanthan, kappa–carageenan, iota-carageenan, low methoxyl pectin can be used to create food products.

'Carezzo' is a company founded in 2011, with the purpose of developing palatable, appealing, protein-enriched products to provide hospitalised and elderly patients with the necessary nutrients. The company collaborates with nutritionists and knowledge centres, validates its products by testing them with panels consisting of older persons. Carezzo has developed a soy protein-enriched bread containing 17%protein, (60 to 100 % more protein than traditional bread) which was well accepted. Other products e.g. snacks, juices, soups and dairy products containing two to three times the amount of protein compared to the traditional product have been developed. The fruit juices contain about 10 grams of protein per 150 ml.

Textures that older persons may like	Textures that older persons may dislike
Present some resistance to biting and chewing, and give textural interest and variety	Finely pureed foods present little interest and are disliked
Crisp textures, textures that present initial resistance but which break down readily in the mouth with relatively little effort.	Textures that are hard give rise to biting difficulties, but might be managed by breaking or cutting into smaller pieces before ingesting.
	Sticky foods that adhere to the teeth and the palate
	Foods containing peels, seeds, grains and particulates especially for denture wearers

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In Germany, researchers are working on 3-D printed food that looks like real food, for elderly with chewing and swallowing problems. 3-D foods retain the original shape of the desired food, while their texture facilitates chewing, swallowing and digestibility. The 'Smooth food' concept was introduced by the German company Biozoon in 2010, aimed at producing food for elderly in nursing and care homes who have mastication and swallowing problems. Similarly, Nisshin Healthcare Food Service, a Japanese company manufactures a mousse that looks like a fillet of salmon and provides more nutrition in a small portion than a large volume of liquid, and can be eaten without choking. Also, application of molecular gastronomy techniques may help provide convenience while eating along with different textures and visual enjoyment.

In the Asia-Pacific region, Japan and China are supposed to be the biggest markets for new elderly-targeted products. These two countries are believed to be very active in product development with senior claims. It is not surprising that food tailored specifically for the elderly is a fast growing market in Japan, because it is estimated that by 2060, one out of its every four citizens will be above 75 years of age.

Many seniors may spend on products that reduce signs of ageing or good for heart, bone, brain health and healthy life expectancy. Thus, there is a need to develop foods containing anti-oxidants, those that will reduce age-related physical decline or development of cataract. Incorporation of prebiotics to prevent chronic disease or functional ingredients to improve immune response are promising areas. Combined with improved sensory properties, such foods could help people age healthily.

Current choices available to the elderly in the Indian market are limited. Not many food products have been are specifically formulated taking into account the particular dietary requirements and physical needs of older consumers, that effectively nourish seniors by improving nutritional value of foods they like and simultaneously involve innovative and appealing modes of preparation.

Increasing number of seniors live alone, and for many, the idea of making the effort to cook from scratch may be unappealing. Hence, there is a need to bring to market, ready meals that would meet the needs and desires of senior consumers. This is especially relevant among cultures in which many men reaching older age with little experience or knowledge about food preparation. Yet older persons have more time, so food has the potential to play an important role in their day-to-day lives. Hence, foods that will support home cooking need to be developed. Some experts suggest that this may also help to stimulate appetite. Manufacturers need to be aware that they must offer the older consumer a sense of pride in feeling there was some skill in preparing the meal.
It is also important to consider the social aspects of eating among the elderly, such as consuming meals with family/ friends to promote intake of healthy meals and reduce nutritional risk.

All this means that we need to respond to seniors' needs differently in terms of not only the product (i.e. texture, consistency, nutritional value) but also packaging. Many senior citizens find it difficult to open products and many may not be able to read labels properly. Seniors may spend more time to reading labels; so they need to be legible, and directions for use need to be in sufficiently large font sizes. The possibility to see the food through a window on the package, clear markings, easy-to-read labels and easy-to-open packages package are important features.

In conclusion, products for seniors need to have realistic portion sizes (smaller than for younger adults), visualization of sizing (too large and bulky portions may be intimidating, the meal should look easy to eat) nutrient - dense foods('provide the most nutrition per bite'), flavour enhancement rather than amplification, modified texture, enhanced with micronutrients and/or functional ingredients, with compensatory strategies for persons with reduced motor skills or arthritis and easily handled, cut and eaten.

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RESEARCH IN HEALTH AND NUTRITION

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Mindfulness-based Eating Awareness Helps Adolescents Eat Healthier Foods, Be More Active

Medical News Today 5 April 2016

Some of the simplest, safest lessons to help adolescents combat obesity may be raising their awareness of what they are eating and whether they are even hungry, researchers say.

A pilot study of 40 adolescents in Richmond County, Georgia, showed that mindfulness-based eating awareness training encouraged adolescents to eat healthier and exercise more and marginalized their tendency to gain weight.

"This gives us a safe, inexpensive intervention that could be translated into a real-world program for overweight kids," said Dr. Vernon A. Barnes, physiologist at the Georgia Prevention Institute at the Medical College of Georgia at Augusta University. "If you can make a practice of keeping the awareness with you at every meal, this could benefit you throughout your life."

"If you can make a practice of keeping the awareness with you at every meal, this could benefit you throughout your life," said Barnes, corresponding author of the study in the International Journal of Complementary & Alternative Medicine.

In this first study looking at the impact of mindfulness approaches on the diet, exercise and eating behavior of adolescents, ninth-graders from six high school health physical education classes were randomly assigned to the control group, which just continued health classes or 12-week sessions of mindfulness intervention. Intervention starts with easier techniques such as breathing awareness meditation, where students focus on the movement of their diaphragm as a way to learn to pay more attention to their bodies. The dozen sessions also included researchers using chocolate to increase awareness of taste and taste satiety, explaining how emotions can trigger overeating as well as the benefit of mindful movement, including using pedometers and walking meditation.

The majority of the adolescents were overweight; most had bad eating habits and most were black. About 20 percent of intervention participants reported they were not conscious of the fact that they were eating too fast or that they were uncomfortable afterward. Nearly 60 percent reported a binge-eating problem, which, unfortunately, mindfulness-based eating awareness did not reduce, Barnes said. Progress, including what they ate, how often they exercised and whether they continued to binge, was assessed at the end of the 12-week session and again three months later, Barnes said.

Study co-author, Dr. Jean L. Kristeller, clinical psychologist and professor emeritus at Indiana State University, had already adapted mindfulness-based stress reduction into an eating awareness program so adult consumers would be more aware of what they are eating and ideally better regulate it. She and Barnes further adapted that two-hour program into a 50-minute session that would fit into normal class time for younger individuals. Adolescents in the intervention arm ate better and exercised more, said Barnes. Moderate physical activity for participants increased 1.4 days per week compared with controls who actually decreased their activity over the study period by about half a day per week. Over six months, intervention participants went from 2.9 to 3.6 to 4.3 days of activity each week vigorous enough to make them breathe hard and/or sweat. Controls dropped from nearly three days to about two days of vigorous activity per week.

Adolescents in the intervention group experienced a slight downward trend in their weight compared with their also mostly overweight peers who continued to trend slightly upward. Weight loss, even maintaining a steady weight, is difficult among adolescents, who typically experience multiple growth spurts and puberty, Barnes said. "At least for this group, we were able to keep them on an even keel for a few months," he said.

While those in the intervention arm were consuming a healthier diet - lower fat and calories - many also continued binge behavior, with most continuing to report mild to moderate binge behavior. Intervention participants did report a decrease in perceived hunger.

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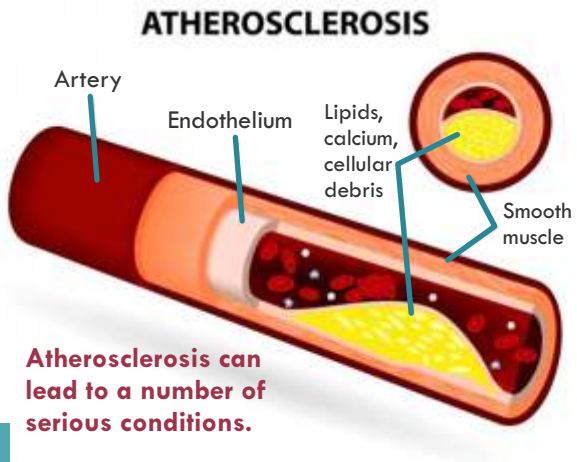
How can red wine help the gut microbiome to prevent heart disease?

Written by Yvette Brazier
Medical News Today 5 April 2016

Red wine contains a compound called resveratrol, which could reduce the risk of heart disease by changing the gut microbiome, according to research published in mBio.

Cardiovascular disease is the number one cause of death in the US and other industrialized countries, and it is fast becoming a major health problem in developing countries, too.
Recent research into the gut microbiome suggests that it holds the key to many health issues, and now it appears that it could have an impact on the development of atherosclerosis. According to the University of Maryland Medical Center, atherosclerosis affects 80-90% of Americans over the age of 30. Atherosclerosis occurs when plaque, which consists of fat, cholesterol, calcium and other substances, accumulates in the arteries. In time, the plaque hardens, restricting the arteries and limiting the flow of oxygen-rich blood. This can lead to heart attack, stroke, vascular dementia and even death. Atherosclerosis can also affect the arms and legs, the pelvis and the kidneys, and it can lead to a range diseases involving the arteries.



Atherosclerosis can lead to a number of serious conditions.

Resveratrol is a plant compound that occurs naturally in peanuts, grapes, red wine and some berries. It is a polyphenol, believed to have antioxidant properties that may protect against conditions such as heart disease, cancer and neurogenerative diseases.

The protective action of resveratrol

Researchers, led by Man-tian Mi, PhD, of the Research Center for Nutrition and Food Safety in Chongqing, China, wanted to find out more about how resveratrol might protect against atherosclerosis. They carried out a series of mouse experiments to investigate how resveratrol might alter the bacterial community in the gut in a way that could provide such protection.

Findings showed that resveratrol reduces levels of trimethylamine-N-oxide (TMAO), known to be a contributory factor in the development of atherosclerosis. It also inhibited the gut bacteria's production of TMA, which is necessary for the production of TMAO. In mice, resveratrol appears to increase the Bacteroidetes-to-Firmicutes ratios, to inhibit the growth of Prevotella and to makeBacteroides, Lactobacillus, Bifidobacterium, and Akkermansia more abundant.

Dr. Mi says: "Our results offer new insights into the mechanisms responsible for resveratrol's anti-atherosclerosis effects and indicate that gut microbiota may become an interesting target for pharmacological or dietary interventions to decrease the risk of developing cardiovascular diseases."

The findings suggest that, in future, a natural polyphenol without any side effects could be used to treat cardiovascular disease. The next step will be to further define the role of resveratrol in cardiovascular disease and to replicate the findings in humans. According to Oregon State University Micronutrient Information Center, humans absorb resveratrol well, but since it is quickly metabolized and eliminated, its bioavailability is low.

Tomatoes may combat the damaging effects of radiation

Medical News Today 4 April 2016


Image © iStock.com/Indiah

A team of researchers have discovered that lycopene - the red pigment in tomatoes - is extremely successful at guarding against the harmful effects of radiation.

Dr Ruth Edge from The University of Manchester, together with her colleagues Professor George Truscott from Keele University and Professors Fritz Boehm & Christian Witt from Berlin, undertook a study of lycopene (one of the carotenoids - plant pigments found in many fruits and vegetables) and its effectiveness at protecting against radiation at the University of Manchester's Dalton Cumbrian Facility, part of the Dalton Nuclear Institute.

Radiation therapy is used to treat a wide range of tumours, but until now, its side effects have constrained its effectiveness. Recently, there has been interest in the possible role of dietary carotenoids in limiting these effects. In addition, interest has grown in identifying dietary counter-measures against nuclear accidents.

The results of the study, published in FEBS Letters, have shown that lycopene is an effective carotenoid at offering protection from the damaging effects of gamma radiation, and that dietary intervention could be useful in efforts to defend people from these effects. A plentiful supply of tomatoes, cooked in oil which helps the body to absorb carotenoids, would be an effective way of adding lycopene to diets. A major finding of the study is that such protective effects are reduced as the oxygen concentration is increased.

Dr Ruth Edge, Experimental Officer and Laboratory Manager at the Dalton Cumbrian Facility, said: "We have shown that lycopene can protect human cells efficiently against gamma radiation at low, but not high oxygen concentrations, and we hope that this effect may allow for improvements in radiation cancer therapy if the oxygen concentration can be increased in solid tumours compared to the healthy surrounding tissue".

Future studies will look at other dietary carotenoids, as well as mixtures, to determine whether there is also an oxygen effect and to try to increase any protection range observed with oxygen concentration. In addition, the team will also study the oxygen effect using other sources of radiation, such as proton and alpha particle beams from the Dalton Cumbrian Facility accelerator.

Gluten: What Is Gluten? Facts, Foods and Allergies

Written by Megan Ware Medical News Today 5 April 2016

Gluten is the general term for a protein found in wheat, barley, rye and triticale. All forms of wheat contain gluten, including durum, spelt and farro.

Wheat is commonly found in bread, baked goods, crackers, cereals and pasta. Soups may contain gluten, as well as sauces and salad dressings. Barley is often found in malt, food coloring, soups, malt vinegar and beer. Unfortunately, a significant number people have an adverse reaction to gluten when they consume it, meaning that they must adhere to a gluten-free diet to remain healthy. This Knowledge Center article provides further information on gluten, including why some people should avoid consuming it and which foods are known to contain gluten.

Fast facts on gluten

Here are some key points about gluten. More detail and supporting information can be found in the main article.

- Gluten refers to a protein that is present in wheat, rye and barley
- Gluten can be found in food products as diverse as salad dressings and beer
- Cosmetics, medications and nutritional supplements can also contain gluten
- For people with celiac disease, gluten causes damage to the small intestine
- Celiac disease should be treated with a gluten-free diet
- Gluten is only hazardous to the health of people with celiac disease.

What is gluten?

Gluten is a name given to proteins found in all forms of wheat, barley, rye and triticale. These proteins help bind foods together, maintaining their shape.

Gluten is most commonly found in foods such as bread, cereals, baked goods and pasta for which wheat, barley, rye and triticale are often key components. However, these grains are also used less obviously in other foods, including soups, food coloring, sauces, salad dressings, vinegar and beer. An individual may need to eat a gluten-free diet for several reasons.

Celiac disease is an autoimmune disorder in which someone is genetically predisposed to have a reaction to gluten that damages the small intestine. This leads to intestinal damage, poor nutrient absorption and physical pain. A person with celiac disease should consume a completely gluten-free diet.

Gluten sensitivity is a condition in which individuals may experience abdominal pain, bloating, diarrhea, constipation, headaches and fatigue after consuming gluten. Those with gluten sensitivity will not experience the small intestine damage that a person with celiac disease will. Elimination of gluten may improve these symptoms.

Some people also choose to follow a gluten-free diet because they believe that it is a healthy diet to follow. However, there is limited evidence to suggest that gluten is bad for your health outside of celiac disease. You can learn more about the trend of following a gluten-free diet in our Spotlight article. Last year, Gaynor Bussell, a dietitian and spokesperson for the UK's Association for Nutrition, told Medical News Today: "Gluten is only bad for health if you are a celiac."

Avoiding gluten

For individuals trying to avoid gluten, checking ingredient labels is extremely important. If a product contains wheat, it will be clearly labelled under allergy information. Products labelled wheat-free are not necessarily gluten-free. They may still contain spelt (a form of wheat), rye or barley-based ingredients, for example.

Image © iStock.com/Nik_Merkulov

Gluten can be found in many common foods such as bread and baked goods.

Fast facts about celiac disease

Around 1 in 141 Americans has
❖celiac disease
❖ Symptoms of celiac disease include stomach cramps and nausea
❖ The only effective treatment for celiac disease is a gluten-free diet.

Learn more about celiac disease

A law enacted in August 2014 by the FDA ensures that all products labelled gluten-free are safe for individuals with celiac disease or gluten intolerance to consume.
Some non-food products may contain hidden sources of gluten, sometimes in the form of lecithin. Always check the ingredients for the following products if you are avoiding gluten:
❖ Prescription and over-the-counter medication
❖ Vitamin, mineral and herbal supplements
❖ Cosmetics
❖ Lip balm
❖ Other skin and hair products
❖ Toothpaste and mouthwash
❖ Adhesive glue found on stamps and envelopes
❖ Modelling dough.

Individuals with celiac disease should also avoid cross-contact of gluten-containing foods; this is when a gluten-free food comes into contact with gluten-containing foods.
Cross-contact can frequently occur with:
❖ Toasters
❖ Colanders
❖ Cutting boards
❖ Oil used in fried foods
❖ Shared containers
❖ Utensils.

Oats are often contaminated with gluten. Look for oats that are specifically labelled as gluten-free.

Gluten-free foods

There are many naturally gluten-free foods that are safe to consume on a gluten-free diet:
❖ Fruits
❖ Vegetables
❖ Legumes
❖ Meat
❖ Dairy products
❖ Eggs.

Be sure if you purchase any of these in packaged form that nothing was added containing gluten. There are also versions of gluten-containing products that replace certain ingredients to make them gluten-free, such as gluten-free bread, cereals or baked goods.
Rice and quinoa are naturally gluten-free.
It is important to not self-diagnose the need for a gluten-free diet. If you suspect that you should eliminate gluten from your diet, talk to your doctor or a registered dietitian first.

Celiac disease may be driven by specific gut bacteria

Only a small proportion of individuals who are genetically susceptible to celiac disease actually develop the condition, though the reasons why have been unclear. Now, a new study suggests it may be down to how certain gut bacteria respond to gluten.

Tanning may protect skin against harmful UV irradiation but block vitamin D synthesis

Medical News Today 4 April 2016

As skin tans, it darkens to protect itself against harmful ultraviolet (UV) radiation, but the increasing pigment blocks vitamin D synthesis, limiting the skin's ability to produce more vitamin D, a new study from Brazil finds.

The results were presented in a poster Saturday, April 2, at ENDO 2016, the annual meeting of the Endocrine Society, in Boston. Even people exposed to high levels of sunlight may be deficient in serum vitamin D because it is mainly induced by UV irradiation and synthesized in the skin.

"Our research showed that, in a large sample of individuals living in a tropical region located 8 degrees south of the equator with very high rates of sun exposure and extremely high UV irradiation, most people had serum vitamin D below 30 ng/ml (nanograms per milliliter), the cutoff for normal," said lead study author Francisco Bandeira, MD, PhD, associate professor of medicine and chief of the Division of Endocrinology and Diabetes at the University of Pernambuco Medical School in Recife, Brazil. "Our findings suggest that skin tanning, which is a natural protection against the harmful effects of UV irradiation, limits the progressive rise in serum vitamin D towards optimal concentrations."

Bandeira and colleagues evaluated 986 people between 13 and 82 years of age, with roughly equal numbers of males and females, living in the city of Recife, Brazil. All study participants had high rates of daily sun exposure and did not regularly use sunscreen or take vitamin D supplements.

The researchers evaluated each participant's Fitzpatrick skin phototype scale to estimate the response of different skin types to UV light. In general, higher Fitzpatrick scale scores indicate deeper color and tendency to tan rather than burn in the sun.
They also calculated each participant's sun index, the number of hours of sun exposure per week multiplied by the fraction of body surface area exposed. They measured everyone's serum vitamin D levels and compared them with their skin phototype and sun index scores.

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Although the individuals with greater sun exposure had skin that was more tanned and less vitamin D deficiency than other participants, most of those with very high daily exposure had serum vitamin D levels below the normal cut off. Overall, 72 percent of participants had vitamin D deficiency, and their mean vitamin D level was only 26.06 ng/ml. The participants with deficient serum vitamin D tended to be older and have lower sun index values than those with normal levels.

Daily coffee, even decaf, may protect against colorectal cancer

Written by Honor Whiteman
Medical News Today 1 April 2016

You probably don't need an excuse for your morning coffee fix, but a new study offers one. Researchers from the US and Israel found that drinking coffee every day - even decaffeinated coffee - may lower the risk of colorectal cancer.

Senior study author Dr. Stephen Gruber, of the University of Southern California (USC) Norris Comprehensive Cancer Center, and colleagues publish their findings in the journal Cancer Epidemiology, Biomarkers & Prevention.

In the US, colorectal cancer is the second most common cancer among men and women combined, excluding skin cancer, with more than 95,000 new cases of colon cancer and 39,000 new cases of rectal cancer expected to be diagnosed this year. The American Cancer Society state that the lifetime risk of developing colorectal cancer is 1 in 21 for men and 1 in 23 for women. But according to this latest research, one of America's favorite beverages -coffee - could have a protective effect against the disease.

Colorectal cancer risk halved with more than 2.5 coffee servings daily
For their study, Dr. Gruber and colleagues analyzed the data of 5,145 individuals who had been diagnosed with colorectal cancer, alongside 4,097 people who did not have the disease.

All participants were part of the Molecular Epidemiology of Colorectal Cancer (MECC) study, which is a population-based, case-control study conducted in northern Israel.
Fast facts about coffee
Around 54% of American adults drink coffee every day
65% of Americans drink their coffee with breakfast
The US spends around $40 billion on coffee each year.
As part of the study, subjects were required to complete a food frequency questionnaire, detailing their daily intake of espresso, instant, decaffeinated and filter coffee, as well as their daily consumption of other beverages.

The participants also completed a questionnaire that disclosed information on family history of cancer, diet, physical activity levels, smoking habits and other factors that may affect their risk of colorectal cancer.
The researchers found that drinking one to two servings of coffee a day - defined as moderate coffee consumption - reduced the risk of colorectal cancer by 26%, compared with participants who drank less coffee.
And the risk reduced even further with an increase in coffee intake; participants who consumed more than 2.5 servings of coffee daily had up to a 50% lower risk of colorectal cancer.


Drinking more than 2.5 servings of coffee daily reduced the risk of colorectal cancer by up to 50% in the new study.
Image © iStock.com/klenova

Not only did these findings remain after accounting for known colorectal cancer risk factors, but the researchers also found that the reduced risk was seen across all coffee types - even decaffeinated.
"We were somewhat surprised to see that caffeine did not seem to matter," says Dr. Gruber. "This indicates that caffeine alone is not responsible for coffee's protective properties."
What other coffee compounds are at play?
If caffeine is not solely responsible for coffee's protective effect against colorectal cancer, what is?

The researchers explain that both caffeine and polyphenol have antioxidant properties that can reduce the growth of colon cancer cells. Additionally, studies have suggested that compounds called melanoidins - which are produced during the roasting process - boost colon mobility, while the compound diterpene in coffee may boost the body's defence against oxidative damage, preventing cancer development.
"The levels of beneficial compounds per serving of coffee vary depending on the bean, roast and brewing method," says first author Stephanie Schmit, PhD, also of the USC Norris Comprehensive Cancer Center. "The good news is that our data presents a decreased risk of colorectal cancer regardless of what flavor or form of coffee you prefer."

The researchers note that in Israel - where the study participants were from - coffee consumption is less common and more variable than in the US. However, because their results indicate the protective effect of coffee exists across all types, the researchers believe there is no reason to believe the findings would not be applicable to Americans.
Still, Dr. Gruber says further research is needed before they can recommend coffee consumption as a preventive strategy for colorectal cancer.

He adds: "That being said, there are few health risks to coffee consumption; I would encourage coffee lovers to revel in the strong possibility that their daily mug may lower their risk of colorectal cancer." Coffee consumption has been linked to an array of possible health benefits. In February, Medical News Today reported on a study suggesting that coffee protects against liver cirrhosis, while a more recent study suggests six cups of coffee daily may lower the risk of multiple sclerosis (MS). However, some studies have noted the possible health risks of coffee consumption. A study published last September, for example, found that drinking coffee in the evening may disrupt our body clock.

Asthma-free? Maybe Mom experienced a sunny second trimester

Medical News Today 31 March 2016

The best way to reduce a child's chances of developing asthma might be making sure Mom had enough vitamin D during the second trimester, a new study from the University of Kansas shows.

The most cost-effective way to get Mom more vitamin D could be as simple as health recommendations that consider the benefits of soaking up a little more sun, a practical and cost-effective way to get a dose of D. According to the Centers for Disease Control and Prevention, 1 in 12 of us in the U.S. suffers from asthma. "Our health system spends billions and billions treating asthma, and there's lots and lots of opportunity costs," said David Slusky, assistant professor of economics. "Pain and suffering, loss of productivity and premature death -- asthma has all of those." When resources are being used inefficiently, that's when Slusky and his fellow economists like to step in. They knew about a recent medical hypothesis by Scott Weiss and Augusto Litonjua, both of whom are physicians with Brigham and Women's Hospital in Boston and professors at Harvard Medical School. Weiss and Litonjua hypothesize that vitamin D levels in the second trimester of pregnancy influence the probability that a fetus will develop asthma later in life. Slusky and colleagues Nils Wernerfelt of the Massachusetts Institute of Technology and Richard Zeckhauser of Harvard's Kennedy School put the medical hypothesis to the test using an economist's tools, such as survey and health data.

"This is the golden age in the way that data about hospital discharges, insurance claims, birth certificates and death certificates are more and more available and more and more set up for researchers," Slusky said. "And that allows economists to get really large sample sizes with not a lot of cost." Using data from hospital discharges in two states and from a national survey, Slusky and his colleagues looked at where and when asthmatics were born. Then the economists looked at the measurements of sunlight in the birth locations when the asthmatics' mothers would have been in their second trimesters. Sunlight is where Americans get more than 90 percent of our vitamin D.


Image © iStock.com/MariaDubova

What the economists found was that a mother's increased sunlight exposure -- and therefore, vitamin D -- during this period lowers her child's chance of developing asthma. Because of concerns about individuals in different parts of the country being systematically different, Slusky and his co-authors looked at relative differences. "We're not looking at sunny places versus non-sunny places," Slusky said "We looked at the relative differences of the level of sunlight at a particular place at a particular time of year." In other words, people born in Georgia in July of 1978 received a different exposure to sunlight in utero than did their fellow Georgians born a year later. "If that place is relatively more sunny during the second trimester, we found relatively lower rates of asthma," Slusky said.
The findings indicate that the way pregnant women can get more vitamin D -- and lessen the likelihood of asthma in their children -- may be as simple as 10 minutes in the sun, which medical literature indicates is all most of us need for a daily dose of the "sunshine vitamin."

"Skin cancer is a very serious disease, and I don't want to minimize it, but at some point that extra minute you spend inside is costing you more vitamin D than it's helping you not get skin cancer," Slusky said. Vitamin D can be acquired from dietary supplements, too, but Slusky and his colleagues point out that the prenatal vitamins many pregnant women take already include vitamin D and that they may not be getting the full benefit from them. Moreover, sunshine is free.

"Calibrating this into the proper policy recommendation is something I'll leave to others, but I think that's where this research is going," Slusky said. Case in point, health officials in Australia are becoming more aware of vitamin D deficiencies. They have begun urging schools to relax requirements that students wear hats while outside during that continent's winter months of June and July. "Clearly if I'm going to the beach or going to spend all day outside, I need to put on sunscreen," Slusky said. "But spending 10 minutes outside without it may not be such a bad idea."


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Coffee may improve insulin sensitivity in diabetics

IFT Weekly April 6, 2016

A study published in the International Journal of Pharmacy and Pharmaceutical Sciences shows that drinking coffee may lower blood sugar and uric acid levels in type 2 diabetic patients.

For the study, 200 people drank three to four cups of filtered coffee made of roasted coffee beans and chicory each day for more than 16 years. Of the 90 participants who were diabetics, 48 were coffee drinkers. Blood tests showed that non-diabetic patients experienced an average 5% decrease in blood sugar levels and 10% decrease in uric acid levels over the course of the 16 years. The diabetic coffee drinkers experienced even greater results; they had lowered their average uric acid levels by nearly 15% and blood sugar levels by 20%.

Studies have shown a link between high uric acid levels and insulin resistance, or the body's inability to process insulin. By lowering levels of this chemical, as well as blood sugar (another risk factor when it's high), coffee helped to improve insulin sensitivity, the researchers wrote.

WHO study: Diabetes cases reach 422 million worldwide

IFT Weekly April 13, 2016

A World Health Organization (WHO) study published in The Lancet shows that the number of adults with diabetes has quadrupled worldwide in under four decades to 422 million, and the condition is fast becoming a major problem in poorer countries.

In one of the largest studies to date of diabetes trends, the researchers said aging populations and rising levels of obesity across the world mean diabetes is becoming "a defining issue for global public health."

The study used data from 4.4 million adults in different world regions to estimate age-adjusted diabetes prevalence for 200 countries. It found that between 1980 and 2014, diabetes has become more common among men than women, and rates of diabetes rose significantly in many low- and middle-income countries, including China, India, Indonesia, Pakistan, Egypt, and Mexico.

The study found that northwestern Europe has the lowest rates of diabetes among women and men, with age-adjusted prevalence lower than 4% among women and at around 5%–6% among men in Switzerland, Austria, Denmark, Belgium, and the Netherlands. No country saw any meaningful decrease in diabetes prevalence, it found.

The data also showed that half of adults with diabetes in 2014 lived in five countries—China, India, the United States, Brazil, and Indonesia. Rates more than doubled for men in India and China between 1980 and 2014.

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Genetic variation may help vegetarians process omega fatty acids

IFT Weekly April 13, 2016


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A study by Cornell University researchers published in Molecular Biology and Evolution shows that a genetic variation—called an allele—has evolved in populations that have historically favored vegetarian diets, such as in India, Africa, and parts of East Asia. They also discovered a different version of this gene adapted to a marine diet among the Inuit in Greenland, who mainly consume seafood.

The vegetarian allele evolved in populations that have eaten a plant-based diet over hundreds of generations. The adaptation allows these people to efficiently process omega-3 and omega-6 fatty acids and convert them into compounds essential for early brain development and if they stray from a balanced omega-6 to omega-3 diet, it may make people more susceptible to inflammation, and by association, increased risk of heart disease and colon cancer. The researchers analyzed frequencies of the vegetarian allele in 234 primarily vegetarian Indians and 311 U.S. individuals and found the vegetarian allele in 68% of the Indians and in just 18% of Americans. Analysis using data from the 1,000 Genomes Project similarly found the vegetarian allele in 70% of South Asians, 53% of Africans, 29% of East Asians, and 17% of Europeans.

In Inuit populations of Greenland, the researchers uncovered that a


Image © iStock.com/Pilin_Petunyia

previously identified adaptation is opposite to the one found in long-standing vegetarian populations: While the vegetarian allele has an insertion of 22 bases (a base is a building block of DNA) within the gene, this insertion was found to be deleted in the seafood allele. “The opposite allele is likely driving adaptation in Inuit,” said Kaixiong Ye, co-lead author of the paper and postdoctoral researcher in Cornell’s biological statistics and computational biology department. “Our study is the first to connect an insertion allele with vegetarian diets, and the deletion allele with a marine diet.”

Previous work by co-senior author Tom Brenna, professor of human nutrition and chemistry at Cornell University, showed that the allele insertion can regulate the expression of FADS1 and FADS2— enzymes that are essential for converting omega-3 and omega-6 fatty acids into downstream products needed for brain development and controlling inflammation—and hypothesized it could be an adaptation in vegetarian populations. “One implication from our study is that we can use this genomic information to try to tailor our diet so it is matched to our genome, which is called personalized nutrition,” said Ye.

The unique biology of human breast milk

Medical News Today 19 April 2016

Humans may have the most complex breast milk of all mammals. Milk from a human mother contains more than 200 different sugar molecules, way above the average 30-50 found in, for example, mouse or cow milk.

The role of each of these sugars and why their composition changes during breastfeeding is still a scientific puzzle, but it's likely connected to the infant immune system and developing gut microbiome. A Review of what's known and the different jobs of human breast milk appears in Trends in Biochemical Sciences. Breast milk is often an infant's first meal, but many of the sugar molecules in the milk are not meant to feed the baby. Infants are born sterile of any bacteria in their guts, but within a few days they have millions, and after a week there are billions. The sugars that come from mother's milk are usually the first compounds that these bacteria have to chew on, a free lunch that is intended to culture specific bacterial species. "The first impact breast milk has is favoring the colonization of the gut by specific bacterial groups that can digest these sugar molecules," says Review co-author Thierry Hennet, from the Institute of Physiology at the University of Zurich. "Infants don't have the machinery to digest these sugars so they are literally for the bacteria - it's like a seeding ground, and breast milk is the fertilizer."

Human breast milk also helps lay the foundation for the new baby's immune system. After birth, milk is rich in antibodies and molecules that slow the growth of harmful bacteria and coordinate white blood cell activity. After one month, when the infant begins developing an adaptive immune system of his or her own, the composition of breast milk transitions so that levels of maternal antibodies drop by more than 90 percent. There is also a sharp decrease in the diversity of breast milk sugars, indicating less selection for bacterial species. Instead, mature human breast milk has an increased number of fat and other nutrients that support infant growth. Despite the many functions of breast milk, children can grow up healthy with limited supplies or without ever being exposed, raising controversial questions about what is normal when it comes to breastfeeding. Breast milk clearly reduces infant mortality and significantly decreases a newborn's risk for gut and airway infections, but there's little support for longer-term benefits.

"We have to be careful about giving any recommendations," says Hennet, who co-wrote the Review with Lubor Borsig, also a physiologist at the University of Zurich. "On the one hand, breast milk is the product of millions of years of evolution and certainly possesses the optimal nutrients for a newborn, but the question is how long does the newborn really need this supply? We feel families should make that decision, and not scientists." What researchers can do is continue to work on understanding the role of all of the different molecules in breast milk, something that has become much easier with advances in gene sequencing technologies. The next few years are likely to yield new understanding of the hormones within human breast milk and the exact role of the bacterial populations that it cultures in the infant gut.

Nutrient supplements can give antidepressants a boost: International evidence review gives thumbs up to omega-3s

Medical News Today 26 April 2016

An international evidence review has found that certain nutritional supplements can increase the effectiveness of antidepressants for people with clinical depression.


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Omega 3 fish oils, S-adenosylmethionine (SAMe)*, methylfolate (bioactive form of folate) and Vitamin D, were all found to boost the effects of medication. University of Melbourne and Harvard researchers examined 40 clinical trials worldwide, alongside a systematic review of the evidence for using nutrient supplements (known as nutraceuticals) to treat clinical depression in tandem with antidepressants such as SSRIs, SNRIs and tricyclics. Head of the ARCADIA Mental Health Research Group at the University of Melbourne, Dr Jerome Sarris, led the meta-analysis, published today in the American Journal of Psychiatry. "The strongest finding from our review was that Omega 3 fish oil - in combination with antidepressants - had a statistically significant effect over a placebo," Dr Sarris said. "Many studies have shown Omega 3s are very good for general brain health and improving mood, but this is the first analysis of studies that looks at using them in combination with antidepressant medication. The difference for patients taking both antidepressants and Omega 3, compared to a placebo, was highly significant. This is an exciting finding because here we have a safe, evidence-based approach that could be considered a mainstream treatment."

The University of Melbourne research team also found good evidence for methylfolate, Vitamin D, and SAMe as a mood enhancing therapy when taken with antidepressants. They reported mixed results for zinc, vitamin C and tryptophan (an amino acid). Folic acid didn't work particularly well, nor did inositol. "A large proportion of people who have depression do not reach remission after one or two courses of antidepressant medication," Dr Sarris said. "Millions of people in Australia and hundreds of millions worldwide currently take antidepressants. There's real potential here to improve the mental health of people who have an inadequate response to them." Dr Sarris said medical professionals may be hesitant to prescribe nutraceuticals alongside pharmaceuticals, simply because there has been a lack of scientific evidence around their efficacy. "Medical practitioners are aware of the benefits of omega 3 fatty acids, but are probably unaware that one can combine them with antidepressant medication for a potentially better outcome," he said.

The researchers found no major safety concerns in combining the two therapies, but stressed that people on antidepressants should always consult with their health professional before taking nutraceuticals and should be aware these supplements can differ in quality. "We're not telling people to rush out and buy buckets of supplements. Always speak to your medical professional before changing or initiating a treatment," Dr Sarris said. The researchers are currently conducting a National Health and Medical Research Council study using a combination of these nutraceuticals for depression.

China pays price of western lifestyle with soaring childhood obesity

Medical News Today 26 April 2016

China is paying the price of adopting a western lifestyle with soaring childhood obesity, shows a 29 year study in nearly 28 000 children and adolescents published today in the European Journal of Preventive Cardiology.

Less than 1% of children and adolescents were obese in 1985 compared to 17% of boys and 9% of girls in 2014. The authors speculate that boys may be fatter than girls because of a societal preference for sons. "This is extremely worrying," said Professor Joep Perk, cardiovascular prevention spokesperson for the European Society of Cardiology. "It is the worst explosion of childhood and adolescent obesity that I have ever seen. The study is large and well run, and cannot be ignored. China is set for an escalation of cardiovascular disease and diabetes, and the popularity of the western lifestyle will cost lives." Data for the study was obtained from six national surveys in schoolchildren carried out by the Department of Education in Shandong Province, China, between 1985 and 2014. A total of 27 840 rural students aged 7 to 18 years had their height and weight measured. Body mass index (BMI) was calculated as kg/m2. Overweight and obesity were defined using cut-off points recommended by the Working Group on Obesity in China (WGOC), the International Obesity Task Force (IOTF), and the World Health Organization (WHO).

The prevalence of overweight and obesity in boys increased from 0.74% and 0.03% in 1985 to 16.35% and 17.20% in 2014, and in girls increased from 1.45% and 0.12% in 1985 to 13.91% and 9.11% in 2014, respectively. "China is a large agricultural country and our findings have huge implications for the entire nation," said Dr Ying-Xiu Zhang, leader of the investigation team at the Shandong Centre for Disease Control and Prevention, Shandong University Institute of Preventive Medicine, Jinan, Shandong, China.

"The rises in overweight and obesity coincide with increasing incomes in rural households and we expect this trend to continue in the coming decades in Shandong Province and other regions of China."
"China has experienced rapid socioeconomic and nutritional changes in the past 30 years," continued Dr Zhang. "In China today, people eat more and are less physically active than they were in the past. The traditional Chinese diet has shifted towards one that is high in fat and calories and low in fibre."

The authors speculated that boys are fatter than girls because they are given preferential treatment. The Chinese 2005 National Youth Risk Behaviour Surveillance reported that 4.3% of boys and 2.7% of girls frequently had soft drinks, while 12.7% of boys and 4.3% of girls spent more than two hours per day playing computer games. Dr Zhang said: "Traditionally the societal preference, particularly in rural areas, has been for sons. That could result in boys enjoying more of the family's resources. In addition, boys may prefer to have a larger body size than girls." "Computer games themselves are not the issue," added Professor Perk. "The problem is that kids sit there with a two litre bottle of fizzy drink. To burn those calories they would need to walk 46 km but they don't."
The prevalence of overweight and obesity is rising faster in children than (7 to 12 years) than adolescents (13 to 18 years), which the authors say could be because teenagers are more concerned about their appearance. "Adolescents generally pay more attention to their body shape and do more exercise than children," said Dr Zhang. "Rural areas of China have been largely ignored in strategies to reduce childhood obesity," said Dr Zhang. "This is a wake-up call for policymakers that rural China should not be neglected in obesity interventions. We need to educate children on healthy eating and physical activity, and monitor their weight to check if these efforts are making a difference." Professor Perk said: "This calls for a catastrophe committee in China to stop the alarming rise in childhood and adolescent obesity. They need to return to their former nutritional habits instead of eating junk food. Parents must take some responsibility and point their children in the direction of healthier choices."

Cashews: Nutritional Information, Health Benefits

Written by Megan Ware RDN LD
Medical News Today 25 April 2016

Cashews are a type of nut with a soft consistency and sweet flavour.

They are native to South America, specifically Brazil, and were introduced by colonists to Africa and India; these regions are the largest producers of cashews today. Cashews are sold both raw or roasted, and salted or unsalted. Cashews have recently been used to make dairy alternatives, such as cashew milk, cashew-based cheese and cashew-based cream sauces and sour cream. This MNT Knowledge Center feature is part of a collection of articles on the health benefits of popular foods. It provides a nutritional breakdown of cashews and an in-depth look at their possible health benefits, how to incorporate more cashews into your diet and any potential health risks of consuming cashews.
Nutritional breakdown of cashews

- 157 calories
- 8.56 g of carbohydrate
- 1.68 g of sugar
- 0.9 g of fiber
- 5.17 g of protein.

According to the US Department of Agriculture (USDA) National Nutrient Database, approximately 1 oz of raw cashews (28.35 g) contains:
A 1 oz serving of raw cashews will provide the following percentages of recommended daily nutrient intake:

- 31% of copper
- 23% of manganese
- 17% of phosphorus
- 10% of iron
- 8% of selenium
- 5% of vitamin B6.

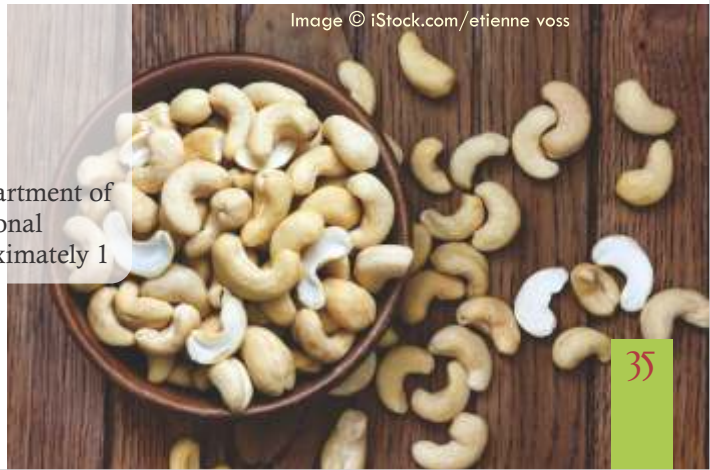
A 1 oz serving of cashews is about 18 whole cashews. Cashews are high in monounsaturated and polyunsaturated fats and a good source of protein.

Possible benefits of consuming cashews

Consuming plant-based foods of all kinds has long been associated with a reduced risk of many lifestyle-related health conditions. Many studies have suggested that increasing consumption of plant foods like cashews decreases the risk of obesity, diabetes, heart disease and overall mortality while promoting a healthy complexion and hair, increased energy and overall lower weight.

Heart health

The monounsaturated and polyunsaturated fatty acids found in cashews are known to decrease LDL cholesterol and triglyceride levels, which reduces the risk of cardiovascular disease, stroke and heart attack. A study published in the British Journal of Nutrition showed that the risk of coronary heart disease is 37% lower for those consuming nuts more than four times per week compared with people who never or seldom consume nuts. The US Food and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Drug Administration (FDA) have approved a health claim for food labels that "eating 1.5 oz per day of most nuts as part of a diet low in saturated fat and cholesterol may reduce the risk of heart disease." Cashews are a good source of magnesium, which plays an important role in over 300 enzymatic reactions within the body including the metabolism of food and synthesis of fatty acids and proteins. Magnesium is also involved in muscle relaxation and neuromuscular transmission and activity. Magnesium deficiency, especially prevalent in older populations, is linked to insulin resistance, metabolic syndrome, coronary heart disease and osteoporosis. Several studies have found that a high intake of calcium without sufficient magnesium could increase the risk of arterial calcification and cardiovascular disease, as well as kidney stones. People with the highest intake of magnesium were found in the Framingham Heart Study to have a 58% lower chance of having coronary artery calcification and a 34% lower chance of abdominal artery calcification.

Weight management

Limited data suggest that routine nut consumption is associated with elevated resting energy expenditure. In addition, in trials that compare weight loss between food regimens that include or exclude nuts, regimes that include nut consumption in moderation showed greater weight loss. A study published in the American Journal of Clinical Nutrition found that women who reported rarely eating nuts had a greater incidence of weight gain over an 8 year period than women who consumed nuts two or more times a week.

Gallstones

According to a study in the American Journal of Clinical Nutrition, frequent nut consumption is associated with a reduced risk of requiring a cholecystectomy - a surgical procedure to remove the gallbladder. In over a million people documented over a time span of 20 years, women who consumed more than 5 oz of nuts a week had significantly lower risk of cholecystectomy than women who ate less than 1 oz of nuts each week.

Bone health

Cashews are one of the few food sources that are high in copper. Severe copper deficiency is associated with lower bone mineral density and an increased risk of osteoporosis. More research is needed, however, on the effects of marginal copper deficiency and the potential benefits of copper supplementation for prevention and management of osteoporosis. Copper also plays an important role in the maintenance of collagen and elastin, major structural components of our bodies. Without sufficient copper, the body cannot replace damaged connective tissue or the collagen that makes up the scaffolding for bone. This can lead to a range of problems, including joint dysfunction as bodily tissues begin to break down. The magnesium in cashews is also important for bone formation as it helps with the assimilation of calcium into the bone. Manganese, another mineral in cashews, has been shown to prevent osteoporosis in combination with calcium and copper.

How to incorporate more cashews into your diet

Nuts have a high fat content, and so they are prone to rancidity. Keep cashews in a cool, dark and dry place to improve their shelf life. If stored properly, cashews will keep for a few months at room temperature, a year in the refrigerator or 2 years in the freezer. Rancid nuts are not unsafe but have a sharp flavor most people find unpleasant.

Quick tips:

✓ Make homemade trail mix with a mixture of cashews and other nuts, seeds and dried fruit
✓ Make your own cashew butter (like peanut butter) by blending whole, raw cashews in a food processor until smooth
✓ Top main dishes such as fish or chicken with a mixture of chopped cashews and herbs before baking
✓ Mix cashews into your next salad or stir fry.

Potential health risks of consuming cashews

It is the total diet or overall eating pattern that is most important in disease prevention and achieving good health. It is better to eat a diet with variety than to concentrate on individual foods as the key to good health.

Less body fat for toddlers taking vitamin D

Science Daily May 2, 2016

Supple-ment given during first year of life critical for muscle-mass development

A healthy intake of vitamin D in the first year of life appears to set

Image © iStock.com/bhowie

children up to have more muscle mass and less body fat as toddlers, according to a new study published in the journal Pediatric Obesity. The findings emerged from research initially aimed at confirming the importance of vitamin D for bone density.

The additional benefit in terms of body composition came as a surprise for the research team. "We were very intrigued by the higher lean mass, the possibility that vitamin D can help infants to not only grow healthy skeletons but also healthy amounts of muscle and less fat," said Hope Weiler, one of the study's authors and Director of the Mary Emily Clinical Nutrition Research Unit at McGill University. For the first time, a connection was made between the benefits of achieving healthy vitamin D status during a baby's first 12 to 36 months and how muscle mass develops. The researchers achieved this by following up on a 2013 study in which 132 infants in Montréal, Québec, were given a vitamin D3 supplement at one of four different dosages between the ages of 1 month and 12 months.

The new study confirmed the importance for the development of strong bones of a vitamin D supplement of 400 IU/day during a baby's first year. This amount is in line with current Canadian health guidelines. The researchers found that higher doses did not provide any additional benefit -- at least not in terms of bone development. But the body scans used to assess bone density also allowed the team to measure the children's muscle and fat mass. While there were no significant differences in body composition across the different dosage groups, the researchers found children who had vitamin D stores above the threshold recommended by the Canadian Paediatric Society (CPS) averaged around 450 grams less body fat at 3 years of age.

Supplements important in long winters

Vitamin D supplementation is routinely recommended for babies until they can get an adequate amount through their diet. The skin synthesizes vitamin D when exposed to sunlight, making supplementation all the more important where long winters reduce the opportunity for this to happen. In addition, Health Canada advises parents and caregivers to avoid direct sunlight and avoid use of sun block creams in young infants.

Physical activity also reduces body fat

Further analysis also indicated a correlation between lean muscle mass and the average level of vitamin D in the body over the first three years of a child's life. The only other factor found to make a significant difference to the children's amount of body fat was their level of physical activity.

Reducing waste while improving snack nutrition

Science Daily April 26, 2016

Carrot pulp adds fibre, increases puffiness of snack foods.

Your favorite puffed snack food may soon contain more fiber and nutrition, thanks to research from Washington State University food scientists. Girish Ganjyal and some of his graduate students have discovered how to add carrot pomace -- the pulpy leftover from juicing the veggies -- to cornstarch, increasing the "puffiness" of snack foods.

"That's great -- we didn't know what we would find," said Ganjyal, a WSU/University of Idaho School of Food Science assistant professor and WSU Extension food processing specialist. "We hope to continue researching and see just how the starch and fiber are interacting at the molecular level. Hopefully, we can include even more pomace in the recipe."

The results are published as "Carrot pomace enhances the expansion and nutritional quality of corn starch extrudates," in the May edition of the journalLWT-Food Science and Technology. The research team experimented with concentrations of 5, 10 and 15 percent carrot pomace. "At five percent, it was great," Ganjyal said. "But at the higher concentrations, the end product got more dense and didn't puff nearly as much."

Pomace doesn't affect the taste of snack foods, he said. In addition to adding fiber and some important nutrients to foods, the research creates a use for a wasted byproduct. Pomace is a leftover after industrial juicing of fruits and vegetables including apples, cherries, blueberries, grapes and carrots.

Ganjyal said he talked with juice industry professionals and farmers who want to do something with the residue. With juice production increasing, there is more pomace byproduct. "If we can find a real use for this, and add something positive to snack foods without affecting the taste or texture, it's a real win-win," he said.

WSU professor Girish Ganjyal holds the snack puffs he and his students made with added carrot pomace.

Image Source http://news.wsu.edu

FOOD SCIENCE & INDUSTRY NEWS

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How we feed the world is unsustainable, reports IFPRI

IFT Weekly April 13, 2016

The International Food Policy Research Institute (IFPRI) has released its "2016 Global Food Policy Report," which provides an in-depth look at major food policy developments and events in the past year, and examines key challenges and opportunities for the coming year.

The report states that today's global food system has major weaknesses: nearly 800 million people are left hungry, one-third of the human race is malnourished, more than half of some crops never make it to the table, and we use environmentally-unfriendly agricultural practices. It also states that as the global population is expected to soar exponentially in the coming years, various ways must be examined to feed more people efficiently and sustainably, while combating climate change. "The Sustainable Development Goals task us all with the challenge of eradicating hunger and under-nutrition in 15 years or less," said Shenggen Fan, IFPRI director general. "We must promote and support a new global food system that is efficient, inclusive, climate-smart, sustainable, nutrition- and health-driven, and business-friendly in order to ensure that no one goes to sleep hungry."

The 2016 report takes a look at the latest research on opportunities and challenges the world will face in achieving multiple Sustainable Development Goals (SDGs). The report includes chapters on climate change and smallholder farmers, sustainable diets, food loss and waste, and water management. Finally, the report examines how shifting diets—the type, combination, and quantity of foods consumed—can help close the food gap sustainably. While the focus here is on calories and protein, diet shifts must also be implemented with an eye toward providing the full range of nutrients essential to a healthy diet. Three current global diet trends increase the challenge of sustainably closing the food gap: 1) overconsumption of calories, 2) overconsumption of protein and a shift toward animal-based sources, and 3) growing demand for beef, in particular. The report concludes with recommendations to shift those diet trends in order to help close the food gap and reduce agriculture's pressure on land, water, and climate.

United Nations aims to eradicate hunger, prevent malnutrition

IFT Weekly April 6, 2016

Calling attention to the nearly 800 million chronically undernourished people and over two billion with micronutrient deficiencies, the United Nations (UN) General Assembly has introduced the Decade of Action on Nutrition that will run from 2016 to 2025.

The 193-member General Assembly adopted a consensus resolution on April 1, calling on the Food and Agriculture Organization (FAO) and the World Health Organization (WHO) to lead the implementation of the Decade.

The UN agencies, in addition to working with national governments, will collaborate with the World Food Program (WFP), the International Fund for Agricultural Development (IFAD), and the UN Children's Fund (UNICEF), and involve coordination mechanisms such as the UN System Standing Committee on Nutrition (UNSCN) and multi-stakeholder platforms such as the Committee on World Food Security (CFS).
Among other topics to be focused on during the Decade will be assistance to the some 159 million children under the age of five who are stunted, meaning too short for their age, and the approximately 50 million in that age bracket who are wasted, or have a low weight for their height. Meanwhile, around the world, about 1.9 billion people are overweight, of whom 600 million are obese.

"This resolution places nutrition at the heart of sustainable development and recognizes improving food security and nutrition are essential to achieving the entire 2030 Agenda," said José Graziano da Silva, FAO director-general. "Children can't fully reap the benefits of schooling if they don't get the nutrients they need; and emerging economies won't reach their full potential if their workers are chronically tired because their diets are unbalanced. That's why we welcome the Decade of Action on Nutrition and look forward to helping make it a success."

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Consumers prefer protein blends in ready-to-drink beverages

IFT Weekly April 6, 2016

DuPont Nutrition & Health has published the findings from its multi-phase, proprietary "Beverage Key Drivers of Liking Study," which shows that consumers rank taste as their most important criteria when choosing a high-protein beverage.

Protein content ranked second, according to the study, which was conducted to better understand consumer taste preferences in the $2.7 billion U.S. retail ready-to-drink (RTD), high-protein beverage category, while protein source was significantly less important.

A trained descriptive panel profiled more than 65 commercial high-protein (>8g of protein per 237 mL/serving, with the maximum level being 20 g/237 mL serving) beverages containing various sources of protein. Descriptive profiling enabled DuPont to create a "sensory map" of the category, which demonstrated how much flavor diversity exists in the high-protein beverage category. Following descriptive profiling, consumer panels in three U.S. cities evaluated 20 beverages—both commercial and DuPont prototypes—occupying unique spots on the sensory map. Consumers perceived the ideal protein content level to be 25 g of protein per serving. This finding was consistent across consumer segments that indicated they either used such beverages to support weight loss, as a supplement before or after exercise, or as a meal or snack alternative. Another key finding from the study pointed to the value of blending proteins, particularly soy and dairy proteins. RTD high-protein beverages formulated with blends of dairy and soy protein performed better in flavor liking than beverages that were all dairy or all plant-based. Of the seven beverages that scored highest in the study, six were formulated with blends of dairy and soy proteins. "This study adds to existing data confirming the benefit of soy and dairy blends in driving better flavor in the category," said Colleen Conley, DuPont Nutrition & Health principal scientist/sensory science and one of the main study collaborators. "All proteins, including dairy and soy, have inherent positive and negative flavor attributes. By blending them, you can create formulas that maximize their positive attributes and minimize any negatives."

Soy shows promise as natural anti-microbial agent

Medical News Today 26 April 2016

Soy isoflavones and peptides may inhibit the growth of microbial pathogens that cause food-borne illnesses, according to a new study from University of Guelph researchers.

Soybean derivatives are already a mainstay in food products, such as cooking oils, cheeses, ice cream, margarine, food spreads, canned foods and baked goods. The use of soy isoflavones and peptides to reduce microbial contamination could benefit the food industry, which currently uses synthetic additives to protect foods, says engineering professor Suresh Neethirajan, director of the BioNano Laboratory. U of G researchers used microfluidics and high-throughput screening to run millions of tests in a short period. They found that soy can be a more effective antimicrobial agent than the current roster of synthetic chemicals. The study is set to be published in the journal Biochemistry and Biophysics Reports this summer and is available online now. "Heavy use of chemical antimicrobial agents has caused some strains of bacteria to become very resistant to them, rendering them ineffective for the most part," said Neethirajan. "Soy peptides and isoflavones are biodegradable, environmentally friendly and non-toxic. The demand for new ways to combat microbes is huge, and our study suggests soy-based isoflavones and peptides could be part of the solution." Neethirajan and his team found soy peptides and isoflavones limited growth of some bacteria, including Listeria and Pseudomonas pathogens. "The really exciting thing about this study is that it shows promise in overcoming the issue of current antibiotics killing bacteria indiscriminately, whether they are pathogenic or beneficial. You need beneficial bacteria in your intestines to be able to properly process food," he said. Peptides are part of proteins, and can act as hormones, hormone producers or neurotransmitters. Isoflavones act as hormones and control much of the biological activity on the cellular level.

North America has one of the safest food sources in the world, said Neethirajan, but the United States Centers for Disease Control and Prevention estimates that about 48 million people in the U.S. suffer from some sort of food-borne illness every year. "In addition, some people are worried about the potential for long-term illnesses resulting from the use of synthetic chemicals," Neethirajan said. "The use of soy peptides and isoflavones could combat bacteria and reduce these concerns." The next step is for researchers to conduct large-scale tests, Neethirajan said. "We've created a recipe for this to go ahead. This could be very beneficial to food processors, as well as the farmers who grow soy beans."


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Bühler aims to 'close the global protein gap' with algae, insects and pulses

Food Navigator, 19 Apr 2016


Image © iStock.com/Magone

Swiss giant Bühler has backed a series of research and development (R&D) projects looking at insects, algae and pulses as alternative protein sources. By the year 2050 an additional 265 million tonnes of protein will be needed each year to feed the world's growing population.

"[But] closing this protein gap is a serious challenge," says Swiss processing giant Bühler. To meet this challenge, the company has teamed up with the Federal Institute of Technology in Zurich (ETH Zurich) to develop cultivation, extraction and processing technologies for proteins that can be produced in a more sustainable way compared with meat and dairy products. Insects, algae and pulses have been selected for their good nutritional profiles while microalgae, such as Chlorella and Spirulina, as well as insects are attractive because they do not compete with existing farmland and grow quickly. In the short term Bühler believes most demand will come from pulses but in the long term its sees algae, and insects in particular, as having the most potential. It has dedicated 40% of the project resources to pulses, 20% to algae and 40% to insect protein, and the first ingredients are expected to be rolled out within the next few years. Nadine Müller, nutrition programme manager at Bühler told FoodNavigator the ingredients would also be tailored to suit regional preferences across the globe.

"Food consumption differs from region to region. Therefore processes also have to be adapted to local attitudes. Let's take pulses as an example: in India, it is important to get splits with sharp edges and a shiny surface. In Europe, pulses are milled to flours that are applied in ready-to eat products like pasta, snacks, backed goods or meat analogs. For insects and algae a strong focus will be on Asia, where most algae are cultivated and regulatory and mindset barriers for insects are lower." Each protein is at a different stage of development. For pulse processing, Müller said some of the applications were fully developed for instance cell disruption technology developed for algae processing is ready for market but others are still in the research phase. Insect proteins are partly under development and partly in the research phase, and Bühler is in the process of setting up a pilot facility in China to process fly larvae and mealworms on an industrial scale, with the aim of producing both an insect flour that can replace fishmeal and a highgrade fat with a similar profile to palm kernel oil.

For insects, Bühler is looking into which ingredients are safe and whether there are any long-term effects on human and animal health. But with the novel food regulation still looming large in Europe, it will first develop insects as an ingredient for animal feed and pet food. "A completely new value chain has to be built up," Müller said. "Starting from ensuring a safe and reliable feedstock supply for the insect, via mass rearing of insect larvae as well as their processing into insect ingredients (e.g. protein meals), and finally application of this ingredients in final products like fish feed formulations or pet food products. To be successful, all activities need to be developed at the same time. Therefore we will rely on the success of certain other companies, but by having a good network the risk is manageable.""The regulatory framework regarding insects [for human consumption] is expected to be changed, but nobody knows, when this will be the case," she added.

Bühler, which transforms around 65% of the wheat harvested across the world into flour, is not the only industry player to be looking towards alternative proteins. Earlier this year non-profit organisation Forum for the Future launched its Protein Challenge 2040 . The project aims to boost plant-based protein consumption, scale up sustainable feed and reduce protein waste. Members include conservation NGO World Wide Fund for Nature (WWF), the Global Alliance for Improved Nutrition (GAIN), dairy firm Volac, flavour firm Firmenich, confectionery manufacturer Hershey and meat-free brand Quorn.

Changing conversation around Ayurveda leading to massive growth for herbal products

Food Navigator Asia, 29 Mar 2016

Disillusionment with allopathic medicine among Americans is driving interest in Ayurveda and other herbal supplements, says Amy Keller, Director of Education and Training at Organic India.

"There has been a definite change in the conversation around Ayurveda, and an increase in interest," Keller told NutraIngredientsUSA. "Many Americans see allopathic medicine as failing them and this has prompted them to look into Ayurveda." Keller's role as director of education and training is to make Ayurveda simple and accessible to all. "Ayurveda is very different to the Western model because it treats a person as an individual. In the US


Image © iStock.com/nilanewsom

the classic view is that if something is common then it's normal, but Ayurveda looks at you as an individual." Organic India doesn't call itself an Ayurveda company but it does offer safe and effective Ayurvedic herbal products produced using organic and biodynamic agriculture in India.

Teas and supplements

The company offers both tea and herbal supplements. "Tea used to be the leading market, but supplements growth is far outpacing the tea business," said Keller. Teas have seen sales growing at a rate of 610% overall, with some "specialty" teas such as Moringa and Sleep seeing 20%+ growth, she said. The two best selling products are its Original Tulsi tea (Holy Basil) and Sweet Rose Tea. "We have a new tea with turmeric and ginger with holy basil," she said. "I suspect that be number one or two in the next year or two." Herbal supplement sales are growing at over 20% with some products like Turmeric, Moringa, and Ashwagandha seeing 40% to 50% growth, she noted. "Five years ago we thought we'd do better with products with the structurefunction type labels for sleep or flexibility, but what is growing is the products with the Sanskrit names of the herbs." So who's buying these products? Consumers are really all over the board, she said, from Millennials to Baby Boomers. "They're coming at it for different reasons but in equal numbers."

There exists some tension in the wider community about synergistic and singleingredient approaches, with Organic India firmly in the whole herb camp. "We are a full herb company and we don't do extracts, with the exception of turmeric that has additional turmeric extract [95% curcuminoids] added," she said. In addition to the whole herb approach, the company also relies on the traditional science established over thousands of years. "Most companies rely on the latest science out there," said Keller. "We subscribe to traditional use versus the latest study."

Sourcing

The company is vertically integrated and controls everything from seed to shelf, said Keller. The vast majority of the herbs are sourced from India (with some flavors sourced from elsewhere). "We have complete supply chain control," she said. Formed in the 1990's by a small group of people from around the world who met in northern India, the company started with one farmer. Today the company works with 2,000 partner farms. "There is also a need for organic farming in India because the country is seeing increasing numbers of farmer suicides," said Keller. "When they work with the GMOs, the crops need excessive amounts of water versus conventional crops, and these smaller scale farmers cannot afford irrigation and rely on the monsoons. They have to repurchase the seeds because they're not allowed to save them for the next year. It's very difficult economically for them and they are drinking the pesticides to kill themselves." "These farmers are some of the most at risk people in the world," she added. "We work with them, we teach them to farm organically and biodynamically, we provide electricity and healthcare, we pay for all the certifications, and we pay them whether their crops succeed or fail."

Education

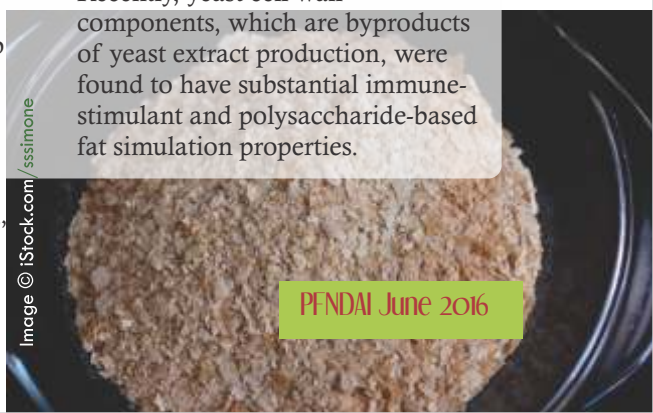
Internet buying has changed the buying habits of consumers, and Organic India has responded by positioning its education for consumers as well as the traditional audience of retailers, brokers and distributors. Unsurprisingly, the most viewed presentations on the company's Herbal University education platform relate to the top selling herbs, but the most watched educational video on their site is about Organic India's regenerative agriculture initiative. "People are more interested in being part of something that makes a difference," said Keller. Organic India's US headquarters are in Boulder, CO and the products are available in 40 countries across the globe. Many of the products are Non-GMO Project verified. The company has organic certifications from Control Union and SGS as per USDA, EU and NPOP Organic Standards. Organic India is also a B Corporation.

David seeks Goliath to make nutrient-rich yeast protein for the poor

Food Navigator Asia, 20 Apr 2016

In a country where more than 120m malnourished children depend on a school lunch programme for their nutrition, India would benefit most from a form of protein which is dirt cheap to produce, and just as importantly, is suitable for a vegan diet. Don McLellan, an Australian entrepreneur, thinks he can provide exactly what is needed. "I've got this feeling that what we have is so, so good for countries like India," he says.

"I've read that there are 16m homeless children in India who get a few grams of protein a day in their lunches, which costs governments something like 30 cents a child. I could supply the same amount of protein for a fraction of the price— though I'm not saying I could take on the whole school food operation!." McLellan, through his company AFC Yeast, owns the intellectual property behind a means of manufacturing cheap, high quality yeast protein from an ethanol byproduct. Yeast is an excellent natural, non-animal source of nutritional protein, vitamins and minerals, as well as a flavouring extract and enhancer. Recently, yeast cell wall components, which are byproducts of yeast extract production, were found to have substantial immune-stimulant and polysaccharide-based fat simulation properties.



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But two factors have held back the development of yeast protein as a widespread functional food: the high cost of producing food quality primary yeast; and the poor and variable quality of byproduct yeast from the brewing and distilling industries.

Through his partnership with a leading Australian continuous fermentation researcher, McLellan has been marketing a process that can produce large volumes of high quality, human food grade yeast that is rich in protein at minimal cost. "Our product could be used for a whole range of yeast and vegetable proteins that have now been taken over by the commercial soy industry," he says. "It's certainly innovative, it's globally sustainable and it's inexpensive. As countries target malnutrition, it's a wonderful way of getting high quality protein at low cost, and we are sure that either a government or a large food corporation will pick up this process from us." But first, he needs to open the right doors and find the right sets of ears. As a "tiny speck" of a company looking to attract global brand clients, the task has been challenging, but he says he is reassured that the "tremendous advantages" of his product, as well as its uniqueness, will win out. "Innovation is driven by the experts in their particular field, and big businesses sometimes rely on people like us who know our subject inside out," he says. Moreover, it is unlikely that anyone else will approach this technology in the future.

AFC Yeast's process was developed by David McLennan, who holds patents in continuous fermentation and lectured on the subject at Sydney University. "However, continuous fermentation is no longer taught at universities, so the scientists in this day and age don't know anything about it," says McLellan, who will be outlining the technique as part of a discussion on the sources of innovation at Food Vision Asia 2016 in Singapore next week. Food Vision Asia will be the first time that this professional forum, which has become established over four years in France, and debuted in Chicago last year as Food Vision USA, will take place in this region. It's two day schedule of debates, discussions and presentations will encourage interaction, networking and the exchange of ideas between food and nutrition industry leaders from across Asia and around the world. "Our programme will investigate opportunities for collaboration across global geographies," says events development director Christina Wood.

The fruit of the tamarind, the secret ingredient in Asian cooking

VICTORIA WELER Food News Latam
APRIL 19, 2016

The fruit of the tamarind is widely used in different foods and products, it can be considered a "secret ingredient" because not many people know about your taste and unique functions. For starters, the tamarind is a leguminous tree in the family Fabaceae and usually can be found in tropical climates. He is originally from Africa, but this tree is commonly grown in South Asia and Mexico.

While used throughout the world, India produces the largest quantity of this ingredient. The tamarind produces edible fruit - shaped pod resembles a peanut, can be eaten fresh pod or left to dry. The fruit is an indehiscent legume; it means it is not open naturally once it reaches maturity. Inside the pods are large, seeds and pulp can be bitter. Both the fruit and the wood of the tree are in great demand worldwide. His sweet but tangy flavor makes it a delicious spice for Asian cuisine, and its nutritional value can offer many health benefits. As the tamarind is rich in vitamins and minerals, it is one of the many reasons why it was used for traditional medicinal uses. In Southeast Asia, tamarind is used to relieve fever. The tree bark, leaves and root is used in stews in order to restore power and energy. It can also help with inflammation and swelling. In a 2012 study, the scientists investigated the role of tamarind as a dietary supplement. "When diet supplemented with tender leaves tamarind, significant improvements in the profiles of carbohydrates and lipids produced were seen as evidenced by the decrease of glucose and plasma lipid levels, lipid peroxidation, increased content of liver glycogen, hexokinase activity and cholesterol excretion, with simultaneous improvement of antioxidant profiles in both liver and kidney tissues." revealed the study.

The tamarind fruit is also a rich source of vitamin B and minerals like iron. Vitamin B is essential for metabolism and energy; Moreover, it also offers distinct advantages such as promoting healthy hair and preventing memory loss. As a supplier of phosphorus, iron and other minerals, can improve blood flow, bone health and overall body growth and development. The taste of tamarind is an unusual combination of sweet and spicy , therefore, can be found in sweet or savory dishes. This fruit is quite popular in the Mediterranean and Asian cuisine. It is used as a condiment to compliment the main course. Tamarind Chutney is a very popular dish in northern India that blends with spicy sweet by mixing fruits and vegetables, along with a tamarind sauce includes spices like ginger and cumin.Tamarind jam is also very popular in the world of dessert. Often it used as a filling in cakes or candy generally available in Mexico. While many of the uses of tamarind fruit needed to improve the flavor, it can also be used as a meat tenderizer due to the acidity and as a key ingredient in Worcestershire sauce. Finally, tamarind can also be found as a delicious and refreshing drink. In Mexico, tamarind pods are boiled and the pulp is removed in order to make a drink called Agua de Tamarindo. It may also be available as a juice, and can be mixed with other fruits for a fresh taste.


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REGULATORY NEWS

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Food should be labelled with 'activity equivalent' calorie information

Science Daily April 6, 2016

Food should be labelled with the equivalent exercise to expend its calories to help people change their behaviour, argues an expert in The BMJ today.

Shirley Cramer, Chief Executive at the Royal Society of Public Health, says giving consumers an immediate link between foods' energy content and physical activity might help to reduce obesity. She explains that with more than two-thirds of the UK population either overweight or obese, "we desperately need innovative initiatives to change behaviour at population level." Yet little evidence indicates that the current information on food and drink packaging, including traffic light labelling, actually changes behaviour. The Royal Society for Public Health has therefore called for the introduction of "activity equivalent" calorie labelling. Symbols could show the minutes of several different physical activities that would be equivalent in calories expended to the calories in the product, explains Cramer. "The objective is to prompt people to be more mindful of the energy they consume and how these calories relate to activities in their everyday lives, and to encourage them to be more physically active."

Public polling by the society has shown that almost half (44%) of people find current front of pack information confusing, she writes. And more than half (53%) said that they would positively change their behaviour as a result of viewing activity equivalent calorie information, including choosing healthier products, eating smaller portions or doing more physical exercise, all of which could help counter obesity. For example, the calories in a can of fizzy drink takes a person of average age and weight about 26 minutes to walk off. "Given its simplicity, activity equivalent calorie labelling offers a recognisable reference that is accessible to everyone," she says.

She believes that placing information on food and drink packaging to promote an active lifestyle "could be a logical solution to a multifaceted problem, and the benefits of being active go far beyond maintaining a healthy weight." She acknowledges that messages of the importance of healthy and varied eating must also continue -- and that some concerns have been raised about possible negative implications for people with eating disorders. But says "we have a responsibility to promote measures to tackle the biggest public health challenges facing our society, such as obesity." Finally, she points out that food packaging is governed by European legislation and that "fundamental change to packaging harbours little appetite among EU officials and food manufacturers." Nevertheless, she calls for detailed research to explore the potential effects of activity labelling on consumer choices, including potential harms. And if it is shown to be an effective means to influence consumers' decisions, "we would implore law makers and industry to implement it to reduce obesity in the UK."

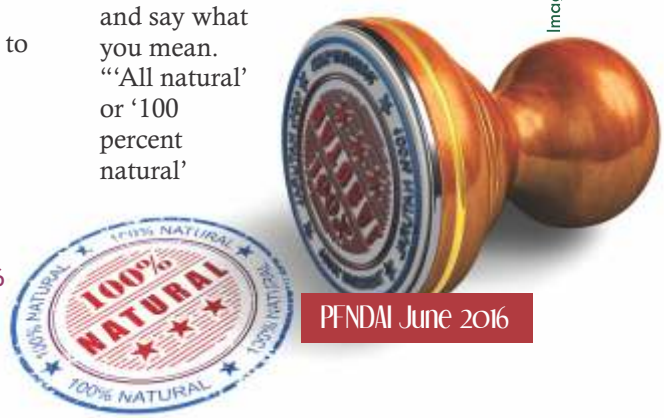
FTC action casts more doubt over usefulness of 'all natural' claims

Nutra Ingredients USA, 14 Apr 2016

The Federal Trade Commission has taken action on natural claims, something which should make dietary supplement companies sit up and take notice, an attorney says.

This week FTC took action against five personal care product companies making natural claims on their products in online ads. It's true that the companies involved are outside of the dietary supplement arena, but Denver-based attorney Justin Prochnow, a shareholder in the firm Greenberg Traurig, said the message is relevant to all manufacturers of goods that are intended to go on, or into, a consumer's body. "I think in this era when all natural claims are such a hot button topic, when any regulatory agency weighs in it is relevant. There is nothing in their comments or their decisions that would lead you to conclude that they would behave differently if it were a dietary supplement company," Prochnow told NutraIngredientsUSA.

The five companies, based in California, Colorado, Tennessee and Utah, make sunscreens, hand and body lotions and hair care products. The claims used were "all natural" and "100% natural." FTC took issue with this, as the products contained synthetic ingredients such as dimethecone, polyethelene and phenoxyethanol. For FTC, the concept is clear. Mean what you say and say what you mean. "'All natural' or '100 percent natural'



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means just that no artificial ingredients or chemicals," said Jessica Rich, Director of the FTC's Bureau of Consumer Protection. "Companies should take a lesson from these cases." Prochnow admitted that there is no regulatory definition of what "natural" means. It seems in the present situation that it's easier to say what isn't natural that what is. Dimethecone—not natural. Polyethelene, the same. Neither dimethecone (an emollient) nor polyethelene (a plastic usually listed
as polyethelene glycol that is used as a surfactant) are intended to mimic something that is natural. But what about some of the synthesized versions of botanical compounds that are found in the dietary supplement industry? "Just because you call it 'bioidentical' does not mean it is natural. I don't think it means that at all," Prochnow said.

Don't forget the excipients

The same could be said for that list of excipients and other trace ingredients for which there is no suitable organic alternative, such as magnesium stearate, a lubrication additive that makes tablet manufacture feasible (though an organic alternative for this is just coming to market). Does that mean that a product could be certified organic and still not qualify for a "100% natural" claim? "What I tell companies is that a '100% natural' claim does not leave much room for error," Prochnow said. "That's why you have to be very careful, and very specific. 'All natural' doesn't mean natural, except for the excipients I used."

Prochnow said the key is to craft a claim in such a way that it communicates as effectively and specifically with the consumer as possible. It's unclear what consumers take away from an 'all natural' claim, and how powerful a marketing message that is. But there is no doubt that such claims will get the attention of regulators and that the plaintiffs bar views such claims as an opportunity. So Prochnow said if companies are still committed to the natural claims there are some ground rules to follow. "I'd try to steer them to claims such as 'made with natural, botanically-sourced ingredients.' SoBe (a brand that manufactures teas and juice blends) modified their claims to something like 'all natural with added vitamins and minerals' to account for the synthetic nature of those ingredients," he said.

Limit certifications on packs to most important to maximize impact

Food Navigator USA, 18 Apr 2016

Product packaging today often is cluttered with so many certifications that consumers' can't absorb everything in the brief time they look at labels in stores, and as a result the icons' impact is diminished and manufacturers likely aren't getting their full value, according to a CPG marketing manager.

"Only so many things can fit on a package," and be quickly understood by consumers, which is why manufacturers need to call out on labels only the points that are most intriguing to their target consumers, explained Joanne Mizner, retail marketing manager at J&J Snack Foods Corp. Other certifications or marketing points that are important to a smaller or more peripheral subset of consumers should be discussed on the website or social media so that consumers who care about those elements enough to look for them can easily find them, she said.

For example, Mizner said, J&J Snack Foods Corp.'s new Whole Fruit Organic Juice tubes only call out on the front of the package the frozen treat's calorie count and that it is gluten-free, non-GMO and has no high fructose corn syrup, even though it also is dairy free and made in a facility that is peanut-and-nut-free, making the product ideal for families with allergies and vegans. She explained that the company decided not to advertise on the package that the fruit tubes were allergy-free because most people with severe allergies, and their caretakers, are used to researching whether products are safe for them to eat before they buy them. So, she added, J&J knew that this information would still get to those who most needed it and that it is not a trendy point of differentiation for mainstream shoppers like gluten-free.

Similarly, the company gave prime real estate to the claim that the tubes are free from high fructose corn syrup, because this is a flash point for many mainstream shoppers who are hoping to reduce added sugars in their diets, Mizner said. It also provided a way to quickly communicate that the product, which is 90% juice, is naturally sweetened, she added.

Consumers don't understand relationship between organic and non-GMO

The brand gave space to both Organic and Non-GMO icons, even though Organic covers both, because not many consumers understand that products must be non-GMO to be Organic, Mizner said, adding, "We wanted to make it a brainless decision for shoppers." She also noted that the company wanted to stress the products' organic certification with the USDA seal and by including the term in the product name because Organic is going mainstream with more shoppers looking for it and interpreting it as an indicator for healthier, cleaner

products. The company also wanted to show consumers new to organic that even though organic products tradition-ally have been more expensive than conventional versions, they don't have to be, Mizner said. She explained that the fruit tubes are "price sensitive" at $3.29-$3.99 for a six pack, making them about 60-70 cents a bar. Maintaining an everyday low price was important to the brand because "we didn't want to segregate the primary shopper and just make this product available to those who always buy everything organic regardless of price," Mizner said. "We wanted to hit the mom who wants to give her kids a quality product that is non-GMO and free from high-fructose corn syrup, and we were able to do that by covering the organic set." She added that J&J also wanted to emphasis organic because the company plans to expand its organic offerings and it wanted to lay a solid foundation of knowledge with consumers that it offers organic products. Vegan is gaining popularity Mizner said the decision not to include on the product packaging that the tubes are dairy free or vegan was difficult, as both of these demands are trending upwards.

"We are just starting in the frozen dessert sections to see vegan as part of the mainstream set this year," with the launch of Ben & Jerry's vegan frozen desserts earlier this year and expansion of existing vegan frozen dessert brand's portfolios, Mizner said, adding, "next year, I expect it will become even more of a mainstream trend." But for now, J&J omitted it from packaging because it is not as mainstream as other factors and, like consumers with allergies, vegans often research products before they buy them, she said. "Again, it goes back to choosing the best icons or callouts, the ones that are most relevant and balancing not being able to easily decipher all the claims on the package," Mizner said.


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Nutrient claims and cartoon characters will sway children

Food Navigator, 30 Jun 2016

Front-of-pack nutritional information is largely ignored by children but combine a nutrient claim and a cartoon character and it can "significantly affect" the product choices they make, according to new research.

The findings have important implications for labelling regulations and packaging designs, the authors said. The research, carried out by experts at three universities in Uruguay, involved labels designed around three variables – cartoon characters, nutrition claims and the traffic-light system – for two products, a sponge cake and a yoghurt. The nutrient claim considered in the yogurt labels was 'Calcium + Vitamin D', whereas the claim ''Enriched with Iron and Folic Acid' was used for the sponge cake labels.

The researchers divided 238 children into two groups. In one group, they were asked to rate eight different labels on a hedonic scale. In the other, they had to choose the label they liked most in each of eight pairs. Influence In the group that chose their favourite label in each of eight pairs, the authors discovered that the inclusion of cartoon characters and nutrient claims "significantly influenced children's preferences for yogurt and sponge cake labels". The relative importance of cartoon characters and nutrient claims depended on the specific product being considered and age of the children. For yoghurt labels, for instance, the relative importance of nutrient claim to children's choice of their preferred label was higher than that of cartoon character. Meanwhile, the relative importance given to the cartoon character tended to be higher for six to nine-year-olds than for the older children – 42% versus 27%. This trend was more evident for sponge cake labels. "The cartoon character was clearly the most important variable for the choices of [six to nine-year-olds], whereas the opposite trend was found for [ten to twelve-year olds]," they concluded.

Calls for close regulation

Nutrient claims also tended to resonate more than the front-of-pack nutritional information. The claims therefore needed to be closely regulated, the authors said. "None of the variables was found to significantly affect children's hedonic scores in the rating-based conjoint analysis. On the contrary, choice-based conjoint proved to be easily understood and enabled to discriminate among labels." "The choice-based conjoint proved to be easily understood by children and enabled to identify design variables that influenced children's preferences for two snack foods," they said. The finding is important in terms of designing labels for healthy food that will appeal to children. The study, published in the Journal Food Quality and Preference, also suggested that the best method of assessing children's label preferences is to use a 'choice-based conjoint' rather than a 'ratings-based conjoint'.

Regulator issues post-Maggi clarification on MSG stance

Food Navigator Asia, 05 Apr 2016

The presence of monosodium glutamate from natural sources in noodles and pasta is not illegal under food safety legislation,

Image © iStock.com/pedphoto36pm

India's food regulator has announced in a bid to end confusion over the taste enhancer's status.

With no established laboratory procedures to find out if MSG has been added artificially, the clarification by the Food Safety and Standards Authority of India will be viewed as tacit approval for the salt. According to the FSSAI's notification: "Commissioners of Food Safety are advised that specific enforcement/prosecution may not be launched against the manufacturer of noodles/pasta on account of presence of MSG or glutamic acid unless it is ascertained by the department that monosodium glutamate enhancer (INS E621) was deliberately added during the course of manufacture without required declaration on the label."

The move follows last year's action by the FSSAI against Nestlé, when it banned the popular Maggi noodles for allegedly containing excess MSG. The regulator also accused the Swiss multinational for misleading consumers with a declaration that Maggi products did not contain any "added MSG". It now acknowledges the Nestlé's argument that MSG is found naturally "in several common foods such as milk, spices, wheat, vegetables etc".

"To prevent both avoidable harassment/prosecution of food business operators, as well as to ensure that consumers are facilitated to exercise informed choices in respect of what they eat, proceedings may be launched against manufacturers in case of mislabelling," the FSSAI added in its notification.

Simple paper test could better detect food pathogens

Food Navigator, 14 Apr 2016

A simple, paper-based test could help detect food pathogens before they reach supermarket shelves and restaurants, say Korean researchers. The simplicity of this method is in stark contrast to current testing procedures for pathogens in food, for which complicated machinery and trained personnel are needed.

Methods to detect foodborne pathogens such as polymerase chain reaction (PCR) magnetic force-based methods require external equipment and complicated operational procedures that are not suitable for onsite detection, making them unsuited for large scale food manufacturing.

According to the World Health Organisation (WHO), foodborne diseases are a growing worldwide public health problem, particularly for infants, children and the elderly. Salmonellosis and Campylobacteriosis are the most commonly reported foodborne diseases. They are spread across the whole European Region and mainly transmitted from animals. Many foodborne illnesses caused by E. coli O157:H7 and Staphylococcus aureus go undetected in the early stages of the supply chain. The paper-based test was designed to accommodate the multistep reactions necessary for pathogen analysis. This is achieved by controlling the pore size of the paper-based dipstick.

New approach in detection

When dipped into solutions that contain the E. coli strain O157:H7, Salmonella typhimurium or both, lines appeared on the dipstick showing a positive result within 15 minutes. As the method requires dipping the device into a solution once, producing an easy-to-read result, it could be performed by workers without special training, the researchers say.

Multistep reaction

The test is an example of a lateral flow test, which offers the advantage of portability and userfriendliness.
However, the strip-type format is unable to deliver the reagents in a certain sequence, which is essential to perform multistep reactions. Sandwich immunoassay and colorimetric reactions used to enhance test findings are examples of procedures needed to confirm the presence of food pathogens.

"A one-step operation of multistep reactions is achieved by utilising both delayed fluid flow and channel partitions which are made by pressing the nitrocellulose (NC) membrane using only a press machine," the researchers said. They also pointed out the test did not need multiple reagent loading as the user simply needed to dip the device into the sample solution. The team said the test could eventually be used in wide-scale manufacturing. However, they flagged a potential issue in repeating the test when using different standards of pressed papers. "On the basis of these results and the repeatability of the manufacturing process of the pressed papers, it is improbable that the deviation in the fluid flow between devices would contribute to the deviation in the average signal intensity of bacteria detection," they said.

"It is assumed that the deviation in the signal intensity of bacteria detection would be derived from reagent dispensing procedures. The sensitivity and selectivity of detection would depend largely on the quality and specificity of antibodies used," they added.

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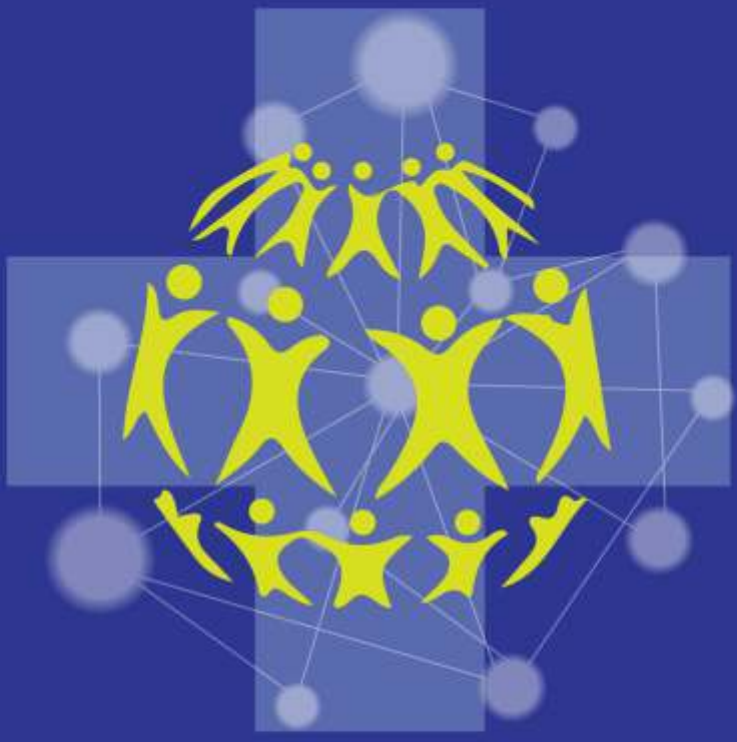

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