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JANUARY 2015

PFNDAI Bulletin

CHALLENGES IN FOOD SAFETY

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Column

PROTEIN FOODS AND NUTRITION DEVELOPMENT ASSOCIATION OF INDIA

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Cover Design & Bulletin Layout by Ms. Leena Shanbhag

Editorial

Ministry of Health in Brazil has recently published a Dietary Guidelines for the Brazilians. It has come down hard on processed foods and beverages and hardest on health and wellness products including better-for-you offerings.

Brazil like many other emerging economies has shown increase in non-communicable diseases. These are now the leading cause of death. About 50% adults and 30% children in Brazil are overweight. To combat this, the Health Ministry of Brazil has issued new dietary guidelines which emphasise on fresh, unprocessed foods including fruits and vegetables.

Guideline goes further to advise consumers to limit consumption of processed foods like bread, cheese, canned fruits, vegetables and fish and avoid 'ultra-processed foods' which are considered 'nutritionally unbalanced' e.g. soft drinks, sweetened breakfast cereals, cereal bars, sweetened yogurts and dairy drinks.

They recommend any product containing more than 5 ingredients should be avoided, mentioning undesirable ingredients such as soy and milk proteins and protein isolates.

Probably no one told Brazilian Health Ministry officials that one of the main reasons for increase in non-communicable diseases in most societies with growing economy is lack of physical activity. Unhealthy diet is one among many other reasons such as increasing stress, smoking, pollution and many forms of entertainment gadgets like TV, computers & games, smart phones as well as increases in shopping and entertain malls at the expense of playgrounds.

To add to the problems, Indian kids are pushed into round the clock rote-learning in schools, tuition classes and also private coaching. This does not give them any time to play when they want to have some entertainment at home. Also in schools there is less time for playing games and sports as they have to study more and to make up for classes lost due to election, floods or other natural or man-made calamities, and many celebrations & festivals. Many schools don't even have playgrounds as they wanted more classrooms or auditoriums which could be rented out.

We love symbolism so if we could identify one specific enemy of all our problems, we can blame it and be happy. In Diwali, we burn effigy of demons and are very happy about doing our duty irrespective of whether our troubles go away or not. It is easier to blame processed foods than to find solutions for lack of physical activity among children and adult. Then the government would have to provide them the means as well.

To provide fresh food to growing cities is becoming more and more difficult as distances between places of production and consumption increasing rapidly. Large proportion of fresh commodity is spoiled in transit and storage. Processing, whether chilling, drying, freezing, fermentation, or converting into more stable product, is increasingly necessary to feed all these urbanites at reasonable cost. Finding ways to minimise nutrient and quality losses by innovative means of processing should be coupled with fortification to produce better-for-you foods and products.

Our increasing knowledge of nutraceuticals and functional foods will further help us keep healthy and trying to keep away from the non-communicable diseases. No food is bad but it can have more or less nutrients. We must try to ensure that our overall diet is balanced which may contain both nutrient dense as well as those low in nutrients.

Wishing everyone a Very Happy Prosperous & Healthy New Year,

Prof. Jagadish S. Pai,
Executive Director
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CHALLENGES IN FOOD SAFETY

By Dr. Pulkit Mathur, Assistant Professor,
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The food that we eat is the source for all the nutrients required by our bodies to grow and survive. Sometimes the same food can become a threat to our health and survival.

. Some of the foods contain naturally occurring toxic compounds while some others may contain chemicals which have been added artificially by man or are present in the form of unintentional contaminants. Food can become contaminated with harmful substances while it is still in the fields, or while being transported, stored or processed for consumption. There has been growing concern regarding the environmental contamination of food and excessive use chemicals in food production and processing in the country in recent times. In addition adulterants may be intentionally added to the foods for economic gain. Consumption of poor quality or unwholesome food can lead to ill-health and thus poor work efficiency. Providing good quality food is thus of considerable importance for public health and the national economy.

Food Hazards

A *hazard* has been defined as a physical, biological or chemical agent in or a property of food that may have a harmful effect on health. These hazards may be naturally occurring in foods or present as contaminants. Naturally occurring toxicants in some plant and animal foods pose a health hazard. Shellfish toxins, toxic amino acids, alkaloids and cyanogenic glycosides are some of the toxicants present in seafood, legumes or starchy vegetables, etc. that

can have very serious and sometimes fatal consequences. These can be removed by various processing methods before consumption.

Physical contaminants in food include dust, stones, bone chips, wood, fruit pits, hair, twigs, straw, husk, paper, rodent and insect excreta or body parts, shards of glass or metal filings which may find their way into food during processing or inappropriate storage.

Chemical contaminants on the other hand, are the products of fast growing modern technology. Increased agricultural productivity requires constant large scale application of fertilisers, insecticides, pesticides, antibiotics and chemicals for stimulating the growth of plants and farm animals. Residues, sometimes at toxic levels, from most of these products end up in the food supply via the soil, air and water.

Pesticides used include insecticides to control insects, rodenticides to control rodents, herbicides to control weeds, fungicides to control mold and fungus and antimicrobials to control bacteria. Every pesticide has some safety or waiting period which is defined as the number of days to lapse before the pesticide residues get dissipated after their application. Food products become safe for consumption only after the waiting period has lapsed. If fruits and vegetables are harvested before completion of the waiting period, they are likely to have higher level of residues which are hazardous to health. Residues of pesticides have been found in almost all kinds of foods viz. milk and milk products, edible oils and fats, food grains, vegetables and fruits in nationwide surveys. In fact our own bodies at present may contain at least one pesticide in detectable amounts. Studies in India have shown the presence of pesticides like DDT and BHC in the breast milk of some women.

Veterinary drug residues result from the use of a number of drugs used for animal husbandry. The milk and flesh of animals fed antibiotics and other growth stimulating medicines and hormones becomes contaminated with the residues of these drugs. Usually these drugs remain in the body of the animal for a few days and the animal should not be milked or killed for meat during that period after the administration of the drug. Ignorance and non - compliance with safety norms can however lead to these compounds entering our food. Veterinary drug residues, especially antibiotic residues, are of concern because of their possible adverse effects on persons allergic to certain antibiotics like penicillin and the potential build up of antibiotic resistant organisms in humans. In addition antibiotic residues present in milk, intended for the production of cheese or for the formation of milk products requiring the use of bacterial or yeast cultures, may result in killing of these cultures. This results in subsequent economic loss to the dairy industry.

Studies in some Indian cities like Delhi and Hyderabad have shown traces of antibiotics in the milk being sold. Usually milk supplied by bulk suppliers tests negative for antibiotics because of the dilution of the contaminant. Milk from small dairy farms or milk vendors is more likely to have the residue. Milk in fact is also the most commonly adulterated food item. Water is the most common adulterant, followed by neutralisers which can counteract developed acidity. Laboratory experiments have shown that if milk has a high concentration of antibiotic residue or for that matter any other adulterant like a neutraliser or urea added to increase the specific gravity, the milk will not set into a firm curd. If curd doesn't set well in a household repeatedly, even after changing the starter culture, one should suspect the presence of an adulterant and change the milk supplier.

Heavy metals like mercury, cadmium, nickel, arsenic, lead and aluminium are used by several industries. These contaminate our foods when factories throw their waste products into the seas and rivers or bury their wastes before appropriately treating them. Smoke from industries as well as exhaust fumes from vehicles and machinery pollute the atmosphere. Thus heavy metals enter our bodies via the water we drink, the air we breathe and the food that is grown in such contaminated soil. Metals may also enter food from metallic cans in which the food is packaged. Acidic conditions in the stored products may cause the surface layer of the cans to dissolve into the food products. Another source of metal contaminants is vessels and utensils used in cooking and storage of prepared foods and beverages.

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ENRICHED BAKERY PRODUCTS

By Mr. Amitabh Tewari,
GM R&D and QA,
Parle Products

The concept of baking food is almost as old as human civilization and cereals are closely connected with our civilization. Baked products turned up when accident or experiments with cereal and water mixture upon heating yielded all kinds of products.

Biscuits or cookies were easy to store and carry so were convenient to carry on long journeys particularly at sea. Early biscuits were hard to withstand handling and storage but over the centuries many changes have occurred and there are now hundreds of varieties of biscuits with different colours, flavours, textures and appearances to suit the palates of children, adult and very old. They could be salty, sweet, and with many different ingredients like cocoa, fat, dairy products, other cereals etc.

Bread is also another product made since ancient times using cereal and water with heat. This also has many variations although not as many as biscuits. There are leavened products and unleavened bread including roti and naan. There are varieties of cereals used in making bread and that gives variations in hardness or softness as well as colour and flavours. Some are made using fruit and vegetable products and many herbs and botanicals are added. Recently there has been large scale use of whole cereals and fibre ingredients in bread making.

Global biscuit market was valued at $ 45 billion and is growing at about 3.1%. The growth in Asian countries is very high with Asia-Pacific around 5.9%. Total bakery products industry is quite large and is expected to reach $ 410 billion by 2015.

In India, market for the bakery products witnessed a turning point in the latter part of 20th century. Factors contributed were urbanization, increased demand for ready-to-eat products at reasonable costs. At present, it stands third in position among food industry in revenue generation. Breads, Biscuits, Pastries, Cakes, Buns and Rusk are the major bakery products consumed in India. According to estimates, the bakery industry in India is worth approximately $69 billion. India is the second largest producer of biscuits after USA.

Both bread and biscuits have been consumed in India for over hundred years. Biscuits are quite popular not only among ages but also in entire cross section of India, rural and urban at different economic segments. This makes it a good candidate for enrichment or fortification.

What is enrichment & why it is required?

Enrichment or Fortification: Means the addition of one or more essential nutrients to a food for the purpose of preventing or correcting a demonstrated deficiency of one or more nutrients. In general, Industry is adding nutrient which has

been lost during manufacturing process. Commonly enrichment is done to restore the nutrients lost during the processing of a particular food. Thus if refining removes fibre and certain minerals these may be added to restore the original amounts in an enriched food.

Fortification is generally carried out to add certain essential nutrient which is commonly deficient in the diet of a population. Iodised salt is an example of fortification. The food should also have good stability and be of relatively lower cost. If it centrally processed then adding of nutrient would be uniform. It should also be consumed across all sections of the population so everyone gets the benefit.

While the concept of food fortification is relatively uncommon in India, Developed Economies are mandatorily adding nutrients in different food products as per their national need. As an example, Canada has been able to remove childhood rickets by fortifying Vitamin D in their fluid milk.

Why Bakery Products?

Bakery products remain the cheapest of the processed ready-to-eat products in India. Nearly 55% of the biscuits are consumed by the rural sector. Food enrichment is cost effective and is done for those foods which are consumed by mass without changing its taste. All kinds of bakery products are commonly consumed in India by various populations irrespective of economic strata, age, rural or urban etc. Thus enrichment or fortification would benefit the entire population without affecting cost structure much.

Limitations of Enrichment

Most of the nutrients used at present for enrichment are synthetic in nature. Its process stability and bioavailability are questionable and required to be studied more extensively. Newer technologies are available that have been tried elsewhere and could be tested here. Natural source has some limitations such as inconsistency and the need to add higher amounts as naturally their concentrations may be low. So we have to think other ways.

Also we need to consider the effect of baking on the retention of nutrients added as some of them may be degraded at high temperatures of baking and some may react with the other ingredients affecting their bioavailability.

Natural ways of Enrichment

Cereal Flours like whole wheat flour, bajra, jowar, ragi, and oats can be used in the bakery products as it contains greater amounts of micronutrients. Similarly, while using red palm oil we can retain its carotenoids by using partial refinement process. One more thought is use of jaggery in place of refined sugar as jaggery is a rich source of minerals like calcium & phosphorous.

Newer bakery products with many unconventional ingredients using herbs and other plant substances can be used to add many nutrients and nutraceuticals such as omega 3 fatty acids, fibre, antioxidants, carotenoids etc. that have health benefits.

Challenges in India

The Government should issue clear policies for fortification. Awareness should be created about the sources of fortification. Detailed research should be done for utilizing natural resources available in India. The study of processing of raw materials and food products should be done in order to minimize nutrient losses in its processing.

(Based on the presentation at Conference on Innovative Safe & Nutritious Foods: Technology & Regulations, 2014)

Cont'd from Pg 4

Vessels made of brass are usually tinned from inside. Poor quality tin coating or improper tinning of the vessels can result in tin and copper leaching into the food cooked or stored in the vessel. Aluminium cookware is also very common and the metal is known to leach out into food being cooked and stored in such utensils. Aluminium in foods has been implicated in Alzheimer's disease, a chronic progressive disease characterised by gradual loss of cognitive functions. The role of aluminium in a variety of bone diseases is also well recognised. Heavy metals pose a substantial risk to human health. These metals are not readily excreted from our bodies and can accumulate to toxic levels over a period of time.

A host of other toxic chemicals can be present in our foods as contaminants. Some contaminants leach out of packaging materials into the food products. *Dioxins* are a group of chemicals (polychlorinated aromatic compounds) which are formed as a by-product of chemical processes such as manufacturing of chemicals, pesticides, steel and paints, pulp and paper bleaching, exhaust emissions and incineration. They are not biodegradable so they are persistent and accumulate in the food chain. This means that once released into the environment, via air or via water, they pile up in the fat tissue of animals and humans.

Dioxins have a broad series of toxic and biochemical effects and some of them are classified as known human carcinogens.

PCBs, or *polychlorinated biphenyls* are another group of chemicals. They are chlorinated aromatic hydrocarbons. PCB mixtures are still widespread and present today, such as in transformers, building materials, lubricants, coatings, plasticizers and inks. Animal fat acts as a sponge for PCB and hence they are found in foods containing animal fat like meat, fish, eggs and milk. High levels of PCB in the blood have been linked to reduced cognitive skills, mental development and suppressed immune reactions especially in children exposed to PCB in the womb.

Contaminants from plastics are the more recent threat with the use of plastic in food processing equipment, food utensils, and as food packaging has increased tremendously. In their manufacture, numerous additives are used depending on the type of produced polymer. These additives include plasticizers, antioxidants, catalysts, suspension and emulsifying agents, stabilizers and polymerization inhibitors, pigments, fillers, etc. The extent to which migration of contaminants into foods occurs will depend upon such factors as the contact area, the rate of transfer, the type of plastic material, the temperature, and the contact time. The migration of substances from plastic into food is also related to the type of food packaged. Alcoholic beverages and edible fats and oils will extract substances more readily than dry food such as cereals. Some of these substances have been shown to cause allergic effects, to damage the liver and reproductive functions, and to cause cancer.

Changes in our lifestyle have increased the demand for processed foods. Everyone is looking for convenient, easy-to-cook and ready-to-eat foods which require less time to prepare than traditional home-cooked foods. Manufacture of processed foods requires the addition of several chemicals. These chemicals which we intentionally put in our foods during processing are known as *food additives*. These include chemicals which are used as preservatives, artificial colouring and flavouring agents, antioxidants, emulsifiers, stabilisers, leavening agents, anticaking agents, etc. Some of the foods that we eat almost daily like biscuits, bread, sugar confectionery, chewing gum, carbonated beverages and fruit squashes and syrups have a large number of food additives.

In deciding whether an additive should be approved for use, the regulatory authority considers the composition and properties of the substance, the amount likely to be consumed, its probable long-term effects and various safety factors. Absolute safety of any substance can never be proven. Therefore, it must be determined if the additive is safe under the proposed conditions of use, based on the best scientific knowledge available. Studies have shown that though

these additives are permitted for use in food products, the level at which some of these are being added by small scale manufacturers are beyond permissible limits. This increases the dietary exposure to levels more than the Acceptable Daily Intake (ADI).

Biological Contaminants continue to be a serious health hazard and a major cause of morbidity and mortality. They consist of micro-organisms and fungi and their metabolic products. In fact they are a major public health concern which cuts across national boundaries in terms of human ailments and economic loss. Most of the reported cases of food-borne diseases are due to consumption of food contaminated with micro-organisms. Micro-organisms present in the soil, water and air may infect the growing plant and stored foodstuffs and produce harmful metabolites. Warm temperatures and high moisture content serve as ideal conditions for the growth of micro-organisms like bacteria and fungi in stored food products. These types of contaminated foodstuffs have been the cause of many serious poisonings in man and animals which have even resulted in death. There are several studies which show high microbial contamination levels in foods sold on the street as well as by other food business operators.

Unhygienic Food Preparation Premises and Poor Food Handling Practices Make the Food Microbiologically Unsafe

Reducing Exposure to Food Hazards

So the food that we eat may not be very safe. However certain precautions can help reduce our exposure to these hazards. Physical hazards are best removed by hand picking, winnowing or filtration. Buying pre-cleaned grains, washing and cleaning thoroughly before consuming any food stuff is important. Biological hazards are reduced by cooking. Foods cooked and raw need to be stored at appropriate temperatures to prevent microbes from thriving. Washing hands often is perhaps the best precaution one can take to prevent food poisoning as often we ourselves are the primary source of contamination. Eating food from unsafe sources is another way of preventing foodborne diseases. However an interesting study conducted in Delhi found that only about 53% of consumers no longer ate food at the outlet if it was found to be unhygienic. A large number of respondents consumed high risk foods most of the times they ate out.

Ingestion of chemical contaminants can be greatly reduced by following good agricultural practices, minimising the use of pesticides, chemical fertilisers, following good practices of animal husbandry especially when the animals need medication, and ensuring safe disposal of toxic wastes from our industries. This requires sensitization of farmers and industrial workers to the issues of food safety and educating them about safe handling of chemicals. Washing thoroughly will remove not only the adhering dirt and microbes, but also a significant amount of chemicals like pesticides and waxes. Removing the peels of fruits and vegetables also helps in removing contaminants adhering to the skin. Fruits and vegetables growing in the vicinity of polluting industries should be avoided. Fish from deep sea and lakes or free-flowing rivers are safer than those caught in water bodies close to industries releasing effluents or sewage treatment plants. Small fish are also safer than larger fish as the latter tend to accumulate more heavy metals.

The migration of plasticizers can be aggravated by heat and by the presence of a food into which the plasticizing chemical will dissolve (for example, oil, acid or alcohol).

Marks which Promise Quality Assurance

Avoid using plastic containers for heating foods and for storing foods which contain oil, acid, alcohol or liquids in general. The food industry needs to look at safer alternate packaging material.
In order to cut down on the intake of food additives the best way is to choose fresh and natural foods that are free of additives. However as that is not always possible, selection of brands of processed foods which have a minimum number of additives helps. The label of the food product declares the presence of the additives used in the product. Certain marks also assure us of quality of the food product. The FSSAI logo with license number is mandatory for all packaged food products in India. Agricultural products may carry the AGMARK logo and some others like milk powder, food colours, etc. may have the Bureau of Indian Standards logo. Others whose manufacturing plants are HACCP or ISO certified will carry the appropriate declaration.

The Food Safety and Standards Act (FSSA) 2006, has replaced all the mandatory Food Safety Acts like the PFA, FPO, MFPO and MMPO. It incorporates the salient provisions of the Prevention of Food Adulteration Act 1954 and is based on international legislations and Codex Alimentarius Commission. The Act is considered to be contemporary, comprehensive and uses Food Safety Management Systems in order to ensure safety of the consumer. The Act has provisions relating not only to laying standards for specific food items, but also to maintenance of hygienic conditions in and around manufacturing premises, assessment of and management of risk factors to human health in a scientific manner so as to make the food safe for human consumption. In fact the Act shifts the emphasis from prevention of adulteration to a broader concept of food safety.

Hazard Analysis and Critical Control Points (HACCP) is a systematic preventive approach to food safety . HACCP is used in the food industry to identify potential food safety hazards, so that key actions, known as Critical Control Points (CCPs) can be taken to reduce or eliminate the risk of the hazards. The system is used at all stages of food production and preparation processes including packaging, distribution, etc.

HACCP is a food safety management system based on logical, scientific approach to controlling safety problems in food processing in a timely manner.

HACCP is product specific and plant specific, and therefore, a unique plan has to be chalked out for each product and/or process. In principle, HACCP can be applied throughout the food chain, starting from the primary producer to final consumer. Before HACCP is implemented it is a prerequisite that the food manufacturing plant follows Good Manufacturing Practices (GMP). Several studies have been conducted to see the feasibility of using HACCP approach for small scale manufacturers of food product, catering establishments and also for street food vendors.

Often very simple modifications in the work environment or the flow of processing operations can make the food safer. For example, thorough cleaning of the cloth used for straining during production of paneer; sautéing the vegetable filling of a momo before steaming and washing hands each time the food handler touches food ingredients with bare hands. It is not enough for instance during preparation of ladoos that the food handler washes hands before collection of ingredients and roasting of gram flour. Once the ladoo mixture cools and the handler has to roll it into balls, he needs to wash up again.

A lot of research and a lot of hand-holding is needed to enable our vast and diverse food industry to gear up and supply safe food to the people of this country. From the vendor who cooks in his shack in the slum to the chef in a fancy restaurant, a concerted effort to sensitize, educate and train has to be made.

Research in Health & Nutrition

What are the health benefits of lemons?

7 October 2014 Medical News Today

Lemons first achieved their healthy claim to fame onboard the ships of early explorers to help treat scurvy, a then-common disease among the sailors. In 1747, James Lind found that lemons and oranges were extremely effective at treated the disease, which we know was caused by a vitamin C deficiency from months at sea without any fresh produce.

Lemons are rarely consumed as a stand-alone fruit due to their intense sour flavour but are extremely popular when used in smaller quantities and in combination with herbs and spices to lend a wonderful and dynamic flavour to many sauces, salad dressings, marinades, drinks and desserts.

Nutritional breakdown of lemons
According to the USDA National nutrient database, one raw lemon, without peel (about 58 grams) provides 17 calories, 0.6 grams of protein, 0.2 grams of fat, 5.4 grams of carbohydrate (including 1.6 grams of fibre and 1.5 grams of sugar, 51% of daily vitamin C needs as well as small amounts of thiamin, riboflavin, vitamin B-6, pantothenic acid, calcium, iron, magnesium, phosphorus, potassium, copper and manganese.

Lemons have an intense sour flavour but are popular when used in combination with herbs and spices for many sauces, salad dressings, marinades, drinks and desserts.

One fluid ounce of lemon juice provides 7 calories, 0.1 grams of protein, 0.1 grams of fat, 2.1 grams of carbohydrate (including 0.1 grams of fibre and 0.1 grams of sugar) and 23% of daily vitamin C needs.

Possible health benefits of consuming lemons:
Lowering stroke risk
According to the American Heart Association, eating higher amounts of citrus fruits may lower ischemic stroke risk for women. Those who ate the highest amounts of citrus had a 19% lower risk of ischemic stroke than women who consumed the least.

Combating cancer
As an excellent source of the powerful antioxidant vitamin C, lemons and lemon juice can help fight the formation of free radicals known to cause cancer.
Maintaining a healthy complexion
The antioxidant vitamin C, when eaten in its natural form or applied topically, can help to fight skin damage caused by the sun and pollution, reduce wrinkles and improve overall skin texture.
Vitamin C plays a vital role in the formation of collagen, the support system of your skin.

Preventing asthma
The risks for developing asthma are lower in people who consume a high amount of certain nutrients, one of these being vitamin C.

Increasing iron absorption
Iron deficiency is one of the most common nutrient deficiencies in developed countries and a leading cause of anemia. Pairing foods that are high in vitamin C with foods that are iron-rich will maximize the body's ability to absorb iron. For example, squeeze lemon juice atop a salad with spinach and chickpeas (both a good source of iron).

Boosting the immune system
Foods that are high in vitamin C and other antioxidants can help the immune system battle germs that cause a cold or flu. Maintaining a healthy diet high in fruits and vegetables is especially important during the winter months when physical activity levels tend to drop.

More benefits
Consumption of fruits and vegetables of all kinds has long been associated with a reduced risk of many adverse health conditions. Many studies have suggested that increasing consumption of plant foods like lemons decreases the risk of obesity, diabetes, heart disease and overall mortality while promoting a healthy complexion, increased energy, and overall lower weight.

What are the health benefits of coconut oil?

1 October 2014 Medical News Today

Previously shunned by the health and wellness community for high saturated fat content, coconut oil has experienced a huge increase in sales and taken the media by storm

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Think Asia. Think DKSH.

Coconut oil is becoming more of a staple cooking oil in many households. There are claims that coconut oil can do everything from supporting weight loss to slowing the progression of Alzheimer's disease.

in recent years. Coconut oil can be found not only in specialty health food stores, but at most local grocers as well.

Formerly unheard of, coconut oil is becoming more of a staple cooking oil in many households. Manufacturers are using coconut oil in favour of other oils in packaged products, and there are claims that coconut oil can do everything from supporting weight loss to slowing the progression of Alzheimer's disease. Nevertheless, many organizations such as the American Heart Association and the USDA continue to caution consumers against all tropical oils, including coconut oil.

Nutritional breakdown of coconut oil
According to the USDA National Nutrient Database, one tablespoon of coconut oil contains 117 calories, 0 grams of protein, 13.6 grams of fat (11.8 saturated, 0.8 monounsaturated and 0.2 polyunsaturated) and 0 grams of carbohydrate (0 grams of fiber and 0 grams of sugar). It provides little to no vitamins or minerals.

Coconut oil is made up of 100% fat. However, the structure of fat in coconut oil differs from the traditional saturated fat often found in animal products (primarily comprised of long-chain fatty acids).

Coconut oil has an unusually high amount of medium-chain fatty acids or triglycerides (MCFAs or MCTs), which are harder for our bodies to convert into stored fat and easier for them to burn off than long-chain fatty acids or triglycerides (LCFAs or LCTs).

Tom Brenna, a professor of nutritional sciences at Cornell University's College of Human Ecology, states that all coconut oils are not created equal.4 Partially hydrogenated coconut oil is just as harmful as other highly processed oils containing trans fat and clearly wreaks havoc on our health.

The second type, refined coconut oil, is extracted from chemically bleached and deodorized coconut meat. Virgin coconut oil, on the other hand, is extracted from the fruit of fresh mature coconuts without using high temperatures or chemicals, is considered unrefined and may paint an entirely different story for our health.

According to the Academy of Nutrition and Dietetics, virgin coconut oil has potential antioxidant properties due to certain plant nutrients it contains called phenolic compounds.

Possible health benefits of consuming coconut oil:
Cardiovascular disease
In a randomized clinical trial, 40 participants were given either 2 tablespoons of coconut oil or 2 tablespoons of soybean oil once a day for 12 weeks. The soybean oil group saw their HDL (good cholesterol level) go down and their LDL (bad cholesterol) go up, both markers of an increased risk for cardiovascular disease. The coconut oil group did not experience a significant change in their cholesterol numbers but were more likely to have a higher HDL level.

Diabetes
Diets high in MCTs (65% of coconut oil's makeup) have been shown to improve glucose tolerance and reduce body fat accumulation when compared to diets high in LCTs. MCFAs have also been shown to preserve insulin action in, and insulin resistance in rat studies.2 Coconut oil may also improve insulin sensitivity in type 2 diabetics.

Researchers observed that study participants who followed a diet in which 40% of calories came from fat, either comprised of mostly MCTs or LCTs, the MCT group improved insulin-mediated glucose metabolism by 30% when compared with the LCT group.

Weight loss
In the coconut oil versus soybean oil study described above, both groups lost weight however only the coconut oil group saw a decrease in waist size.

Another study had participants consume 18-24 g of MCTs per day as part of a 16-week weight-loss program, which resulted in more weight loss and fat loss when compared to olive oil. These findings suggest that substituting oils high in medium chain triglycerides for those with long chain triglycerides could be beneficial for weight loss in healthy individuals.

When compared with other fats, coconut oil contains 2.6% fewer calories. Keep in mind however that all high-fat foods and oils are calorically dense and simply adding in more calorically dense food to a diet already ample in calories is not likely to result in weight loss.

Improving Nutrition in Snacks

November 03, 2014 Food Product Design

Consumers are looking for more beneficial ingredients in their foods—and that includes snacks.

Nutritionally speaking, snacks aren't always high on the totem pole. They're a source of extra calories, with those calories sometimes being empty. However, snacks can be a healthful choice to carry consumers from one meal to the next.

Fibre, protein and whole grains are some key ingredients consumers are seeking in their foods products. Among protein ingredients, pea protein is riding the wave of interest—pea protein can be used in snacks for protein enrichment or to replace other protein sources. In addition, pea protein has a balanced amino acid profile, making it useful for weight management and sports nutrition applications.

Pea protein is a dry ingredient, and can be added to a dough with other powdered ingredients. However, pea proteins, like other proteins, absorb water, so formulas need to be adjusted. In baked snacks, pea protein will have minimum impact on the product and will improve texture.

Nuts are another indulgent yet healthy ingredient that contribute to a positive impression in snack foods. According to a 2013 report from Innova Market Insights, almonds are the No. 1 nut used in new snack product introductions in North America, and are the most popular nut in bars. This is due, in part, to their nutritional benefits, but almonds also come in 15 different forms, which can serve up endless possibilities for snack creations. Almond flour, for example, is naturally gluten-free, provides nutrients such as calcium, fibre, iron and protein, and is suitable for a wide range of artisan-like bakery and snack applications.

Often, consumers who seek snack with a healthy halo are also watching fat intake and sodium content. A strong flavour profile can aid in reduced-sodium products. Some seasonings can cross over to fit both healthful and indulgent profiles. Examples include: curries with turmeric; cinnamon blends; seasonings with dehydrated fruit and vegetable powders; and fibre powders or cocoa.

Flavanols Reverse Age-Related Memory Decline

October 30, 2014 Food Product Design

Dietary cocoa flavanols—naturally occurring bioactives found in cocoa—reversed age-related memory decline in healthy older adults, according to a study led by Columbia University Medical Centre (CUMC) scientists.

The study provides direct evidence that one component of age-related memory decline in humans is caused by changes in a specific region of the brain and that this form of memory decline can be improved by a dietary intervention. Flavanols are also found naturally in tea leaves and in certain fruits and vegetables, but the overall amounts, as well as the specific forms and mixtures, vary widely.

Some decline in cognitive abilities is common as people age, including learning and remembering such things as the names of new acquaintances or where one parked the car or placed one's keys. This normal age-related memory decline starts in early adulthood, but usually does not have any noticeable impact until later stages of life.

Previous work, including by the laboratory of senior author of the study Scott A. Small, M.D., Boris and Rose Katz Professor of Neurology (in the Taub Institute for Research on Alzheimer's Disease and the Aging Brain, the Sergievsky Center and the Departments of Radiology and Psychiatry) and director of the Alzheimer's Disease Research Centre in the Taub Institute at CUMC, had shown that changes in a specific part of the brain—the dentate gyrus—are associated with age-related memory decline. Until now, however, the evidence in humans showed only a correlational link, not a causal one.

To test whether the dentate gyrus is the source of age-related memory decline in humans, researchers studied the effects of cocoa flavanols—which previously had improved neuronal connections in the dentate gyrus of mice—specifically, whether they could improve the function of this brain region and improve memory.

Thirty-seven healthy volunteers aged 50 to 69 years received either a high-flavanol diet (900 mg of flavanols a day) or a low-flavanol diet (10 mg of flavanols a day) for three months. Flavanols were extracted from cocoa beans to create a cocoa flavanol-containing test drink by Mars, Incorporated, which also partly supported the research.

Brain imaging and memory tests were administered to each participant before and after the study.
"When we imaged our research subjects' brains, we found noticeable improvements in the function of the dentate gyrus in those who consumed the high-cocoa-flavanol drink," said lead author Adam M. Brickman, Ph.D., associate professor, neuropsychology, Taub Institute.

The high-flavanol group also performed significantly better on the memory test. "If a participant had the memory of a typical 60-year-old at the beginning of the study, after three months that person on average had the memory of a typical 30- or 40-year-old," Small said.

Resistant starch may improve insulin sensitivity

IFT Weekly November 5, 2014

A study presented at the Annual Obesity Week conference on Nov. 4 shows that high amylose resistant starch (HI-MAIZE) may improve insulin sensitivity in women. Resistant starch is a type of dietary fibre that has beneficial metabolic effects including lowering blood glucose concentrations and improving insulin sensitivity. The study was performed to better understand its effects in women.

The study was conducted in 43 healthy normal-weight and obese, pre- and post-menopausal women ages 22–68, using a randomized, placebo-controlled, double-blind crossover design. HI-MAIZE 260 corn starch was formulated into snack foods and tested at two doses, 15 g and 30 g resistant starch per day. An isocaloric snack formulated with a highly-digestible waxy corn starch served as a control. The participants consumed the snack foods for four-week intervals with a four-week washout period between the three test periods. Insulin sensitivity was assessed at the end of each test period using an intravenous glucose tolerance test.

The results show that the high amylose resistant starch improved insulin sensitivity in the combined group of pre- and post-menopausal women. Baseline insulin sensitivity and waist circumference affected the response. A subset of women with unusually high insulin sensitivity was identified, and no improvement was found in this subgroup. For the remainder of the women, a 26% improvement in insulin sensitivity was found after consuming the snacks containing 30 g resistant starch compared to the snacks containing no resistant starch. The effects were also affected by waist circumference with greater improvements noted in women with larger waists.

Overcoming Formulation Challenges in BFY Beverages

November 06, 2014 Food Product Design

Consumers are increasingly concerned about health, especially when it comes to the products they consume. Add in the demand for convenience, and beverages have a unique position to offer enhanced nutrition in an accessible, portable format. "Better-for-you" (BFY) beverages encompass a range of attributes health-seeking consumers desire. In energy drinks, dairy beverages and enhanced waters, product developers are improving nutrition.

Dairy beverages already offer a healthy halo due to dairy itself, which provides calcium, protein and "shortfall" ingredients, such as vitamin D, that are lacking in the American diet. However, to further improve nutrition in theses beverages, product developers often add protein or reduce sugar content.

Protein has become quite popular among consumers, largely due to its contribution to satiety and weight management, as well as its role in sports nutrition. When adding protein ingredients to dairy beverages, product developers should carefully consider protein options to ensure quality of the end product.

Milk protein concentrates (MPCs) contribute minerals such as calcium, magnesium and phosphorous, which could reduce need for additional fortification. In addition, MPCs provide benefits like water binding, viscosity, gelling, foaming/whipping, emulsification and heat stability. Whey protein concentrate (WPC) provides a neutral taste and is soluble across a wide pH range, while casein proteins are often used in neutral-pH beverages and offer heat stability. Non-modified whey proteins, on the other hand, are not heat stable, and should be combined with casein proteins in neutral-pH beverages.

Added protein can also affect flavour of these beverages. Robust flavour systems or selecting a flavour profile that will work with the inherent notes of the protein can be beneficial if flavour challenges arise.

Not unlike most other segments in the food and beverage industry, consumers are seeking energy drinks made with "natural" ingredients. For this reason, BFY energy drinks typically fall into one of two camps—"natural" energy or caffeine-free energy. Energy drinks powered natural energy sources typically utilize extracts and herbal sources of caffeine compared to anhydrous caffeine. Some sources

include green tea extract, green coffee bean and guarana, among others.

“Natural" sources of energy also tend to bring unwanted flavours, such as astringency, bitterness or herbal notes. Utilizing strong, robust flavours or taste modification can help. Certain flavours can also help overcome bitterness, such as citrus, cranberry and dark chocolate flavours.

Enhanced waters offer consumers a flavourful, often low-calorie beverage that also often provides added vitamins or other biologically active ingredients. While these beverages may make water a more enjoyable and nutritionally lucrative experience for consumers, they can offer unique challenges to beverage formulator in that they are generally clear and lightly flavoured.
Solubility is a key consideration in enhanced waters; specifically, product developers need to be aware of the volume of material being put into solution. This means it’s important to select the correct market form of the ingredient being added—different market forms generally have different chemical compositions and contain a different percent of the desired nutrient.
For example, if the nutrient being added is calcium, there are number of materials that contain calcium, but their solubility differs along with their percentage of calcium. It would take almost twice as much calcium citrate (21 percent calcium) to deliver the same calcium content as calcium carbonate (40 percent).

Herbs, Spices Enhance Heart Health

November 18, 2014 Food Product Design

Spices and herbs are rich in antioxidants, which may help improve triglyceride concentrations and other blood lipids, according to Penn State nutritionists.

Spices are commonly used to add flavour to meals, as well as food and beverage products. Increasingly, they are recognized for their contribution to health. Guy Johnson, Ph.D., executive director, McCormick Science Institute, discussed in a Food Tech Toolbox video some of the health benefits associated with spices and herbs, including the benefit of red pepper in a soup on weight management.

New research, however, shows the addition of a high-antioxidant spice blend into a high-fat meal can reduce triglyceride by as much as 30 percent when compared to eating an identical meal without the spice blend. Triglyceride levels rise after eating a high-fat meal—which can lead to increased risk of heart disease.

For the study, Sheila G. West, professor, biobehavioral health and nutritional sciences, Ann C. Skulas-Ray, research associate in nutritional sciences, and researchers prepared meals on two separate days for six men between the ages of 30 and 65 who were overweight, but otherwise healthy. The meals were identical—consisting of chicken, bread and a dessert biscuit—except that the researchers added two tablespoons of a high-antioxidant culinary spice blend to the test meal. The spiced blend included garlic powder, rosemary, oregano, cinnamon, cloves, paprika, turmeric, ginger and black pepper.

Researchers followed the participants for three hours after each meal, drawing blood every 30 minutes. Antioxidant activity in the blood increased by 13 percent after the men ate the test meal when compared to the control meal, which may help prevent cardiovascular disease and other chronic diseases.

West and Skulas-Ray also reviewed a variety of research papers that focused on the effects that spices and herbs have on cardiovascular disease risk.

The researchers looked at three categories of studies—spice blends, cinnamon and garlic. “We live in a world where people consume too many calories every day," West said. "Adding high-antioxidant spices might be a way to reduce calories without sacrificing taste."

Several cinnamon studies looked at the effect of the spice on both diabetics and non-diabetics, where cinnamon was shown to help diabetics by significantly reducing cholesterol and other blood lipids in participants. However, cinnamon did not appear to have any effect on non-diabetics.

The garlic studies reviewed were inconclusive, but this is likely because the trials had a wide range of garlic doses, from 9 milligrams of garlic oil to 10 grams of raw garlic. The reviewers noted that across the studies there was an eight percent decrease in total cholesterol with garlic consumption, which was associated with a 38 percent decrease in risk of heart problems in 50-year-old adults.

West and colleagues are currently working on a study to monitor study participants for eight hours after eating a meal with a high-antioxidant spice blend to determine what happens to the fat in the meal.

"If (the fat) isn't being absorbed when spices are included in the meal, it might be excreted instead," said West. "We will examine whether spices affect how rapidly the meal is processed through the stomach and intestines.”

Fibre's impact on gut bacteria, weight loss

IFT Weekly November 19, 2014

A study published in the American Journal of Clinical Nutrition shows that in addition to promoting the growth of beneficial bacteria in the gut, two specific functional fibres may also have the potential to assist in weight loss when made part of a long-term, daily diet.

University of Illinois researchers had previously been able to see a "snapshot" of what bacteria were present in the gut after a diet had been supplemented with polydextrose and soluble corn fibre. Using the samples from the same trial, the researchers used whole-genome sequencing to explore the full range of bacterial genomic information in the gut after fibre supplementation. The new information is helping the researchers to understand more about the functional capabilities of the bacteria in the gut when these fibres are consumed as part of a regular diet.

Hannah Holscher, a University of Illinois postdoctoral researcher and registered dietitian in animal sciences, said what was most surprising and novel in the recent study was a shift in the Bacteroidetes:Firmicutes ratio toward more Bacteroidetes, something the researchers had not seen previously.

"This was of particular interest to us because other research has shown that having more Bacteroidetes may be beneficial because the higher that proportion is, the individual tends to be leaner. With higher Firmicutes, that individual tends to be more obese," said Holscher. "We don't know if there is any causality for weight loss, but studies have shown that having a higher fibre diet is protective against obesity. It's an exciting shift and helps to drive researchers to study these fibres as part of a weight loss diet."

Holscher added that the whole-genome sequencing data also revealed shifts in the functional capacity of the microbiome including modifications in nutrient metabolism. "We saw that there was a decrease in genes associated with protein metabolism, which correlated with the reduced protein fermentation that occurred in the study participants' guts when they consumed the fibres," she said. "The information from this study, in combination with the results from the previous study, has allowed us to put together a more complete picture of what the bacteria in our gut are doing."

The researchers stressed that though there were significant shifts in the gut bacterial populations with fibre supplements, when the supplements were stopped populations seemed to go back to where they were before.

Whey Protein Hydrolysate Improves Athlete Recovery

November 25, 2014 Food Product Design

Endurance athletes consuming sports drinks containing carbohydrates and electrolytes plus a whey protein hydrolysate outperform athletes using sports drinks alone, a new study reveals.

A growing body of research underscores the value of dairy ingredients, including whey protein hydrolysate and other dairy proteins, in sports nutrition. Dairy provides easily digestible, high-quality protein for building and repairing muscle, carbohydrates for energy and vitamins and minerals that can help strengthen bones and replaces electrolytes, according to the Food Product Design Digital Issue, "Dairy Ingredients in Sports Nutrition."

For the present study, 18 top-class runners from Team Denmark took part in a one-week training camp. The athletes were training twice a day, every day (apart from on one rest morning) equating to 13 training sessions during the week.

Athletes were divided into two groups of nine; each consumed diets containing the same amount of calories. One group consumed a traditional sports drinks containing carbohydrates and electrolytes before and after each training session, while the other group consumed whey protein hydrolysate before each session and both a sports drink and afterwards.

The run-test was undertaken initially before the camp and then again following the conclusion of all 13 of the training sessions held over the course of the week, making it possible to compare the impact of the whey protein hydrolysate supplementation during the training camp.

The results demonstrated that the athletes who consumed whey protein hydrolysate before and after training performed better in a final 4 km run-test than the sports drink-only group, with a mean improvement of 17 seconds. The whey protein group also experienced less muscle damage compared with the sports drink-only group.

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Food Science & Industry News

High-temperature treatment can improve pineapple colour and aroma

IFT Weekly November 12, 2014

Applying a high-temperature treatment postharvest to pineapples grown during low-temperature seasons can improve the fruit's colour and scent, according to a study published in the Journal of Food Science.

In the study, researchers performed two experiments involving elevated temperature treatments, storing pineapples with no packaging in an artificial climate chamber for 36 hours. They then looked at the temperature's effect on pineapples' colour, physiochemical characteristics, and aroma components. The lightness values of the skin and pulp of the fruit were decreased, and in terms of colour, the greenness-redness and blueness-yellowness values of the skin and pulp were markedly increased.

The researchers also found that the higher temperature significantly increased the contents of total soluble solids (TSS) and slightly affected contents of vitamin C (non-significant). Titratable acidity (TA) of pineapple fruits were notably decreased, while the values of TSS/TA of pineapple fruits were significantly increased. The firmness of the pineapple fruits decreased and more esters and alkenes were identified, improving the aroma of the fruits. The total relative contents of esters were increased, and the total relative contents of alkenes were decreased.

Functional foods market increases in size

IFT Weekly November 26, 2015

A new report from Leatherhead Food Research has revealed that the global market for food and drinks offering functional health benefits continues to increase in size. The report, "Future Directions for the Global Functional Foods Market," shows that in 2013 the global market for functional foods was worth an estimated $43.27 billion (this figure uses a very strict definition of the market, limited to food and drinks that make specific functional health claims and excludes products such as energy drinks). This represents an increase in value terms of 26.7% compared with 2009.

Despite this, the growth rates of the market remain well below the levels observed in the early years of the millennium. The market suffered during the global economic downturn, owing to consumers switching to cheaper groceries, while changes in the regulatory situation are also thought to have hindered growth. In the European Union, for example, more pressure is being placed upon manufacturers of functional foods to provide robust scientific evidence backing up the health claims made by their products.

Analyzed by health outcome, the energy and mood-enhancing sector is the market's largest, worth an estimated $16.5 billion in 2013 for the countries under review. This equates to 27.1% of the total market (assuming a wider definition is applied), and reflects the widespread popularity of energy drinks in particular in most parts of the world. Other significant sectors by health outcome include digestive health and heart health foods, worth $16 billion and $13.75 billion, respectively, in 2013.

"The functional foods market has experienced fairly strong growth in certain parts of the world," said Jonathan Thomas, Principal Market Analyst, Leatherhead. "For instance, more U.S. consumers appear to be turning towards functional food and drinks in order to address perceived nutritional shortfalls, away from dietary supplements, which have traditionally been the preferred option. However, future growth is likely to be dependent upon the global economic situation."

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Can Chlorella Crunch into Food? Allma Launches Microalgae Crispy Snacks

17-Nov-2014 Food Navigator

Portuguese microalgae supplier Allma has debuted cereal-based chlorella pieces as it drives the ingredient beyond food supplement aisles.

The firm is producing rice cereal and Chlorella vulgaris blends in multiple sizes and flavours like carrots, rosemary and lemon. Talking to NutraIngredients, Sofia Mendonça, business development manager at Allma, said: "There is a huge potential for chlorella powder as a food ingredient. Mainly because of its nutritional value but also because of its food technology characteristics. It could for example be used as a natural colorant." Matrices proposed by the firm include yoghurts, breakfast cereals, snack bars, soups and salad.

Raising awareness
The company started working on the project a couple of months ago and food manufacturers are beginning to show an interest in it. "We expect the first big jump to happen in either Europe or North America. Asia is also an interesting market for us as they have a long tradition in terms of microalgae. What we need is an acceptance and investment in chlorella as a food ingredient," Mendonça added.

Chlorella contains vitamins, minerals, carotenoids, protein and polyphenols but claims are only emerging as regulator friendly science builds, and so most marketing is based around 'wellbeing' messaging. "Chlorella is widely-recognised among people who are taking dietary supplements as well as those who are looking for natural products. Our biggest challenge is to consolidate the awareness and reach the rest of the consumers globally," Mendonça said.

Malnutrition Costs 11% of World's GDP: Global Nutrition Report

14-Nov-2014 Nutra Ingredients USA

Malnutrition is costing the global economy $3.5 trillion (€2.8trn) a year in both the developing and developed worlds, the biggest ever global survey of nutrition has concluded.

The Global Nutrition Report finds not a single country out of 193 assessed escapes the burden of either under (usually hunger and micronutrient deficiencies and related ailments) or over nutrition (obesity and related ailments) that affects 2bn people around the globe and costs trillions in lost productivity.

The work will form the centrepiece of the Food and Agriculture Organization (FAO) 2nd International Conference on Nutrition which takes place in Rome next week. The International Food Policy Research Institute (IFPRI), which produced the report in conjunction with a large number of NGOs, research institutions, academic journals like The Lancet and policy makers found around 100 countries experience both hunger and obesity concerns simultaneously.

While it notes progress in some areas such as the battle against childhood stunting in selected countries (see a country-by-country table and an industry focused table on that), the overall picture is damning, especially in youth nutrition. "Globally, little progress is being made in decreasing rates for anaemia, low birth weight, wasting in children under age five, and overweight in children under age five," it states.

It says World Health Assembly goals including reducing the number of children under five who are stunted by 40% and halting increases in the number of overweight children by 2025 are unlikely to be achieved in many countries, even though some were making good progress toward the targets. "When we put all this data together, there isn't a country that doesn't experience significant malnutrition," said IFPRI researcher Lawrence Haddad.

'Political commitment is growing… Margaret Chan, director general of the World Health Organization (WHO) welcomed the report and said the fight for better nutrition needed to involve as many parties as possible. "Ending malnutrition throughout the world requires action on many fronts. The health sector cannot do it alone. But political commitment is growing. More and more countries know what they need to do to ensure access to healthy diets for all. This report will help us track progress toward global nutrition targets and understand where greater investments are needed," she said.

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Committee for Comprehensive Review of Food Safety & Standards Act 2006

Recently the Ministry of Health & Family Welfare announced the creation of a committee to review the Food Safety & Standards Act that was enacted in 2006 which was enacted to consolidate the laws relating to food in the country, to lay down science-based regulation for manufacture and sale of food products in India. The Food Authority to regulate the laws under this act was created in 2008 which notified rules and regulations under the act in 2011.

The ministry felt that there were some difficulties under this act and certain amendments are needed. It said there were many representations received from Food Business Operators and other stakeholders for amending FSS Act, Rules & Regulations.

The ministry has constituted a committee under the chairmanship of Mr. R. K. Jain, Secretary, National Disaster Management Authority. The CEO of FSSAI Mr. Y.S. Malik is a member. The committee is expected to get inputs from representatives of food industry, associations and other stakeholders. It may also co-opt members that it may feel whose involvement and advice may be useful. It is expected that the committee will complete its work within forty five days from the date of its first meeting.

The industry has been having a lot of hardship so this may be an opportunity to address its grievances to the committee. There have been many court cases that show the intensity of problems. Industry has been having special problems with the product approval of many proprietary food products.

There have also been problems with the registration and licensing. Industry can now air these difficulties and hopefully the committee may recommend the solutions in terms of changes in the rules and regulations of Food Safety & Standards.

If there are any suggestions that any stakeholders have they may write to Dr. Tarsem Chand, Director (Food), Dept. of Health and Family Welfare, who is the Member Secretary of the committee. Also PFNDAI welcomes any suggestions from its members and well-wishers.

Send your suggestions to:

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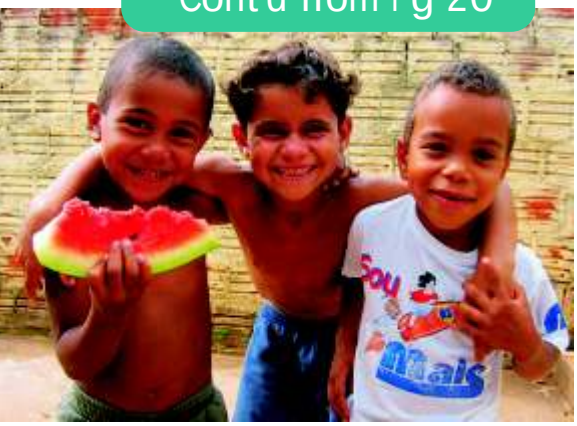

Melinda Gates, co-chair of the Bill & Melinda Gates Foundation, urged governments to make use of the report's findings. "Policymakers should heed the report's call to prioritise collecting more and better nutrition data to drive even greater impact on the lives of the poorest in the years ahead."

The United Nations World Food Programme estimates poor nutrition is the cause of about of the annual 3m deaths of children under 5-years-old. UN Children's Fund (UNICEF) executive director Anthony Lake took a positive slant on infant and child nutrition in stating:

"This has started to change as the Scaling Up Nutrition Movement has gained force, supported by more than 50 countries and the commitment of governments, international organizations, civil society, and communities to scale up nutrition."

Manufacturers Urged to Develop 'Tasty' Protein-enriched Foods for the Elderly

14-Nov-2014 Food Navigator

Researchers have urged food producers to develop good tasting protein-rich products that are based on foods that the elderly already regularly consume.

This study, published in Appetite, provides insights into what types of protein-enriched food may appeal to elderly consumers, and what remains to be done to successfully promote protein consumption among elderly using these products.

Led by Lotte van der Zanden from Wageningen University in The Netherlands, the team explored the knowledge, perceptions and preferences of elderly consumers regarding protein-enriched food – finding that confusion, distrust and a perceived lack of personal relevance were main perceived barriers to purchasing and consuming these products, although a majority of the participants did report occasionally consuming at least one type of functional food.

"Contrary to what is found in most studies on functional food, the elderly in our sample were predominantly sceptical about these products," noted the research team. "This scepticism was strongly driven by distrust which is regularly found in research on functional food and may be partly explained by a lack of nutritional knowledge."

The focus group led research found that carrier preferences were similar for elderly consumers that both independent living (ID) and in a residential home (RH) – revealing that they preferred protein-enriched foods based on healthy products that they consumed frequently.

"In line with our findings, we recommend that food producers develop tasty and healthy protein-enriched foods, based on carriers that are consumed often by elderly," stated the Dutch team – adding that in the case of the Dutch elderly they focused on, good carriers could include bread or dairy products.

The Dutch team conducted their study based on insights from focus groups with independently living (ID) elderly and residential home living elderly people in The Netherlands.

A total of 42 elderly (14 males, 28 females, aged 55+) participated in six focus groups, consisting of four to eight participants each. According to the findings, both the ID and RH elderly consumers were predominantly sceptical about functional food in general.

"For the ID elderly, medical advice was an important facilitator that could overcome barriers to purchasing and consuming protein-enriched food, indicating the importance of personal relevance for this group," explained the team. "For the RH elderly, in contrast, sensory appeal of protein-enriched foods was a facilitator."

In addition, the RH elderly were less familiar with a range of functional foods than the ID elderly, said the team – suggesting that this is presumably because they only have access to a small supermarket in the residential home with a limited assortment. In addition, the

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Apple Peel Powder Improves Joint Function

November 20, 2014 Food Product Design

Daily consumption of dried apple peel powder was linked to improved joint function in individuals with moderate loss of joint range of motion (ROM), and increased serum antioxidant protection status, according to results of a new study.

The study, conducted by NIS Labs, looked at the effects of consuming dried apple peel powder (DAPP) daily on joint function and ROM. Additional in vitro and clinical testing was performed to investigate specific mechanisms of action.

To determine the effects of the apple peel powder, healthy individuals experiencing moderate loss of joint range ROM, and associated recurring pain, consumed 4.25 grams of DAPP daily for 12 weeks, with evaluations at baseline, 2, 4, 8 and 12 weeks.

According to Gitte Jensen, research director, NIS Labs, the pilot study results suggest "multifaceted anti-inflammatory properties of dried apple peel powder. The study indicated that daily consumption of DAPP was associated with a statistically significant improvement in serum antioxidant protective status, as well as improved ROM."

DAPP contains a rich polyphenol blend with high levels of antioxidants, and was shown to increase antioxidant activity, including cell protection from oxidative damage in vitro. When consumed daily for 12 weeks, AppleActiv DAPP showed both inhibited COX-2 and lipoxygenase enzyme activity.

The study also observed pain reduction, which may be associated with the improved antioxidant status, and is likely linked to the anti-inflammatory effects of the polyphenols. The ingredient is also certified organic.

"We are extremely encouraged but the results of the NIS study that validate DAPP as an effective ingredient for use in a variety of applications supporting joint health and comfort," said Lorraine Leahy, nutritionist and director, division of functional foods, Leahy Orchards. "Product formulators and brand managers are taking serious notice of this research as they evaluate DAPP for use in a variety of functional food and supplement products."

Increasingly, consumers are grasping the concept behind functional foods. In fact, according the International Food Information Council (IFIC) Foundation's 2013 Functional Foods Consumer Survey, not only are most consumers aware of functional foods (90 percent agree that certain foods have health benefits beyond basic nutrition), but they have an active interest in them (86 percent are interested in learning more about functional foods). And 62 percent think they can integrate these foods into their diets.

But in our label-conscious consumer climate, it's important to know which ingredients consumers are gravitating to. In general, a "healthy" label can lead to healthy sales. Specifically, in the U.S., the market for products labelled to include fruits and vegetables was valued at $11.4 billion in 2013. Other healthy labels included descriptors such as "natural" ($43 billion), "vitamin/mineral" ($26.4 billion) and "organic" ($8.9 billion).

Mediterranean diets have lasting health benefits

November 6, 2014 Science Daily

Got grapes? UCLA researchers have demo

The health benefits of switching to a Mediterranean style diet and upping the amount of time spent exercising for a period of just eight weeks can still be seen a year after stopping the regime, a new study has shown.

The research by Sheffield Hallam University and the University of Lincoln in the UK revealed that the diet and exercise combination leads to improved blood flow in cells in the inner lining of the blood vessels -- called the endothelial cells -- a full 12 months after completing participation in the intervention programme.

Endothelial cells line the interior of the entire vascular system of the human body -- from the large arteries to the smallest capillaries -- and improvements in their function could reduce the risk of people developing cardiovascular disease, the study said.

Researchers believe the long-term health benefits observed after such a short intervention could be due to molecular changes associated with

the Mediterranean diet. Traditional Mediterranean cuisine is based on olive oil, fruit, vegetables and salad, fish, legumes, wholegrain foods, wine and limited consumption of red meat.

Lead researcher Dr Markos Klonizakis, a Research Fellow at Sheffield Hallam University, said: "Preserving a patient's endothelial function as they get older is thought to reduce the risk of developing cardiovascular disease, so these findings are very encouraging. "Although exercise on its own can beneficial, other lifestyle factors such as nutrition play an important role as well.

"Considering the scientific evidence already out there that a Mediterranean diet offers health benefits, it made sense to examine how such a diet, when combined with exercise, could affect the small veins of our body due to their important role in our overall well-being, in the longer-term."

The study focused on healthy people over the age of 50. Participants were originally assessed over an eight-week period. One group was encouraged to eat more vegetables, fruit, olive oil, tree nuts and fresh oily fish, as well as take up a moderate exercise regime, while the other just took up exercise alone.

The results showed more health improvements in the Mediterranean diet group than the exercise only group, which one year later, were still evident despite the lifestyle changes implemented during the study no longer being carefully followed.

Co-researcher Geoff Middleton, Senior Lecturer in the School of Sport and Exercise Science at the University of Lincoln, added: "With cardiovascular disease being on the rise, adding a huge burden to healthcare systems around the globe, it is important to find ways to reduce the number of cases. Even a medium-duration intervention with a Mediterranean diet and exercise regime can promise long-term health benefits, especially in people at high risk of developing cardiovascular disease."

The paper, Long-term effects of an exercise and Mediterranean diet intervention in the vascular function of an older, healthy population, was published in the journal Microvascular Research.

Body weight heavily influenced by gut microbes: Genes shape body weight by affecting gut microbes

November 6, 2014 Science Daily

Our genetic makeup influences whether we are fat or thin by shaping which types of microbes thrive in our body, according to a study by researchers at King's College London and Cornell University.

By studying pairs of twins at King's Department of Twin Research, researchers identified a specific, little known bacterial family that is highly heritable and more common in individuals with low body weight. This microbe also protected against weight gain when transplanted into mice.

The results, published today in the journal Cell, could pave the way for personalised probiotic therapies that are optimised to reduce the risk of obesity-related diseases based on an individual's genetic make-up.

Previous research has linked both genetic variation and the composition of gut microbes to metabolic disease and obesity. Despite these shared effects, the relationship between human genetic variation and the diversity of gut

microbes was presumed to be negligible.

In the study, funded by National Institutes of Health (NIH), researchers sequenced the genes of microbes found in more than 1,000 fecal samples from 416 pairs of twins. The abundances of specific types of microbes were found to be more similar in identical twins, who share 100 per cent of their genes, than in non-identical twins, who share on average only half of the genes that vary between people. These findings demonstrate that genes influence the composition of gut microbes.

The type of bacteria whose abundance was most heavily influenced by host genetics was a recently identified family called 'Christensenellaceae'. Members of this health-promoting bacterial family were more abundant in individuals with a low body weight than in obese individuals. Moreover, mice that were treated with this microbe gained less weight than untreated mice, suggesting that increasing the amounts of this microbe may help to prevent or reduce obesity.

Professor Tim Spector, Head of the Department of Twin Research and Genetic Epidemiology at King's College London, said: 'Our findings show that specific groups of microbes living in our gut could be protective against obesity -- and that their abundance is influenced by our genes. The human microbiome represents an exciting new target for dietary changes and treatments aimed at combating obesity.

'Twins have been incredibly valuable in uncovering these links -- but we now want to promote the use of microbiome testing more widely in the UK through the British Gut Project. This is a crowd-sourcing experiment that allows anyone with an interest in their diet and health to have their personal microbes tested genetically using a simple postal kit and a small donation via our website (www.britishgut.org). We want thousands to join up so we can continue to make major discoveries about the links between our gut and our health.'

Ruth Ley, Associate Professor at Cornell University in the United States, said: 'Up until now, variation in the abundances of gut microbes has been explained by diet, the environment, lifestyle, and health. This is the first study to firmly establish that certain types of gut microbes are heritable -- that their variation across a population is in part due to host genotype variation, not just environmental influences. These results will also help us find new predictors of disease and aid prevention.'

Marked benefits found for cancer prevention with a higher intake of fatty fish

November 12, 2014 Science Daily

A new research review published today will once again have people asking for a second helping of wild Alaskan salmon at the dinner table.

While several other studies have recently challenged the long-held belief of the benefits of a diet high in omega-3 fatty acids, this new study led by Saint Luke's Mid America Heart Institute Cardiovascular Research Scientist James J. DiNicolantonio, PharmD, cites compelling evidence that eating the right kinds of fatty fish, in the right quantity, and prepared the right way, can in fact help prevent the body's development of adenocarcinomas, a common type of cancerous tumour. A high proportion of the cancers arising in the breast, prostate, pancreas, colon, and the rest of the gastrointestinal tracts are adenocarcinomas.

The review, titled "A Higher Dietary Ration of Long-Chain Omega-3 to Total Omega-6 Fatty Acids for Prevention of COX-2-Dependent Adenocarcinomas," is being presented in the journal Nutrition and Cancer: An International Journal, published by Routledge. The authors first cite evidence that the recently-demonstrated ability of daily low-dose aspirin to decrease risk for adenocarcinomas is attributable to its ability to modestly decrease the activity of cyclooxygenase-2 (cox-2), an enzyme which contributes importantly to the genesis and progression of adenocarcinomas. They then propose that an ample dietary intake of omega-3 fats -- the type prominent in fatty fish -- could also be expected to oppose cox-2 activity, and thereby reduce risk for adenocarcinomas.

The authors emphasize that it is not only the amount of fish consumed daily, but also the nature of this fish, and how it is preserved or cooked, that can have a major impact on the potential of dietary fish to lower cancer risk. "An easy way to see the benefit of omega-3 is to look at Italy," Dr. DiNicolantonio said. "The staple oil used in cooking and as a salad dressing in Italy is olive oil, which is quite low in omega-6. Meanwhile, fish -- high in omega-3 -- is a staple food in the Italian diet, and this fish is rarely salt-preserved or fried. In Italians studies, subjects who consumed fish at least twice weekly as compared to those who ate fish less than once a week, were found to be at a significantly lower risk for a number of cancers, including ovarian, endometrial, pharyngeal, esophageal, gastric, colonic, rectal, and pancreatic."

The authors also focus on several recent studies in which regular consumption of fish oil is correlated with lower subsequent cancer risk. These studies have reported lower risks for colorectal, breast, and advanced prostate cancer in those taking such supplements. And a recent study from the University of Washington, which estimated total omega-3 intakes of its subjects from both fish and from supplements, found that a high omega-3 intake was associated with a 23 percent reduction in total cancer mortality. Indeed, mortality from all causes was significantly lower in those with higher omega-3 intakes. The authors also noted that cox-2 is significantly expressed in pre-malignant and early stage adenocarcinomas, but expression is sometimes lost as cancers mature. This may be why cox-2 inhibition (via increased omega-3 intake) seems to have greater potential for cancer prevention, than for cancer therapy.

Healthy diets are good for the kidneys

November 16, 2014 Science Daily

A healthy diet may help protect the kidneys, according to two studies that will be presented at ASN Kidney Week 2014 November 11-16 at the Pennsylvania Convention Centre in Philadelphia, PA.

Dietary modifications may be a

low-cost, simple intervention to reduce the burden of chronic kidney disease (CKD). To test this hypothesis, Andrew Smyth, MD (National University of Ireland Galway) and his colleagues analyzed questionnaires completed by 544,635 participants of the National Institutes of Health-AARP Diet and Health Study that assessed diet quality, as well as sodium and potassium intake.

A higher-quality diet, as measured using 3 different scoring systems for dietary qualities known to reduce the risk of cardiovascular disease, was associated with a 16% to 23% reduced risk of needing dialysis or dying from kidney problems. Higher-quality diets included those high in fruits, vegetables, and unsaturated fats. The researchers also found that high sodium intake (average of 4.7g g/day) was linked with an increased risk of needing dialysis or dying from kidney problems, but no significant benefit was seen for low sodium intake (average 2.0 g/day) compared with moderate intake. In contrast, high potassium intake was associated with a reduced future risk.

"Our findings extend the known benefits of healthy eating and show that the consumption of a healthy diet may protect from future major renal endpoints," said Dr. Smyth. "As dietary modification is a low-cost, simple intervention, it offers the potential to significantly reduce the burden from chronic kidney disease, while also protecting from cardiovascular disease."

In another study, Meg Jardine, MBBS, PhD (The George Institute for International Health, in Australia) and her colleagues found that reducing salt intake reduces albuminuria, or excess protein in the urine, which is a hallmark of kidney dysfunction. For the study, 120 rural villages in China were randomized to no intervention or an 18-month sodium reduction program, including education and access to a reduced-sodium salt substitute with added potassium.

Individuals in villages that received the sodium reduction intervention had a 33% decreased likelihood of having albuminuria compared with individuals in the control villages.

"The fundamental question now is whether dietary salt reduction will also protect against progressive kidney damage," said Dr. Jardine. "If it does, community dietary interventions would present a new method for improving kidney health with efficient uptake and relatively low cost, which would supplement current pharmaceutical-based approaches."

Nothing fishy about health benefits of plant-based omega-3 fatty acid

November 17, 2014 Science Daily

Increasing the amount of omega-3s in your diet, whether from fish or flax, will likely decrease your risk of getting heart disease, according to Penn State nutritionists.

A substantial amount of evidence exists supporting the heart-health benefits of eicosapentaenoic acid and docosahexaenoic acid (EPA and DHA), marine-derived omega-3 fatty acids. However, much less evidence exists to demonstrate the positive effects of alpha-linolenic acid (ALA), a plant-based omega-3 fatty acid.

"The benefits reported for EPA and DHA are stronger because supplements of EPA and DHA were tested, and EPA and DHA was the only difference between the treatment and control groups," said Jennifer Fleming, instructor and clinical research coordinator in nutritional sciences. "In contrast, in the ALA studies, there were diet differences beyond ALA between the treatment and control groups."

EPA and DHA can be found in seafood and fish oil, and are often consumed in the form of dietary supplements. ALA is found in flaxseed and its oil, vegetable oils, and some nuts, and is now available in supplement form. EPA and DHA have been available for much longer. Other sources of ALA, EPA and DHA are fortified foods such as orange juice, eggs, peanut butter, margarine and bread, among others. While there are many other omega-3 fortified foods in the market place, most are relatively low in omega-3 fatty acids.

Omega-3 fatty acids are considered essential for human health, but the body does not produce them -- therefore they must be consumed in order to maintain appropriate levels.

In reviewing existing literature on the subject, the researchers have come to the conclusion that ALA is likely just as effective in preventing cardiovascular disease as EPA and DHA have proven to be, as they report on the current issue of Advances in Nutrition.
"Our understanding of the cardiovascular disease benefits of ALA has advanced markedly during the past decade," said Penny Kris-Etherton, Distinguished Professor of Nutrition. "Based on the current evidence, ALA decreases CVD risk."

Fleming and Kris-Etherton believe that dietary recommendations should be amended to increase the amount of ALA consumed, but note that randomized controlled clinical trials need to be conducted

in order to determine the amount recommended.

"Heart disease is the leading cause of death in the country," said Fleming. "Learning what you can do to prevent heart disease is important and relevant for everybody."

Trans fat consumption linked to diminished memory in working-aged adults

November 18, 2014 Science Daily

High trans fat consumption is linked to worse memory among working-age men, according to research presented at the American Heart Association's Scientific Sessions 2014.

In a recent study of approximately 1,000 healthy men, those who consumed the most trans fats showed notably worse performance on a word memory test. The strength of the association remained even after taking into consideration things like age, education, ethnicity and depression.

"Trans fats were most strongly linked to worse memory, in young and middle-aged men, during their working and career-building years," said Beatrice A. Golomb, M.D., Ph.D., lead author and professor of medicine at the University of California-San Diego. "From a health standpoint, trans fat consumption has been linked to higher body weight, more aggression and heart disease. As I tell patients, while trans fats increase the shelf life of foods, they reduce the shelf life of people."

Golomb and her coauthor studied adults who had not been diagnosed with heart disease, including men age 20 or older and postmenopausal women. Participants completed a dietary questionnaire, from which the researchers estimated participants' trans fat consumption. To assess memory, researchers presented participants with a series of 104 cards showing words. Participants had to state whether each word was new or a word duplicated from a prior card.

They found:

• Among men under age 45, those who ate more trans fats showed notably worse performance on the word memory test. The strength of the association remained even after taking into consideration things like age, education, ethnicity and depression.

• Each additional gram a day of trans fats consumed was associated with an estimated 0.76 fewer words correctly recalled.

• For those eating the highest amounts of trans fats, this translated to an estimated 11 fewer words (a more than 10 percent reduction in words remembered), compared to adults who ate the least trans fat. (The average number of words correctly recalled was 86.)

"Foods have different effects on oxidative stress and cell energy," Golomb said. In a previous study, we found chocolate, which is rich in antioxidants and positively impacts cell energy, is linked to better word memory in young to middle-aged adults. In this study, we looked at whether trans fats, which are prooxidant and linked adversely to cell energy, might show the opposite effect. And they did."

Oxidative stress is associated with the development of diseases such as heart disease and cancer.

Industrial trans fats are artificially produced to turn liquid oils into solids at room temperature and extend food shelf life. They can be found in margarines, fast foods, baked goods, snack foods, frozen pizza, coffee creamers and some refrigerated doughs. The Food and Drug Administration is taking further steps to reduce the amount of artificial trans fats in the U.S. food supply.

Analyses in younger women are needed to determine whether effects extend to this group, Golomb said.

Are Salt Reduction Efforts Reflected in Heart Health?

17-Nov-2014 Food Navigator

Salt reduction efforts around the world are making progress – but how has lower salt consumption affected health?

The premise of salt reduction strategies has been that cutting salt cuts blood pressure, which is a major risk factor for heart disease, stroke, and many other health conditions. However, there are plenty of critics, who argue that just because X leads to Y, and Y leads to Z, that doesn't necessarily mean that X (high salt intake) leads to Z (higher risk of heart disease and stroke).

The UK's salt reduction programme is consistently held up as an example for other global initiatives. With about three quarters of salt consumption coming from packaged foods, its voluntary targets for food manufacturers have helped cut average UK salt intakes from 9.5 g per day in 2002 to about 8.1 g per day in 2014.

After ten years of the UK's campaign, a study published earlier

this year suggested that there was indeed a link between salt reduction, lower blood pressure, and deaths from heart disease and stroke. It looked at data on these factors for 30,000 English people from 2003 to 2011 and found average adult blood pressure fell 3/1.4 mm Hg. Meanwhile, mortality from stroke fell 42%, and heart disease, 40%.

'Likely an important contributor'
Even after controlling for increased fruit and vegetable intake, blood pressure treatment and alcohol consumption, among other factors, lead author Dr Feng He said the findings suggested population-wide salt reduction "is likely an important contributor to the falls in BP [blood pressure]".

In Finland, where a salt reduction campaign began in the 1970s, average consumption of salt fell by about a third over 30 years, to about 7 g a day for women and 8.3 g a day for men. According to a 2006 study published in Progress in Cardiovascular Diseases, during the same time period, average blood pressure (both systolic and diastolic) fell by more than 10 mm Hg, and there was a 75% to 80% decrease in both stroke and coronary heart disease mortality in Finland. However, the suitability of population-wide salt reduction continues to attract debate, as critics continue to say that correlation does not prove causation.

'Other risk factors'
In particular, a major review of 167 randomised controlled trials published in the Cochrane Library and the American Journal of Hypertension in 2011 challenged salt reduction policy. The Danish researchers found that although cutting sodium consumption did decrease blood pressure, it also tended to increase levels of hormones, cholesterol and triglycerides, which are all thought to be risk factors for heart disease too.

Commenting on the Finnish data, Dr Larry Appel, director of the Welch Centre for Prevention, Epidemiology and Clinical Research at Johns Hopkins Medical Institutions, said it was hard to reconcile existing data with the idea that salt reduction might be harmful.

"I can't attribute all of the benefit to sodium reduction, but again it is hard to believe that there would be a net benefit from the intervention if indeed sodium reduction were harmful," he told FoodNavigator. Meanwhile, most people consume far more salt than the 5 g daily upper limit recommended by the World Health Organisation – an average of 8 g to 12 g in Europe.

Tea and Citrus Flavonoids May Lower Ovarian Cancer Risk

29-Oct-2014 Nutra Ingredients

Flavonoids from tea and citrus fruits and juices may be associated with a lower risk of developing ovarian cancer, according to new research.

The study, published in the American Journal of Clinical Nutrition, suggests that women who consume foods containing certain dietary flavonoids significantly decrease their risk of developing epithelial ovarian cancer, the fifth-leading cause of cancer death among women.

Led by Professor Aedín Cassidy from the University of East Anglia (UEA) in the UK, the team found that those who consumed food and drinks high in flavonols (found in tea, red wine, apples and grapes) and flavanones (found in citrus fruit and juices) were less likely to develop the disease.

"This is the first large-scale study looking into whether habitual intake of different flavonoids can reduce the risk of epithelial ovarian cancer," said Cassidy. "We found that women who consume foods high in two sub-groups of powerful substances called flavonoids – flavonols and flavanones – had a significantly lower risk of developing epithelial ovarian cancer."

Cassidy and her team studied the dietary habits of 171,940 women aged between 25 and 55 for more than three decades. All of the women took part in the Nurses' Health Study and Nurses' Health Study II. The team analysed food intakes and health outcomes from the participants to examine associations between intakes of total flavonoids and their subclasses (flavanones, flavonols, anthocyanins, flavan-3-ols, flavones, and polymeric flavonoids) and risk of ovarian cancer.

The team revealed that total flavonoids were not statistically significantly associated with ovarian cancer risk. However, participants in the highest quintiles of flavonol and flavanone intakes had modestly lower risk of ovarian cancer than that of participants in the lowest quintile, they said. "A couple of cups of black tea every day was associated with a 31% reduction in risk," noted the team. Intakes of other subclasses were not significantly associated with risk, they added.

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Regulatory & Safety News

USDA approves genetically modified potato

IFT Weekly November 12, 2014

The U.S. Dept. of Agriculture has determined nonregulation status of a potato that has been genetically modified to reduce levels of a potentially harmful ingredient called acrylamide, which has been suggested may cause cancer when potatoes are cooked in certain ways. The potato, which was developed by J.R. Simplot Co., has been genetically engineered for low acrylamide potential and reduced black spot bruising.

Should Energy Drinks be Age-Restricted Like Alcohol? WHO Official Asks in Report

24-Oct-2014 Food Navigator

Energy drink consumption among young people, particularly in connection with alcohol, presents a significant public health concern that warrants further research and regulation, according to a report authored by World Health Organisation (WHO) officials.

Looking at the possible risks, adverse health effects and policy options for caffeinated drinks, the paper published in the journal Frontiers in Public Health suggested that an upper limit for caffeine per single serving should be established, as well as regulations for labelling, marketing and restrictions for sales to children and adolescents.

"As energy drink sales are rarely regulated by age, unlike alcohol and tobacco, and there is a proven potential negative effect on children, there is the potential for a significant public health problem in the future," the authors wrote in their conclusion. The review was penned by a member of WHO's nutrition, physical activity and obesity programme at the organisation's regional office for Europe, Dr João Breda, as well as the head of its country office in Estonia, Marge Reinap, although they stressed that the report did not necessarily reflect the official policy of WHO.

Tallying up the risks

The report cited studies that had shown links to seizures, caffeine overdosing, risk-taking behaviour and addiction particularly when consumed with alcohol and obesity and dental cavities through sugar content. They said more research was needed to show the causal link between energy drink consumption and these public health problems, for which data should be harmonised across Europe to show population groups at particular risk.

Within this call for data in Europe, more was needed on reports to poison centres, where caffeine was not always given its own unique tracking code meaning underestimation of reports was likely. In Australia, in seven years 297 of the calls made to a poison information centre related to caffeinated drinks, increasing from 12 in 2004 to 65 in 2010.

They also cited cases where people had died or suffered a cardiac arrest after energy drink consumption, with a question mark hovering above the safety of caffeine consumption before sport, something which the European Food Safety Authority (EFSA) is currently investigating. They argued that marketing around sporting events should be reconsidered for this reason.

Appealing to kids

The researchers said that consumption amongst young people was a particular concern given the scientific uncertainty on adverse effects. Looking at different regulatory landscapes, they cited the example of Sweden where sales were restricted to pharmacies and banned altogether for children below 15 years.

"The full impact of the rise in popularity of energy drinks has not yet been qualified, but the aggressive marketing of energy drinks targeted at young people combined with limited and varied regulation has created an environment where energy drinks could pose a significant threat to public health."

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'Partying subculture'
They said aggressive marketing techniques had been used by some energy drink brands, often targeting young males by plugging psychoactive, performance-enhancing and stimulant effects, one brand even advertised itself as a "legal alternative" to cocaine. The practice of mixing alcohol with energy drinks was also on the rise – with the EFSA study revealing 71% of young adults aged 18-29 who consumed energy drinks did so with alcohol.

The drinks have become a "central part of the partying subculture", and more research was needed on the perception of inebriation, i.e. whether the caffeine could give the drinker the impression that they were less drunk than they actually were, leading them to perform dangerous tasks like driving.

Beverage for thought
Beyond this, they said health care practitioners should be trained on the risks and symptoms of energy drinks (over) consumption and patients with a history of diet problems and substance abuse, both for energy drinks alone and in combination with alcohol, should be screened for heavy consumption. Furthermore they said the role of other common ingredients like taurine, guarana, glucoronolactone and B vitamins needed further investigation.

Denmark Widens Warning on Weight Loss Herbal Linked to Brain Haemorrhage

30-Oct-2014 Nutra Ingredients USA

The Danish food safety authority has issued a second warning on the illegal herbal weight loss ingredient Acacia rigidula – which contains substances implicated in a brain haemorrhage case in Sweden.

Earlier this month the Danish Veterinary and Food Administration, Foedevarestyrelsen, warned consumers against the use of dietary supplement 7 Phenylstack after a risk assessment revealed the herbal it used contained the same naturally occurring amphetamine-like substances implicated in a medical report on the brain haemorrhage of an apparently healthy woman who had consumed the pre-workout supplement 'Jacked Power'.

Now the Danish authority has reiterated its warning on the herbal itself, stating the ingredient was found on sale on several international websites. The Danish National Food Institute (DTU) risk assessment upon which its warnings were based suggested the plant may cause adverse effects for the reproductive and movement systems, while its naturally occurring amphetamine-like substances - β-phenyl-ethyl-amine (β-PEA) and its derivative N, N-di-methyl-phenyl-ethyl-amine (N, N-DMPEA) – may cause high blood pressure and in the worst case bleeding in the brain.

Tracking sources
Speaking with NutraIngredients, Sofie Søe, an officer for the Danish authority's special task force for food supplements that initially detected the sale on a website that appeared to be registered to Sweden, said: "*We have heard from the Swedish Authority and the product 7 Phenylstack is no longer available on the site www.bodystore.dk.*"

On Monday she said the team were continuing to search sites marketing this product and others which may contain the herbal and related substances to consumers in Denmark. Elsewhere, the product could be seen on sale on a website which appears to be registered to New York, with a returns address listed in the UK. "Concerning the website www.Stacker7.co.uk, it is a foreign website where marketing is not intended for Danish consumers. Thus, this page is not subject to our control," Søe said.

What's its novel food status?
Acacia rigidula is not authorised as a novel food in the European Union. In October 2013 the UK's Food Standards Agency (FSA) responded to an initial request for novel food approval by saying it had no evidence of a history of consumption of ingredients obtained from the herbal anywhere in the EU before May 1997 and invited stakeholders to submit proof of this.

In a second letter dated March this year the agency said that a small number of interested parties had submitted information, but these documents had not been able to demonstrate a history of significant use safe or otherwise.

Therefore, according to the requirements of the novel food Regulation (EC) 258/97, Acacia rigidula would need to be evaluated to determine it did not mislead or present a risk to the consumer and was not nutritionally disadvantageous compared with other foods that it might replace in the diet. "We are therefore minded to view it to be a novel food, which cannot be sold legally until it has been formally authorised," the FSA said.

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groups preferred to use the products in their current diet as carriers for protein enrichment, said the team – noting that the reasoning behind this was twofold.

"On the one hand, they indicated that this was practical because they would not have to change their grocery shopping or eating habits. On the other hand, they argued that protein enrichment would replenish a protein deficiency most quickly when put in these frequently consumed foods."

The consumers also indicated that they could imagine that other food categories would be more suitable for other consumer groups - for example: candy for children and microwave meals for busy people.

"Nevertheless, participants indicated that enrichment of unhealthy products could falsely associate them with being healthy, which they did not approve of," noted the team – adding that they recommend food producers develop tasty and healthy protein-enriched foods, based on carriers that are consumed often by elderly.

What's Driving Functional Food and Beverage Growth? Snacking, Convenience and Consumer Behaviour

20-Nov-2014 Nutra Ingreidents USA

With sales of $176.7 billion this year functional foods are a hot growth sector. But which ingredients, sectors and countries are the best bets for product launches?

According to the Nutrition Business Journal, the United States leads the world in terms of market size, with sales valued at $43.9 billion in 2012. Japan comes in second with sales of about $22 billion, followed by the UK ($8 billion) and Germany ($6.4 billion).

Analyst Euromonitor International developed an equation last year - a magic number of sorts - that quantified the readiness of consumers in specific regions to buy functional products by correlating per capita spend on food and drink with per capita spend on FF food and drink.

With a correlation coefficient – the degree to which the two variables' movements are associated – of 0.84, there is a clear relationship present, it found. It found North America, Australasia and Western Europe have a higher spend on FF food and drink products which offer preventative health measures, especially anti-aging measures.

Consumers

Data from the Datamonitor Consumer 2013 consumer survey showed that 52% of American consumers say that the prospect of a 'product that is naturally high in nutrients' is 'very appealing', said Tom Vierhile, Innovation Insights Director for the market researcher. This contrasts with just 5% that say it is 'not at all appealing'.

"Another stat from the same survey is that 53% of American consumers either 'tend to agree' or 'strongly agree' that 'food or drinks can provide the same or better health benefits as non-prescription medications can'," Vierhile told us. "That is a pretty strong endorsement for functional foods," he said.

The categories

According to MSI, the most-consumed functional foods in the US are yogurt for digestive health and cereal for heart health. These are followed by cholesterol-lowering butter/margarine, cholesterol-lowering orange juice, shakes/bars to reduce hunger, orange juice for joint health, and immune-boosting dairy beverages.

Taking a bigger view, beverages are largest US functional product sector, with sales growing by almost 10% year-on-year from 2011 to 2012 to hit $27.8 billion, according to the Nutrition Business Journal.

The most growth is coming in snack foods, with 11.7% growth, although sales are smaller at $3.5 billion. Function dairy sales are growing at a rate of about 7% with sales of about $22 billion. Functional foods and beverages now account for 5% of the overall food market.

Convergence of nutrition, convenience and taste

So what's driving all of this growth? Peter Leighton, founder and director of Abunda, has identified seven consumer platforms as "significant" drivers behind the market.

Many functional foods and beverages feed into bigger, macro trends, which in turn "affect consumer attitudes and behaviours," he told NutraIngredients-USA . He compiled the findings in a report titled How to Succeed in Functional Foods:

7 Consumer Platforms.
"Consumers don't think in terms of 'functional foods'; but more in terms of, 'I like that product,' or 'That's a better choice than x'," he said.

And those decisions are influenced by a set of common factors, which include taste, price, validation, experiential nature of a product and simplicity of the concept.

The seven functional foods platforms driving success in this growing market include:

Lifestyle antidote: Many consumers are looking to foods as a health solution for managing chronic conditions, such as diabetes, CVD or obesity—examples include pomegranate juice or beverages or bars fortified with vitamins and added fibre. But when it comes to these foods, taste is key, Leighton noted.
"If a functional food tastes as good as a non-functional alternative, and it's not priced too high, adoption will likely pursue intent," he said.

Healthier snacking: Consumers refuse to give up snacking—evidenced by the projected value of the global snack foods market in 2015 of $334.7 billion—but they do want to feel better about the snacks they eat, according to the report. Indeed, 74% of consumers surveyed believe "natural" means "healthier". When it comes to snacking, guilt reduction is key.

Boosting reality: Nutraceuticals that pack an "experimental punch", such as energy or mood alteration always get a strong consumer response; the challenge comes through the inherent paradox that the more experiential the product, the more likely it will face regulatory hurdles.

Better breakfasts: Roughly 31 million Americans don't eat breakfast, according to the report. Consumers are looking for convenient, fast breakfast options that provide the right combination of nutrition and taste.

Nutricosmetics (or cosmeceuticals): With a growing penchant for self-directed health care (think WebMD), consumers are seeking new functional ingredients for topical use and supplements that provide anti-aging and other solutions. In 2011, skin and hair care nutricosmetics in the US accounted for $4.7 billion and $3 billion, respectively.

Trend monger: From esoteric kimchi brands to forbidden rice, foods that provide a unique ethical or cultural story can become something of a statement or even a "badge of sophistication" for consumers—if they're fair trade, heirloom, identity-preserved, all the better.

Eco warrior: One step beyond the trend monger, a growing spate of consumers use food choices as a means of activism. Thoughtful ingredient sourcing (with small carbon footprints), manufacturing practices and packaging all factor into products that help drive social change.

Functional foods will continue to influence mainstream products in the near term, as consumers seek more and better options to meet their needs, Leighton said.
"Generally I see the category influencing mainstream products in a positive way; overall products are becoming 'healthier' to deliver what consumers are seeking."










If It's Food additives it must be FINE ORGANICS

Food Emulsifiers

- Glyceryl Mono Stearate
- Sodium
- Stearoyl - 2 - Lactylate
- Distilled Monoglycerides
- Sorbitan Esters
- Propylene Glycol Esters
- PGPR and other
- Speciality Emulsifiers
- Cold water dispersible
- Emulsifier system
- Daterns (Powder & Liquid)
- Ammonium Phosphatide
- (Soyalecithin Substitute)
- M.C.T. Oils

Anti-Fungal/ Anti Mold agents

Calcium Propionate/
Sodium Propionate

Beverage Clouding Agent

Speciality Additives

- Bread Improver
- Cake Improver
- Biscuit Improver
- Whipped Topping
- Concentrate for Cakes and Frozen Desserts
- Eggless Cake Concentrate
- Lecithin Replacer (Biscuit)
- Fondant
- Egg wash substitute
- Mousse Mixes
- Glazing Gel
- Marzipan
- Vital wheat Gluten
- Enzymes
- American Brownie
- Bread Mixes

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FORMULATING FUNCTIONAL BEVERAGES

Functional beverages are attractive to consumers because they provide nutrition and convenience. However, like any other food or beverage, taste is the primary concern. For functional beverages, maintaining taste, texture, mouthfeel and overall quality can be challenging. Thus careful choosing of ingredients, processing and intended health benefits are factors that decide the success of a functional beverage.

Elements of Design

Consumers expect beverages to deliver a portion of nutrients needed for their active lifestyles. Beverages are as diverse as highly-concentrated shots of energy and vitamin/mineral blends to balanced meal replacements and refreshing sports recovery drinks. All provide additional benefits to consumers beyond simple hydration. What the benefit is and how it is received is the most important consideration for designing a functional beverage.

Different markets need different nutritional blends. Stimulants and other ingredients including caffeine, beta alanine, L-arginine, BCAAs and creatine etc. in sports nutrition products help consumers get the most out of workouts.
Energy drink is an important and one of the fastest growing beverage categories according to Nielsen. The category had sales growing 40% from 2010 to 2012. The data showed that in the US, energy drink consumers may be who you think. Busy moms are in fact more likely to use energy drinks than average, even more so than young, post-college adults and single in their 20s and 30s.

In response, some companies have launched women-friendly energy drinks. One features no sugar or calories, a sweeter flavour and packaging with feminine design elements. Another is pink lemonade and contributed a portion of its sales to a breast cancer foundation. Both saw immense success prompting similar products. Companies developed an understanding of intended consumer and provided beverage to fulfil the needs, which are keys to successful product development. Manufacturers must clearly identify the functional benefits demanded by consumers. Consumer demand, taste and consumer messaging are critical when functional beverages are designed.

The Taste Test

Achieving good taste is one the biggest challenges of creating functional beverage. Many nutritional and wellness ingredients ranging from vitamins to herbals to omega-3 oils tend to contribute off-flavours, which may require the use of masking agents or other ingredients or processing to improve taste. Formulation technology is needed to overcome taste issues. Encapsulation can protect sensitive ingredients from degradation during processing and storage and also block off-flavours.

Ingredients like sweeteners, acids and flavour modifiers can also be used to improve taste of functional beverages. Acids like citric, malic, lactic, phosphoric and tartaric can be used independently or in combinations to help modify the flavour of beverages and mask unpleasant notes contributed from fortification.

Flavour modifiers, including bitter masks and taste modifiers, can also

help combat off-notes. Thaumatin is one example. Common salt is another and has been used to enhance flavours in beverages along with other salts like sodium citrate, which is useful to minimise bitterness of stevia.

Caffeine is an example of functional ingredient affecting flavour of beverage. It adds undesirable bitter note to the beverage, but can be easily covered up with a bitter masker (expensive flavonones or cheaper benzyl amide).

Taste can be a bigger challenge while formulating natural functional beverages as "natural" high-intensity sweeteners like stevia, monk fruit or polyols like xylitol can lend off-notes, like bitter or licorice aftertaste. Finding the balance between taste and functionality can be a struggle.

Sometimes, product designers weigh the benefits that nutritional ingredients provide to consumers against the off-flavours they provide. If the benefit outweighs the negative taste the ingredient brings, then it would be used. Fish oil is a popular functional ingredient promoting healthy heart along with other things but it lends an undesirable taste that is difficult to mask. If consumers realise that its benefit outweighs bad taste, they will make that compromise and consume the product.

Smooth Moves

Texture, mouthfeel, viscosity and suspension can all be important factors when designing a functional beverage. Use of gums and starches can aid in providing desired sensory attributes when adding nutritional components to beverage products. Gums control viscosity and provide creamy texture that may be lost when adding a high amount of protein. They also help in suspending particles and provide a homogeneous solution.

Texture and suspension are two difficult tasks in functional beverages. Large amount of protein or insoluble particulates will tend to settle to the bottom of beverage looking unappealing. High amounts of protein also impart grainy texture. Adding gums improves suspension providing creamy and smooth mouthfeel correcting the problem.

Starches can function as carbohydrate and in case of resistant starches as dietary fibre. Some starches provide emulsification and also impact mouthfeel by altering viscosity. Use of orange or lemon oil requires emulsification. Emulsifying starches provide emulsification needed. To improve mouthfeel low-viscosity starches could be used. In drinkable yogurt, starches can add some viscosity to the product.

Functionality of gum including thickening, suspension, creamy texture, desired rheology or flow characteristics and desired clarity or opacity must be considered while designing functional beverage. Processing will affect the gum selection with respect to its hydration rates, temperature and pH of process. For low-pH system (less than 4) pectin, xanthan gum and soy fibre work well. A combination of fenugreek gum, konjac and xanthan gum will help produce creamy texture and yield suspension and quick hydration rates for instant protein beverage.

Plant-based Nutrition

Many people do not get enough vitamin D. This can be added to a variety of functional beverages. One company has prepared a concentrated vit D ingredient that is prepared from mushrooms that can be added to any beverage. It does not affect taste or texture of beverage as very small quantities are needed.

Plant sterols are other ingredients making headway in functional beverages. They can lower LDL or bad cholesterol by obstructing its absorption in bloodstream. Water soluble version has been developed that is highly stable in beverages.

Protein Power

Despite consumers getting adequate protein in their diets, its association with health and weight management and its efficacy in sport nutrition made it very desirable in foods and beverages. In beverages, animal proteins, whey or gelatine, can cause milky or astringent flavour characteristics. One solution is to blend soy protein isolate with dairy-based proteins. At 50/50 blend of whey and soy protein isolates provide cleanest tasting beverage.

In high amounts, proteins can cause grainy texture. Whey protein remains in suspension over a wide range of pH making it a good choice in beverages. Soy may be used if dairy allergens are a concern. It may require stabilisation. Pea protein and other

vegetable derived protein sources also have this concern. One company has developed 100% soluble and transparent soy protein at low pH so it does not need homogenisation or stabilisers.

Powered by Probiotics

Consumers are realising that probiotics are good and need to be taken every day. More convenient products are entering market. Several probiotic strains are used based on intended application. In some juices Lactobacillus plantarum 299v works successfully while in HTST, hot-filled and High-pressure processing spores are useful as they withstand more severe conditions. Bacillus coagulans is added to beverages that are refrigerated throughout supply chain, which keeps the organism from germinating in product. These beverages can be pasteurised while spores remaining viable. Depending on application probiotics can be added before, during or after heat treatment. It causes no change in texture, flavour, odour and other sensory attributes.

Testing is crucial when formulating probiotic-fortified beverage both at the time of manufacture and at the end of shelf life to ensure that intended benefits would be throughout the shelf life.

Ensuring Efficacy

Creating a beverage that provides benefits people are seeking and providing good taste are only part of challenge. Designers must ensure functional benefits remain effective through the shelf life. It is essential that the functional ingredient is stable and effective under factors like pH, processing, exposure to high temperature, packaging etc. Sensitive ingredients need to be protected against degradation. Encapsulation can protect sensitive ingredients against interactions with other ingredients, light, temperature extremes, enzymes, oxidising agents and oxygen.

Whatever might be the benefit offered in functional beverage, adding functional ingredients can make it easier for consumers to address their needs and ultimately help in successful product.

Condensed from article by Rachel Adams in Food Product Design July 2014

Research in Health & Nutrition

Cont'd from Pg 9

Beetroot Juice May Benefit Athletes & Heart Failure Patients

28-Oct-2014 Nutra Ingredients

Nitrate from beetroot juice could aid athletes by pushing more oxygen rich blood to muscles that need it the most, and may also improve the quality of life for people who have suffered from heart failure.

Beetroot juice, and specifically the nitrate it contains, has been long touted for its heart healthy benefits and potential for improving sports performance. Now, researchers from Kansas State University in the US have suggested that supplementation with nitrate from beetroot could help both athletes and people with heart conditions.

Writing in the Journal of Nitric Oxide, Biology and Chemistry, the team use a rat model to provide the basis for how beetroot juice could benefit athletes such as football players by preferentially increasing blood flow to fast-twitch muscle fibres that are used for explosive running and movement.

In addition to improving athletic performance, the research team – led by David Poole – suggestthat

beetroot juice can help to improve the quality of life for heart failure patients, adding that for every athlete that could see a performance boost, there are hundreds or thousands of heart failure patients that could see a benefit.

"It's a big deal because even if you can only increase oxygen delivery by 10%, that can be the difference between a patient being wheelchair-bound versus getting up and walking around and interacting with his or her family," said Poole.

Poole and his team randomly assigned 12 rats to receive either beetroot juice or water for five days. The team then measured the effects on blood flow – finding that the nitrate from beetroot juice resulted in a 38% higher blood flow to the skeletal muscles during exercise and was preferential to the less-oxygenated, fast-twitch muscles.

The team noted that the preferential flow of oxygen rich blood to active fast twitch muscles is the mechanistic basis for the observations that beetroot juice can boost athletic performance.

However the team also suggested that the mechanism could be used to aid those with disabilities and heart conditions. They explained that much of human muscle is made up of such 'fast-twitch' fibres, and that there is an "increased reliance on these fibres in diseased states (e.g. heart failure)"

As a result, nitric oxide supplementation via beetroot juice "may constitute a novel and powerful "bench-to-bedside" therapeutic modality," wrote the team. "Heart failure is a disease where oxygen delivery to particular tissues, especially working skeletal muscles, is impaired, decreasing the capacity to move the arms or legs and be physically active," Poole added. "The best therapy for these patients is getting up and moving around. However, that is often difficult."

"Increasing the oxygen delivery to these muscles through beetroot can provide a therapeutic avenue to improve the quality of life for these patients." Clinical trials are currently underway to assess the potential for beetroot juice in benefiting those with heart failure, the team noted.

Steamed v Baked Bread: Processing Change Impacts Glycemic Response

29-Oct-2014 Food Navigator

The way in which breads are processed could play a role in determining its GI, according to new research that shows steaming rather than baking bread alters glycemic responses.

Published in Food Chemistry, researchers investigated how macronutrient composition and processing conditions differed between steamed bread and baked bread and how combining recipes and methods influenced GI. Findings showed that modified steamed bread – made with a western baked bread recipe and oriental steamed bread process – had a reduced glycemic response.

The peak glycemic response for the modified steamed bread was 30 minutes, compared to 45 minutes for regular western baked bread. "The study demonstrated for the first time that even with the use of identical bread recipe ingredients, the application of varied processing conditions, namely mixing time, mixing intensity, proofing period and method of cooking, resulted in lower starch digestibility in vitro and reduced glycemic response in vivo as compared to baked bread," the researchers wrote.

Different low-GI potential?
However, the overall average GI in the breads remained unchanged. Despite this, the researchers said changes to glycemic response through processing changes could provide manufacturers with a "new approach to manipulate the glycemic index of carbohydrate-rich foods".

Traditionally, ingredients like beta-glucan, galactomannan, non-starch polysaccharides and polyols had been used to reduce the glycemic index of high GI foods, the researchers said, but this study showed glycemic response manipulation was possible without ingredient alterations.

The bread was steamed at 100°C for 10 minutes instead of baked at 210°C for 11 minutes. Mixing intensity and time were also lowered and proofing almost halved to 40 minutes instead of 70 minutes. "The manipulation of physical structure, and in turn, starch digestibility, was brought about by differences in processing procedures. A more compact bread structure could have hindered the accessibility of amylase to starch

granules, resulting in a slower rate of glucose release, and reduced glycemic response in oriental steamed breads and modified steamed breads," they explained.

One negative, however, was that volumes were significantly lowered in modified steamed bread, despite the product containing high-protein flour typically found in baked breads. The researchers said it was likely due to shorter mixing times with a lower intensity leading to insufficient development of the gluten network. "The combination of low energy input during dough development, as well as a shortened fermentation period, resulted in modified steamed bread having the least porous structure as compared to other types of bread."

COMING EVENTS

Gulfood 2015
Food & Hospitality Show
8-12 February 2015
Dubai World Trade Centre
W: www.gulfood.com

Conference on Food Safety Technologies
18 February 2015
Hotel Hilton, Chennai
Org by: Tamil Nadu Tech Dev & Promo Centre, CII
Tel: +91 44 42 444 555 /664
Email:tndpc@cii.in
W: www.cii.in

43rd Dairy Industry Conference
19-21 February 2015
Science City Auditorium, Kolkata
Org by: Indian Dairy Association (EZ)
Tel: 033-2358 8047
M: 84440 16664
Email: idaezone@gmail.com

Agrex India 2015
International Exhibition of Agri, Farm Machinery & Agri Processing Tech
20-22 February 2015
Chandigarh
Org by: Media Today Group, Delhi
Tel: 011-41407851 / 65656554
Email: agrexindia@gmail.com
W: www.agrexindia.com

Workshop on Dehydration of Food & Agricultural Products
February 25-27, 2015
NIFTEM, Sonepat, Haryana
Web: www.niftem.ac.in

Seminar on Sustainable Solutions in Food Industry
Mumbai February 27, 2015
Org by: PFNDAI, Sponsor: Novozyme Association (EZ)
Tel: 022 2353 8858
Email: nutritionist@pfndai.org or foodtechnologist@pfndai.org

TechnoFood 2015
1st Conference on Methods to Increase Shelf-Life of Food Products
March 3-4, 2015
Tehran, Iran
Tel: +98 21 88862008
Email: pr@technofood.ir
Web: www.Technofood.ir

Aahar 2015
International Food & Hospitality Fair
March 10-14, 2015
Pragati Maidan, New Delhi
Contact:
aaharways@gmail.com,
aaharways@hotmail.com
Tel: 98978 21407

Ingredient Marketplace
April 7-9, 2015
Orlando World Center Marriott, Florida
Email:
ingredientmarketplace@virgopub.com

India International Dairy Expo IIDE 2015
April 23-25, 2015
Bombay Exhibition Centre Mumbai
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