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FOOD, NUTRITION & SAFETY MAGAZINE

VALIDATION OF HEALTH CLAIMS & CLINICAL RESEARCH

Also Inside

Snacking Trends

Palm Oil: Usage, Properties &
Nutritional Aspect: A Review

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EDITORIAL



Things are changing so fast everywhere and more so in food industry especially in distribution and marketing. Having the smart phone and its various apps allow the e-stores to display their products and allow the payment to be made by either credit cards or by a variety of different payment apps makes it even easier to place an order and receive the goods in a day or two if not faster.

One can review a large number of products not only from one store but from several suppliers from different stores and then make a choice based on price, brand, size and delivery. It has affected the physical stores both the small local shops around the corner but also the bigger stores.

The reasons are several but the availability of large number of choice is certainly one very big reason. You literally have choice of dozens of different brands and in each one there are different sizes. When one goes to stores, not only are the choices limited but often one finds it difficult to find them. On computer or mobile one can simply search through an amazing array of

products and pinpoint the exact product. This also saves a lot of efforts of going there through the traffic and lugging all these things after one stands in line for a long time. One negative side is one converts all those calories saved into kilos put on.

There is also another advantage and that is prices, which are much lower than the local shops and even less than in big stores. Since there is no requirement of shelf space the cost of inventory is minimal.

There is just one problem. FSSAI has very nicely mandated manufacturers to put on label all the information about ingredients, nutrition information, various statutory warnings and additional information about the products. When one sees these products they are easily seen by the prospective consumer but when one sees a picture on the website, often there is only one picture of the main panel of label seen. Some of the bigger e-stores provide several graphics so one can see the whole label and read all the information.

Some stores try to save space and cost on website by just giving one shot. There are some manufacturers who probably do not want the consumers to see all the information. Probably stores charge them for additional uploaded information. May be they want consumers to see only the good side of the product.

This is more important in dietary supplement market where there are vitamins, minerals and other nutrients and nutraceuticals included in the formulation and the amounts of these would be critical for the consumers to make a choice. Some products provide all the information but others may not be so forthcoming with this information.

It would be interesting to know if enforcement authority is aware of it and whether there are rules related to this aspect of marketing of food products.

Prof. Jagadish S. Pai,
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VALIDATION OF HEALTH CLAIMS & CLINICAL RESEARCH

Consumers are demanding food products to be healthful and so many food manufacturers have been introducing healthy ingredients as well as reformulating to reduce the substances such too much sugar, salt or fat out of it. When a manufacturers has a food product with health benefits they would like to make a claim of it. In the US, the FDA has been monitoring all food products with labels making various claims to ensure that no unjustifiable claims are made. This helps consumers get accurate, science-based information they need for consuming foods that are good for their health.

FDA in the US has given guidelines regarding nutrient and health claims being made on labels. The nutrition labelling act there makes FDA to authorise health claims about substance/disease relationship for those meeting Significant Scientific Agreement

standards. This provides adequate validity for the claims. Some of the claims are unqualified so there is no need for manufacturer to show any relationship which is already adequately available in public domain. However, some unqualified claims also can be made which needs science-based evidence or support provided by the manufacturer and may be later verified by others and also by FDA. Such claims need evidence that may involve clinical trials by manufacturer.

Although dietary supplements are often recommended by a friend, family member or even from an ad, people started asking questions about how it works, or if the ingredients are of high quality, safety and effectiveness. They want scientific validation of a product's effectiveness and safety. And this is where research enters in supplement market. Third party Contract Research Organisations (CROs) have been conducting research for supplements, ingredients and health

food companies so health claims could be made on these substances or foods containing them. In order to make claims other than structure/function relation, they much substantiate them by randomised controlled trials (RCTs).

Clinical research is very essential for developing and marketing dietary supplements and food products containing them. Manufacturers can use information in public domain based on research done by others. However, there may be differences in conditions of research done by others with respect to species, dose, concentration, standardisation, source etc. as well as in the finished product, other ingredients in the formulation, delivery and product type. There may also be differences in standards set by regulatory agencies.

Good research costs money, time and other resources with RCTs needing even more. Many types of studies observational,

epidemiological, case studies, animal studies etc. can give a lot of valuable information on supplement's effectiveness, safety and efficacy on humans. However, conducting RCTs





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would provide “gold standard”.

Most companies are today involved in research in order to get sufficient confidence in their product’s safety and efficacy.

These studies may be on their final product or the ingredients they use in their final product as many academic researchers would rather study ingredients and then publish paper or get patents on them rather than product itself. There are many Contract Research Organisations (CROs) who will do either and also allow companies to retain all rights to results although there are various possibilities available.

Since claims will invite regulatory scrutiny, many companies employ experts who know about regulations and how claims are evaluated and the proper study design to avoid any problems regarding substantiation of a claim later. Some companies rely on the CROs or may consult an expert in such events. Many companies prefer to go with universities and academic institutions that are at times viewed as more credible by consumers. Others may prefer CROs as they are considered to be cost and time-effective.

How to Design a Study for a Claim

If a clinical study is designed only around the specific claim to be made for the product then one may miss out on the opportunity to learn more about a product than the specific mechanism or benefit in the desired claim. A way around this is to design a study with multiple

endpoints, both primary and secondary. For example, a clinical study may look primarily at a product’s effect on the inflammatory markers in

the blood, but secondarily look at lipid levels as well as physical function performance of say knee or shoulder. This allows an opportunity of learn more about the product and possibility of additional claims in one trial. A separate trial may cost a lot more. It also allows for newer avenues of further research and development.

Endpoints are crucial for claims development but one must also consider legalities. For this purpose a legal expert is necessary to guide in the legal area of making claim and substantiation.

Dissemination of results of the clinical trials for dietary supplements is now considered important. Some companies want to publicise their results as much as possible in peer-reviewed publications but even in other popular publications. They may also present papers at conferences to help disseminate results. Even email blasts and other means of reaching customers are sought.

People are now becoming aware of importance of diet on health and they seek advice from doctors but since internet can provide a lot of information, they try to learn about health themselves. They shop for health products and supplements and they want to know what is in them, how it works and whether it is safe. They are attracted to ancient

cultures and medicines & herbs, but their modern sensibilities look for scientific validation of a product or ingredient’s efficacy. This is where scientific research comes in.

Companies have been noticing this trend for over two decades when the use of third party Contract Research Organisations (CROs) to conduct the supplement studies started vigorously.

Research is becoming importance not just for getting consumer confidence but the consumers like to see claims made on the label of product about what product can do for them. In order to make that claim, regulators want companies to prove these claims by scientific studies. One may do on animals or in vitro, but the best evidence would be when studies are conducted on humans.

Importance of Proper Clinical Trial

Companies can make structure/function claims (e.g. calcium builds strong bones or fibre maintains bowel regularity) which are weak claims when they have these substances in their formulation. For stronger claims beyond this requires Randomised Controlled Trials (RCTs). Substantiation of health claims for natural products including dietary supplements and functional foods is becoming more important for both consumers as well as regulatory bodies. Proper clinical trials can provide the substantiation needed to effectively market the product and at the same time staying away from trouble from regulators. Clinical trials take long time and a lot of

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- Snacks
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cost so proper consideration to ensure that all the necessary points are considered and taken care of to ensure that the trial is not wasted. For this a proper research partner, selection of appropriate study

subjects and location need to be chosen carefully.

Conducting clinical trial gives protection from regulatory action by substantiating claims with adequate evidence. It can be made a part of product development

as it can provide valuable product specific suggestions from which claims can be made.

Companies can rely on existing ingredient literature reviews to make basic structure/ function claims such as “supports joint function”. A clinical trial allows more specific claims for a product such as “reduces discomfort within seven days” or “exercise 20% longer”. Such claims cannot be made just based on ingredient literature reviews.

There is also another advantage of clinical trials. When companies make claims on products containing more than one ingredient, relying on literature with single ingredient study for a formulation containing several ingredients is difficult without clinical study. Two ingredients may provide synergy boosting the effectiveness or they may block activity of each other. Thus it is better to conduct clinical trials for such substantiation of claims.

Selection of Research Partner

Selection of research organisation for conducting clinical trial is very critical as several things depend on it such as timeframe and cost. Sometimes success will also depend on proper selection. Usually three types of choices are available for conducting such trials: a practising physician, an academic institution and a commercial Contract Research Organisation (CRO).

Even within each type, final selection can be based on whether they have intimate familiarity with regulatory framework and rules. Working with researcher who understands regulatory requirements, including the R&D requirements mandated by regulators is extremely important. It can avoid incorrect study design which is key for claim substantiation. Many researchers and organisations do not know the difference between drug studies and dietary supplement studies. A wrong design of the study may prevent it from making claim substantiation.

From among the above three options, practicing physician is not skilled in conducting research compared to organisations that specialise in clinical trials. Academic institutions while being proficient in conducting research may not have adequate understanding of the regulatory nuances. Companies at times may want key opinion leaders affiliated with large academic institutions in their research programs for credibility with consumers, but these institutions are usually more expensive, and need more time to complete the trial, sometimes two or three times more than commercial CRO. They may

impose large overheads, slow ethics review and often take ownership of intellectual property generated from trial.

Private clinical research sector is highly cost-competitive and generally does not have other hurdles faced by larger institutions. It is better to go with CROs specialising in natural health and

dietary supplements versus pharmaceuticals CROs. The latter may have skills and capabilities but may not have same understanding of regulatory nuances of dietary supplements and can be more expensive.

Once the organisation has been shortlisted, it is also important to research the researcher. Speaking with their references gives first-hand account of their experience with researcher. Information regarding studies published and conducted as well as types of studies undertaken should be looked at. Selection may also depend on the experience the organisation may have with the indication that company is looking for their product or substance. This will be useful additional experience beside that in conducting trials. Investigators should also be qualified in making decisions like what subjects may be needed and inclusion/exclusion criteria etc., as well as experience in adverse events.

Importance of Location

This is another factor that may be considered for trials which will decide the baseline population that is to be studied. Besides genetic variation, environmental factors including diet and lifestyle will determine which population to be studied. Dietary variations are very important in evaluating effectiveness of product e.g. the weight management. Also if the product is developed for a specific country or region, then it makes sense to conduct a trial there. Study site is also important sometimes as it should be well equipped and staffed to conduct the any procedures and visits outlined in protocol. Study site must have sufficient database of subjects to recruit from.

In recent years, virtual remote clinical trials have become increasingly popular. These are conducted remotely via mobile application downloaded by study

subjects. The subjects are recruited online and can complete protocols from home while reporting via mobile application. Screening of the subjects as well as scheduled visits are conducted by telemedicine by medical personnel.

Not only it is possible to screen a large number of subjects scattered over a wide area which is difficult to access, but the readings could be daily compared to weekly in most other studies where subjects come to a site where medical personnel screen them.

(Condensed from articles in **Natural Products Insider special issues March 2015** by **Rachel Adams & November 2015** by **Steve Myers**)



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COMING EVENTS

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M: 09897272407, 09869284170

E: aaharway@gmail.com

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E: icnfs@cbees.org

W: <http://www.cbees.org>

IFT17: Go With Purpose

Institute of Food Technologists

June 25-28, 2017

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SNACKING TRENDS

In the past, people used to have three square meals at the family table. In the fast paced world of today, that has given way to new type of eating namely snacking any time any place when one is hungry. Today food is available all around at all the time so consumers take advantage of convenience to take nutrition in forms suitable to them. Modern people like to work any time any place so their eating occasions are also vast and snacking is convenient. Americans are a nation of snackers; 94% adults snack at least once daily while 50% snack 2-3 times a day. Percentage of Americans snacking 3-4 times a day increased from 11% to 42% from 1977 to 2002.

Definition of snacks is changing along with their popularity. People are using whatever they can find to fight hunger from leftovers to lattes to portable cereal cups. One definition is snack is anything smaller than a full meal. More consumers are considering any kind of food a snack from mini meals to drinkable soups. Boundaries are getting blurred in snacking field.

Even though always snacking, Americans are not snacking mindlessly. Consumers deliberately choose their snacks; about 80% snacking with a purpose whether to address hunger or an emotional

need and over 60% snack for craving. They are choosing different snacks at different times of day, choosing healthier snacks earlier and more indulgent in the evening.

Mintel research shows that sales of snacks have increased by 30% from 2007 to 2012. Nielsen data states that snacking industry is over \$124 billion in North America. While more growth is expected it may be interesting to see what considerations decide when consumers choose their snacks: good-for-you ingredients, clean labels, convenience and of course flavour. There are some categories of food products that may be top of consumers' minds while thinking about snacks to fight hunger.

Healthy Snacks

This is a growing food trend that shows no sign of slowing down. This category offering health benefit gives them instant edge in the evolving market. Healthy snackers have grown from 29 million to 41 million since 2004 and a third of them made better snacking choices than they did last year. Health-minded consumers are driving innovation in snacks. Consumers want nutritious ingredients especially with plant based protein and better-for-you or free-from snacks like gluten-free or with natural flavours and colours. More snacks bases are made with fruits,

vegetables, seeds, beans or their combinations. These can provide more fibre or protein while in salty snack category, provide healthy snacking option.

Even though there are many healthy snacks appearing in market, most snackers wish for even healthier snack options and even greater percentage from households with children. Manufacturers must however, keep flavour in mind while designing healthier snacks. Majority of consumers feel that taste and flavour matter more than health and if it does not taste great, they won't eat it no matter how good it is for them.

Consumers are not choosing healthier options to lose weight unlike in the past. They want lasting energy throughout their days. Energy is almost as important as concerns surrounding weight management and physical fitness. This is a notable change from the past. Most consumers feel that health and wellness means having energy to live an active life. Growing number of snacks are making energy claims. This claims in terms of percentage of snacks launched making it has increased from 2.7% to 4.1% in 2015. One company offers products with glucose instead of maltodextrin or sucralose for "twice the energy, twice as fast".

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



Consumers also want protein and fibre for their sustained energy, with over half saying they are trying to get a certain amount of protein or as much as possible. Similar number says the same about fibre. Over 20% expect added nutrition from snacks, but these have to be naturally functional i.e. using ingredients like ancient grains, nuts and dark chocolate.

Consumers want more functional food options, including foods that provide benefits normally offered by OTC medications. While few foods can make actual health claims, manufacturers are seeking foods having strong science behind them.

Many consumers are not overly concerned about sugar and sodium levels in snacks, except older individuals with health problems monitor sodium levels.

Clean Labels

Consumers always want to see a clean label which is also a trend driver for snack development arena. They want to see familiar ingredients in foods and also snacks. They worry about potentially harmful ingredients in foods and prefer free-from foods such as non-GM, organic, hormone-free, gluten-free, cage-free and free from additives. Among products drawing on cleaner and clearer labels is RXBAR, whole food protein bar which uses labelling to show consumers exactly what it is and is not in each bar e.g. Coconut Chocolate flavour label lists “3 egg whites, 6 almonds, 4 cashews, 2 dates and no B.S.” Another product contains seven ingredients and states it is free from gluten and high fructose corn syrup.



Over one-third consumers feel that gluten-free products are beneficial for everyone, not just those with allergy or intolerance. A number of products have appeared with various such claims and containing a variety of different seeds.

On-the-go Snacks

Consumers will incorporate snacks into their lives if they are portable. On-the-go snacking is a growing trend with most consumers are looking for convenient, easy-to-pack snacks. Ready-to-eat snacks are important to most snackers and portability is important when they choose a snack. Consumers pack bars in their backpacks and purses as “emergency insurance” against sudden hunger. They continue to seek small single packs and other products for on-the-go snacking. Re-sealable pouches allow consumers to decide how much of a product they want to at a time, enabling them to determine their own portion size, thus larger sizes can enter snack territory.

Some examples of conveniently packed products include “pairs” such as Almond Butter with Pretzels and guacamole and salsa with tortilla chips. Mini cheeses have single-serve brie bites that could be eaten as such or with pretzels. Compartmentalised snack packs allow snackers to build a mini meal out of several healthy foods like apple slices, cheese, and hard-boiled eggs.

Convenient also does not have to mean “processed”; there are freshness indicators on packs such as made-on-dates. Manufacturers have opportunity to create healthy boxes, packs, and mini-sized

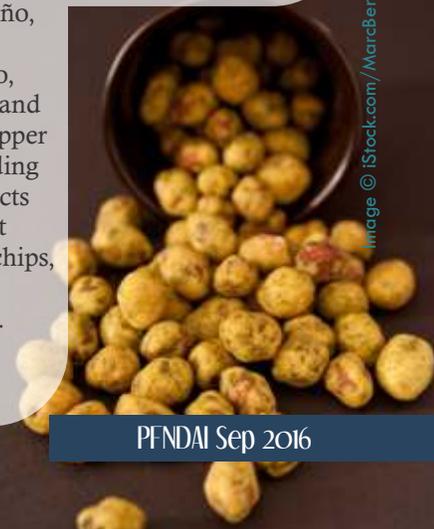
portions of favourite foods to make them an easy and obvious choice for snackers who feel that there aren't enough conveniently packaged snacks.

Flavours Rule

Consumers eat snacks for fun and something new and exciting at minimal risk and without too many calories. They look for familiar food types with new flavours like snack mixes, pretzels, chips and popcorn. A large number of flavour profiles have hit the snack market with combination of tastes and spices which were unthinkable a decade ago. With experimenting and exploring, stepping outside the realm a bit and reaching even global flavours like spicy Thai etc. have brought a lot of new experiences in snacks to consumers as they are looking for something to break boredom.

Ethnic flavoured snacks explore other parts of world flavours. As consumers learn about different types of foods they want to see those flavours in their daily eating patterns. Thus global flavours, even those from regions consumers may not expect such as Africa and smaller Asian countries, are entering snacks. These are bold and spicy and younger consumers get gravitated to spicy.

Consumers are looking for more variety and adventure in their eating experience and peppers provide a unique, fun and flavourful way of adding heat to a snack product. Peppers such as jalapeño, chipotle, habanero, Serrano and ghost pepper are trending in products like meat snacks, chips, nuts and popcorn.



They not only want snacks to be bold and hot but flavours should be unique and feel specific having authentic heritage behind it.

Categories of Snacks

While anything is a snack, consumers turn to some categories as preference. Bars, meat snacks and salty snacks represent some favourite categories and much innovation is occurring in these segments to appeal to new and long-time consumers.

Bars: Almost 70% consumers purchase bars and snack bars make almost half of total sales in the US. Health is very important in bar category and many offer protein boost. These are portable snacks that consumers can take with them replacing or supplementing meals when they lack time. A third of high-protein products from snack category are bars. These contain 15 g protein or more although opportunity is available for super high-protein bars.

Makers of bars are turning to plant-based proteins, such as peas, help seeds and even watermelon seeds. Proteins sources range from whey and soy protein to pulses, nuts and seeds, mostly more than one source. Combining types of proteins allow a large variation of nutritional profile while improving flavour, texture and appearance.

Almonds are popular in bars being

about a third of all nuts used in bars and are very much associated with cereal and energy bars. Consumers are looking for filling, healthy snacks to help them tide over.

As bar market is saturated, it is important for brands to find ways to differentiate their products. Products that stand out include those with superfoods line that comes in flavours including turmeric, ginger & beet and hazelnut, hemp and cacao; products making bars from grains used by breweries and those with coffee together with dates, oats, nut butter and chia. One line of brand contains fig & hazelnut and almond & apricot which also include balsamic vinegar, honey, lemon and quinoa.

As bars supplement or replace meals sometimes, consumers have begun to move away from sweet and embracing more savoury bars. This may help them compete with salty snacks. Consumers have started accepting savoury bars. There are almond & sea salt bar and a quinoa, corn & roasted pepper bar associated with Andean culture and a basil, white bean & olive oil bar inspired by Mediterranean. There are also savoury gluten-free, non-GM and vegan bars made from crunchy seeds and peanuts. Flavours include jalapeno and roasted garlic and sea salt. A small percentage of bars launched recently made low-sugar claims so there is an opportunity to create options for those consumers watching their sugar. Some have claimed that their bars contain only fruits & veggies or fruit & chia.

Meat Snacks:

Americans spent \$2.8 billion on dried meat snacks last year, and sales grew 12.5%. Their popularity is because they are portable, lightweight and they don't spoil. Consumers seek grass-fed, locally and responsibly raised animal meat. Even big companies are focussing

on regional and specific exotic flavours showing that they understand food culture of consumers today and producers are competing and giving attention to specific ingredients and compelling stories to help differentiate from others. One company makes small batch boldly flavoured craft jerkies from grass-fed New Zealand animal. Bigger companies can't incorporate the same level of detail in their processing like labour-intensive hand slicing and marinating.

Meat snacks are also taking different forms such as meat bites and a combination of meat and dried fruit which blends meat with fruit inclusions. This category will be tempered by the fact that a growing number of consumers are hoping to get protein from non-animal sources.

Salty Snacks:

When it comes to snacking consumers want everything including salty snacks but they want them to be healthier as well. Concern about nutrition and ingredients in salty snacks is quite important but the sales of salty snacks have not been affected. The category has sales in 2014 of \$5.6 billion and is likely to reach \$6.8 billion in 2019. Almost all of US household purchases salty snacks despite competition from yogurt, cheese and meat snacks. Potato chips continue to be top salty snack in the US.

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Consumers are looking for bold, spicy flavours and some amount of fun in their snacks. Manufacturers can attract consumers in a number of ways including broadening flavour profile through regional and global flavours and pairing salty and sweet flavours together. One company feels that spicy, bold and ethnic flavours will help bolster sales of salty snacks. Consumers are looking for adventure in their snacks.

Salty snacks manufacturers are introducing an array of products designed to appeal to consumers' desire for healthy snacks. With health halo and low calorie count, ready-to-eat popcorn offers way to experience interesting and often ethnically inspired flavours. These

products have seen popularity recently with sales growing in double digits.

There are better-for-you snack types e.g. one tortilla chips include sprouted chia, flaxseed and quinoa and another with almost $\frac{3}{4}$ less fat and over half less calories. One international brand has introduced snacks free from artificial flavours, colours, cholesterol, partially hydrogenated oils and high fructose corn syrup. These were designed for those consumers who do not want to give up enjoyment in order to live well.

Future for Snacking

Snacks market got complicated because there are so many kinds of snacks and they are all trying to find

what consumers want which is pretty challenging. Now there are ever greater opportunities because new processing methods are available. Future of snacking lies in versatility. Some consumers decide to eat vegan or vegetarian one meal and consume meat the next so giving them access to a range of possibilities to meet their needs is the key. There is potential in mix-&-match refrigerated snacks and mini meals as well as snacks-focused version of salad bar where on-the-go snackers may make their own snack boxes.

Some upcoming product types include seaweed snacks. Fat laden balls featuring nut butters or "fat bombs" are becoming popular. There are products with crunchy blend of seeds and spices with creamy chocolate centre which could be replaced by peanut or alternative nut butter.

Whatever the big snack that come, it will be important to have them affordable, convenient and offer healthy ingredients which provide value while addressing consumers' personal values. There should also be possibility of products serving multiple eating occasions to widen the possibilities for consumer use.

Marketers may find that their view of their products is much narrower than that of its consumers. The same product may function as in-between-meal 'snack' one day, as lunch the next day and afternoon munchies the following day. Producers should expand usefulness of their products by promoting different uses for them, such as bagels that is eaten for breakfast but also for sandwiches or as appetiser when topped with cheese or hummus.

(based on article by **Melanie Zanoza Bartelme** in **Food Technology** May 2016)



PALM OIL: USAGE, PROPERTIES AND NUTRITIONAL ASPECTS:

A REVIEW

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Introduction

Palm oil is one of the most commonly consumed vegetable oil due to its ease of availability, lower cost and widespread applicability. It is produced from the pulp of the fruit of the oil palm. Like palm kernel oil, copra oil (produced from coconut), and cocoa butter, palm oil is a solid fat. This means that it is solid at room temperature. As such, it is rich in saturated fats (around 50%) and especially, as the name implies, in palmitic acid.

The demand for palm oil has been growing since the 1980's due to its functional properties which provide it with good stability, shelf life and desirable sensory properties. As a result, palm oil and palm kernel oil are ingredients of almost 50% of the consumer goods products.

Palm Oil Production & Consumption

Globally, palm oil makes up more or less a third of the 175 million tonnes of vegetable oil. Palm production mainly occurs in South East Asia as the tropical climate of this region is conducive for the development of the palm fruit. Indonesia and Malaysia are leading producers of palm oil contributing

about 85% of total palm oil production.

India is the 2nd largest consumer of palm oil in the world, consuming around 15% of total world consumption. Consumption of palm oil in India is now nearly 45% of the total edible oil consumption followed by soybean oil and rapeseed oil as shown in Figure 1.

India's palm oil imports have grown rapidly over the past decade. India has become the largest importer of palm oil worldwide and is expected to account for 21% of world palm oil imports in 2015/16. Indonesia and Malaysia account for majority of imported palm oil in India, accounting for 60% and 39% respectively in 2014-15 (USDA, 2015). The imports of

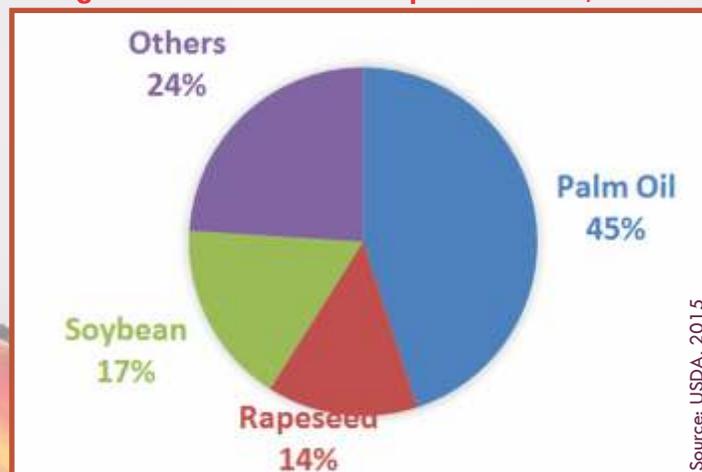
palm oil in India contribute about 77% of total edible oils imported into the country.

Palm Oil: Multiple Usage

Palm plantations produce the world's highest yielding crop of edible oil per acre of land. One acre of palm land can produce as much oil annually as 10 acres of land for soybean oil.

Palm oil and palm kernel oil are ingredients of almost 50% of the products on supermarket shelves. The main conventional applications

Figure 1. Palm Oil Consumption in India, 2014



of palm oil in food products include cooking/frying fats, margarines, shortenings and confectionary fats, non-dairy creamers, dressings, cheese analogues, supplements, and vitamins. It is also used in personal care and cosmetics, soaps, industrial cleaning, lubricants, ink, biofuels, fertilizers, animal feed, and various pharmaceutical products.

Multiple uses across different categories in industry in India are as follows:

- The food industry in India accounts for 90% of its use: in cooking oils, margarine, fats for baking, pastries and all kinds of food preparation.
- Oleochemistry accounts for 10%: in cosmetics, soaps, lubricants and oils, candles, pharmaceutical products, leather, surfactants, agrochemistry, paints, glosses and biofuel industry.



Palm Oil: Technological Properties

Palm oil provides economic benefits in addition to higher stability and resistance to oxidation as compared to most other common vegetable oils because it has a high smoke point (Table 1) and high induction period.

The oil extracted from the palm fruit is referred to as crude palm oil, which is processed further to obtain refined, bleached and deodorized (RBD) palm oil. The stability of RBD palm oil can be explained by the fact that it has higher degree of saturation and the single bonds provide a tighter arrangement to the molecular structure of a fat molecule. This tighter arrangement of straight chain fatty acid molecules is difficult to break down. On the other hand, a higher degree of unsaturation makes the oil more susceptible to degradation during frying. Therefore, a good frying oil

needs to have a higher degree of saturation and lower degree of unsaturation as in case of palm oil.

Palm oil can also withstand oxidative damage more than other common vegetable oils because it has low amounts of Linolenic acid which adds to the increased stability of the on shelf products.

Palm Oil: Nutritional Properties

Composition:

Like all oils, liquid or solid, crude and refined palm oil contains almost 100 % lipids, mainly in the form of triglycerides. These are molecules derived from glycerol with three attached fatty acids. The proportion of saturated fatty acids is around 50%. RBD Palm oil is made of about 44% palmitic acid which is the major saturated fatty acid found in the oil (Table 2). The

Table 1. Comparative Analysis of Commonly Used Frying Oils

Vegetable Oils	Total SFA %	Linoleic Acid (18:2) %	Linolenic Acid (18:3) %	Smoke Point
Palm Oil	50	10.1	0.4	232
Canola Oil	7.2	21.0	8.8	204
Corn Oil	13.5	59.6	1.2	232
Cottonseed Oil	25.4	54.4	0.7	216
Olive Oil	12.1	6.3	0.7	210
Rice Bran Oil	25	34.4	2.2	254
Sunflower Oil	12.7	67.5	0.8	227
Soybean oil	15.4	53.7	7.6	238

Source: O'Brien, 2009

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saturated fatty acid content of palm oil is higher than all other common vegetable oil sources such as soybean, canola, cottonseed, rice bran oil, sunflower oil and olive oil (Figure 2). Further, mono-unsaturated oleic acid constitutes approximately 39% and poly-unsaturated linoleic acid makes up 11% of the total fatty acids in the oil. The PUFA (Poly Unsaturated Fatty Acid) concentration of palm oil is lower than all the other above mentioned vegetable oils. The high saturated fat content and low PUFA content make palm oil a very stable oil which makes it an ideal oil for frying applications. The remaining concentration of palm oil is made up of stearic acid (5%) and myristic acid (1%). Palm Kernel Oil however contains almost 85% saturated fatty acids.

Table 2. Fatty Acid Composition of Refined Palm and Palm Kernel Oils

Fatty Acid	Palm Oil		Palm Kernel Oil		
	Typical %	Range %	Typical %	Range %	
SFA	C-6:0 Caproic	---	0.2	0.1-0.5	
	C-8:0 Caprylic	---	3.3	3.4-5.9	
	C-10:0 Capric	---	3.4	3.3-4.4	
	C-12:0 Lauric	0	0.1-1.0	48.2	46.3-51.1
	C-14:0 Myristic	1.1	0.9-1.5	16.2	14.3-16.8
	C-16:0 Palmitic	44.0	41.8-46.8	8.4	6.5-8.9
	C-18:0 Stearic	4.5	4.5-5.1	2.5	1.6-2.6
	C-20:0 Arachidic	0.4	0.2-0.7	0.1	Trace - 0.9
MUFA	C-16:1 Palmitoleic	0.1	0.1-0.3	---	
	C-18:1 Oleic	39.2	37.3-40.8	15.3	13.2-16.4
	C-20:1 Gadoleic	---	---	0.1	Trace - 0.9
PUFA	C-18:2 Linoleic	10.1	9.1-11.0	2.3	2.2-3.4
	C-18:3 Linolenic	0.4	0.4-0.6	---	---

Source: O'Brien, 2009

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Regulatory Aspects: Labelling of Palm Oil

Labelling of Palm Oil in India:

As per FSSAI, palm oil is one of the most commonly used ingredient in the food industry and has been approved for use with a long history of safe usage. In India it is labelled as palm oil, palmolein and palm kernel oil.

DECLARATION

As per the Gazette Notification issued by FSSAI on 25 May 2016, in the Food Safety and Standards (Packaging and Labelling) Regulations, 2011 changes have been made to the regulations related to **'Labelling' in the category**

'Labelling of Pre-packaged Foods.

However, extension for six months has been granted to implement this which falls on 2 December 2016. In the clause 'List of Ingredients', in the Table with heading 'Classes' for the entry 'Edible vegetable oils/Edible vegetable fat' and the corresponding entry under the heading 'Class Titles' will be changed as follows:

Classes	Class Titles
Edible vegetable oil	Give name of the specific edible oil such as mustard oil, groundnut oil, etc.
Edible vegetable fat	Give type of vegetable fat (interesterified) vegetable fat, hydrogenated oils, partially hydrogenated oils, edible vegetable fats, margarine and fat spreads, such as mixed fat spreads, vegetable fat spreads"

Source: O'Brien, 2009

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This means that the labelling of vegetable oil and vegetable fat will be separated and will be different and not combined as formerly. In the same sub-regulation on 'Labelling of pre-packaged foods' under the clause called 'Nutritional information' which says that if the nutrition declaration is made per serving, the amount in gram (g) or milliliter (ml) shall be included for reference as also the serving measure.

Palm Oil: Environment and Sustainability

The use of Palm oil in commercial food products fuels since some time general public concerns around its negative contribution to the environment (e.g. deforestation, greenhouse gas emissions, soil erosion, water pollution, loss of biodiversity). However, production and use of palm oil that has been sourced responsibly will help to maintain or

enhance biological, ecological and social values in the countries of origin. Production and use of responsible sourced Palm oil will help to maintain or enhance biological, ecological and social values in the countries of origin. The industry and multinational companies have demonstrated their support towards sustainable palm oil by adoption of new policies, primarily pertaining to procurement.

Conclusion

In summary, good stability, shelf-life and desirable sensory properties make palm oil one of the most commonly used oil in the food industry. Considering the vast amount of palm oil imported into India, many large corporations have made commitments to use palm oil that has been responsibly

sourced. Demand for palm oil is expected to further rise owing to the variety of its uses and therefore it is essential that sustainable production practices are used.

Disclaimer: Please note that the current work reflects the expert opinion of the authors alone and in no form and/or manner represents the official position of the parent organization.



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RESEARCH IN HEALTH & NUTRITION

Gut bacteria may be able to predict, prevent rheumatoid arthritis

IFT Weekly July 13, 2016

The bacteria in your gut do more than break down your food. According to Veena Taneja, an immunologist at Mayo Clinic's Center for Individualized Medicine, they may also be able to predict susceptibility to rheumatoid arthritis. Taneja recently published two studies—one in *Genome Medicine* and one in *Arthritis and Rheumatology*—connecting the dots between gut microbiota and rheumatoid arthritis.

More than 1.5 million Americans have rheumatoid arthritis, a disorder that causes painful swelling in the joints, but scientists have a limited understanding of the processes that trigger the disease. Taneja and her team identified intestinal bacteria as a possible cause; their studies indicate that testing for specific microbiota in the gut can help physicians predict and prevent the onset of rheumatoid arthritis.

The paper published in *Genome Medicine* summarizes a study of rheumatoid arthritis patients, their relatives, and a healthy control group. The study aimed to find a biomarker that predicts susceptibility to rheumatoid arthritis. The researchers found that an abundance of certain rare bacterial lineages causes a microbial imbalance that is found in rheumatoid arthritis patients.

"Using genomic sequencing technology, we were able to pin down some gut microbes that were normally rare and of low abundance in healthy individuals, but expanded in patients with rheumatoid arthritis," said Taneja.

After further research in mice and, eventually, humans, intestinal microbiota and metabolic signatures could help scientists build a predictive profile for who is likely to develop rheumatoid arthritis and the course the disease will take.

The second paper, published in *Arthritis and Rheumatology*, explored another facet of gut bacteria. Taneja treated one group of arthritis-susceptible mice with a bacterium, *Prevotella histicola*, and compared that to a group that had no treatment. The study found that mice treated with the bacterium had decreased symptom frequency and severity, and fewer inflammatory conditions associated with rheumatoid arthritis. The treatment produced fewer side effects, such as weight gain and villous atrophy—a condition that prevents the gut from absorbing nutrients—that may be linked with other, more traditional treatments.

While human trials have not yet taken place, the mice's immune systems and arthritis mimic humans, and shows promise for similar, positive effects. Since this bacterium is a part of healthy human gut, treatment is less likely to have side effects, says study co-author Joseph Murray, a Mayo Clinic gastroenterologist.

Hundreds of years later, teeth tell the story of people who didn't get enough sunshine

Medical News Today 19 July 2016

Researchers at McMaster University have found a rich new record of vitamin D deficiency, one that resides in the teeth of every person and remains viable for hundreds of years or more. The team of anthropologists has determined that looking into the microscopic structure of teeth opens a window into the lives and challenges of people who lived hundreds of years ago, and whose only record is their skeletal remains.

Their paper, published online in the *Journal of Archaeological Science*, establishes that when the body is deprived of vitamin D, permanent microscopic abnormalities form in the layers of dentin, the tooth structure under the enamel, creating an ongoing record that can later be read like the rings of a tree.

"The layers store what happens as teeth grow," says author Lori D'Ortenzio, a PhD candidate in Anthropology at McMaster. "We all know the importance of vitamin D, but until now we did not have such a clear way of measuring exactly what happened to people, and when." The discovery is significant, since it can yield valuable information about vitamin D deficiency - also known as rickets - which continues to be a serious public health issue, affecting some 1 billion people worldwide. Most cases of rickets are caused by a lack of sun exposure, with effects that can include pain, bone deformities and failure to achieve or maintain adequate bone levels.

"If we can properly understand past changes in deficiency levels, we can evaluate where we currently are and move forward," says author Megan Brickley, a professor of Anthropology at McMaster who holds the Canada Research Chair in the Bioarchaeology of Human Disease.

Until now, scientists trying to understand historical patterns in vitamin D deficiency have had to use bones, which are problematic sources of such information. In life, bone material is constantly being remodelled, obscuring details of prior damage. After death, bones interact with soil and break down. Dentin is not remodelled, and dental enamel - much harder than bone - protects the dentin long after death, making teeth a rich and accurate source of archaeological information.

"They're essentially fossils in your mouth," says author Bonnie Kahlon, a Lab Co-Ordinator in McMaster's Department of Anthropology.

The researchers compared the teeth of modern-day control subjects to teeth extracted from bodies buried in rural Quebec and France in the 1700s and 1800s. Their analysis showed that one Quebec man had suffered four bouts of rickets in his 24 years of life - all before he turned 13. Examining thin sections of the teeth under a microscope and using technology at the McMaster-based Canadian Centre for Electron Microscopy, the researchers were able to show that anomalies formed in the dentin layers during years when victims failed to get enough Vitamin D to fully mineralize the structures that form dentin and bone.

Cinnamon: Could this popular spice make us better learners?

Medical News Today 17 July 2016

Cinnamon is a warm, sweet spice that you can sprinkle on top of your latte while consuming a sticky cinnamon roll. In addition to tantalizing your taste buds, cinnamon may improve your ability to learn, new research has found.

The study, published in the journal *Neuroimmune Pharmacology*, finds that mice that are considered poor learners improve in learning ability after consuming cinnamon. "This would be one of the safest and the easiest approaches to convert poor learners to good learners," says Kalipada Pahan, Ph.D., lead researcher of the study and the Floyd A. Davis Prof. of Neurology at Rush. Little is known about why some people are naturally good at learning and why some people who struggle with learning can either learn or fail to learn new skills with effort.

Pahan comments that by finding out why some brain mechanisms result in poor learning, strategies can be

developed to increase learning ability and improve memory. Researchers have located proteins in the hippocampus - the part of the brain that is involved in memory formation, memory organization, and memory storing - that are present in poor learners.

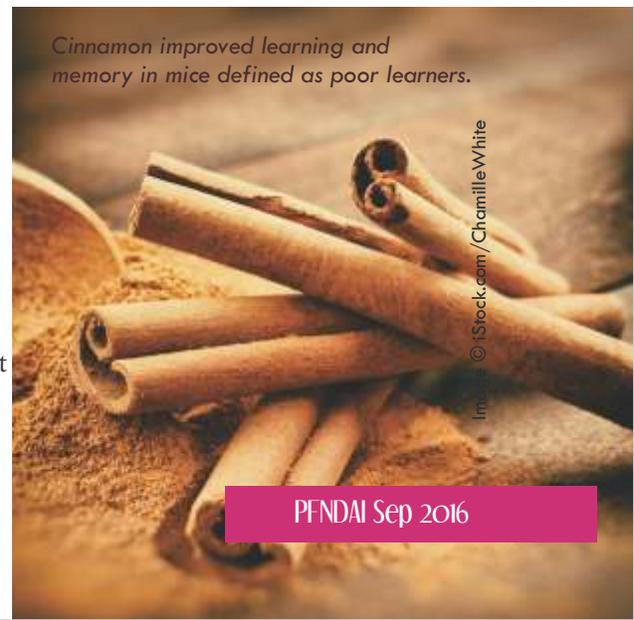
In poor learners, less of the CREB protein - that plays a role in memory and learning - was present in the hippocampus. More of the alpha5 subunit of GABAA receptor or GABRA5 proteins - that generates tonic inhibitory conductance in the brain - was observed in poor learners than those mice that learned more effectively.

Cinnamon successfully reversed poor memory and learning

Feeding the mice cinnamon improved their learning and memory by altering the proteins associated with poor learning. On consuming cinnamon, the mice metabolized the spice into sodium benzoate, which can be used as a treatment for brain damage.

The sodium benzoate had the effect on the mice of increasing the CREB in the brain and decreasing GABRA5 while increasing the ability of the hippocampal neurons to change. Consequently, these changes improved memory and learning. The researchers trained the mice for 2 days in a maze consisting of 20 holes to observe if they could learn to find their target hole.

Cinnamon improved learning and memory in mice defined as poor learners.



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- NABL (ISO/IES 17025:2005 - National Accreditation Board for testing & calibration Laboratories in the field of Chemical & Biological)
- FSSAI - Local and Import Food (Food Safety & Standard Authority of India)
- APEDA - (Agricultural & Processed Food Products Export Development Authority)
- BIS - (Bureau of Indian Standards, approval for Infant Formula Food, Water & Salt)
- EIC - (Export Inspection Council of India, approval for Fish, Water, Peanut and Peanut products)
- GAFTA - (Grain and Feed Trade Association, approval for Grain & Feeding Stuff)
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"We have successfully used cinnamon to reverse biochemical, cellular and anatomical changes that occur in the brains of mice with poor learning," says Pahan. After 1 month of feeding the mice cinnamon, those mice deemed as poor learners improved in memory and learning, and the good learners were unchanged.

"Individual difference in learning and educational performance is a global issue. We need to further test this approach in poor learners. If these results are replicated in poor learning students, it would be a remarkable advance." Kalipada Pahan, Ph.D., Floyd A. Davis Prof. of Neurology at Rush University Medical Center.

Pahan and co-workers have previously found a relationship between consuming cinnamon and the reversal of changes in the brains of mice with Parkinson's disease. The team has also detected through analysis that not all types of cinnamon are equal. Of the two major types of cinnamon available in the United States - Chinese and Ceylon - Ceylon cinnamon is purer, and Chinese cinnamon contains a molecule associated with liver damage.

Research finds social influence can prompt healthier eating choices

Medical News Today 13 July 2016

Researchers from the University of Birmingham have found that exposure to social-based messages promoting healthy eating can increase consumption of fruit and vegetables and reduce consumption of high-calorie snacks.

It has been known for some time that people adapt their behaviour to what they think is socially expected



Image © iStock.com/Kritchanut

for that situation and food choices are no exception. If we are told that other people in our social group eat lots of fruit and vegetables then we may try to do the same. In the new research to be presented this week at the Annual Meeting of the Society for the Study of Ingestive Behaviour (SSIB), the foremost society for research into all aspects of eating and drinking behaviour, the researchers found that a "liking social norm" message - information that other people enjoy eating fruits and vegetables - had a particularly powerful effect on food choices.

Student participants were tested in a laboratory and were first asked to rate some posters. One group saw a poster displaying the results of a survey suggesting that the typical student enjoys eating fruit and vegetables every day (experimental group) whereas others saw unrelated facts about the University of Birmingham (control group). The participants were then asked to take part in another study that involved rating emotions and tasting some healthy snacks (cucumber and grapes) and high calorie snacks (cookies and chips).

The participants who discovered that other students like eating fruit and vegetables ate more of the cucumber and grapes during the taste test, but only if they did not report habitually consuming a lot of fruit and vegetables in their daily diet already. Those who already ate fruit and vegetables daily did not consume any more cucumber and grapes, however, they ate less of the cookies and chips. Interestingly, most people were not even aware that the two studies were linked and

were not aware that their behaviour had been altered by exposure to the message.

According to the authors, these results point towards a new approach to promoting healthier eating.

Dr. Jason Thomas said "It might be more effective in terms of health promotion to highlight how much other people enjoy eating fruit and vegetables than to tell people that they should because it is good for them." The team are now interested in finding out more about why social-based message are effective in altering food choices and whether the strategy can be implemented in realistic settings such as cafeterias and supermarkets.

Food supplements in the fight against heart disease?

Medical News Today 25 July 2016

Heart attacks and strokes kill approximately one in three people worldwide and the situation is expected to worsen in the future due to an increased global prevalence of risk factors such as diabetes and obesity. This will continue to impose greater burdens on the health care systems worldwide.

Atherosclerosis is a process associated with inflammation and build up of fatty deposits in medium and large arteries, and is the major underlying cause of heart attacks and strokes. Current



Image © iStock/PRIImageFactory

therapies against atherosclerosis are not fully effective in all patients and their prolonged use is sometimes associated with various side effects. Many drug discovery programs have tried to find alternatives without much success.

Current Diets rich in fruits, vegetables, fish, cereal grains and olive oil have all been associated with many health benefits, and there has been considerable recent interest in natural compounds derived from food sources which are able to exert such health benefits, known as nutraceuticals, in the fight against heart disease.

In an article published in Nature Reviews Cardiology, Joe Moss and Dr Dipak Ramji from the School of Biosciences at Cardiff University have systematically reviewed the current literature on 14 nutraceuticals in the prevention and treatment of atherosclerosis.

This exhaustive analysis of current literature examined the effects of these nutraceuticals on processes associated with atherosclerosis in cells cultured in a laboratory, in animal models of the disease and in human patients.

The authors found many studies demonstrating the beneficial effects of a number of well known nutraceuticals such as omega-3 fatty acids found in fish oil, hydroxytyrosol present in olive oil, dietary fibre, allicin present in garlic, phytosterols in plants, and flavanols in green tea and cocoa products.

Some less studied nutraceuticals, such as Coenzyme Q10, certain omega-6 fatty acids, curcumin present in turmeric and resveratrol in red wine, were also found to have many benefits in limiting atherosclerosis.

"The current literature points to immense promise on the use of nutraceuticals as a complementary strategy to current therapies in both

the prevention and treatment of atherosclerosis" said Dr Ramji, a co-author of the article.

"However, more research is required to fully understand how nutraceuticals mediate their beneficial effects. Additionally, larger, more robust clinical trials are required in the future before they can be widely used.

Two such trials on omega-3 fatty acids are already underway with results expected in the next three years. It is important that this is extended in the future to all the other nutraceuticals that show promise".

Researchers find biological explanation for wheat sensitivity

IFT Weekly July 27, 2016

A study published in the journal Gut may explain why people who do not have celiac disease or wheat allergy nevertheless experience a variety of gastrointestinal and extra-intestinal symptoms after ingesting wheat and related cereals. The findings suggest that these individuals have a weakened intestinal barrier, which leads to a body-wide inflammatory immune response.

Celiac disease is an autoimmune disorder in which the immune system mistakenly attacks the lining of the small intestine after someone who is genetically susceptible to the disorder ingests gluten from wheat, rye, or barley. This leads to a range of gastrointestinal symptoms, including abdominal pain, diarrhea, and bloating.

Researchers have struggled to determine why some people, who lack the characteristic blood, tissue, or genetic markers of celiac disease, experience celiac-like GI

symptoms, as well as certain extra-intestinal symptoms, such as fatigue, cognitive difficulties, or mood disturbance, after ingesting foods that contain wheat, rye, or barley. One explanation for this condition, known as non-celiac gluten or wheat sensitivity (NCWS), is that exposure to the offending grains somehow triggers acute systemic immune activation, rather than a strictly localized intestinal immune response.

Because there are no biomarkers for NCWS, accurate figures for its prevalence are not available, but it is estimated to affect about 1% of the population, or 3 million Americans, roughly the same prevalence as celiac disease.

In the new study, the researchers examined 80 individuals with NCWS, 40 individuals with celiac disease, and 40 healthy controls. Despite the extensive intestinal damage associated with celiac disease, blood markers of innate systemic immune activation were not elevated in the celiac disease group. This suggests that the intestinal immune response in celiac patients is able to neutralize microbes or microbial components that may pass through the damaged intestinal barrier, thereby preventing a systemic inflammatory response against highly immunostimulatory molecules.

The NCWS group was markedly different. They did not have the intestinal cytotoxic T cells seen in celiac patients, but they did have a marker of intestinal cellular damage that correlated with serologic markers of acute systemic immune activation. The results suggest that



Image © iStock.com/ViktorCap

the identified systemic immune activation in NCWS is linked to increased translocation of microbial and dietary components from the gut into circulation, in part due to intestinal cell damage and weakening of the intestinal barrier.

“A systemic immune activation model would be consistent with the generally rapid onset of the reported symptoms in people with non-celiac wheat sensitivity,” said study leader Armin Alaedini, assistant professor of medicine at Columbia University Medical Center. NCWS patients who followed a diet that excluded wheat and related cereals for six months were able to normalize their levels of immune activation and intestinal cell damage markers, the researchers also found. These changes were associated with significant improvement in both intestinal and non-intestinal symptoms, as reported by the patients in detailed questionnaires.

“The data suggest that, in the future, we may be able to use a combination of biomarkers to identify patients with non-celiac wheat sensitivity, and to monitor their response to treatment,” said Alaedini. In future studies of NCWS, the researchers plan to investigate the mechanisms responsible for triggering the intestinal damage and breach of the epithelial barrier and to further characterize the immune cell responses.

Research shines light on lesser known form of vitamin D in foods
IFT Weekly July 27, 2016

Some people worry that they aren't getting enough vitamin D, which is critical for bone health, but they may be consuming more than they think.

New research finds that animal foods (eggs, some meats, and dairy products) that contain vitamin D also have another lesser known form of this nutrient that hasn't been measured routinely in foods, said Janet Roseland, a nutritionist with the U.S. Dept. of Agriculture's (USDA) Nutrient Data Laboratory. She presented her findings at a July 17 symposium at IFT16: Where Science Feeds Innovation.

For years most nutrient laboratories measured only the vitamin D3 (the primary form) and vitamin D2 in foods and supplements, she said. But some foods also contain 25(OH)D, which has not typically been included as part of the total vitamin D given for foods, even though it may be two to five times more potent than D3 or D2.

Scientists at five technically-skilled laboratories in the United States and other countries used rigorous methods to analyze the content of several foods and a supplement to see if they could all obtain the same results. “We found that the labs' values were consistent in measuring 25(OH)D and other forms, so in the future we can have better measures of vitamin D's total content in foods,” said Roseland. The research was funded by the USDA's Agricultural Research Service and the National Institutes of Health's Office of Dietary Supplements.

She says this additional information may one day be available in the USDA's National Nutrient Database for Standard Reference, which is considered an authoritative source of nutrient data for about 9,000 foods.

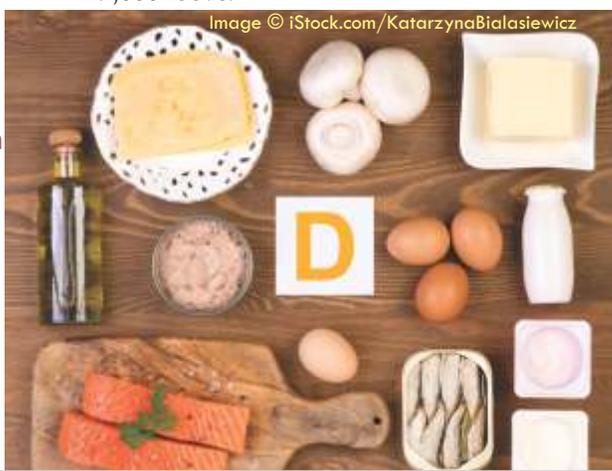


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Gut bacteria unleash anti-aging power of pomegranates

Written by Catharine Paddock
PhD Medical News Today 11 July 2016

In uncovering a compound's potential anti-aging properties, researchers reveal a fascinating result of the co-evolution of plants, bacteria, and animals over millions of years. They show the compound enables muscle cells in animals to protect themselves against one of the major causes of aging. The compound - called urolithin A - is naturally produced in the gut when a molecule that is present in pomegranates is digested by intestinal bacteria.

Tests of urolithin A's effect in humans are not yet complete, say researchers from the École Polytechnique Fédérale in Lausanne (EPFL), Switzerland, who report promising results from studies using nematodes and rodents in the journal Nature Medicine.

There have been many claims about the health benefits of pomegranates - including their supposed anti-aging properties.

However, the authors note that a lack of conclusive evidence - plus controversial marketing - has led to much skepticism. So they decided to take a closer look.

As we age, an important process that our cells rely on for energy slows down and begins to malfunction. This process - called "mitophagy" - recycles worn-out mitochondria, the tiny powerhouses inside cells that make the chemical units of energy that fuel their work.

If worn-out mitochondria are not recycled, they and their decomposing components build up inside cells, eventually causing problems in many tissues, including muscle, which gradually becomes weaker.

There is also evidence that build-up of faulty or worn-out mitochondria plays a role in the diseases of aging, such as Parkinson's disease. Scientists have also found that defects in the Parkinson's gene *Fbxo7* also disrupt mitophagy.

Urolithin A is the only molecule that can relaunch mitophagy

In the new study, the EPFL team establishes that urolithin A can restore mitophagy in cells where the process has become sluggish. Co-author Patrick Aebischer, a professor in neuroscience and president of EPFL, says urolithin A is unique in this respect: "It's the only known molecule that can relaunch the mitochondrial clean-up process, otherwise known as mitophagy. It's a completely natural substance, and its effect is powerful and measurable."

He and his colleagues first tested the effect of urolithin A in the nematode worm *Caenorhabditis elegans*, a very useful model for studying human biology at the cell level for several reasons: it is multicellular, its cells have many features in common with human cells, and it develops from a fertilized egg. For these reasons, and the fact that at 8-10 days of age, *C. elegans* is considered elderly, scientists also find the worm very useful for

studying the process and effects of aging.

The researchers found that when they exposed *C. elegans* to urolithin A, the worms lived on average more than 45 percent longer. The team also observed that urolithin A prevented the accumulation of dysfunctional mitochondria as the worms aged.

Urolithin A improved endurance in elderly mice

The researchers then repeated the tests with rodents. They found, like they did with the worms, that urolithin A led to a significant reduction in faulty mitochondria. Also, older mice - around 2 years old - showed 42 percent better endurance while running than other mice of the same age that had not been exposed to the compound.

In further tests with young rats, the team also found that exposure to urolithin A improved exercise capacity. These tests showed that a robust cellular recycling of mitochondria - mitophagy - was taking place, the authors conclude. However, while the study results appear promising, the researchers are by no means suggesting people should start consuming pomegranates to slow aging or preserve muscle strength on the basis of their findings.

The team points out it is not urolithin A that is present in pomegranates, but a precursor, a molecule in a family called the ellagitannins. When the molecule mixes with water in the gut, it breaks down into ellagic acid, which is further processed by gut bacteria to produce urolithin A.

Because of the number of steps involved in its natural production, and because of the role of the bacteria, the amount of urolithin A produced can vary widely. In fact, the necessary bacteria may be absent altogether in some individuals.

Human trials of urolithin A under way

If you happen to be one of the people whose gut bacteria do not produce urolithin A, then it is possible that pomegranates and pomegranate juice will not give you the benefits seen in the study. To try and overcome this, the team has launched a start-up biotechnology company, Amazentis, which has developed a way to deliver finely calibrated doses of urolithin A. Human trials have already started on testing the effects of urolithin A delivered this way.

The authors are optimistic that they will find urolithin A has similar results in humans. In evolutionary terms, *C. elegans* and rodents are quite distant, which is a good sign that the study has revealed a mechanism that is essential to living organisms. "Precursors to urolithin A are found not only in pomegranates, but also in smaller amounts in many nuts and berries." Chris Rinsch, co-author and CEO of Amazentis.

Omega-3 improves heart damage, function after heart attack

Written by Honor Whiteman
Medical News Today 2 August 2016

Once a person has had a heart attack, their heart may be damaged, raising their risk of further heart-related problems. But according to a new study, this risk could be reduced with a daily dose of omega-3.

Researchers found that people who



took a high dose of omega-3 fatty acids every day for 6 months after a heart attack showed reduced heart muscle scarring and better heart function, compared with heart attack patients who took a placebo.

Senior author Dr. Raymond Y. Kwong, director of cardiac magnetic resonance imaging at Brigham and Women's Hospital in Boston, MA, and colleagues publish their findings in the journal *Circulation*. A heart attack occurs when blood flow to a section of the heart muscle becomes blocked, which starves the heart of oxygen and causes damage.

According to the American Heart Association, the amount of heart muscle damage that occurs following a heart attack is dependent on the size of the area that is deprived of oxygen and how long for. The heart's healing process begins soon after a heart attack, taking an average of 8 weeks. However, this normally involves the formation of scar tissue - or fibrosis - which can alter the heart's structure and function.

Such impairments can increase the risk of other heart-related conditions, including irregular heartbeat (arrhythmia) and heart failure. Dr. Kwong and colleagues note that, despite advancements in heart therapies, heart failure remains a major issue; it affects around 5.7 million adults in the United States and contributes to around 1 in 9 deaths.

Better outcomes for heart attack patients with daily omega-3 For their study, the researchers investigated how omega-3 fatty acids might be an effective treatment option for heart attack patients.

Fast facts about heart attack

In the U.S., someone has a heart attack every 43 seconds
1 in 5 heart attacks are silent, meaning the heart suffers damage,

but the person is unaware of it
Coronary artery disease is the primary cause of heart attack.

Learn more about heart attack
Omega-3 fatty acids are deemed essential for human health, though the body is unable to produce them. As such, we need to get them through food sources, such as oily fish - including salmon, tuna, and halibut - plants and nuts, and dietary supplements.

Previous studies have found that omega-3 may improve survival after heart attack, but according to Dr. Kwong and team, the mechanisms by which it does so have been unclear.

To further investigate, the team enrolled 360 adults who had experienced a heart attack. For 6 months after their heart attack, half of the participants were randomized to take either a high daily dose of omega-3 (4 grams) - along with their usual medications - while the remaining half took a placebo.

Subjects' heart structure and function were assessed at the end of the study period, and during the study, patients were monitored for any adverse outcomes. Participants also underwent regular blood tests, which were used to ensure omega-3 was being taken.

Compared with the heart attack patients who took a placebo, those who took omega-3 showed a 5.6 percent reduction in scarring of non-damaged heart muscle, as well as a 5.8 percent reduction in the left ventricular end-systolic volume index - an indicator of a patient's outcome following a heart attack. Based on these results, the researchers believe a daily dose of omega-3 may be beneficial for heart attack patients.

"Our findings show that omega-3 fatty acids are a safe and effective treatment in improving cardiac

remodelling, so it may be promising in reducing the incidence of heart failure or death, which are still major healthcare burdens to patients who suffer a heart attack." Dr. Raymond Y. Kwong

Written by Honor Whiteman

Cravings for high-calorie foods may be switched off in the brain by new supplement

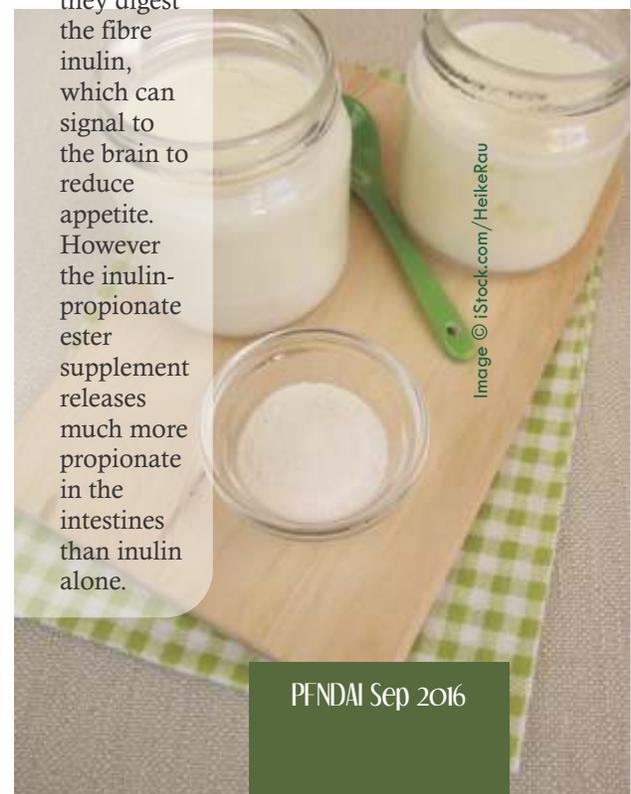
Science Daily July 1, 2016

Eating a type of powdered food supplement, based on a molecule produced by bacteria in the gut, reduces cravings for high-calorie foods such as chocolate, cake and pizza, a new study suggests.

Scientists from Imperial College London and the University of Glasgow asked 20 volunteers to consume a milkshake that either contained an ingredient called inulin-propionate ester, or a type of fibre called inulin.

Previous studies have shown bacteria in the gut release a compound called propionate when they digest

the fibre inulin, which can signal to the brain to reduce appetite. However the inulin-propionate ester supplement releases much more propionate in the intestines than inulin alone.





Now every dish
will be healthy.



Nutrela Soya Biryani

INGREDIENTS :

- 1 heaped cup basmati rice
- 1/2 cup Nutrela Soya Chunks
- 2 tablespoon Curd or 3 tablespoon thick coconut milk
- Oil & Salt as needed
- 3/4 to 1 tablespoon. garam masala or biryani masala powder (adjust the quantity as needed)

Dry spices

- 1 bay leaf
- 2-3 brown cardamom
- 1 star anise
- 2 green cardamom
- 3 cloves
- 2 cinnamon stick
- 1 small strand mace
- 1/4 tablespoon shahi jeera
- Few pepper corn
- 1/2 cup mint leaves pudina
- 1/4 cup coriander leaves (updated)
- 1 to 2 green chilies
- 1 ginger pieces
- 3 garlic cloves
- 1 medium onion
- Salt to taste

METHOD :

- Heat oil in the cooker and fry Nutrela Soya chunks till light golden brown.
- Then add onion, green chilli, cloves, cardamom green, cardamom brown, cinnamon stick, coriander powder, red chilli powder, turmeric powder and salt into pressure cooker. Cook on medium heat for about 15 minutes.
- Heat oil in the pan and sauté onion, bay leaf, cinnamon stick till onion are light golden brown. Now add soaked rice, salt and water
- Once rice's half cooked, add the fried prepared soya chunks and cover with lid and cook.
- Fry cardamom green, brown, black pepper and cloves on high flame till nice aroma comes. Grind it and sprinkle this mixture in Biryani. Cook it in slow flame.
- Nutrela Soya Biryani is ready to serve with any gravy or raita.



After drinking the milkshakes, the participants in the current study underwent an MRI scan, where they were shown pictures of various low or high calorie foods such as salad, fish and vegetables or chocolate, cake and pizza.

The team found that when volunteers drank the milkshake containing inulin-propionate ester, they had less activity in areas of their brain linked to reward -- but only when looking at the high calorie foods. These areas, called the caudate and the nucleus accumbens, found in the centre of the brain, have previously been linked to food cravings and the motivation to want a food.

The volunteers also had to rate how appealing they found the foods. The results showed when they drank the milkshake with the inulin-propionate ester supplement they rated the high calorie foods as less appealing.

In a second part of the study, which is published in July edition of the American Journal of Clinical Nutrition, the volunteers were given a bowl of pasta with tomato sauce, and asked to eat as much as they like. When participants drank the inulin-propionate ester, they ate 10 per cent less pasta than when they drank the milkshake that contained inulin alone.

In a previous research study by the same team, published in 2013, they found that overweight volunteers who added the inulin-propionate ester supplement to their food every day, gained less weight over six months compared to volunteers who added only inulin to their meals.

Professor Gary Frost, senior author of the study from the Department of Medicine at Imperial, said: "Our previous findings showed that people who ate this ingredient gained less weight -- but we did not

know why. This study is filling in a missing bit of the jigsaw -- and shows that this supplement can decrease activity in brain areas associated with food reward at the same time as reducing the amount of food they eat." He added that eating enough fibre to naturally produce similar amounts of propionate would be difficult: "The amount of inulin-propionate ester used in this study was 10g -- which previous studies show increases propionate production by 2.5 times. To get the same increase from fibre alone, we would need to eat around 60g a day. At the moment, the UK average is 15g."

Claire Byrne, a PhD researcher also from the Department of Medicine explained that using inulin-propionate ester as a food ingredient may help prevent weight gain: "If we add this to foods it could reduce the urge to consume high calorie foods." She added that some people's gut bacteria may naturally produce more propionate than others, which may be why some people seem more naturally predisposed to gain weight.

Dr Tony Goldstone, co-senior author of the study from the Department of Medicine added: "This study adds to our previous brain imaging studies in people who have had gastric bypass surgery for obesity. These show that altering how the gut works can change not only appetite in general, but also change how the brain responds when they see high-calorie foods, and how appealing they find the foods to be."

Dr Douglas Morrison, author of the paper from the Scottish Universities Environmental Research Centre at the University of Glasgow, commented: "We developed inulin-propionate ester to investigate the role of propionate produced by the gut microbiota in human health. This study illustrates very nicely that signals produced by the gut

microbiota are important for appetite regulation and food choice. This study also sheds new light on how diet, the gut microbiome and health are inextricably linked adding to our understanding of how feeding our gut microbes with dietary fibre is important for healthy living."

The research was funded by the National Institute for Health Research Imperial Biomedical Research Centre and the Biotechnology and Biological Sciences Research Council.

Your diet plan isn't working? New research explains why

Science Daily July 12, 2016

Study shows health-plan successes determined by 'approach' or 'avoidance' strategies

The reason? Dieters tend to adopt the wrong strategies, often planning to ditch their favourite foods and replace them with less-desirable options, according to new research from Baylor University's Hankamer School of Business.

Conversely, successful dieters focus on adding healthy foods -- foods that they actually like, said Meredith David, Ph.D., assistant professor of marketing at Baylor. She is the lead author on the study, "Saying 'No' to Cake or 'Yes' to Kale: Approach and Avoidance Strategies in Pursuit of Health Goals," published in the journal Psychology & Marketing.



"Our research shows that instead of creating rules to avoid one's favourite treats, dieters should focus on eating healthy foods that they enjoy," David said. "Dieters who restrict themselves from consuming the foods they love most may be setting themselves up for failure. Instead, they may be better off by allowing occasional 'treats' and focusing attention on healthy foods that they enjoy and making it a point to include those tasty, but healthy foods in their diet."

The outcomes of the research -- three studies and a total of 542 study participants -- hinged on a person's level of self-control. "In coming up with plans to enhance one's health and well-being, low self-control individuals tend to set themselves up for a harder pathway to success by focusing on avoiding the very foods they find most tempting," David said. "Our data reveals that individuals who are generally more successful at reaching their goals tend to develop more motivating plans regarding the inclusion of healthy, well-liked items and the exclusion of unhealthy items that are not one's favourites."

The research found:

- When asked to list specific rules that individuals might use to guide their food consumption, a large percentage of individuals listed rules that involve restricting and avoiding certain foods. This was particularly the case among low self-control individuals -- those who generally have less success in reaching their goals. Individuals who are generally more successful in goal pursuit tended to list rules that involved things they should approach and/or consume.
- When thinking of unhealthy foods to avoid as a part of a diet, low self-control individuals think of foods that they really like -- their favorite snacks, and most tempting items. High self-control individuals think of foods that they like but could

reasonably forgo.

- When thinking of healthy foods to eat as a part of a diet, low self-control individuals think of foods they do not like, such as those that they find highly unpalatable (e.g., Brussels sprouts). High self-control individuals think of foods they enjoy eating (e.g., strawberries).

"Frequent attention is given to health advice surrounding well-intentioned lists of 'magical' foods that everyone should eat or practically 'poisonous' foods that people should avoid consuming," David said. "The next time you decide to go on a diet or seek to improve your health by altering your food consumption, opt for strategies that focus on including healthy foods in your diet, and focus specifically on those healthy foods that you really enjoy eating."

Food nudging can help us to eat in a healthier way

Order in which dishes are presented to us matters
Science Daily July 13, 2016

Is it possible to change our behaviour when it comes to food choices only by presenting the food to the guests in a canteen in a different order, or by making it more difficult to reach the less healthy food? Yes, a review of existing research in this area concludes.

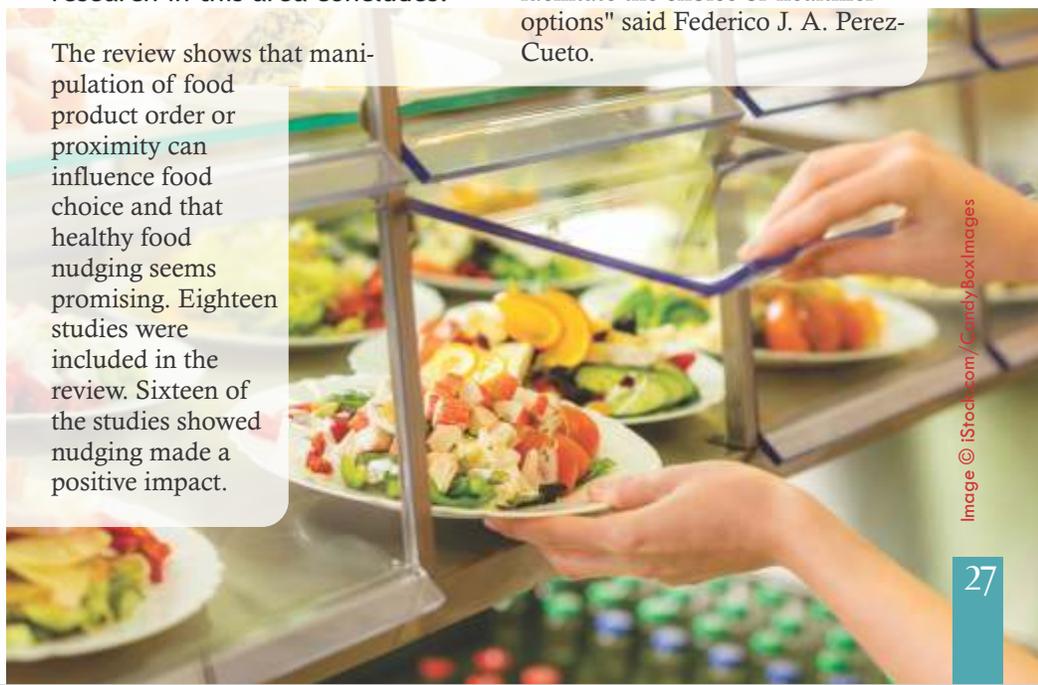
The review shows that manipulation of food product order or proximity can influence food choice and that healthy food nudging seems promising. Eighteen studies were included in the review. Sixteen of the studies showed nudging made a positive impact.

"The review confirmed our expectation that there are very few scientific works available which deal with nudging healthier food choices by changes in the position of the food offers. We also corroborated that changing the organization of buffets, supermarkets and the other environments where people come across food can contribute to people eating more healthily," said Associate Professor Federico J. A. Perez-Cueto from the Department of Food Science at the University of Copenhagen, Denmark.

Using the methods of the private sector

Nudging or "choice architecture" refers to strategic changes in the environment that are anticipated to alter people's behaviour in a predictable way, without forbidding any options or significantly changing their economic incentives. However, until now the scientific evidence of nudging towards healthier eating has been scarce.

"The food service operators and the retail sector have been using the principles of nudging to push its products to the consumers e.g. placing specific products at adult's eye level, while other products are left at children's eye level. The question is whether we can also use this simple and low-cost method to move people's food behaviour in a more healthy direction, or to facilitate the choice of healthier options" said Federico J. A. Perez-Cueto.



Other studies suggest that even a small move towards healthier eating has an impact on the health and life expectancy of a population.

"Some can start by eating more vegetables. Some will go from zero to one portion a day and it will contribute in the long run. Those are studies from the medical world that inspire the idea of small changes having impact in public health, so how can you translate that knowledge into practical food service? Based on the review we suggest that a way ahead contributing to achieve public health goals through the food service sector is e.g. by making changes in the placement of the products we want to promote, like vegetables by putting them first in line. Likewise, by making it a little bit more difficult to reach the products that should be consumed with moderation or that should be strictly limited like some products of animal origin or highly processed foods," said Dr. Perez-Cueto.

Healthy food nudging in the coming years

He expects food nudging in canteens to be one of the hot topics when it comes to interventions aimed at promoting healthy eating habits.

"There is already some activity in the area, and changing eating towards healthier behaviour is going to be the challenge for the next couple of years. Together with the big retail companies and the food industry such as canteens, we will have to think about whether the focus is just to keep business as usual -- or if it is also about keeping the population healthy, and preserving the environment," said Federico J. A. Perez-Cueto.

He states however that nudging is just one tool in the box. "If you want

people to eat enough vegetables, it is not the only thing to do, there is need for policies, recommendations, voluntary agreements, information campaigns, but nudging can contribute, and we think the contribution can be substantial," he said.

The review also concludes that there is a need for high-quality studies that quantify the magnitude of positional effects on food choice in conjunction with measuring the impact on food intake, particularly in the longer term. Future studies should use outcome measures such as change in quantities of food consumed or energy intake to quantify the impact on dietary intake and the potential impact on nutrition-related health.

Butter may not be as bad for the heart as previously thought: Review

Dairy Reporter, 04 Jul 2016

Eating butter has no effect on raising cardiovascular disease (CVD) risk and may even have protective effects against diabetes, according to a review.

The PLoS ONE review's main results found consuming butter was weakly associated with all-cause mortality, was not significantly associated with any CVD, coronary heart disease or stroke and was inversely associated with the incidence of diabetes. In total, the combined group of studies included 28,271 deaths, 9,783 cases of CVD, and 23,954 cases of new-onset type

2 diabetes. The researchers combined the nine studies into a meta-analysis of relative risk.

"Even though people who eat more butter generally have worse diets and lifestyles, it seemed to be pretty neutral overall," said Dr Laura Pimpin, former postdoctoral fellow at the Friedman School of Nutrition Science and Policy at Tufts in Boston. This suggests that butter may be a more healthful choice than sugar or starch, and a worse choice than many margarines and cooking oils those rich in healthy fats such as soybean, canola, flaxseed, and extra virgin olive oils," she added.

The findings are sure to ignite opposition from health campaigners, who believe butter's high saturated fat content has the effect on heightening risk of chronic conditions such as heart disease and type 2 diabetes. The World Health Organization (WHO) states that CVD causes more than half of all deaths across Europe. CVD causes 46 times the number of deaths and 11 times the disease burden caused by AIDS, tuberculosis and malaria combined in Europe. 80% of premature heart disease and stroke is preventable.

Review criteria

A review that looked at nine research papers involving 15 country-specific cohorts was analysed. All in all, 636,151 individuals took part in the analysis. Butter consumption was kept consistent in the studies to 14 grams/day.

Butter consumption across the studies ranged from around one third of a serving per day to 3.2 servings per day. The effects of butter consumption over a longer period and its influence on



all-cause mortality and CVD, are not well-established. Previous reviews have evaluated only some of these outcomes, included butter as part of a wider investigation into dairy foods or types of fats.

Review limitations

In response to the review's findings, Tom Sanders, Professor emeritus of Nutrition and Dietetics at King's College London highlighted a limitation of the review commenting that in some of the prospective studies in serum cholesterol at baseline and intake of monounsaturated and polyunsaturated fatty acids were adjusted for difference.

"The finding is not surprising as 14 g butter per day would only be expected to change blood cholesterol level by 1% and this alone would have an unnoticeable effect on risk of CVD," he said. "The studies were also unable to make any allowance for butter in processed foods such as cake and biscuits. Generally, I agree with the review that it is the overall dietary pattern that matters rather than the intake of specific food items."

Tracy Parker, heart health dietician at the British Heart Foundation, added: "Understanding the true relationship between diet and our health is difficult, but we know that replacing saturated fat with unsaturated fats seems to have a positive impact on our heart health and this is recognised by the authors of this study. "Whilst the findings of this review indicate a small or neutral association between butter consumption and increased cardiovascular risk, it does not give us the green light to start eating more butter. More investigations are needed into the effects of saturated fat."

According to the Eatwell Guide, the UK's official dietary advice, the average man should have no more than 30 g saturated fat a day and average woman should have no more than 20 g saturated fat a day.

Canola researchers in omega-3 breakthrough

Food Navigator Asia 08Jun2016

New canola varieties being developed in Australia look capable of producing the highly coveted, high-value long-chain omega-3 oil

Australia has taken the lead in the development of new GM canola lines that produce long-chain (LC) omega-3 oils. These are the oils in increasing demand for their human health properties and as a feed additive in the world's rapidly growing fish-farming industries.

The Australian research has effectively succeeded in extending canola's existing short form of omega-3 (alpha-linolenic acid, or ALA) into the LC varieties – eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) – that are normally sourced, via fish, from marine plants. It is a significant scientific development that has the potential to shift the sourcing of these important omega-3 health oils from marine plants to a terrestrial crop. This is expected to ease the heavy worldwide pressure on fish stocks. The research has been a collaboration between the GRDC, CSIRO and Nuseed. At CSIRO, the project is being led by Dr Surinder Singh and coordinated by Dr James Petrie.

Dr Petrie credits a large part of the team's world-leading position to a CSIRO research ethos that has been very end-point focused. This encouraged an acceleration of the development phase by using a method that allows many gene combinations (for oil production) to be tested more efficiently. "We have been able to determine much more rapidly than our competitors how to put together all the genes we need into a single combination," Dr Petrie says.

Dr Singh says that in glasshouse trials over three seasons – a comparatively short timeframe – the germplasm developed at CSIRO achieved levels of DHA in the canola oil comparable to levels found in bulk fish oil. "These glasshouse trials are now ready to move to field trials, to test the technology under field conditions, and begin the process of selecting the best combination of agronomic performance and DHA oil levels," Dr Singh says.

Nuseed will manage the field trials and subsequent commercialisation, and if the project is successful will bring LC omega-3 canola varieties to market. Dr Malcolm Devine at Nuseed says the project's ultimate goal is to make Australia the first and foremost global supplier of DHA-containing canola oil, therefore creating valuable new markets for Australian growers.

"Post-farmgate, we intend the grain to be processed into oil in Australia, targeting a number of potential markets. These could include dietary supplements, pharmaceuticals and DHA-rich aquafeed markets," Dr Devine says.

However, as successful as the research has been to this point, he says commercialisation is still several years away: "We have seen some very interesting and positive results so far, and taking the material into the field is the next step." The field trials have been approved by the Office of the Gene Technology Regulator. The trials will allow the canola to be evaluated for agronomic performance, LC omega-3 content and genetic stability under field conditions – all important factors in achieving commercialisation.



While being aware that GM food crops can be controversial with the public, the project partners all say that few feasible alternative supply options exist for this particular nutrient and there is a compelling need for a sustainable source given EPA and DHA's health benefits. Unlike previously released GM canola varieties, the DHA trait is an example of an 'output trait', meaning it is designed to provide benefits to consumers. This differs to existing 'input traits' that provide agronomic benefit to growers.

While uptake of input traits – primarily herbicide and pest resistance – has become commonplace, GM output traits globally are still finding their way through the R&D pipeline.

"I think the sustainability and environmental credentials of the crop are significant factors supporting the use of GM technology in this particular application," Dr Petrie says. "When you do the calculations, if you can achieve 12 per cent levels of DHA in the canola oil, then one hectare of this crop can meet the same production levels produced by 10,000 ocean fish. And we couldn't have achieved this using conventional plant breeding methods."

Dr Ron Osmond, the GRDC's manager for commercial technology delivery, says the GM canola system is already well established in Australia. "It has worked quite well so far. So the same principles around high-quality stewardship and identity preservation would be expected for the DHA-producing canola when it is commercialised." Overall, Dr Osmond and Dr Devine say that the potential for commercialisation is strong and the science developed by CSIRO is robust and thorough.

"Technically and scientifically it has been a world-class achievement,"

Dr Osmond says. "I think it's a great example of public sector and private sector working together towards a new technology with a profitable outcome for Australian growers."

Prebiotic fibre may boost growth and immune function in infants: Piglet data

NutraIngredients, 29Jun2016

Early supplementation with prebiotic shortchain fructooligosaccharides (scFOS) may enhance the response to vaccinations and promote growth, says a new study with piglets.

Data published in the Journal of Functional Foods indicated that prebiotic supplementation of mother during pregnancy and lactation, and then of the offspring after weaning produced significantly improved responses to flu vaccine, and improved growth.

"Our results confirm the functional activity of scFOS as immune and growth-modulators according to a periodspecific dependent effect," wrote researchers from INRA Saint Gilles, France and prebiotic supplier Tereos. "It agrees with the potential interest of supplementing formula with scFOS to favour immune response in infants."

Study Details

Led by Cindy Le Bourgot at INRA Saint Gilles, the researchers divided 17 sows into two groups: One group received the standard diet and the other had its diet supplemented with scFOS (Profeed P95, BeghinMeiji) for the last 4 weeks of gestation and during lactation. After weaning, piglets from each litter have been divided

into two groups, and received either the diet or the scFOS supplemented diet for 7 weeks. The piglets were given a flu vaccine on day 35 and day 56.

Results indicated that the post-weaning scFOS diet was associated with increases in levels of anti-influenza IgA (markers of the immune response) in pig serum and feces. "This is an important finding because the protection against pathogens that penetrate the respiratory tract mucosa, such as the influenza virus, requires responses from both mucosal and systemic compartments of the adaptive immune system," wrote the researchers.

On the other hand, no effects on immune function were observed as a result of maternal scFOS supplementation only. However, maternal supplementation did prevent some of the decrease in growth observed after vaccination, and also resulted in a higher body weight at 10 weeks of age.

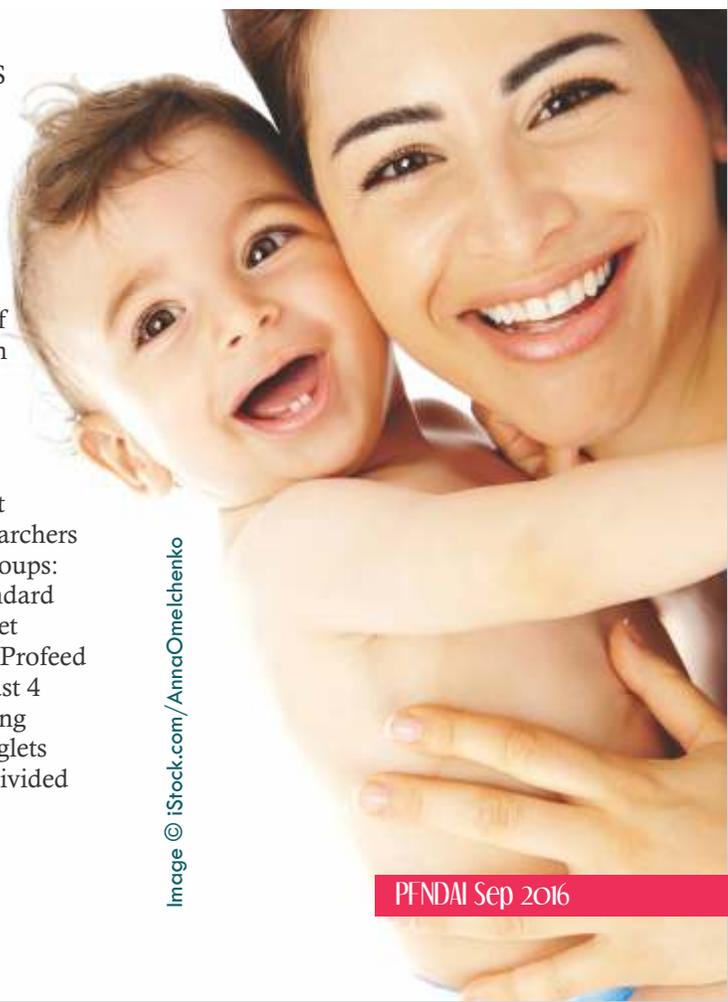


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FOOD SCIENCE & INDUSTRY NEWS

Want kids to eat their veggies? Turn squash into a superhero

Medical News Today 5 July 2016

Cartoon characters can triple salad bar trips in elementary schools.

Convincing kids to choose vegetables becomes easier when you deploy a team of animated characters to sell them on the good stuff, new research has found. Miki Mushroom, Zach Zucchini and Suzie Sweet Pea appear to wield the kind of influence many moms and dads only wish they had.

Marketing vegetables in school lunchrooms using the Super Sprowtz - a team of fun-loving characters with super powers - as much as tripled the percentage of elementary school students choosing items from the salad bar, found researchers led by Andrew Hanks of The Ohio State University.

"If we put the time and good resources into marketing healthy choices to kids, it can work," said Hanks, an assistant professor of human sciences, whose study appears in the journal *Pediatrics*.

"These interventions don't need to be costly and there is a great opportunity to improve nutrition, performance in school and behaviour as well," Hanks said, referring to previous studies that have linked healthful diets to

success in the classroom.

Marketing to children is controversial in some circles, but Hanks said this study illuminates its potential if done well and with the best interest of kids in mind. "Marketing can have both positive and negative effects," Hanks said. "But instead of avoiding it completely, we can harness the power of marketing to help us."

Hanks and his collaborators conducted the study while he was at Cornell University in New York. They tested three interventions in 10 public elementary schools in urban New York State. In some, they wrapped the bottom portion of the salad bar with a vinyl banner depicting the super veggies. In others, they played Super Sprowtz videos in the lunch room. And in others, they tried both tactics.

In schools with the salad bar banners, the researchers saw 24 percent of kids taking vegetables from the salad bars, almost double what they'd observed in the weeks leading up to the change. In those schools that had characters on the salad bar and on video, veggie selection jumped from 10 percent to almost 35 percent. The researchers saw no significant improvement in schools with videos alone.

Though previous research has shown that boys are less likely than girls to choose healthier options, the results were robust in both groups. Hanks said it's hard to say how the

study would play out in suburban or rural districts. "And it's unlikely such a technique would work with older students," he said.

"It's important to be strategic. If you use these characters in a middle or high school I doubt they will have much of an impact," said Hanks, who is also a member of Ohio State's Food Innovation Center. "For anyone thinking 'Will this work?' our study is best generalized to an urban elementary school setting," he said. "Also, the district was not extremely poor."

Hanks noted that not many U.S. schools have salad bars, something he found surprising given the recent federal push for healthier options in the schools. "Salad bars could be met with more enthusiasm than a spoonful of cooked carrots on a lunch tray," he said. "If we can encourage kids to take vegetables of their own accord, rather than have someone put it there for them, they're much more likely to eat them," Hanks said.

Healthy snacks growth outpacing overall food, beverage market

IFT Weekly July 30, 2016

According to the new *Packaged Facts report "Healthy-Ingredient Snacks in the U.S., 2nd Edition,"* healthy-ingredient snacks offer the perfect convergence of many important modern food industry trends and as a result the segment is thriving.

They are portable, healthy, and have transparent labels and packaging. As a result of these factors, among

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others, the past 5 years have seen steady growth for healthy-ingredient snacks. The market's compound annual growth rate (CAGR) of 4.7% has outpaced overall food and beverage sales growth.

The past two years in particular have seen much stronger market growth due to double-digit gains in the meat snack and trail mix categories in 2014, and stronger growth in snack bars in 2015. Packaged Facts projects the healthy-ingredient snack segment will continue enjoying steady growth in sales; a CAGR of 5.7% is expected between 2016 and 2020.

There is a variety of industry trends that are responsible for this bullish outlook:

- There is a growing preference amongst snackers for products that provide more healthful options than typical snacks.
- "Free from" remains a top driving trend for healthy-ingredient snack sales, with allergen- and gluten-free claims the most popular.
- Protein, bite-sized snacks, and innovative flavours are in high demand.

Not to be overlooked is retailers increasingly marketing private label healthy snacks. Many different retail chains have recognized the growing interest of consumers for healthy-ingredient snacks and they are not only developing and introducing new products to the segment, but are spending money advertising them. In the convenience channel, the most notable new brand is 7-Eleven's 7-Select Go!Smart

brand and its yogurt-drizzled snack bars. In the natural channel, Trader Joe's does a significant amount of in-store ads and out of category displays for its many distinctive private label healthy-ingredient snacks.

Supermarket chain

Aldi introduced its Simply Nature line of all natural and organic foods at the beginning of 2014, and continues to support and advertise the brand.

Beans, peas, lentils, chickpeas: The hottest ingredients in the snack developer's toolbox?

Food Navigator USA, 29Jun2016

North American pulse growers still export a lot of their wares, but domestic demand has ramped up significantly in recent years as beans, peas, chickpeas, and lentils have started to infiltrate every aisle in the grocery store, from hummus, bean dips, pasta and salads, to chips, brownies and nutrition bars, according to pulse processor AGT Food and Ingredients.

"We're definitely not exporting as many chickpeas as we used to as so many of them are now going into the domestic market due to the huge growth in the hummus market," says Eric Bartsch, director of food ingredients at AGT. "But we're also seeing the same trend in lentils and peas, thanks to a growing market for pulse ingredients in extruded snacks, pasta, meat analogs, [nondairy] beverages and pet food."

In some cases, food manufacturers are using pulses to improve the nutritional profile of pantry staples from pasta (chickpeas are the #1 ingredient in Banza) to baked goods (Pure Genius brownies have 40% chickpeas) by replacing 'empty carbs' with protein and fibre – while novel ingredients can also revitalize tired categories by adding a new twist, he says.

In other cases, he says, pulses are driving completely new products and categories, especially in the snacks arena, from Beanitos bean chips; roasted chickpeas from brands such as The Good Bean, Saffron Road and Biena Foods; coated peas and fava bean snacks from World Peas; lentil chips from Plentils; and 'other bean' hummus from Eat Well Embrace Life. "I'd say pasta and snacks are the two biggest growth areas."

Gluten-free

Richer in fiber, protein, and micronutrients than gluten-free staples rice and tapioca flour, pulse-based ingredients can also significantly improve the texture, nutrient quality and shelf life of gluten-free products, says Bartsch. Overall, he predicts, pulses will continue to gain ground as they tick so many boxes (sustainable 'plant-based' protein source, non-GMO, gluten-free, allergen-free, high in protein, fibre and micronutrients, and low in fat) and companies such as Ripple Foods and AGT come up with ways to make them easier to formulate with.

"For example, we've recently introduced a mechanical deflavouring process so you can increase the inclusion rates for pulse ingredients as the flavour is far

more neutral."

There's a growing market for pulse ingredients in extruded snacks, pasta, meat analogs, beverages and

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Enzymes for Specialty Applications

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Tea Fermentation

accelerates tea fermentation and improves strength, body & color of tea liquor.

Herbal Extraction

increases the solubility of herbal mass & the extract yields

Oil Extraction

aids in the extraction of vegetable oils in aqueous process

petfood While domestic demand for pulse proteins tends to eclipse demand for starches, there is a lot of interest in pea starch in overseas markets, he observes. “China went from importing no peas to importing millions of tons as they are extracting the starch to make noodles.”

Faba bean protein

So which pulse-based ingredients are generating the biggest buzz right now? Probably faba beans, says Bartsch. “They are high yielding and they have a more neutral flavour and high protein levels, so for example we’ve seen people use faba bean protein as an egg replacement in pasta. We’re also seeing them in meat analogs, bakery and snacks. Yellow peas have traditionally dominated because they were cheaper, but now formulators are looking for something different, so we’re seeing strong demand for lentil protein, faba bean protein and so on. Consumers are looking for new things and as it’s the international year of the pulse, they are also hearing more about pulses in the media. Look at hummus – it’s everywhere now, but a lot of people hadn’t even heard of it 10 years ago.”

Fish trimmings could be new value-added protein source

NutraIngredients, 30Jun2016

Fish trimmings could become a source of protein with the simple addition of commercially available enzymes, say Nofima researchers.

The bitter taste of fish trimmings-based hydrolysates (protein powder) is a big hurdle in the human consumption market. Despite containing high quality food grade proteins, off cuts are usually discarded or used in low-

value commodity products such as fishmeal and oil, Nofima scientist and study lead Tone Aspevik said.

However, the research found that adding commercially available protease enzymes to salmon-based trimmings (heads and spines) creates non-bitter hydrolysates without affecting nutritional value. “Reduction of the bitter taste is of utmost importance in the production of fish protein hydrolysates (FPHs), but also knowledge of the surface-active and nutritional properties of a hydrolysate may be important for its potential inclusion in food products,” Aspevik said. “The nutritional properties of the raw material and resulting hydrolysates revealed low levels of tryptophan, leucine, isoleucine and valine to meet dietary requirements of children under three years of age.”

Nofima (the Norwegian food research institute) is funded by the Norwegian government, the EU and commercial investments and has an annual budget of about €60 million. The findings could be a business opportunity for companies already producing fish products as well as young businesses looking for new sources of protein supplementation, Dr Åge Oterhals, senior scientist at Nofima told NutraIngredients. Laura Jones, global food science analyst at Mintel told us there is rising demand for alternative proteins. The 2015 EU ‘landing obligation’ policy has also piqued European interest in fish as

potential novel sources of protein, Dr Chris McLaughlin from the University of Ulster in Northern Ireland previously told us.

Study details

FPHs’ bitter taste is a result of the size and composition of the peptides, Aspevik explained. Specifically, the taste is due to “exposure of hydrophobic amino acids and moieties during the hydrolysis process,” she said. The study used five protease – Alcalase 2.4L, Corolase 7089, Neutrase 0.8L, Promod 671L and Protex 7L – to cleave the fish trimmings proteins into smaller peptides. “Proteases act by cleaving proteins into smaller peptides and free amino acids that are more water-soluble and have altered sensory and surface-active properties compared to the intact protein,” Aspevik said.

Nutritional and chemical properties of the final products were tested, and taste was evaluated by Nofima’s sensory panel of judges. “The main conclusions were that the bitter taste really depends on type of enzymes used in the process and the degree of hydrolysis that is obtained,” said Dr Oterhals, who was also a supervisor on the study.

He stressed that further research is needed to identify the enzymes with the best effects. “(We) learned a lot about what parameters influence the development of bitter taste, but there is still more to do in that area before you can actually control it,” he added.

Limitations & further research

Despite removing bitterness, the hydrolysates in question still hold a “fishy” taste, Aspevik notes. This could be a limiting factor for the powder’s food applications as a protein ingredient, Dr Oterhals and Jones agreed.



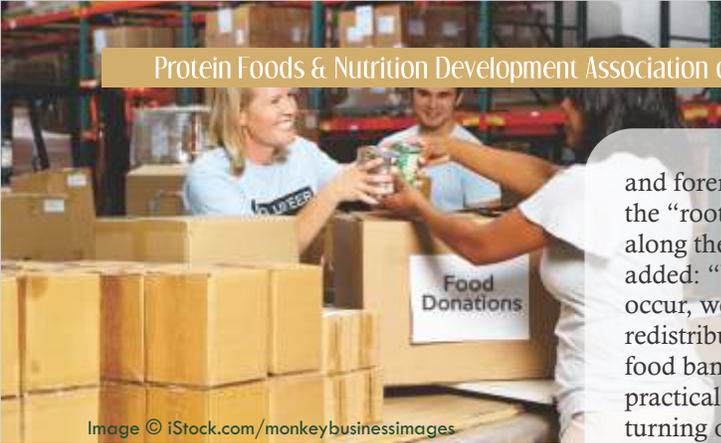


Image © iStock.com/monkeybusinessimages

Food donation guide for manufacturers launched

Food Manufacture UK, 30 Jun 2016

A guide offering food manufacturers practical advice on how to donate food surpluses to food banks has been launched by three trade organisations.

The guide, put together by the European Federation of Food Banks (FEBA), FoodDrinkEurope and EuroCommerce, is designed to help manufacturers and retailers understand the types of food that can be donated, and who they can donate to. There is also advice on whether food that has passed its best-before date can be donated, and the information on donations that manufacturers and retailers need to document.

With around 100Mt of food wasted annually in the EU, preventing waste in the food chain is a key priority for food and drink manufacturers, retailers and wholesalers, said the guide's authors. Patrick Alix, secretary general of FEBA, said it was imperative to recover more nutritious food to support more vulnerable people.

Proactive steps

"I hope an increasing number of food businesses will adopt those guidelines and engage with our food banks to take proactive steps to support those experiencing poverty," he suggested. Mella Frewen, director-general of FoodDrinkEurope, said it was first

and foremost imperative to tackle the "root causes" of food waste, all along the food chain. However, she added: "When food surpluses do occur, we all agree they should be redistributed as much as possible to food banks. With these very practical guidelines, we are simply turning our words into action and encouraging more food companies to best use their surpluses." Christian Verschuere, director-general of EuroCommerce, said that the organisations involved were all committed to making sure that wholesome and nutritious food was not wasted.

Member help

"Not only do our members donate to food banks and other social organisations – many of them help food banks –and charity organisations with logistics," he said. "These very useful guidelines show how best to donate food, and many examples of good practice. We hope that these will inspire others to follow the path many retailers and wholesalers have already adopted," he added.

According to the organisations, the joint guidelines contribute to the ongoing EU and global policy discussions on food waste prevention and stimulating the circular economy. They are also part of the ongoing efforts to supporting the implementation of the UN Sustainable Development Goal 12.3 – which aimed to halve food waste by 2030.

Sustainability: A longterm investment and driver of innovation?

Food Navigator, 29 Jun 2016

The food industry has taken notable steps to address the issue of sustainable

sourcing, compelled by a corporate and social responsibility that ensures products that are produced in a safe, supportive and environmentally responsible manner.

But are there other reasons why food makers want to go down the sustainability route? Presumably the task to remould an existing business model to include sustainability is somewhat of a time-consuming burden.

There is also the expense in sourcing sustainable raw materials, ensuring its complete traceability as well as safeguarding the livelihood of the people involved in the product's lifecycle. According to a report by Harvard Business Review, businesses cannot afford to dismiss the concept of sustainability as a drain on an organisation's bottom line. In fact, the report hailed sustainability as 'a touchstone for innovation.'

'In the future, only companies that make sustainability a goal will achieve competitive advantage,' the authors said. 'That means rethinking business models as well as products, technologies, and processes.'

That was back in 2009. Since then the food industry has come on leaps and bounds, embracing this ecological and socioeconomic concept to not only innovate but form a backbone to which company philosophies and products abide by.

Image © iStock.com/fotoluk1983



Market advantage

“Brands that recognise the importance of launching eco-friendly products can also gain a first-mover advantage over their competitors,” said Efrat Kat, vice president of marketing & sales at Algatechnologies. Its main product AstaPure natural astaxanthin, originates from the microalgae strain *Haematococcus pluvialis*.

Manufacturers can combine this product with other nutrients in product formulations to produce dry blended beverages and health bars. “Sustainability is very much an issue related to the food and beverage industry,” added Karina Bedrack, sales and marcom manager at Algatechnologies. “Because you have so many different suppliers today, everyone wants to differentiate themselves from the others.”

“Our astaxanthin is produced in the desert so it’s free from industrial area pollutants. It’s a product that doesn’t need pesticides so is completely grown naturally. We only use water and nutrients to feed the microalgae. In addition, the extraction process is done using supercritical carbon dioxide, which doesn’t use solvents.”

Flexibility in thinking

By no longer using outdated processing methods or raw materials that irreversibly damage the environment, it seems that adopting a sustainable way of working has moved food ingredient makers and suppliers to think differently in how their product is produced and even perceived. In essence companies have had to innovate.

“We control the entire process from the soil to seeds that we breed right through to the final supplement,” said Dr Karin Linnewiel Hermoni, category specialist, CarOBlends at Lycored. “We ensure that we do this in a green and responsible way

because that is part of the promise that we are committed to.”

Lycored’s range of tomato-based products have been especially prepared for use in creating popular foods, enhancing its taste or colour to appeal to customers and consumers alike.

It’s LycOBeta range is used for a variety of applications including colouring foods, beverages, milk, yogurt, fruit preparations, and confectionery, while its SANTE MS range focuses on flavour, often used as a natural tomato concentrate and flavouring agent.

It’s other tomato-related product of note is Cardiomato, a nutrient blend that uses the active compounds found in tomatoes (lycopene, phytoene, phytofluene, betacarotene, phytosterols and tocopherols (vitamin E)) to support cardiovascular health.

Here sustainability has been identified as a way to produce the vegetable’s rich intense flavour direct from nature. “Sustainability makes it easier to innovate,” said Lycored’s VP of marketing and communication Zev Ziegler. “Breed selection for example is under our control.”

Sustainability as an investment

Many ingredient suppliers see sustainability as a form of investment in their product, although maybe not in monetary terms. A competitive advantage can also mean how a company and its product is perceived. Naturally, if the view is positive, customers will look upon their offerings with approval, safe in the knowledge that ethical concerns have been heard and addressed.

Observers need only look to how Fairtrade bananas, cocoa and ethically-positioned products have entered into the thinking of consumers, who are asking more questions about products’ origins.

“Consumers are looking for a product from people that care about what they’re doing and why they’re doing it. That’s a trend that we’re seeing,” said Ahiflower’s Andrew Hebard, president and CEO of TCI, the holding company for Nature’s Crops.

Ahiflower is a plant-based source of omega3, which goes on to form a vital ingredient in food products such as protein shakes, milk shakes, and dairy shake products. Hebard believed that much of the omega3 market was dominated by fish and krill but he found that there was increasing resistance from consumers, who wanted to know more about the origin of the omega3 oil and its sustainability. “Traceability throughout the supply chain is a trend that is increasing all the time. What people are looking for is authenticity,” he said. “Not just authenticity of the product but how authentic is your business when it comes to environmental stewardship, sustainability, traceability, and the livelihood of the people through the supply chain.”

UK launch for plastic packaging that can be 'thrown away like an orange peel'

Bakery & Snacks, 29Jun2016

Biodegradable plastic packaging designed to behave like an orange peel when it is thrown away is launching in the UK next month.

The 100% biodegradable product is already in use in the US, and supplier TIPA is set to announce a number of UK brand partnerships in the next few months.

Image © iStock.com/AnikaSalsera





Image © iStock.com/liubomirt

very blending of materials makes the whole package unfit for recycling or composting. “The vision behind TIPA was to resolve the challenge of creating sustainable flexible

Advanced bioplastics materials TIPA was set up by software engineer Daphna Nissenbaum, CEO, and industrial designer Tal Neuman, senior vice president of products, in Israel in June 2010. It now has a large R&D team, bioplastic manufacturing team and sales and marketing departments, with a subsidiary sales office in the US.

Products include coextruded high-transparent films for fresh produce, coffee, bakery, grain mill products and transparent and non-transparent sealable plastic bags and stand-up pouches for granola bars, potato chips, snacks, grains and dried foods, which are already sold in the EU and US.

Nissenbaum told BakeryandSnacks TIPA’s vision is for flexible plastic packaging to have the same end-of-life properties as organic waste but still give consumers and brands the same durability and shelf life they have come to expect of ordinary plastics for foods including: fresh produce, chilled and frozen food, and dairy products.

“Flexible packaging isn’t made of pure plastic polymers but made by blending several materials which make recycling nearly impossible,” she said. “Even when some of the materials used for flexible packaging are biodegradable, the

packaging by creating advanced Bioplastics materials. To do that, our company is made up of professional experts in chemistry and bioplastics, industrial experts and food engineers. We are offering a new age of packaging, packing food the same way as nature does.” Nissenbaum added, even though bioplastic material has been in existence for a long time, it has been used for agriculture, waste bags, or simple applications, because the material failed on existing production lines.

‘The task was complicated and full of difficulties’

She said the materials tended to break more easily and were sensitive to heat and humidity, with poor permeability rates, a yellowish colour and lacked transparency. “The task of developing a compostable package from scratch was complicated and full of difficulties, not least of which were regulatory, the lack of existing technology, as well as logistics and business development,” said Nissenbaum. “It took hours of development time, but today TIPA has developed the first fully compostable ecofriendly barrier films and laminates with the necessary moisture and oxygen barrier properties to meet the required shelf life standards for a range of foods.

“This breakthrough allows for the replacement of non-recyclable flexible packaging with organically recyclable/compostable packaging. Not only can TIPA’s packages be diverted from landfills and incineration centres but, as an added value, they can serve as a feedstock for producing energy (e.g. biogas facilities) or land fertilizer (compost facilities).”

When cofounders Nissenbaum and Neuman started working together six years’ ago they wanted to design biodegradable water bags (TIPA is Hebrew for ‘droplet’). They hired bio plastic experts to find the appropriate materials for the beverage bags but after six months they were told there were no biodegradable materials on the market that were suitable.

Same properties as conventional plastics

The duo decided, if TIPA biodegradable flexible packaging was to succeed, it would have to have all the qualities of traditional plastics, in terms of transparency, tensile strength and shelf life. It would also have to be fully compostable. “The basic idea is actually an orange peel. A package that would behave like an orange peel. A biodegradable package that we can eat or drink the content and throw the package into the organic waste bin,” said Neuman.

“We created flexible food packaging that looks, feels and has the same properties as conventional plastics on one hand, but on the other hand – post consumption – degrades biologically and becomes a fertilizer that can be used to fertilize the soil again. The food industry operates on complicated, high-quality mechanical standards, which makes it difficult to come up with a compostable effective packaging to support both ecological and functionality requirements. This was the technological challenge we resolved.”

Image © iStock.com/
FlairImages

suggesting a real need for packs that can be easily accessed by those with reduced grip, for example,” Mintel trends and innovation director David Jago told us.

Easy-to-open: German firm seeks to open lid on senior supplement market

NutraIngredients, 28Jun2016

The German firm Sanner has developed senior-friendly supplement packaging, which it says will secure shopping loyalty from happy elderly customers.

The company tested the packaging – which is designed to have an easy-remove warranty band and can be opened with one hand – with 120 women and men who buy and consume supplements or painkiller tablets two to three times per month.

The company claimed that compared to other systems its new closure could be opened in a third of the time – 9.2 instead of 25.8 seconds – and with 70% less physical effort – 12 newtons compared to 36 newtons. Commenting in a release to press, the company’s product manager Ursula Hahn said: “For producers of food supplements this is a decisive factor. In case of bad experiences with the packaging, repurchase rates decline considerably.”

Figures from market research firm Mintel echo this importance. Research from October 2015 on food packaging found that easy-open features are important to 42% of UK consumers, the second highest response after ‘resealability’. “But among consumers aged 55+, easy-open is important to 59% of consumers (reaching 63% among consumers aged 65+),

Meanwhile Sanner cited a survey of 350 people aged over 50 from the German National Association of Senior Citizen’s Organisations (BAGSO), which suggested 92% had problems opening packaging. For 49% this difficulty was experienced several times a week or even daily. The 2003 data showed 57% reacted to dissatisfaction with a brand change.

What are the alternatives to eggs available on the market?

Food News Latam JULY 5, 2016

When you're vegan or allergic to eggs, cathode related to the creation of breads and pastries seem a distant dream, but the truth is that it is not.

With Avian Flu impacting the cost and availability of egg products, ingredients substitutes formulations for bakery come to market offering an alternative. A number of ingredient suppliers offer products that allow bakers to reduce or completely eliminate, the number of eggs they use.

Whey proteins Nutrilac is a whey protein to replace the egg, the company that provides Arla Foods Ingredients is providing an alternative to eggs for the range of products such as cakes, muffins, donuts, cookies, cakes and brownies. Cargill offers multiple solutions to help food manufacturers in the replacement of all kinds of products egg with flour, starches and more.

Citri-Fi 200FG of Fiberstar Inc. A citrus pulp and guar gum can

replace up to 30 percent of eggs in baking applications, maintaining quality, freshness and mouthfeel as the reference formulation. Plus 150W function, a new substitute for egg white Corbion Caravan, which helps keep costs low bakers, while producing baked as rich and sweet as customers expect products.

According to Glanbia Nutritionals, 3000 OPTISOL flax and whey proteins offers a cost effective alternative to eggs for many baking applications. Ingredion Inc. Is helping food manufacturers to overcome the rising costs egg, improve profitability and reduce dependence on eggs with a wide range of solutions ingredients egg substitutes, by stabilizers, starches, proteins and many more deals interesting.

MGP Ingredients Arise provides hydrolyzed wheat protein called Optein can reach up to 100 percent replacement of egg white in bakery and other flour - based applications. The egg replacement solutions of Puratos can totally or partially replace eggs in baked goods, depending on the percentage of eggs and type of final application. Solazyme says his AlgaVia of seaweed meal allows bakers to reduce or replace egg yolks, fats and oils or even dairy without compromising product taste, mouthfeel and texture.

Florida Food Products offers a solution FiberGEL bakers to replace the egg and egg white in many baking applications. I think naming only some of the alternatives that the market for ingredients is proposing to us is no longer a problem to satisfy consumers. You only find the perfect ingredient for your product.

Image © iStock.com/RobertoDavid

REGULATORY NEWS

FDA to update rules on vitamin D fortification of plant-based dairy alternatives

Food Navigator USA, 19Jul2016

The FDA is amending the food additive regulations to allow manufacturers to fortify a wider range of plant-based dairy milk alternatives and yogurt alternatives with vitamin D2, and to increase the current permitted levels of vitamin D3 in dairy milk, in response to a petition filed by Dean Foods and WhiteWave Foods.

Currently, manufacturers are allowed to fortify soy beverages with vitamin D2 at up to 50IU/100g. After the rule change, manufacturers will be able to fortify soy, rice, almond, coconut and other plant-based beverages and yogurt intended as dairy alternatives at levels not to exceed 84IU/100g.

They will also be allowed to add up to 84IU/100g of vitamin D3 to dairy milk (the current upper limit is 42IU/100g). The move comes at a time when there is more focus on vitamin D, which manufacturers will be required to include on the Nutrition Facts panel of foods and beverages from summer 2018. The daily value for vitamin D which is important for bone development and general health – is also increasing from 10 mcg to 20 mcg.

According to the FDA, analysis of NHANES 2005-2008 dietary data showed that the vast majority (94%) of the

US population had vitamin D intakes below the EAR (estimated average requirement) from conventional foods only, while 62% of Americans were still below the EAR if you include vitamin D intakes from dietary supplements in addition to food.

Not all 'front-of-package' nutrition information produces the same effect

Science Daily July 13, 2016

Marketing researchers at the University of Arkansas and their colleague at the University of Mississippi compared nutrition information labels on the front of packaged food products to understand which labels help consumers choose more healthful items. Their conclusion: It depends.

"Our research suggests that there is no single, 'one-size-fits-all' front-of-package nutrition label that is suitable for all the different types of situations in which consumers are evaluating and choosing products," said Elizabeth Howlett, professor of marketing in the Sam M. Walton College of Business. Shoppers often find it daunting to decide which packaged food products are the healthiest. A typical supermarket carries more than 40,000 different items, and previous marketing

research has shown that consumers make the vast majority (82 percent) of their purchase decisions while shopping in the store.

Consumers sometimes evaluate a single product, an activity marketing researchers call non-comparative processing. More often, however, consumers participate in comparative information processing, which means they evaluate multiple products simultaneously. For example, a consumer might ask himself whether he should purchase the French-style lemon yogurt, the Greek-style blueberry yogurt, or the low-calorie berry variety.

Comparative information processing is considerably more difficult than non-comparative processing, because consumers must make direct comparisons between several options and multiple types of calorie and nutrient information. Though these tasks are clearly very different, Nutrition Facts panels provide only one type of standardized nutrition information.

Howlett, Scot Burton, Distinguished Professor of marketing in Walton College; and Christopher Newman, assistant professor of marketing at the University of Mississippi and former doctoral student at the U of A, examined two formats for front-

of-package nutrition labels. One format provided specific, objective and quantitative information -- for example, 10 grams of fat. The other format provided evaluative information, such as Walmart's green "great for you" icon.

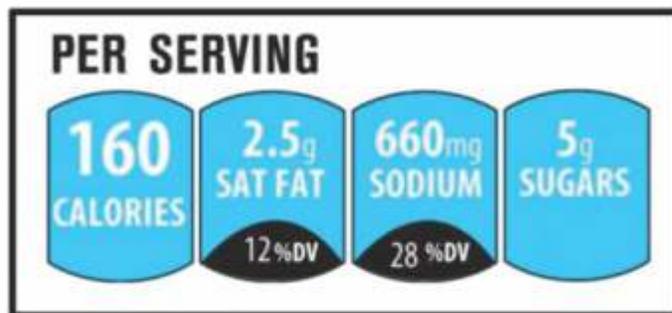


Image © iStock.com/
JordanSimeonov



The researchers found that the different formats worked better in different situations. A front-of-package label that provided specific, objective and quantitative information was more suited to a non-comparative choice, the instance in which a consumer is evaluating a single product. Front-of-package labels that provided evaluative information were more suited to a comparative task, when customers were evaluating multiple products.

"Currently, many different types of front-of-package nutrition information formats appear on product labels and their effectiveness in different choice contexts needs to be better understood," said Newman. "We believe that public policy decision makers such as those at the Food and Drug Administration must consider how well the type of nutrition information presented on a product label matches the consumer's specific type of choice task."

"If the primary goal of nutrition labelling is to help consumers make healthier choices, then the ability to easily identify the most healthful alternatives from a broad set of options is crucial," said Burton. "Our results suggest that, in general, when there is a match between the choice processing context and the type of format used to

Image © iStock.com/piotr_malczuk



present front-of-package nutrition information, consumers tend to make more healthful food choices. This is particularly important in comparative contexts in which

evaluative information may improve choice from a set of brands."

The researchers' study was published recently in the Journal of Consumer Research.

EFSA panel adopts energy conversion factor for sweetener D-tagatose – consultant calls for guidance

NutraIngredients 30Jun2016

The European Food Safety Authority (EFSA) has adopted a draft opinion on the energy conversion factor for 'functional sweetener' D-tagatose, meaning its calorie count can be listed on product labels.

The opinion was requested by the European Commission and based on a dossier from Belgian food engineering company Nutrilab NV and submitted by Swiss regulatory service Bioresco. It is important to find an energy conversion factor comparable to other nutrients –

such as carbohydrate (4 kcal/g 17 kJ/g), protein (4 kcal/g 17 kJ/g) or fat (9 kcal/g 37 kJ/g) – to synchronise nutrition labelling, which in the EU can contain both kilocalories (kcal) and kilojoules (kJ).

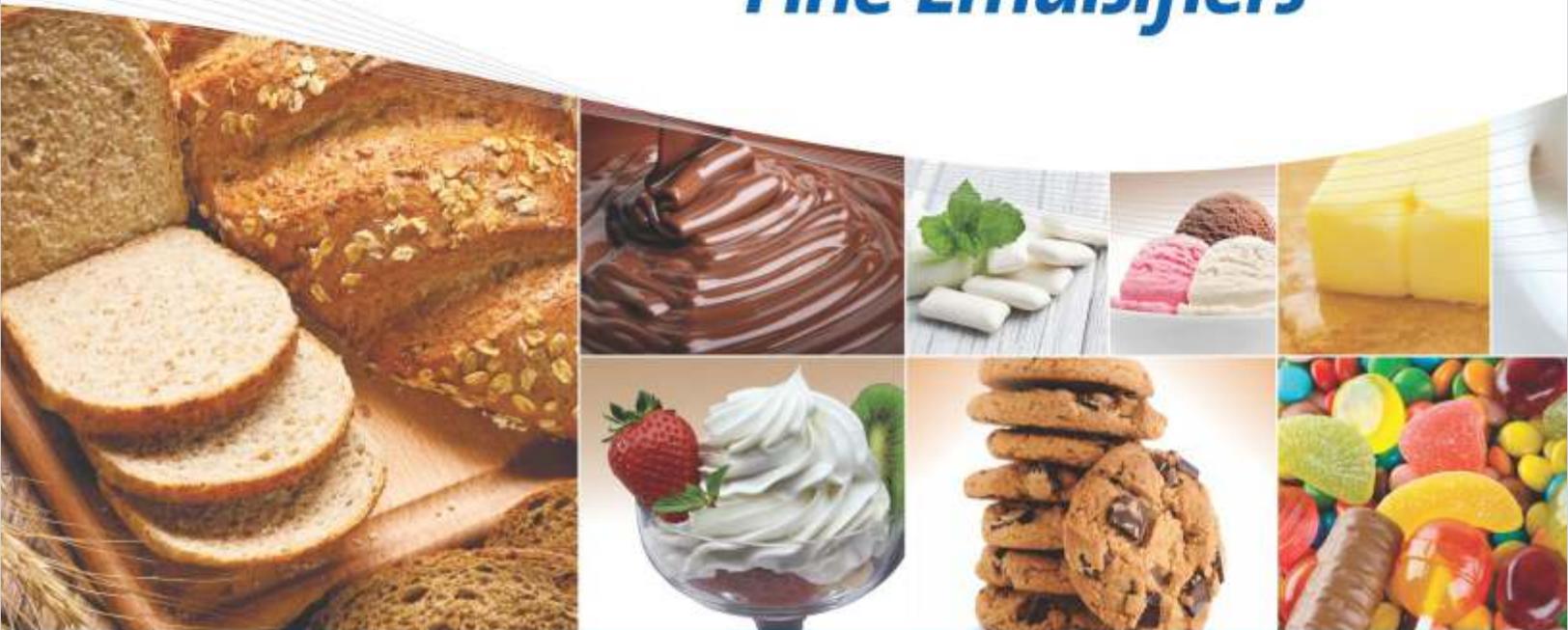
Yet EFSA gave only tentative metabolisable energy values between 2.67 and 3.45 kcal/g (11.15 and 14.44 kJ/g) because of a lack of data. Energy conversion factors for nutrients for labelling have previously been set based on the concept of 'metabolisable energy', which means the energy available after accounting for losses of ingested energy in faeces, urine, gases from fermentation in the large intestine and waste products lost from surface areas. However the panel said there was not enough data to do this accurately for D-tagatose.

It therefore looked to its 'gross energy', meaning the energy content of food measured by complete combustion, and then estimated metabolisable energy from there.

"The Panel considers that additional data on the absorption, distribution, metabolism and excretion of D-tagatose in humans would help in the calculation of a more accurate energy conversion factor for D-tagatose based on the concept of metabolisable energy," according to a draft summary of the conclusion seen by NutraIngredients.



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Guidance please

Commenting at an Dietetic Products, Nutrition and Allergies (NDA) panel plenary meeting open to stakeholders yesterday (29 June), Intertek consultant Nigel Baldwin urged EFSA to provide guidance on the evidence required for energy conversion factors.

He said his ongoing work on novel low-calorie food ingredients had prompted him to write to EFSA requesting the guidance and had been expecting greater feedback during today's meeting in Brussels. However Valeriu Curtui, head of EFSA's unit on nutrition, said this would continue to be done on a case-by-case basis as requests came in, a position confirmed by the European Commission's representative at the meeting, Stephanie Bodenbach.

The draft Dtagatose opinion will now be opened up for public consultation over the summer, with a final copy expected to be adopted "ideally" by October, the panel said. The opinion passed with no comments, which the panel put down to extensive discussion previously.

Other items on the agenda for the day included draft scientific and technical guidance for health claim applications; a draft opinion on Dietary Reference Values (DRVs) for potassium a draft report on the outcome of a public consultation on the draft opinion on for vitamin D as well as the DRV for vitamin D itself. All documents were endorsed by the panel.

Today (30 June) the panel discussed guidance for the preparation applications for infant and/or follow on formula manufactured from protein hydrolysates a draft

DRV for sodium and a draft DRV for chloride. Stakeholders at the twoday open meeting included representatives from food giants like Cargill, Nestlé, Chr. Hansen and Mead Johnson Nutrition as well as trade groups the European Dairy Association (EDA) and Specialised Nutrition Europe (SNE). This year marks the first year all ten of EFSA's panels have met for open meetings in Brussels.

FSA to consider freezer advice on food labels Food Manufacture UK, 04Jul2016

The Food Standards Agency (FSA) plans to consider whether to expand its guidance to food manufacturers to cover food storage and freezing advice for consumers.

The FSA, working with the Department for Environment, Food and Rural Affairs, revealed it would consider the move as part of a review of the guidance provided to the food industry on date marking on food. The news comes as it revealed that consumers were wasting 7Mt of food and drink a year. The FSA said a significant amount of that could be saved if consumers had a better knowledge

of how to freeze foods.

New FSA consumer research

New FSA research, based on the views of 1,500 adults, released as part of Food Safety Week, which begins today (July 4), identified a number of freezing 'myths' that prevented people from using freezers to make food last longer.

Of consumers interviewed, 43% thought that food should only be frozen on the day of purchase to be safe. A further 38% incorrectly said it was dangerous to refreeze meat after it had been cooked. And 36% wrongly believed that food could become unsafe to eat while in the freezer.

Over two thirds (68%) of the people surveyed had thrown food away in the past month. Topping the list were bread (36%), fruit (31%), vegetables (31%) and leftover meals (22%). The most common reason (36%) for throwing food away was that it was past its 'use by' date.

Just under a third (30%) admitted to throwing food away as they had bought too much and didn't eat it, while over half (54%) said they felt guilty at throwing food away. The research also found that 90% of people said there were foods they would never freeze.

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Food poisoning worries

Almost a quarter (23%) said they would never freeze meat that was cooked after defrosting, with 73% of these people saying this is down to worries about food poisoning. FSA director of policy Steve Wearne said: "Every year, we throw away 7Mt of food and drink from our homes. Much of this waste is unnecessary, and a better understanding of how to freeze food safely could go a significant way towards tackling the problem."

Our research shows that many of the fears the public has about freezing food are unfounded and we need to ensure they know the facts. 31% of the people we spoke to said that more information about how to safely freeze food would help them to reduce their food waste – that's why freezing is the focus of this year's Food Safety Week."

Nutrient claims and cartoon characters will sway children

Food Navigator, 30Jun2016

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



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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'.

HEALTH INFOSULES

Is Oatmeal Good for People with Diabetes?

Written by Megan Ware RDN LD
Medical News Today 1 July 2016

Oatmeal, also known as porridge, is a popular breakfast food made from oats. There are several different types of oatmeal including rolled oats (old-fashioned), instant, and steel-cut.

All oatmeal starts with whole raw oats, which are harvested and cleaned. The outer shell, or hull, is removed, leaving the edible grain or "groat" behind. People can buy and consume oat groats, but they need to be cooked for 50-60 minutes to soften. Steel-cut oats are made when the groats are chopped with a metal blade. Steel-cut oats cook more quickly - about 20-30 minutes - because they are further broken down.

Rolled oats or old-fashioned oatmeal is made by steaming and rolling the groats into flakes. This cuts cooking time down to 3-5 minutes. Instant oats or "quick oats" are made by further steaming and rolling the oats, bringing the cook time down to as little as 30-60 seconds. The texture of steel-cut, old-fashioned, and instant oats differs widely, and which one is best is a personal preference. People who have tried quick oats and not enjoyed their softer texture should try the harder steel-cut oats. The nutritional profile of each cut

of oats is the same when they are plain. However, many instant oats have added sugar and flavourings and are often high in sodium. Also, the higher the level of processing, the quicker the speed of digestion, and the higher the glycemic index, a measure of how quickly blood sugar rises when eating.

How does oatmeal affect people with diabetes?

Oatmeal is mainly a source of carbohydrate. Carbohydrates are converted to sugar when digested and increase sugar levels in the bloodstream. Carbohydrates that have fibre cause a slower release of sugar into the bloodstream, lowering the potential spike in blood sugar after a meal.

A diet that is high in processed carbohydrates, especially from sugar and packaged processed foods, increases the risk of blood sugar spikes after a meal because they are digested quickly.

Foods that digest quickly can cause quick blood sugar spikes and make it difficult to manage blood sugar levels, especially when eaten alone, which often happens at breakfast. Vegetables, fruits, and whole grains contain complex carbohydrates that are full of fibre and nutrients that fuel the body and give sustained energy.

People should form their meals and snacks around these healthy carbohydrates. Adding in some

Oatmeal contains complex carbohydrates which are useful for managing blood sugar levels.

protein and healthy fat gives a nutritionally complete meal. Some foods contain all three of these components in one, while others may need to be paired up. Mixing proteins and fats with carbohydrates can further slow down digestion, which can help minimize spikes.

Oatmeal contains complex carbohydrate with little protein or fat. Healthy fats are a necessary part of the diet and help people feel full and satisfied. Protein helps to keep people fuller longer and will promote more stable blood sugar levels when paired with a complex carbohydrate. By combining a complex carbohydrate, lean protein, and healthy fat, people can reduce hunger and cravings while providing all three of the body's required macronutrients.

First, start with one half cup of plain oats. Avoid pre-sweetened or flavoured oats. Add a source of healthy fats like walnuts, almonds, chia seeds, hemp seeds, or pecans. As a bonus, nuts and seeds also add a little bit of protein.

People can cook their oats in milk or add milk to the oats after they are cooked for more protein. Cow's milk or soy milk are the best milks for an extra protein boost because almond milk and coconut milk are

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not good sources of protein. However, these also provide more carbohydrate. The same is true for fruit. Fruit will add flavour but also carbohydrate which needs to be accounted for by people who manage their blood sugar by tracking carbohydrate grams. Plain Greek yogurt is a low-carbohydrate option that may add some creaminess to the oatmeal. To jazz up the flavour, people can mix in a few drops of almond or vanilla extract, or sprinkle with **cinnamon**.

Nutritional profile of oatmeal

According to the United States Department of Agriculture National Nutrition Database, one-half cup of non-fortified, dry, instant oats contains:

- ⦿ 153 calories
- ⦿ 3 grams of fat
- ⦿ 27 grams of carbohydrate
- ⦿ 0.4 grams of sugar
- ⦿ 4 grams of fibre
- ⦿ 5 grams of protein

One-half cup of uncooked instant oats also provides:

- ✓ 25 percent of daily thiamin needs
- ✓ 19 percent of iron
- ✓ 28 percent of **magnesium**
- ✓ 33 percent of phosphorus
- ✓ 20 percent of zinc
- ✓ 147 percent of manganese
- ✓ 33 percent of **selenium**

One packet of instant raisin and spice oatmeal has 15 grams of sugar and 210 milligrams of sodium per serving compared with the 0.4 grams of sugar and 0 grams of sodium in plain oats.

Other ways to enjoy oatmeal

Oatmeal doesn't just have to be for breakfast and doesn't even have to be sweet. People with **diabetes** can enjoy savoury oatmeal as well. Making savoury oatmeal is a great way to switch up a normal oatmeal routine and make a quick, healthy, complete meal.

Vegetables like mushrooms, spinach, and green **onions** make great mix-ins, as well as spices like

black pepper and cumin. Top with a small amount of shredded cheddar or parmesan and a fried pasture-raised egg.

The bottom line

People with diabetes should avoid instant oatmeals that are high in sugar or look for the less-processed options. Oatmeal can be a healthy breakfast option, especially when a protein and a healthy fat source are added for balance.

Are Beets Good for Diabetes?

Written by Mark Cowen
Medical News Today 28 June 2016

Use of the word "superfood" has grown in recent years. Many a vegetable has been given this title, often despite little evidence for the health benefits claimed for such foods.

Could the humble beet qualify as a superfood? If the potential health benefits identified in a number of studies are confirmed in further research, the answer could be yes.

What are beets?

Beets, also called beetroot, table beet, garden beet, and red beet, are one of several varieties of *Beta vulgaris*. Beets are grown for their edible root and leaves. Other cultivated varieties include the sugar beet, which has white flesh, and a leafy vegetable called chard. Beets are most often deep red in colour. It is possible to obtain golden, white, and stripy red and white versions of the vegetable, however.

They have been cultivated since the beginning of recorded history and were often used for medicinal purposes as well as for food. Medicinal uses included treating fevers, constipation, and skin complaints. The vegetable was also commonly used by the Romans as an

aphrodisiac.

Are beets good for people with diabetes?

Lowering blood pressure

Research has suggested that eating beets, or drinking beet juice, may benefit people with high blood pressure. High blood pressure is a common condition among people with diabetes, and particularly those with type 2 diabetes.

The blood pressure-lowering effect is thought to be caused by the presence of nitrates in beet juice. These nitrates improve the ability of blood vessels to widen, improving blood flow. In a recent study published in the journal *Hypertension*, researchers found that drinking a cup of beet juice each day was associated with a significant fall in blood pressure among people with high blood pressure levels. The study involved 64 patients, aged between 18 and 85 years, with high blood pressure. Half the participants were taking medications for their condition but could not achieve their target blood pressure. The other half had not yet received treatment.

After 4 weeks, the researchers found that the 34 patients who drank a cup of beet juice each day experienced a significant 8/4 mmHg (millimeters of mercury) reduction in their blood pressure levels. Those who consumed a nitrate-free juice drink experienced no such reductions. Patients who consumed beet juice also showed a significant 20 percent improvement in the stretchiness of their blood vessels.

Beets have been used in medicine throughout history.



"The possibility of using a natural product, rather than another pill, to help lower blood pressure, is very appealing," said Dr. Shannon Amoils from the British Heart Foundation, which funded the study. "The next step will be to see if this result can be repeated in a much larger group of people with high blood pressure and over a longer period of time."

A 2013 review of evidence from 16 trials, involving a total of 254 participants, concluded that drinking beetroot juice was linked with a significant reduction in systolic blood pressure levels. Systolic blood pressure refers to the stage of the heartbeat in which the heart contracts and forces blood through the arteries.

However, in the *Journal of Nutrition*, the authors say the findings need to be tested in longer-term studies before any recommendations can be made.

Reducing nerve damage

A 2012 review of published studies also suggests that alpha-lipoic acid, an antioxidant found in beets, may help reduce the nerve damage that can occur in patients with diabetes.

But the benefits may be limited to injections of alpha-lipoic acid. "It is unclear if the significant improvements seen with the oral administration of alpha-lipoic acid are clinically relevant," the researchers write in the *International Journal of Endocrinology*.

Improving exercise performance

Research has also suggested that drinking beet juice may improve the ability of muscles to take up oxygen during exercise and improve exercise tolerance. Exercise helps reduce the risk and slow the progression of heart disease and other cardiovascular disorders. This particularly benefits people with diabetes as they are at a high risk of

such conditions.

Nutritional properties of beets
Beets are low in calories, containing just 43 calories per 100-gram serving. They are high in levels of antioxidants which mop up damaging molecules called free radicals that can harm blood vessels. They are also high in phytonutrients called betalains, which help reduce inflammation.

In addition, beets are a rich source of folate, with each 100-gram serving providing 20 percent of the recommended daily intake of this B vitamin. They are a good source of manganese, providing 14 percent of the recommended daily intake of the mineral per 100 grams. They also contain no cholesterol and very small amounts of fat.

Each 100 gram serving of raw beet contains:

9.96 grams of carbohydrates, made up of 7.96 grams of sugar and 2.0 grams of dietary fibre

1.68 grams of protein
Other vitamins and minerals contained in beets include:

Beets contain a wide range of vitamins and minerals, including calcium, iron, and potassium.

Thiamine (B1)
Riboflavin (B2)
Niacin (B3)
Pantothenic acid (B5)
Vitamin B6
Calcium
Iron
Magnesium
Phosphorus
Potassium
Sodium
Zinc

Beets are also a rich source of dietary nitrates, which are thought to benefit blood vessel and nerve cell health.

Possible concerns and drug interactions with beets

A diet that contains high levels of nitrates could reduce the effectiveness of organic nitrate and nitrite medications, which are used to treat angina. This diet could also reduce the effectiveness of PDE-5 inhibitor drugs, which are used to treat erectile dysfunction. Nitrates in poorly stored beet juice can also be converted to potentially harmful nitrite if exposed to certain types of bacteria. It should also be noted that a small percentage of people experience beeturia, in which their urine turns red after eating beets. Beeturia has no known harmful effects.

How to include more beet in your diet

Some of the beneficial properties of beets break down with longer cooking times. As a result, the most effective way to get the maximum health benefits from beets is to eat them in their raw state, as juice or simply grated on a salad.

Beet juice can also be used as a base for fruit and vegetable juice cocktails or smoothies. Some popular juicing combinations, for one serving, include:

Two medium beets, three medium carrots, one apple

One large beet, two apples, and one piece of ginger

One large beet, half a pineapple, 4 ounces of coconut, and ice

One large beet, 1 cup of strawberries, half a cup of blueberries, two apples, and ice
One large beet, kale, three carrots, one stick of celery, and ice

Beets can also be steamed, boiled, roasted, or pickled. They form the base for many recipes, including borscht, a type of soup popular in Eastern European countries.

Beetroot is also a delicious addition to risottos and is a traditional accompaniment to mackerel.



Image © iStock.com/photomaru

Try avocado filled with cumin and pomegranate, beetroot, and shallot salsa for a starter or light snack, or reginette pasta with beetroot and sour cream sauce for a main meal. It is important to note, however, that a balanced diet containing a wide variety of healthy foods is important for good health. A balanced diet is always preferred to one that focuses on a few so-called superfoods.

Written by Mark Cowen

Obesity: Could being well hydrated prevent weight gain?

Written by Hannah Nichols
Medical News Today 12 July 2016

Obesity is a global issue with over 600 million adults defined as obese worldwide. Researchers may have found a potential method of prevention for this escalating global epidemic, in the form of hydration.

Drinking enough water every day has long been cited as important for health. Water is lost through many everyday body functions such as breathing, perspiring, urination, and bowel movements. For your body to function properly, water must be regularly replenished through consuming beverages and foods containing water. Lack of water can lead to dehydration, tiredness, and, at the severe end of the scale, it can be life-threatening.

While the amount of hydration an individual needs depends on weight, age, and activity level, the Dietary Reference Intake of fluids from both food and beverages per day is a recommended 2.7-3.7 litres for adults.

New research from the University of Michigan suggests that people who have a higher body mass index (BMI) and are considered obese are more likely to not be properly hydrated. The findings, published in the *Annals of Family Medicine*, are composed of a nationally representative sample of 9,528 adults from the Centers for Disease Control and Prevention's (CDC) National Health and Nutrition Examination Survey (NHANES). The survey ranged in age from 18-64, and about one third of participants were inadequately hydrated.

Link between hydration and weight unclear

Lead author Tammy Chang, M.D., M.P.H., M.S., an assistant professor in the Department of Family Medicine at the University of Michigan Medical School, says, "The link between hydration and weight is not clear. Our study further explains this relationship on a population level using an objective measure of hydration."

Although the association between hydration and weight needs further

investigation, Chang makes reference to current recommendations that hydration may assist with weight loss due to individuals misinterpreting thirst as hunger.

Chang and colleagues are unable to say at this stage whether inadequate hydration causes obesity or if obesity causes inadequate hydration.

However, their findings show a correlation between the two and suggest that those with a higher BMI may possess behavioural traits that lead to insufficient levels of hydration.

"Hydration may be overlooked in adult weight management strategies. Our findings suggest that hydration may deserve more attention when thinking about addressing obesity on a population level.

Staying hydrated is good for you no matter what, and our study suggests it may also be linked to maintaining a healthy weight."

- Tammy Chang, lead author,
University of Michigan Medical School

Maintaining a healthy diet including fruits and vegetables that are high in water content can significantly improve hydration, Chang advises.

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Could the simple act of drinking enough water prevent obesity?



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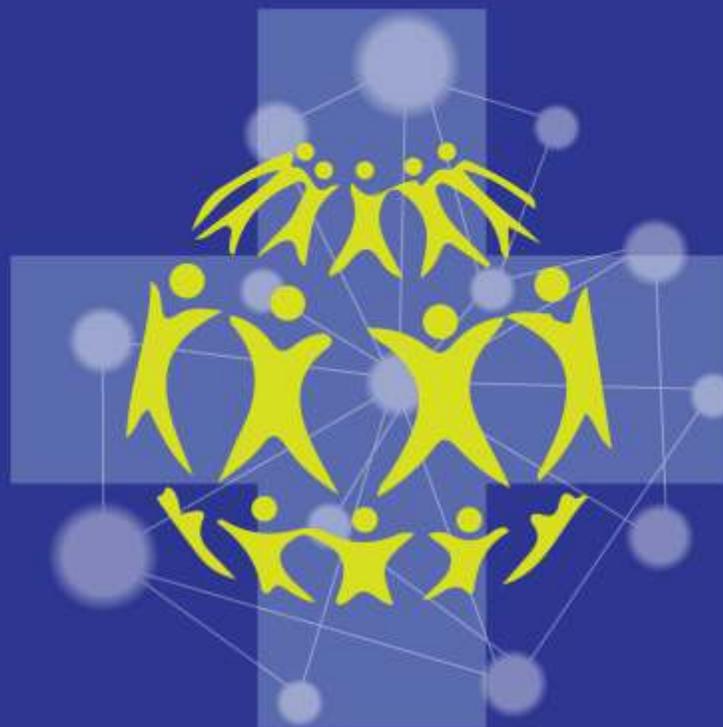
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