Editorial

Indian Railways introduced new trains that look very nice with shiny metal everywhere and with white and purple paint and all the fans working. So everyone was quite pleased that finally Railways have improved and started providing better service to passengers.
Within a few days and certainly within a few months some of the problems started appearing. The seats are too close to each other so passengers' feet get enmeshed and it becomes very uncomfortable. The compartment is too high so getting into the train and getting out requires one to be athletic. Women and old people find it very difficult and at times quite dangerous. During rains compartment design causes water to spray passengers. So railways have gone for looks and may be other operational benefits but not the convenience of passengers.

This is true everywhere including in food products. Both the manufacturers and the regulators consider the benefits to consumers the last while marketing or regulating food products. Things are changing but not fast enough. At one time there used to be tins of oils which needed engineering implements and skills to open them but now one gets easy to open and dispense packages not only for oils but other foods as well. However, labels still leave a lot to desire. Newer technology is used in preparing foods and processing them. The packages are very attractive. However, we still have not considered what consumers would like to know about the food.

When one looks at a new package of food, it is overwhelming to see the kind of information that is printed on it. Manufacturer wants to give information that will help sell the product while regulator wants information supposedly for the benefit of consumer but rarely used by the consumers. Consumer literally struggles to find where the quantity and price are written.

Once these are located there is confusion because many times different brands are of different quantities. It is not necessary to have the exactly same quantity for all brands but then they should at least write both the price for the packet as well as price per unit such as per kg so one can compare prices of different brands.

Nutrition information is given per 100g of food when pack may not be of that quantity so again consumers are confused. Regulators say that this is useful to consumers but very few consumers are able to use it and on contrary it is mostly used by public analysts. Sometimes packs are smaller than 100g and sometimes the serving size information would be more useful. Regulators have not given a guideline for serving size as well.

In some countries in Europe they have developed traffic light system for giving certain nutrients like fats, sugar and sodium. We should explore some innovative system for easier understanding. Also sodium is not necessary in our regulations although many Indians have hypertension and heart diseases. Regulations need sugar to be declared without adequate guidelines so some people give sugar present in product, while others declare added sugar. Some ingredients may have good amount of sugar inherently e.g. fruits. There is also confusion regarding the term sugar as some consider this to be just sucrose (cane sugar).

There is improvement possible and let us hope that Food Authority is able to make labels more consumer friendly with the help of the industry.
With season's greetings

Prof. Jagadish S. Pai
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Food Labels: Right Choices through Labels: Prof. Jagadish S. Pai

Labels on consumer food packages provide a lot of information: commercial, legal, nutritional as well as quality and safety related information. At times the information is so much that it becomes futile to try to read useful information from consumer point of view. So consumers finally try to read only the name of the food product and then the price before making the choice of food.

Benefits of Label Information

Originally labels came into being as manufacturers wanted their product to be distinguished from others because of better quality or some unique selling proposition or feature. They would even provide instructions for usage. Lately brand value of certain consumer products has significantly increased. Earlier some labels of shirts or trousers used to be at places not easily noticeable to others but today they are prominently displayed so everyone can see them. They have attained the snob value.

Labels have been used for food products not only for their brand value but also to provide many other types of information to help not only the consumers but also regulatory agencies and even the distribution channel to know certain information needed by them. Consumers would like to know if it contains certain nutrients or ingredients to select or to avoid, the cost, whether it would remain without spoilage for the duration of usage, instructions how to use it etc.

The government agencies may want to know where it was made, whether it conforms to standards or laws prescribed for it, when it was made or packed, the batch number etc. The company's distribution system uses the information such as batch number, manufacturing place and date so it can distribute products manufactured at different plants properly to different markets using the resources optimally.

Different countries have different labelling regulations although all try to provide information about the product including ingredients, identity, weight, date of manufacture & lot number, nutrition information, safety aspects and warnings besides claims and promotional materials. Codex guidelines tries to provide some harmony among the different laws of different countries.

Indian Regulations

Prevention of Food Adulteration (PFA) provided the latest amendment to labelling rules and regulations in 2008 and currently Food Safety & Standards Act (FSSA) is finalising the regulations.

Indian laws define Label as a display of written, graphic, perforated, stamped, tag, brand, mark, pictorial or other descriptive matter, printed, stencilled, marked, embossed or impressed on, or attached to, a container, cover, lid or crown of any food package. Thus anything that is on food package is covered in this. Lately there are many fresh fruits appearing in market such as apples that carry labels. If these are not packaged then labelling regulations do not apply. Regulations demand that every prepackaged food must carry a label and that should provide following information.

It must give the name of the food and the list of ingredients given in the descending order of quantity. Thus the ingredient having maximum quantity would appear first and that with least would appear last. If the ingredient is a mixture of 2 or more ingredients then after the name of the mixed ingredient in bracket the individual components of the mixture will have to appear. However, if this mixture is less than 5% of food then component list need not be given.

If any of the ingredients is emphasised on the label in words, pictures or graphics, then the percentage of that ingredient used at the time of manufacture of food will have to be given after the name of that ingredient in the list.

Nutritional Information is an important aspect of labelling. This is to be given per 100g or 100ml or per serving of the product and will include Energy (kcal), amounts of protein, carbohydrates along with quantity of sugar and fat need to be given in grams. In addition, if claim is made on label of any other nutrient, then quantity of that also needs to be given.

If there is any claim regarding fat, then additional information on amounts of saturated, monounsaturated, polyunsaturated and trans fatty acids along with cholesterol needs to be given. Also if hydrogenated fat (vanaspati) or bakery shortening is used then a declaration "hydrogenated vegetable fats or bakery shortening used – contains trans fats" is required to be given on label. If, however, the amount of trans fat is less than 0.2 g per serving, then a claim of "trans fat free" can also be made on the label. If saturated fat is not more than 0.1 g per 100 g or ml of food, then "saturated fat free" claim also can be made.

Nutritional information is not necessary for certain foods like raw agricultural commodities e.g. wheat, rice, cereals, spices, herbs, table salt, sugar, tea, coffee, packaged water, alcoholic beverages, fruits & vegetables, pickles, papad, foods served in hospitals, hotels, by food service vendors or halwais or bulk food not for sale as such to consumers etc.

Nutritional and health claims have been permitted to be put on labels. Nutritional claims relate to energy, protein, carbohydrates, fats, vitamins and minerals while health claims pertaining to any ingredient in food that may enhance growth, development and normal functions of the body as well as reduce the risk of a disease. Many products are now able to make health claims including reducing risk of heart disease, cancer and many age-related diseases.

The list of additives in the ingredients list may be written giving the class name along with either specific name or the international numerical identification or INS No. Thus if sodium benzoate is used its name in list may appear as preservative (sodium benzoate or 211). Different additives classes have been given by PFA and include acidity regulator, acid, anticaking agent, antioxidants, colour, emulsifier, firming agent, flavour enhancer, preservatives, sweetener etc.

When colours and flavours are added to food product a separate declaration to that effect is needed besides the list of ingredients.

Label also must give the name and address of manufacturer. If the product is manufactured, packed or bottled by a company on behalf of another company both names and addresses must appear. If the product is imported then the details of importer must also appear.

The label must give the net content of the food and if the food is packed in liquid medium the drained weight must also be declared. Besides weight, label also must give batch number along with the date of manufacture. Best before date is also given up to the date product is best for consumption. For products with best before date more than three months, manufacturing month and year need to be mentioned and for less than three months date, month and year need to be mentioned. There are certain provisos and exceptions in case of certain foods about the way manufacturing and best before dates are mentioned.

Principal Display Panel (PDP) has been defined as that part of package that is displayed to consumer who normally scrutinises when product is displayed for sale. All the mandatory information grouped together must be given on the PDP or at least the pre-printed information must be on PDP and online information may be grouped elsewhere. Rules also give the area of PDP for a package and the size of letters for requisite information depending on area of PDP or the amount of food.

There are many cautionary declarations required under labelling rules. For instance, infant foods much carry IMPORTANT NOTICE followed by statement that MOTHER'S MILK IS BEST FOR YOUR BABY. There are many other cautions including hygienic preparation of infant food as well as for such products like foods for premature or lactose intolerant or allergic babies about use of these products under medical advice.

There are also rule about quality or purity of food products and ingredients like oils, dairy products, spices, beverages and fruit products etc. which require certain statements. Food containing artificial sweetener must write a statement to that effect and also say that it is not recommended for children and that it is not for phenylketoneurics in case of aspartame.

Non-vegetarian food is defined as one containing ingredients from animal including birds, marine animals or eggs or products of any animal origin but not including milk or milk products. Package of non-vegetarian food must bear a symbol of brown dot within a brown rectangle on PDP near the name of the food product or brand. Vegetarian food is defined as food which is not non-vegetarian and such food must bear a green dot inside a green rectangle.

There are many other rules which necessitate declarations on packages to inform consumers of the quality, safety aspects, usage as well as purity of the products. These are all available in the Prevention of Food Adulteration Act & Rules, which is at present being replaced by Food Safety & Standards Act Rules & Regulations, the draft of which is available on the website of Food Safety & Standards Authority of India (www.fssai.gov.in).

Labelling in US

There are some differences in law regarding labelling in the US. While mandatory statements can all be given on PDP or certain specified statements like name or statement of identity and weight or amount of food may be given on PDP, while other information like nutrition facts, ingredients list, name and address of manufacturer may be given on information panel on the right. If a new food resembles and is a substitute for a traditional food, then it must be labelled as imitation. Imported food must give country of origin and if a foreign language is used on label, all statutory statements must appear in English.

Some quality information also needs to be declared, e.g. beverage containing juice may have to declare in information panel the % juice in carbonated and still beverages as well as full strength (100%), concentrated and diluted juices given e.g. "contains __% apple juice". Juice made from concentrate must be labelled to indicate that. There are many guidelines to help declare character of product containing fruit and vegetable juice and ingredients that help indicate the nature of food product for the benefit of consumer.

Food allergens must be declared on label. The following foods need to be indicated as they may be containing substances allergenic to some individuals: milk, egg, fish, Crustacean shellfish, tree nuts, wheat, peanuts, and soybeans. There may be a separate statement or in the ingredients list these foods or products derived from them may be put in parenthesis.

Nutrient declaration is given in Nutrition Facts which contains in tabular form declaring serving size, no. of servings per container, calories, total, saturated & trans fat, cholesterol, sodium, total carbohydrate, dietary fibre, sugar, protein, vitamins A & C, calcium and iron must be declared as amounts per serving and give % daily value (DV) recommended wherever applicable. Other nutrients are voluntary. Foot note is also given providing DVs of certain nutrients based on caloric intakes. There are certain concessions for small businesses, foods of no nutritional significance, small packages, take-away-home foods, bulk containers etc. Serving sizes for many food products have been speficied.

Some nutritional claims are permitted for indicating lower calorie, fat, sugar or salt by putting low, reduced and free in relation to these nutrients but there are clear conditions mentioned as also for product names when mentioned light or lite or low fat or calorie foods. Claims may also be made for nutrient-rich foods e.g. those fortified with vitamins and minerals where high, excellent source of, fortified, etc. may also be indicated by using the conditions mentioned for such claims e.g. “High in Vitamin A” means it has 20% or more of DV of Vitamin A per serving of the food.

Certain health claims are also allowed in different classes. Some claims are approved by US FDA e.g. a food high in calcium may claim that regular exercise and a healthy diet with enough calcium helps maintain good bone health and may reduce risk of osteoporosis. Similar claims relating foods and disease risk reduction have also been allowed for low sodium and hypertension, dietary fat with cancer, fruits & vegetables with cancer, folate with neural tube defects, and plant sterols and heart diseases etc. Certain category of claims is also permitted based on authoritative statements of federal scientific bodies. Finally Qualified Health Claims based on significant scientific agreement are also permitted by FDA.

Other Countries

In UK, food laws are regulated by Food Standards Agency which provides similar rules with some differences. In the ingredients list it requires QUID (quantitative declaration of ingredients) labelling if any of the ingredients is emphasised on the label. Here also allergy advice is necessary if any allergen containing food ingredient is used. It can give gluten free symbol for those trying to avoid gluten and vegetarian symbol for those avoiding animal products. Some animal products are considered vegetarian if they are derived from live animal or without sacrificing animals e.g. milk, honey, vitamin D from sheep wool etc. Label also must declare Use By date. Traffic light format for cautioning fat, sugar and salt are used so consumers can quickly recognise foods high or low in these nutrients in case they are trying to restrict their intake. FSA has also permitted foods to be labelled as Fresh, Pure, Natural etc. if certain criteria are met.

There are similar regulations in other countries like Australia, south-east asian countries, European countries where some differences occur in providing the information. These differences may be in letter sizes, place of declaration of information, nutrition panel format and certain symbols and accepted nutrient and/or health claims. The above discussion is only for general information, but in case a food label is to be designed it is necessary to the actual notification or regulation which gives the details of the rules.

Foods with Health Claims

By Sandra Reis, Director of Regulatory Affairs, Clinical Development Solutions

Consumer interest and demand for functional foods and natural health products have been steadily increasing during the past decade. Hence food companies have invested substantial resources in R&D of innovative food products to fill the demand. As research progresses, new health claims are sought for putting on labels. For appropriate consumer information about use of these products and to protect public safety, regulators have been revising existing regulations. In some cases new laws are being introduced to address these new trends.

Food companies must review their product labels in view of this changing regulatory context. There is also a need for clinical trials for regulatory clearance or to substantiate claims as regulation changes. Regulatory clearance needed for a food product depends on both composition and characteristics of product as well as labeling claims. Those marketing food products with health claims often find identifying proper regulatory pathway complex. Particularly when more than one set of regulation apply to a particular product and claims, it can be confusing. Challenge is greater when product is supplied globally when regulations vary in different countries.

One of the first steps is to understand how the claim will be classified that would help defining regulatory pathway and finding what level of scientific evidence is needed for getting clearance. Following discussion gives regulatory environment for food labels with health claims in Canada, Europe and the US.

Food Product Health Claims in Canada

Health claim is defined in Canada as anything on label or in advertisement that implies a relationship between consumption of an ingredient or food and the person's health. Claims are of three types: disease risk reduction or therapeutic claims, function claims and general health claims. Scientific evidence needed for regulatory pathway and clearance of health claim varies depending on the type of claim. Some claims if truthful and not misleading may be made without approval. In other cases pre-market assessment of health claims is necessary.

Disease Risk Reduction and Therapeutic Claims

Disease risk reduction claim links food or constituent to prevention of diet-related disease while therapeutic claim is about treatment or mitigation of a disease. These drug-like claims may include wording related to treatment or prevention of disease that is beyond what is normally associated with food. These claims are allowed on food products only where specifically permitted by Canadian Food & Drug Regulations (FDR). Currently no therapeutic claims are approved in Canada; several disease risk reduction claims are permitted e.g.

- A healthy diet low in sodium and high in potassium and reduced risk of high blood pressure
- A healthy diet with adequate calcium and vitamin D and reduced risk of osteoporosis
- A healthy diet low in saturated and trans fat and reduced risk of heart disease
- A healthy diet rich in vegetables and fruit and reduced risk of some types of cancers &
- Non-fermentable carbohydrates in gums and hard candies and the non-promotion of dental caries (cavities).

These disease risk reduction claims are permitted due to specific regulatory exemption in the FDR. Once a claim of this type is permitted, any food that meets the stated criteria may carry the claim. A new amendment in FDR is necessary to enable drug-like claims which are not currently listed.

Function Claims & General Health Claims

Function claims describe the specific beneficial physiological effects of foods and constituents when consumed in normal diet on health or physical or mental performance. Function claim cannot refer to drug-like claims. General health claims are broad claims that promote health through healthy eating or claims that provide dietary guidance. These do not refer to specific or general health effect, disease or health condition. Most function and general health claims could be made without applying for a regulatory amendment to FDR. Health Canada maintains a list of permitted function claims that have been deemed truthful and not misleading.

Natural Health Products

Natural Health Products (NHP) are a subset of drugs in Canada and regulated under NHP Regulations. Due to broad definition of NHP there is overlap in regulatory frameworks and it is often not clear when a product is regulated as food or an NHP on the basis of claims and types of ingredients present in a product. Overlap may be found in beverages and nutrition bars that carry health claims and certain substances such as vitamins, minerals and herbs. Classification of Products at the Food-Natural Health Product Interface, published by Health Canada outlines criteria used in determining appropriate classification a product having characteristics of both food and NHP.

Food Product Health Claims in the European Union

European Parliament adopted regulation in 2006 about the requirements for use of health or nutritional claims for foods which had a functional claim and a reduction of disease risk claim. European Food Safety Authority (EFSA) verifies scientific evidence in support of food claims that are currently in use or have been proposed are under review.

Function Claims

In EU Health claim is a claim that states a relationship between a food or its constituent and health. One type is referred to as Article 13 or function claims. These include a) the role of substance in growth, development and function of the body, b) psychological and behavioural functions or c) Slimming or weight control or satiety etc. These claims are further divided into general function and new function claims each having different procedure for evaluation. List of permitted functional health claims under this article consisting of well established health claims related to growth, development and functions or "Community List" is being compiled.

Claims based on newly developed scientific evidence including request for protection of proprietary data are referred to as Article 13(5) claims and subject to evaluation on case-by-case basis by EFSA before adding to permitted health claims.

Reduction of Disease Risk Claims

These referred to as Article 14 claims are health claims that imply that consumption of food or ingredient significantly reduces a risk factor in the development of a disease. Also this article covers children's development and health. These are subject to scientific evaluation by EFSA.

As with other jurisdictions, there are ambiguities about which regulation a food product is subject and some function and disease risk reduction claims are difficult to classify. "The Implementation of Regulation No. 1924/2006 on Nutrition & Health Claims Made on Foods – Conclusions of the Standing Committee on the Food Chain and Animal Health" has been made available to provide guidance in finding appropriate product classification.

Food Product Health Claims in the US

Claims on food and dietary supplement labels fall in three categories: health claims, nutrient content claims and structure/function claims. Health claims relate food or dietary supplement ingredient with reduction of risk of disease or with health related condition. Three types of health claims allowed for foods as follows:

NLEA Authorized Health Claims

Nutrition Labeling and Education Act (NLEA) authorised health claims are those that characterise a relationship between food ingredient or dietary supplement and risk of a disease. FDA authorises these based on scientific literature review, which is usually initiated by submission of a health claim petition. FDA uses significant scientific agreement (SSA) standard to evaluate if the relationship is well established. Under the provisions of this act, FDA has approved 12 specific health claims.

FDAMA Health Claims Based on Authoritative Statements

Prior to FDAMA (Food & Drug Administration Modernisation Act), the only way of authorising health claims on food labels was NLEA authorised claims which took time. This regulation allowed making such claims based on current, published authoritative statements from scientific body of the US with official responsibility for public health protection or research directly related to human nutrition or the National Academy of Sciences (NAS) or any subdivisions like National Institute of Health (NIH) and Centre for Disease Control & Prevention (CDC). While adoption of new regulation is not needed for FDAMA health claim petition, the SSA standard is still used as a basis for evaluating the scientific evidence presented.

Qualified Health Claims

Where sufficiently robust scientific evidence meeting SSA standard needed does not exist, FDA's 2003 Consumer Health Information for Better Nutrition Initiative provides for use of an interim solution through qualified health claims when evidence is "emerging" about relationship between food ingredient and reduced risk of disease or health related condition, provided these do not mislead consumers.

Qualifying language is included as part of the claim showing that evidence is limited. While conventional foods are permitted qualified health claims, dietary supplements are not.

Conclusion

Food regulations are complex and vary in different countries and are evolving. For appropriate marketing and reducing delays, it is critical to ensure that appropriate regulatory pathway is followed. Overlapping food regulations need to be understood for proper product classification which may decide the level of substantiation needed to support a health claim for regulatory clearance needed for marketing the product.

Condensed from: Nutraceuticals World March 2011

Nuts — a healthy treat

Could nuts be one of the secret ingredients to weight loss? A couple of studies have found a correlation between relatively high nut consumption (two or more servings a week) and avoidance of weight gain and obesity. Researchers at Harvard-affiliated Beth Israel Deaconess Medical Center reported results in 2010 from a small (20 volunteers) study that showed walnuts at breakfast gave people a pre-lunch feeling of fullness that might make it easier to eat less. Ultimately, weight loss is about reining in calorie consumption (and increasing physical activity). But if nuts make people feel full, perhaps they can help lower calorie counts over all, even as they add to those totals.

Nuts are dense little packages of fat and protein, with most of the fat being the healthful, unsaturated kind. They don't contribute much in the way of vitamins but make up for it by supplying respectable amounts of potassium, magnesium, and several other required minerals.

Dieters have tended to stay away from nuts because the fat content makes them a high-calorie food. It doesn't help that we tend to shovel them in as snacks, not as part of meals. But nuts contain very little carbohydrate, so they're showing up in low-carb diets these days, particularly the ones that emphasize plant-based foods.

Nutrients in nuts per 1.5 ounces (43 grams)

	Calories	Fat (grams)	Protein (grams)
Almonds	254	22.5	9.4
Brazil nuts	279	28.2	6.1
Cashews	244	19.7	6.5
Hazelnuts	275	26.5	6.4
Macadamias	305	32.4	3.3
Peanuts	249	21.1	10.1
Pecans	302	31.6	4.0
Pistachios	243	19.6	9.1
Walnuts	278	27.7	6.5

Source: Report of the Dietary Guidelines Advisory Committee, 2010.

Nuts and your heart

Apart from weight issues, nuts seem to have some protective effects against heart disease. Numerous studies have shown that if you put people on nut-filled diets, favorable effects on cholesterol levels, blood pressure readings, and inflammatory factors follow. And in large epidemiologic studies, high nut consumption has been associated with lower rates of heart disease. An analysis of data from the Harvard-based Nurses' Health Study showed that having one serving of nuts a day is associated with a 30% lower risk of heart disease compared with having one serving of red meat a day.

A plate full of walnuts for dinner tonight?

Nuts as a meal may not sound very appealing. But cookbooks are full of recipes that incorporate nuts into pasta dishes and the like. And it would be easy for most of us to add almonds or walnuts to a bowl of cereal or low-fat yogurt at breakfast and occasionally eat a meatless lunch or dinner.

Nuts may help with diabetes, too. The lack of carbohydrate content means nuts don't add appreciably to the surges in blood sugar we experience after many meals. In fact, they can blunt the effects of carbohydrates on blood sugar levels. Those "postprandial" spikes in blood sugar contribute to the development of diabetes in people vulnerable to getting the disease and must be controlled in those who

have already have it. Yet the evidence for nut consumption reducing the risk for developing diabetes is mixed, as are results of studies of the effect it has on blood sugar levels.

Harvard Medical School Health Beat March 29, 2011
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Is epigenetics the 'means' to achieving nutrition's potential?

By Stephen Daniells, 25-Mar-2011 Nutra Ingredients Science & Nutrition Research

Related topics: Dosage forms, Minerals, Vitamins & premixes, Cancer risk reduction, Cardiovascular health, Cognitive and mental function, Maternal & infant health, Research, Nutrigenomics

Understanding and achieving nutrition's potential to maintain health and prevent disease may lie with the study of epigenetics, according to a new review.

In the first part of our special series on how nutrition affects genetics and the genome, we take a look at the rapidly emerging area of epigenetics.

Defined as the study of changes in gene activity that doesn't involve a change to DNA, epigenetics is getting a lot of attention from some very influential sources. Indeed, the 7th annual Nestlé International Nutrition Symposium , which ran from October 27-29, 2010 in Lausanne, Switzerland, was all about epigenetics.

And Nestlé provides two out of three authors of a paper in *Nutrition Reviews* which asks the question, where are we with genetic and epigenetic markers for disposition and susceptibility?

Led by Dr Martin Kussman, head of proteomics and metabonomics core at the Nestlé Institute of Health Science, the review states that "modern nutrition focuses on disease prevention and health maintenance, and epigenetics may provide the means to understand and achieve these goals.

"Ultimately, comprehensive knowledge of the human epigenome is required, because the epigenome is not only tissue and stage-of-life dependent, it also varies markedly between individuals and species."

Understanding epigenetics

The majority of epigenetic changes occur at specific times in an individual's life, explain the authors, from their time in the womb, to the development as newborns, then in puberty, and again in old age.

Epigenetics does not result in changes to the DNA sequence, but it does encompass molecular modification to DNA like DNA methylation, explained Dr Kussman and his co-authors, Lutz Krause from the Functional Genomics Group at the Nestlé Research Center (Lausanne) and Winfried Siffert from the Institute of Pharmacogenetics at University Hospital Essen.

As such nutrition has epigenetic implications regarding cancer risk.

According to Cornelia Ulrich from the German Cancer Research Center and National Center for Tumor Diseases and William Grady from the University of Washington in Seattle (Cancer Prev. Res. 2010, Vol. 3, pp. 1505-8): "Modifying the epigenome to prevent cancer is particularly intriguing because epigenetic alterations are potentially reversible, unlike gene mutations, and because certain dietary factors, such as the B-vitamin folate, may affect genes' DNA methylation status."

At the other end of the age-scale, studies are ongoing to analyse the role of epigenetics in newborns. For example, the Newborn Epigenetics STudy (NEST) , a prospective study of women and their children is investigating how differences in the global epigenetic profile are related to a range of factors, including maternal diet and use of vitamin and mineral supplements. Data from this study have recently been published in BMC Public Health (2011, **11**:46).

One piece of the jigsaw

Despite the potential of epigenetics, Kussman, Krause and Siffert see it as part of a bigger genomic picture, which should include genetics (our 'blueprint'), transcriptomics (what actually happens), proteomics (making it happen), and metabolomics (what did happen).

All of these things are "required to understand human variability and to develop biomarkers for response and efficacy, individual disposition, and programming of an organism, respectively", they wrote.

"This concept applies, in our view, to nutrition just as much as it does to pharmaceutical research."

"One of the reasons the understanding of environmental modeling of a genome is only beginning may be that the aforementioned integration of genomics (expression), genetics (predisposition), and epigenetics (programming or imprinting) is just emerging and that the tools for genome-wide analyses are still maturing.

“In the fields of infant nutrition, diabetes, obesity, and the metabolic syndrome, the term “metabolic programming” has been coined to give a name to the observation that environmental experiences early in life may be “genomically” remembered and give rise to health outcomes manifesting later in life. Epigenetics emerges as an important mechanism underlying this phenomenon,” concluded Kussman, Krause and Siffert.

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Whey protein may cut metabolic risk of high-fat diet: Mouse study

By Stephen Daniells, 23-Mar-2011 from Nutra Ingredients

Whey protein isolate may slow weight gain and the accumulation of body fat when added to a high fat, suggest new findings from a study with mice.

Animals consuming a high fat diet supplemented with whey protein isolate (WPI) gained 42 percent less weight, and had 32 percent lower body weight than animals fed only the high fat diet, according to findings published in the *Journal of Nutrition*.

“In mice and humans, high fat diets contribute to the development of insulin resistance and hepatosteatosis, biomarkers and major risk factors for type-2 diabetes and non-alcoholic fatty liver disease (NAFLD),” wrote researchers from the University of Cincinnati and the University of Kentucky.

“In this study, WPI supplementation in mice reduced the severity of several biomarkers, including gain in body weight and adiposity, insulin resistance, and fatty liver,” they added. *“[…] whey protein may have therapeutic potential to reduce the incidence of diabetes and fatty liver diseases, especially in at-risk individuals who consume excess energy and fat and lead a sedentary lifestyle.”*

The whey forward

For a long time whey was viewed as a secondary product within the dairy industry, used simply as a means of feed for animals and not as an added-value ingredient. That, however, is changing, particularly with the impact of high milk costs on the industry.

Such a change has seen whey proteins become an important nutritional and functional food ingredient, with extensive use in food applications such as sport beverages, meat replacement products, baked products, salad dressings, ice creams, artificial coffee creams, soups and dairy products.

In addition to its extensive use in sports nutrition products, the new study suggests that whey protein may also reduce the risk of metabolic disease associated with a high fat diet.

Study details

Led by Howard Shertzer from the University of Cincinnati, the researchers fed mice a high fat diet for 11 weeks. The high fat diet was defined as providing 40 percent of calories from fat. Animals were subsequently randomly assigned to one of two groups: One groups received normal drinking water, while the other received drinking water containing 100 grams of whey protein isolate (Natural Pure WPI, Bioplex Nutrition) per liter.

In addition to the improvements in body weight and body fat levels in whey protein supplemented animals, compared with non-supplemented animals, the researchers also report that whey-fed animals also had 7.4 percent more lean body mass.

Benefits were also observed in analyses of the animals’ liver showed that whey protein supplementation was associated with 50 percent of the lipid droplet and tissue lipid content of the high-fat only animals,

Dr Shertzer and his co-workers also report that the insulin concentrations of whey protein-fed animals were 29 percent of those recorded in the control animals.

“The protective effect of whey protein was consistent with higher basal metabolic rates and mitochondrial oxygen consumption and lower metabolic utilization of dietary lipid, leading to an overall lower feeding efficiency,” wrote the researchers.

“Because the diets utilized in this study were not isonitrogenous, it is possible that supplementation with any protein would have been effective. Certainly, the active component(s) of whey responsible for these results have yet to be identified,” they concluded.

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Phytosterols stable in functional foods

By Stephen Daniells, 22-Mar-2011 Nutra Ingredients

The stability of plant sterols in functional foods for cholesterol reduction is high, says a new study from Spain which adds to the safety data surrounding phytosterols.

Tests with eight commercially available plant sterol-containing ingredients showed that, under oxidizing conditions, only a very small quantity of oxidation products were produced, report researchers from the University of Valencia and the Hero Institute for Nutrition.

"From the results obtained (low rate of oxidation) in the ingredients tested, we can conclude that the plant sterols remain stable in these ingredients," wrote the researchers in the *Journal of Agricultural and Food Chemistry*.

Dosages

Numerous clinical trials in controlled settings have reported that daily consumption of 1.5 to 3 grams of phytosterols/-stanols from foods can reduce total cholesterol levels by eight to 17 per cent, representing a significant reduction in the risk of cardiovascular disease.

According to a recent market research conducted by Frost & Sullivan, phytosterols are the most heart health targeted and benefited from approved health claims in many markets (as well as recently approval from the European Food Safety Authority).

Despite a wealth of studies supporting the efficacy, the Spanish researchers behind the new study state that, as far as they are concerned, *"only one study has been published on the evaluation of the oxidation of phytosterols in different vegetable oils added as microcrystalline phytosterols suspensions prepared from wood-based fractions"*.

Stability tests

In order to test the stability towards oxidation, the researchers employed gas chromatographic (GC) technique with mass-spectrometric detection to identify the specific types of plant sterols present in certain sterol-containing ingredients, and then GC with a flame ionization detector (GC-FID) to quantify the phytosterols.

Eight commercially available phytosterol-containing ingredients were tested, with the sterols present in esterified or free form, and derived from pine, soybean, rapeseed, soybean, corn, and sunflower oils in one of three physical forms: Powder, oil paste, or liquid emulsion. Sterols were tested in their original state and then after thermo-oxidation.

Results showed that the most prevalent sterol was beta-sitosterol, and that under oxidizing conditions this produced a range of so-called plant sterol oxidation products (POPs). However, oxidation of beta-sitosterol was limited to between 10 to 50 micrograms per 100 g of beta-sitosterol.

"In view of this low rate of oxidation in the ingredients tested, it can be concluded that the plant sterols remain stable in these ingredients," wrote the researchers.

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Poor Diet Linked to Anemia in Postmenopausal Women

March 25, 2011 **From Food Product Design**

Inadequate nutrition is linked to a greater risk of anemia in postmenopausal women, according to a study published in the ***Journal of the American Dietetic Association***.

Researchers from the University of Arizona examined data from 72,833 women in the Observational Cohort of the Women's Health Initiative (WHI-OS). They found deficiencies in more than a single nutrient were associated with a 21-percent greater risk of persistent anemia while three deficiencies resulted in a 44-percent increase in risk for persistent anemia.

Women with anemia reported lower intakes of energy, protein, folate, vitamin B12, iron, vitamin C and red meat. Inadequate intake of dietary iron, vitamin B12 and folate were each associated with approximately 10-percent to 20-percent elevated risk for incident anemia among WHI-OS study participants and the odds increased for persistent anemia to 21 percent. Age, body mass index and smoking also were associated with anemia.

"This study suggests that inadequate nutrient intakes are a significant risk factor for anemia in this population of older women and use of multivitamin/mineral supplements is not associated with lower rates of anemia," said lead investigator Cynthia A. Thomson, PhD, RD. "Overall mortality is increased in relation to a diagnosis of anemia, and anemia, particularly iron deficiency, has been associated with reduced capacity for physical work and physical inactivity, injury related to falls and hospitalizations, making this an important health care concern in the aging."

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High-Fiber Diet Benefits Long-Term Heart Health

March 23, 2011 **From Food Product Design**

Adults between ages 20 and 59 who eat a high-fiber diet have a significantly lower lifetime risk for cardiovascular disease compared to individuals with the lowest fiber intake, according to a new study presented today at the American Heart Association's Nutrition, Physical Activity and Metabolism/Cardiovascular Disease Epidemiology and Prevention Scientific Sessions 2011 in Atlanta.

"It's long been known that high-fiber diets can help people lose weight, lower cholesterol and improve hypertension," said Donald M. Lloyd-Jones, M.D., corresponding author of the study and chair of the department of preventive medicine at Northwestern University Feinberg School of Medicine and a cardiologist at Northwestern Memorial Hospital. "The results of this study make a lot of sense because weight, cholesterol and hypertension are major determinants of your long-term risk for cardiovascular disease."

Researchers at Northwestern University examined data from the National Health and Nutrition Examination Survey, a nationally representative sample of about 11,000 adults. They predicted lifetime risk for cardiovascular disease based on study participants' diet, blood pressure, total cholesterol, smoking status and history of diabetes

"The results are pretty amazing. Younger (20 to 39 years) and middle-aged (40 to 59 years) adults with the highest fiber intake, compared to those with the lowest fiber intake, showed a statistically significant lower lifetime risk for cardiovascular disease," the said.

In adults age 60 to 79s, dietary fiber intake was not significantly associated with a reduction in lifetime risk of cardiovascular disease. They said it's possible that the beneficial effect of dietary fiber may require a long period of time to achieve, and older adults already may have developed significant risk for heart disease before starting a high-fiber diet.

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Researchers Assess Bioactives in Minimally Processed Carrots

Source: Nutrition Horizon 3/24/2011 ---

Polyacetylenes are natural products found in certain plants that have been related to a reduction in the risks of developing diseases such as certain types of cancers and other important diseases. Carrots contain relatively high contents of polyacetylenes. Recent studies have focussed on the polyacetylenes from carrots because their bioactive properties could have beneficial health effects.

They can be classified into four groups depending on the impact they have on human health – anti inflammatory and anti-platelet; anti fungal and anti-viral; anti-bacterial and anti-mycobacterial; and, cytotoxicity and anti-cancer. Falcarinol has emerged as the most active polyacetylene in carrots in terms of cytotoxicity against cancer cell lines.

Researchers at the Teagasc Food Research Centre, Ashtown, as part of the Irish Phytochemical Food Network, are developing an understanding of how bioactive compounds in vegetables are affected by passage through the food chain. They assessed the impact of Modified Atmosphere Packaging, which is used to preserve ready-to-eat vegetable products such as carrot disks at the point of sale during chill storage.

In an article for TResearch, the Teagasc research and innovation magazine, Dr Juan Valverde and colleagues outline the results of their analysis. The results show that Modified Atmosphere Packaging is a useful way to retain polyacetylenes levels in carrots. None of the three major polyacetylenes in carrots showed significant difference from the control.

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Right Diet Substantially Lowers Cardiovascular Risk – TNO

Source: Nutrition Horizon 3/31/2011 --

TNO, a Dutch innovation organization, announced that an anti-inflammatory dietary mix has shown significant benefits in cardiovascular health. Signs of inflammation and atherosclerosis are noticeably reduced. Long-term use of the dietary mix in a mouse model even reduced the development of atherosclerosis by more than 90%. This research expands the findings from a previous shorter study conducted in healthy volunteers with the same anti-inflammatory dietary mix.

A sedentary lifestyle and high calorie and high fat diet can contribute to the high incidence of cardiovascular disease. Many studies

suggest that certain dietary compounds can have a beneficial effect on the cardiovascular health in humans. A mixture of these beneficial compounds may be an effective way to prevent cardiovascular disease and promote health. For its anti-inflammatory dietary mix, TNO combined fish oil, resveratrol (present in red wine), lycopene (in tomatoes), catechin (in tea) and vitamins E and C.

According to Henk Hendriks, Business Line Manager Food and Health at TNO: “It is difficult to measure how changes in one’s diet affect health, and the effects may become apparent only after a very long period of time. The combined use of new systems biology approaches in human studies and translational in vivo models appeared to be a successful new strategy to evaluate how effective a specific diet and ingredients are.

Currently, the dietary mix is not commercially available. We expect that companies that want to develop healthy dietary mixes will benefit from the method and the study results so that they can provide new, healthier products to consumers.”

In the placebo-controlled human study, 30 subjects consumed the anti-inflammatory dietary mix during a period of 5 weeks and demonstrated that the volunteers had less inflammation and a better metabolism at the end of the study. The long term study in mice was conducted in a specific mouse strain selected because of its ability to react to a high calorie and high fat diet similarly to humans. The mice had a more effective defense against inflammation and were better able to deal with the ‘Western diet”. This led to an almost complete absence of atherosclerosis. All mice receiving the Western diet without the protective dietary mix developed atherosclerosis. Thus, the protective mechanisms appear to have been activated both in humans and mice.

The findings were published in the renowned scientific journals ‘American Journal of Clinical Nutrition’ and the ‘Journal of Nutrition’. The study was part of TNO’s research program into Healthy Living and Personalized Health and was conducted in Leiden and Zeist in the Netherlands.

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Vitamin K may benefit both elderly men and women: Study

By Stephen Daniells, 29-Mar-2011

The bone benefits of a diet rich in vitamin K may extend to both elderly men and women, according to findings from a new study from Spain.

Data from 200 elderly people showed that high dietary intakes of vitamin K were associated with higher measures of bone mineral density (BMD), and higher scores in an ultrasound test, say findings published in *Bone*.

“The results of the present study showed, for the first time, a direct association between dietary vitamin K intake and calcaneous quantitative ultrasound measurements, suggesting that vitamin K has a direct role in qualitative bone features along with bone mineral density, in a cohort of elderly Caucasian subjects with healthy dietary habits,” wrote the researchers, led by Monica Bullo from the Human Nutrition Unit at the Universitat Rovira i Virgili in Reus, Spain.

Market implications

The study adds to the ever-growing body of potential health benefits of vitamin K intakes. Despite the positive impacts, vitamin K deficiency may be more common than previously thought, according to findings from a Dutch study in 2007 (*Thrombosis and Haemostasis*, Vol. 98, pp. 120-125).

There are two main forms of vitamin K: phylloquinone, also known as phytonadione, (vitamin K1) which is found in green leafy vegetables such as lettuce, broccoli and spinach, and makes up about 90 per cent of the vitamin K in a typical Western diet; and menaquinones (vitamins K2), which make up about 10 per cent of Western vitamin K consumption and can be synthesised in the gut by microflora.

Menaquinones (MK-n: with the n determined by the number of prenyl side chains) can also be found in the diet; MK-4 can be found in animal meat, MK-7, MK-8, and MK-9 are found in fermented food products like cheese, and natto is a rich source of MK-7.

Concerns over deficiency, coupled with increased consumer awareness of the potential benefits, have led to an upsurge in vitamin K formulations as supplements and functional foods. According to Francis Foley from Xsto , the US distributor of Kappa’s K2Vital Vitamin K Product Line, the current K market in the US is valued at $10 million in raw material sales (vs finished product sales). *“What is really impressive is the growth in vitamin K supplementation, estimated to be (my personal estimate) over 15 percent year. We feel the K2 market can double to $20 million in less than five years,”* he said.

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Vegetarian Diet Cuts Metabolic Disease Risk

April 5, 2011 Food Product Design

Individuals who adhere to a vegetarian diet have a lower risk of developing metabolic disease like diabetes and cardiovascular disease, according to a new study published in the journal *Diabetes Care*.

Researchers at Loma Linda University conducted a cross-sectional analysis of 773 adults who participated in the Adventist Health Study 2. Measuring for metabolic risk factors, they found vegetarians had lower levels of triglycerides, glucose, blood pressure and waist circumference than non-vegetarians. The only exception was cholesterol.

As reported by Reuters, the researchers found 23 out of every 100 vegetarians have at least three metabolic syndrome factors, compared with 39 out of every 100 non-vegetarians and 37 out of every 100 semi-vegetarians. Vegetarians' average BMI of 25.7 was four points lower than non-vegetarians, who had BMIs near 30.

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Low-Fat Dairy Products Lower Blood Pressure

April 4, 2011 Food Product Design

ROSEMONT, Ill.—Individuals who consume low-fat dairy products have a reduced risk of elevated blood pressure, according to a study published in the February 2011 issue of the *Journal of Human Hypertension*. The findings suggest dairy can play a positive role in a balanced, healthy diet and lifestyle.

Researchers at Monash University in Australia conducted a systematic review and meta-analysis to examine the association between dairy food intake during adulthood and the development of elevated blood pressure (EBP), specifically comparing the association of EBP with consumption of low-fat dairy foods versus high-fat dairy foods, as well as cheese versus fluid dairy foods (milk or yogurt). Seven databases were searched and five cohort studies selected for inclusion, involving nearly 45,000 subjects and 11,500 cases of EBP.

According to the findings, dairy food consumption resulted in a significant reduction in the risk of elevated blood pressure. However, an analysis of full-fat dairy products including cheese, indicated neither an increased risk nor a decreased risk of elevated blood pressure. Regardless of fat content, fluid dairy foods (including low-fat and full-fat milk and yogurt) were associated with a reduced risk of developing EBP.

“High blood pressure continues to be a critical concern for many Americans and populations around the world," said Gregory Miller, Ph.D., president of the U.S.-based Dairy Research Institute™ and executive vice president of the National Dairy Council®. “This latest review reinforces the value that dairy foods provide, by indicating that three servings of low-fat dairy products per day may help to reduce the risk of elevated blood pressure."

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Effects of High-Protein Diet on Kidney Function Debated

March 30, 2011 Food Product Design

WINNIPEG, Manitoba—High-protein, low-carbohydrate diets like Atkins, South Beach and the newer Dukans diet have been touted as popular ways to shed unwanted pounds and improve blood sugar; however, many nutritionists and health care providers scrutinize the long-term health effects, especially on kidney function.

As reported in the Winnipeg Free Press, a researcher at the University of Manitoba studying the effects of the diet on kidney function has determined that obesity actually presents a bigger problem to the kidneys than damage from a high-protein diets. In a study published last year in the *Journal of Nutrition*, Professor Harold Aukema found pigs fed a diet consisting of 35-percent protein over four to eight months sustained some kidney damage, including enlarged kidneys and fibrosis of the kidney's filter. He said a human or pig kidney has to undergo extensive wear and tear before it starts to affect function; therefore, the high-protein diet may be the lesser of two evils.

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Researchers Find Link Between Common Dietary Fat, Intestinal Microbes and Heart Disease

Source:Nutrition Horizon 4/7/2011 ---

A new pathway has been discovered that links a common dietary lipid and intestinal microflora with an increased risk of heart disease, according to a Cleveland Clinic study published in the latest issue of Nature.

The study shows that people who eat a diet containing a common nutrient found in animal products (such as eggs, liver and other meats, cheese and other dairy products, fish, shellfish) are not predisposed to cardiovascular disease solely on their genetic make-up, but rather, how the micro-organisms that live in our digestive tracts metabolize a specific lipid -- phosphatidyl choline (also called lecithin). Lecithin and its metabolite, choline, are also found in many commercial baked goods, dietary supplements, and even children's vitamins.

The study examined clinical data from 1,875 patients who were referred for cardiac evaluation, as well as plasma samples from mice. When fed to mice, lecithin and choline were converted to a heart disease-forming product by the intestinal microbes, which promoted fatty plaque deposits to form within arteries (atherosclerosis); in humans, higher blood levels of choline and the heart disease forming microorganism products are strongly associated with increased cardiovascular disease risk.

"When two people both eat a similar diet but one gets heart disease and the other doesn't, we currently think the cardiac disease develops because of their genetic differences; but our studies show that is only a part of the equation," said Stanley Hazen, M.D., Ph.D., Staff in Lerner Research Institute's Department of Cell Biology and the Heart and Vascular Institute's Department of Cardiovascular Medicine and Section Head of Preventive Cardiology & Rehabilitation at Cleveland Clinic, and senior author of the study. "Actually, differences in gut flora metabolism of the diet from one person to another appear to have a big effect on whether one develops heart disease. Gut flora is a filter for our largest environmental exposure – what we eat."

Dr. Hazen added, "Another remarkable finding is that choline – a natural semi-essential vitamin – when taken in excess, promoted atherosclerotic heart disease. Over the past few years we have seen a huge increase in the addition of choline into multi-vitamins - even in those marketed to our children - yet it is this same substance that our study shows the gut flora can convert into something that has a direct, negative impact on heart disease risk by forming an atherosclerosis-causing by-product."

In studies of more than 2,000 subjects altogether, blood levels of three metabolites of the dietary lipid lecithin were shown to strongly predict risk for cardiovascular disease: choline (a B-complex vitamin), trimethylamine N-oxide (TMAO, a product that requires gut flora to be produced and is derived from the choline group of the lipid) and betaine (a metabolite of choline).

"The studies identify TMAO as a blood test that can be used in subjects to see who is especially at risk for cardiac disease, and in need of more strict dietary intervention to lower their cardiac risk," Dr. Hazen said.

Healthy amounts of choline, betaine and TMAO are found in many fruits, vegetables and fish. These three metabolites are commonly marketed as direct-to-consumer supplements, supposedly offering increased brain health, weight loss and/or muscle growth.

These compounds also are commonly used as feed additives for cattle, poultry or fish because they may make muscle grow faster; whether muscle from such livestock have higher levels of these compounds remains unknown.

"Knowing that gut flora generates a pro-atherosclerotic metabolite from a common dietary lipid opens up new opportunities for improved diagnostics, prevention and treatment of heart disease," Dr. Hazen said. "These studies suggest we can intelligently design a heart healthy yogurt or other form of probiotic for preventing heart disease in the future. It also appears there is a need for considering the risk vs. benefits of some commonly used supplements."

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Alternating Diet Could Reduce Inflammation and Atherosclerosis – Animal Study

Source:Nutrition Horizon 4/6/2011 ---

Researchers demonstrated that alternating a 3 day high cholesterol diet with a 4 day cholesterol-free diet can effectively reduce inflammation, cardiovascular risk factors and cardiovascular disease. Researchers from TNO and University Medical Centre Groningen found these results in mice. The alternating cholesterol diet could be an easier way for at risk populations to reduce their risk profile than a completely low cholesterol diet.

The results lead scientists to expect that the alternating cholesterol diet would have similar results in humans and in mice. However, the alternating cholesterol diet study in mice does need to be verified in humans. The study results were published in PLoS ONE.

Currently, cardiovascular disease is a leading cause of death in industrialized countries. A healthy diet and exercise can strongly reduce one's risk of developing cardiovascular disease. Compliance with strict dietary measures is difficult for many. Being able to switch between a healthy and less healthy meals could bring longer term compliance within reach.

Peter Wielinga, project leader at TNO, describes the study concept: "The alternating diet concept is based on results on caloric restriction in humans. We investigated whether or not a much milder lifestyle adaptation would work and used cholesterol exposure as a model. The study shows that alternating 3 days high cholesterol with 4 days cholesterol- free diet offers most of the benefits of a continuous cholesterol-free diet."

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Omega-3 DHA safe and 'modestly beneficial' for infants: Study

By Stephen Daniells, 07-Apr-2011 Nutra Ingredients

The study, published in the *British Journal of Nutrition*, shows that high dietary intakes of DHA (docosahexaenoic acid) has no adverse effects of the growth of premature babies, according to the researchers, led by Professor Maria Makrides from the School of Paediatrics and Reproductive Health at the University of Adelaide.

Potential neuro-benefits

In addition, premature infants with a low birth weight and assigned to receive a high dose of DHA had a significantly greater growth rate of the head than infants receiving a standard DHA dose, according to findings published in the *British Journal of Nutrition*.

Researchers led by, note that this small difference in head growth was associated with a *"significant increase in the mental development index"*.

"It is possible that even such small, yet statistically significant, increases in the rate of head growth may be associated with neurodevelopmental improvement," wrote the authors.

An area for further investigation

Commenting on the findings, Harry Rice, PhD, VP regulatory and scientific affairs at the omega-3 trade association Global Organization for EPA and DHA (GOED), told NutraIngredients-USA that what he found interesting about the study was rightfully downplayed by the authors.

"The head circumference of infants born weighing less than 1250 g and randomized to higher DHA was 0.017 cm/week greater than that of infants randomized to standard DHA," noted Dr Rice. *"While statistically significant, it begs the question as to whether or not the difference would be considered clinically significant.*

"The answer remains unknown, but consider that in 2009, Makrides et al. reported a significant increase in the mental development index in this same group of infants. This suggests, as pointed out by the authors, that '...increases in the rate of head growth may be associated with neurodevelopmental improvement'. *At the risk of downplaying the other findings, this association is what I believe deserves further investigation,"* he added.

Study details

Prof Makrides and her co-workers conducted the Docosahexaenoic acid for the Improvement of Neurodevelopmental Outcome in pre-term infants (DINO) trial in order to evaluate the safety and efficacy of DHA at a dose estimated to match levels built up during time in the womb.

Six hundred and fifty seven infants born before the 33rd week of pregnancy were randomly assigned to one of four groups: Two groups received breast milk and two received formula, with one breast milk and one formula group receiving a standard DHA dose (0.2-0.3 percent of dietary fatty acids), and the other two groups receiving a higher DHA dose (approximately 1 percent of dietary fatty acids).

The test feeding of the babies started between their second and fifth day of life, and was maintained until their expected due date. They were subsequently until 18 months of age. The arachidonic acid (AA) content of the diets was maintained at approximately 0.4 percent of the total fatty acid intake, said the researchers.

Results showed that, at 18 months of age, the infants fed the higher dose of DHA were, on average about 0.7 cm longer than their counterparts fed the standard DHA dose.

"In this trial of DHA supplementation, we have shown that high dietary DHA intakes, capable of suppressing AA tissue incorporation, do not adversely affect the growth of pre-term infants," stated the researchers.

"The modest, positive effects of the higher-DHA diet on different measures of growth observed in the birth-weight strata are worthy of further investigation, while the consistent lack of effect by infant's sex indicated that higher-DHA diets have no differential effect on growth by sex," they concluded.

The study was funded by the Australian National Health and Medical Research Council.The infant formula was provided by Mead Johnson Nutritionals and Nutricia Australasia, while treatment and placebo capsules were provided by Clover Corporation. Some of the researchers, including Prof Makrides, have been advisors to companies such as Nestle, Fonterra, Nutricia, and Wyeth.

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Curcumin-soy formulation may boost absorption 60-fold: Indena study

By Stephen Daniells, 06-Apr-2011 Nutra Ingredients

The curcumin-soy lecithin combination, commercialized by Indena as Meriva, was also found to increase absorption of demethoxycurcumin and bisdemethoxycurcumin, compounds present in natural curcumin, up to 60-fold, according to findings published in the *Journal of Natural Products*.

"Curcumin has been a sort of 'forbidden fruit' for biomedical research, since its poor oral bioavailability has substantially hampered clinical development, despite the very promising indications of the preclinical research," wrote the researchers, led by John Cuomo from USANA Health Sciences in Salt Lake City.

"We have demonstrated that formulation with phospholipids improves the human absorption of curcumin, without, however, leading to pharmacologically active plasma concentrations and with only phase-2 metabolites being detectable," they added.

Significant advance

Giovanni Appendino, professor of organic chemistry at the University of Eastern Piedmont, Indena Scientific Advisor, and co-author of the study said the new study *"represents one of the more significant advances in turmeric research"*.

"For the first time, a dramatic formulation-dependent increase in the bioavailability of curcuminoids in humans has been demonstrated, highlighting that curcuminoids have different absorption properties, and that the presence of lipids, as in Meriva and in the traditional culinary use of turmeric, critically magnifies them," said Prof Appendino.

"These results will open up new areas of clinical research on curcumin, rationalizing the clinical efficacy of Meriva at dosages much lower than those of curcumin, and successfully addressing the issue of mega-doses that has plagued the clinical research on curcumin."

Study details

Researchers from USANA Health Sciences, Indena, and the University of Eastern Piedmont recruited nine people with an average age of 35 to participate in the randomized, double-blind, crossover human study. The volunteers received five (low-dose - 209 mg total curcuminoids) or nine (high-dose - 376 mg total curcuminoids) hard-shell capsules of either the soybean-based phospholipid-curcumin formulation (Meriva) or five capsules of a non-formulated curcuminoid mixture containing 1799 mg of curcuminoids.

"Total curcuminoid absorption was about 29-fold higher for Meriva than for its corresponding unformulated curcuminoid mixture, but only phase-2 metabolites could be detected, and plasma concentrations were still significantly lower than those required for the inhibition of most anti-inflammatory targets of curcumin," report the researchers.

"Remarkably, phospholipid formulation increased the absorption of demethoxylated curcuminoids much more than that of curcumin, with significant differences in plasma curcuminoid profile between Meriva and its corresponding unformulated curcuminoid mixture.

"Thus, the major plasma curcuminoid after administration of Meriva was not curcumin, but demethoxycurcumin, a more potent analogue in many in vitro *anti-inflammatory assays,"* they added.

The increase in blood levels of the demethoxylated curcuminoids was *"unexpected"* said the researchers, and the reason for this is unknown.

The researchers said that a possible explanation could be microbial metabolism of curcumin in the gut in a similar process as the one that produces enterolactone and enterodiol from flax lignans.

"The improved absorption, and possibly also a better plasma curcuminoid profile, might underlie the clinical efficacy of Meriva at doses significantly lower than unformulated curcuminoid mixtures," they concluded.

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GM cows produce lysozyme-rich milk: Study

By Nathan Gray, 05-Apr-2011 Nutra Ingredients

The research, published in *PLoS One*, claims to be the first study to result in the production of a herd of cloned transgenic cattle expressing recombinant human lysozyme (rHLZ) in their milk.

Lysozyme, a bactericidal protein that protects human infants from microbial infections, is highly expressed in human milk but is found in only trace amounts in cow milk. The researchers said that the new transgenic milk may allow for the transfer of the nutritional aspects of human lysozyme in human milk to bovine milk.

"Our study not only describes transgenic cattle whose milk offers the similar nutritional benefits as human milk but also reports techniques that could be further refined for production of active human lysozyme on a large scale," said the authors, led by Professor Ning Li, at the China Agricultural University, China.

*"This approach could provide an inexpensive and industrial-scale method for the purification of rHLZ … In addition, we have shown that the enzymatic properties and physicochemical characteristics of rHLZ were identical to those of [h*uman lysozyme (HLZ)*],"* they added.

Lysozyme

Human lysozyme is widely distributed in human tissues and body fluids (tears, saliva, milk) and it plays important roles as a non-specific immune factor and anti-inflammatory factor.

Prof Li and colleagues said that the benefits of lysozyme present in breast milk include improving immunity and preventing infection in infants.

"It increases the levels of beneficial intestinal microflora and strengthens disease resistance in infants. These effects are believed to occur through the lysis of certain potentially damaging Gram-positive bacteria and a few Gram-negative bacteria in the gastrointestinal tract of breast-fed babies," explained Li and co-workers.

The researchers explained that in human milk, the content of lysozyme ranges from 3 to 3000 micrograms per millilitre, with a 'typical concentration' of between 200–400 micrograms per ml.However, bovine milk typically contains only 0.05–0.22 micrograms per ml of lysozyme.

"There is great potential for using transgenic technology to improve the quality of cow milk," said the authors.

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New Review Suggests Drinking 100% Fruit Juice May Offer Disease-Fighting Benefits

Source:Nutrition Horizon 4/11/2011 ---

Drinking 100 percent fruit juices could have protective health benefits similar to those of whole fruits, according to research presented in a literature review yesterday at the 2011 Experimental Biology (EB) meeting.

Highlights from a new report summarizing recent research on the potential benefits of fruit juice suggest a positive association between intake of 100 percent juice and reduced risk for several chronic diseases, including cancer, markers for cardiovascular disease and cognitive decline.

"While it is universally accepted that fruit and vegetable intake is protective, there is not a clear consensus about the benefits of consuming the juices that are extracted from them," said the review's author, Dianne Hyson, PhD, MS, RD. "An analysis of the scientific evidence suggests that 100 percent fruit juices retain important bioactive components that may promote good health and aid in disease prevention."

Among the fruit juices included in the review, consumption of apple, citrus, cranberry, grape, and pomegranate juices all showed beneficial effects. Markers of improved health ranged from reductions in urinary tract infections (cranberry) to improvements in age-related cognitive decline (grape and apple) to reduced risk of prostate (pomegranate) and respiratory and digestive (orange, grapefruit) cancers. Additionally, intake of all juices was linked to heightened antioxidant activity.

Research examined in the review, which was completed at the University of California - Davis, included a range of study types, from in vitro to clinical trials (60 papers total), all published in 2005 or later.

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Potato Consumption in Children's Meals Leads to Higher Overall Diet Quality

Source:Nutrition Horizon 4/12/2011 ---

Research to be presented this week at The Federation of American Societies for Experimental Biology (FASEB) Conference in Washington, D.C., demonstrates that consumption of white potatoes (non-fried) by children does not displace other vegetables from children's meals. In fact, meals that contain white potatoes contain more servings of other vegetables, and are significantly higher in potassium, fiber and vitamin C. Both potassium and fiber were identified as nutrients of concern in the 2010 Dietary Guidelines, released February 2011.

"Potatoes belong in the diet. Children who consume white potatoes have more nutrient-dense diets, overall, and they actually eat more of other vegetables," said lead researcher Adam Drewnowski, PhD. "There were no differences in the prevalence of overweight or obesity between children who did and did not consume potatoes."

Researchers studied more than 11,500 children ages 5-18 years of age using data from four cycles of the National Health and Nutrition Examination Survey (NHANES) 2001-2008. The data set included information on more than 57,000 individual meals in which the white potatoes could be baked, boiled, mashed or roasted but not fried. Separate analyses were conducted for lunch-time and dinner-time meals and at-home and away-from home, including school lunches. The study showed that children's weekday lunches, which included white potatoes, generally had more other vegetables than did weekday lunches without white potatoes.

Potatoes are an economic, nutrient-packed vegetable children typically enjoy eating. One medium-size (5.3 ounce) skin-on potato contains just 110 calories per serving, boasts more potassium (620g) than a banana, provides almost half the daily value of vitamin C (45 percent), and contains no fat, sodium or cholesterol. They are a food that complements the meals served in America's schools and home kitchens.

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Vitamin D linked to lower eye risk in young women: Study

By Stephen Daniells, 12-Apr-2011 Nutra Ingredients

Higher blood levels of vitamin D may be associated with a decreased risk of developing age-related macular degeneration (AMD) in women, says new research.

The new study is the 2nd to link vitamin D and AMD

According to findings published in the *Archives of Ophthalmology*, the highest average intakes of vitamin D from food and supplements (15.1 micrograms per day) were associated with a 59 percent decrease in the risk of developing early AMD, compared with the lowest average intakes (7.9 micrograms per day).

"This is the second study to present an association between AMD status and 25(OH)D, and our data support the previous observation that vitamin D status may potentially protect against development of AMD," wrote the authors, led by Amy Millen, PhD, from the University at Buffalo, New York.

"More studies are needed to verify this association prospectively as well as to better understand the potential interaction between vitamin D status and genetic and lifestyle factors with respect to risk of early AMD," they added.

AMD

As the name suggests, age-related macular degeneration (AMD) is a degenerative retinal disease that causes central vision loss and leaves only peripheral vision.

Despite the fact that approximately 25 to 30 million people worldwide are affected by AMD, awareness of the condition is low, says AMD Alliance International. And as Baby Boomers age, the Alliance expects incidence to be on the rise and triple by 2025.

The macula is a yellow spot of about five millimeters diameter on the retina. As we age, levels of the pigments in the macula decrease naturally, thereby increasing the risk of AMD. The yellow color is due to the content of the carotenoids lutein and zeaxanthin, which we derive from the diet.

Study details

Millen and her co-workers analyzed blood levels of vitamin D – measured as 25- hydroxyvitamin D (25(OH)D), the non-active 'storage' form of the vitamin – in 1,313 women aged between 50 and 79. *"Serum 25(OH)D is the preferred biomarker for vitamin D status, as it reflects vitamin D exposure from both oral sources and sunlight,"* explained the researchers.

Vitamin D refers to two biologically inactive precursors - D3, also known as cholecalciferol, and D2, also known as ergocalciferol. Both D3 and D2 precursors are transformed in the liver and kidneys into 25(OH)D, and 1,25-dihydroxyvitamin D (1,25(OH)2D), the biologically active form that is tightly controlled by the body.

According to the study's findings, the top food sources of vitamin D for the women were milk, fish, fortified margarine and fortified cereal.

Results showed that no overall relationship was found between vitamin D and any form of AMD, but when the researchers limited their analysis to women younger than 75, they found that higher 25(OH)D levels were associated with a significant decreased risk of early AMD.

"The inverse association between early AMD and 25(OH)D in women younger than 75 years was not explained by dietary intake of lutein plus zeaxanthin or polyunsaturated fat," they added.

On the other hand, higher vitamin D levels were associated with a borderline statistically significant increased risk in women over 75.

Is it biologically plausible?

Commenting on the potential mechanism, Dr Millen and her co-workers note that inflammation is reported to be involved in the development of AMD, and that vitamin D has anti-inflammatory activity. As such the sunshine vitamin *"may suppress the cascade of destructive inflammation that occurs at the level of the retinal pigment epithelium–choroid interface in early stages of AMD"*, they added.

The study was supported by the National Institutes of Health and by Research to Prevent Blindness. It was part of the Carotenoids and Age-Related Eye Disease Study, an ancillary study of the Women's Health Initiative.

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Stress Suppresses Gut Bacteria, Immune Health

April 12, 2011 Food Product Design

COLUMBUS, Ohio—Stress can harm good intestinal bacteria and overstimulate the human immune system; however, the exact mechanism by which stress interferes with bacteria has not been identified, according to a new study published in the journal *Brain, Behavior and Immunity*.

Researchers at Ohio State University conducted a series of experiments on mice to understand the role bacteria play in immune balance. For two hours daily for six days, an aggressive mouse was placed in a cage of a group of more docile mice. At the end of the string of experiments, blood samples were taken from both stressed animals and matched mice from a control group, along with samples of material from inside each animal's intestine. Blood samples were analyzed to detect the levels of two biomarkers used to gauge stress—a cytokine called interleukin-6 (IL-6) and a protein called MCP-1—that summons macrophages, or scavenger cells, to the site of an infection. From the intestinal samples, the researches determined the relative proportion of at least 30 types of bacteria residing there.

Compared to the control mice, the stressed animals showed two marked differences. The proportion of *Bacteroides* fell by 20 percent to 25 percent, while *Clostridium* increased a similar amount. Levels of the two biomarkers, IL-6 and MCP-1, jumped tenfold in the stressed mice, compared to controls.

The researchers then treated stressed mice with broad-spectrum antibiotics that could kill as much as 90 percent of the intestinal bacteria for a short period. When they examined the two immune biomarkers in the stressed mice, they saw only a doubling of IL-6 and MCP-1—an increase only one-fifth.

"We know now that if we knock the population of bacteria down with antibiotics, we don't have the same innate immune response," the researchers said. "That showed that the bacteria are involved in the ability of stress to prime the innate immune system."

The findings suggest some of the changes in systemic immunity in the body can be influenced by changes in these bacterial colonies, a result that reinforces the idea that they have a broader effect on the immune response.

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Green Tea Boosts Bone Health in Women

April 11, 2011 Food Product Design

WASHINGTON—Drinking four to six cups of steeped green tea daily coupled with an exercise regimen improves bone health and reduces inflammation in postmenopausal women, according to new research presented at Experimental Biology 2011 on April 10.

Researchers at the Laura W. Bush Institute for Women's Health at the Texas Tech University Health Sciences Center investigated the potential for green tea to work synergistically with tai chi in enhancing bone strength. They conducted a 6-month double-blind, placebo-controlled, intervention trial that involved 171 postmenopausal women with a median age of 57 who had weak bones but not full-fledged osteoporosis. The subjects were divided into four groups—placebo and no tai chi; green tea polyphenols (GTP) (500 mg/day) and no tai chi; placebo and tai chi (3 times/week); and GTP and tai chi.

Women who consumed a level equivalent to about four to six cups of steeped green tea daily and participated in tai chi showed enhanced markers of bone health by three and six months. They also had increased muscle strength at six months. The finding suggests green tea and tai chi may help reduce the underlying etiology of not only osteoporosis, but other inflammatory diseases as well.

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Apples Lower Bad Cholesterol in Women

April 13, 2011 **Food Product Design**

WASHINGTON—Eating an apple a day may provide long-term cardioprotective effects in postmenopausal women by lowering levels of bad cholesterol and improving levels of good cholesterol without causing weight gain, according to new research presented April 12 at the Experimental Biology 2011 annual meeting.

Florida State University researchers randomly assigned 160 women ages 45 to 65 to one of two dietary intervention groups—one received dried apples daily (75g/day for one year) and the other group ate dried prunes daily for one year. Blood samples were taken at three, six and 12 months.

After six months, women who ate an apple every day experienced a 23-percent decrease in LDL cholesterol and had lower levels of lipid hydroperoxide and C-reactive protein.

The extra 240 calories per day consumed from the dried apple did not lead to weight gain in the women; in fact, they lost on average 3.3 pounds. The researchers noted part of the reason for the weight loss could be the fruit's pectin, which is known to have a satiety effect.

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Food Science & Industry News

Taste still trumps health for functional food acceptance: Survey

By Nathan Gray, 25-Mar-2011 from Nutra Ingredients Science & Nutrition Reseach

The study, published in *Journal of Functional Foods*, found that an informed food choice regarding nutrition content from 'health claim' labels is only one aspect of several when consumers choose foods; noting that taste and price are still commonly identified as the most influential factors.

The authors, led by Fiona Lalor from University College Dublin, Ireland, also found that consumer food choices are heavily influenced by the trustworthiness of any related health claim.

"About half of the participants declared that they would trust big food companies to give them accurate information about their products and about one third said that they trusted family/friends as a source of information on the topic," said Lalor and her colleagues.

They added that consumers also *"had a sense of comfort"* with products they are familiar with, which leads to lack of change towards new products on the market.

"Given that many products that make health claims are relatively new to the market place, this suggests that consumers may be slow to try them also," said the authors.

Healthy diet

Lalor and her co-workers explained that consumers are becoming *"increasingly concerned with the foods they eat and the impact they have on their health."*

To address this, the food industry has developed an extensive selection of foods that make 'health claims': to reduce disease risk, or to improve/maintain health, for example.

Such 'functional foods' are designed to be consumed as part of a regular diet, *"but have a health benefit with a clear, nutritional basis,"* said the authors.

They added that whilst there can be *"professional scepticism"* about the role of these products on the market place; *"it is clear that the consumer is showing increasing interest in the purchase of products which could provide solutions to dietary problems or go some way towards preventing problems before they arise."*

Study details

The researchers oversaw a series of five focus groups, involving 35 female consumers, finding that taste, price and packaging were most frequently cited as 'reasons to purchase'.

They added that many were more inclined to buy a product if there 'was an offer on' and the product was reduced in price, whilst *"participants were not prepared to purchase foodstuffs if they did not 'taste good', irrespective of health or any other issue."*

Lalor and co-workers found that health claims do influence purchasing habits in older populations (over 55 years old), and reported that people are more positive towards health claims when a friend or relative suffers from a related condition.

"Participants seemed more inclined to have a positive attitude if they were attempting to reverse a health issue, i.e., reduce cholesterol …but if the claim was non-specific e.g. improves your immunity, they were less inclined to believe it," explained the authors.

As part of the discussions, participants were also asked whom they most trusted as sources of information and advice on foodstuffs that made health claims.

The researchers found that for some participants' familiarity with a long-standing brand *"encouraged them to trust the product"*, whereas for others a branded product produced by a multinational and available all over the world was less trustworthy and *"more likely to be motivated solely by profit"*.

"For these, more sceptical participants, there was a feeling that manufacturers were just using the claims as a 'marketing gimmick' and had limited scientific support," explained Lalor and her colleagues.

However, they noted that for those who trusted multinationals, a clear reason for the trust was that larger companies are in a financial position to conduct research *"and therefore their claims were more credible."*

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Multi-layered microencapsulation systems keep the flavour

By Lynda Searby, 25-Mar-2011 from Food Navigator

Two-layered emulsions were found to increase the retention of volatile flavours during spray drying, according to researchers from the University of Bourgogne.

The study, which has been accepted for publication in *Food Chemistry*, looked at whether a multi-layer pea protein isolate-pectin complex was more effective than a pea protein isolate coating alone at protecting oil droplets from flavour loss.

One of the most common techniques for producing flavours is to create an oil-in-water emulsion to encapsulate the flavour molecules, then spray dry the emulsion to produce an easy-to-work-with powder.

"The incorporation of hydrophobic volatile food flavour molecules into dry powders is of great interest to the food industry, since microencapsulation improves the chemical stability of food flavours and provides controlled release," wrote the researchers.

However, the high temperatures used for spray drying can lead to the loss of volatile molecules. The retention of volatile flavouring esters during spray drying has been shown to be largely dependent on the stability of emulsion droplets and the ability of the droplet walls or 'membrane' to protect the encapsulated ingredient and control its release.

In recent years, several scientific studies have investigated the use of multi-layer emulsions for stabilising oil-in-water emulsions. Multi-layer emulsions are composed of small oil droplets dispersed in an aqueous medium, and each oil droplet is surrounded by a multi-layered membrane generally composed of an emulsifier and a charged biopolymer.

Flavour protection

The aim of this study was to determine whether multi-layer coatings can be used to improve the flavour protective properties of pea protein coated oil droplets.

Pea proteins and pectins are electrically charged biopolymers. The same group of researchers had previously used them to produce stable mono and multi-layer emulsions, and had found them to improve the stability of oil droplets to ageing, pH changes and spray drying versus those droplets coated by a protein single-layer membrane.

In the current study, oil-in-water emulsions were created using three flavour compounds: ethyl acetate (EA), ethyl butyrate (EB), and ethyl hexanoate, one with and one without pectin. Two samples of the oil-in-water emulsions, one with and one without pectin, were then dried in a spray-drier.

The results showed that when pectin was used as an additional oil droplet coating, flavour retention increased significantly, and that the beta-sheet structure was protected by the presence of pectin.

"This protective pectin effect against heat-induced loss of the beta-sheet structure could be used to partly explain the high retention during spray-drying of flavour compounds in oil droplets coated by two-layered interfacial membranes of pea protein and pectin," wrote the authors.

Take home

In summary, pectin was able to improve the physical integrity of emulsion oil droplets during spray drying - improving both droplet stability and flavour retention.

"Engineering the interface of oil in water emulsion droplets with biopolymers that modify its permeability could provide a novel technique to improve flavour retention in dry powders," concluded the researchers.

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70% Milk Protein Crisps

March 29, 2011 from Food Product Design

Zumbo River Brand introduced a 70% milk protein crisp to its line of whey protein crisps. The crisps are made using a proprietary extrusion process and feature all the nutrients of milk protein. The texture and composition is ideal for a variety of applications, including protein bars and cereals. Milk protein isolate (MPI) is the purest form of protein, according to the American Dietetic Association. It contains very little fat, carbohydrates or lactose and can be used as a daily supplement for those who do not consume the recommended amount of protein in their diet. Although milk protein isolate is a derivative of milk, the Mayo Clinic website finds that it may be beneficial for those who are lactose intolerant. MPI is a slow release protein which wards off hunger and aids in the maintenance of lean muscle.

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Consumers Crave Bigger, Bolder Flavor Combinations

March 24, 2011 **From Food Product Design**

Market research publisher Packaged Facts and the Center for Culinary Development released its “Extreme & Edgy Flavors: Culinary Trend Mapping Report" that reveals consumers want more from their culinary experiences, including bigger and bolder flavor combinations that deliver exciting new sensory experiences.

Using their signature 5-stage Trend Mapping® technique CCD and Packaged Facts identified seven emerging and accepted flavors from three primary sources that are transporting consumers to new flavor places.

1. *From the Wild.* Fine-dining chefs are playing with two new ingredients found in forests and along water banks.

- Aromatic Douglas Fir tips are adding delicate, citrusy and woodsy flavor to meats, sauces, cocktails and desserts.
- Sea Buckthorn, a noted superfruit and common ingredient in Chinese medicine, provides a tangy punch and bright orange color to sauces, cocktails and beverages.

2. *From Global Cuisine.* Foreign ingredients are finding their way to more places across the U.S. food landscape, bringing their extreme and edgy flavors with them.

- Exotic Japanese Yuzu, a variety of lime, has a distinctive floral, tart flavor that chefs and mixologists are applying to Japanese and other fine dining cuisines as well as cocktails, marinades and sauces.
- Puckery Tamarind, found in Latin, Indian and Southeast Asian foods like Pad Thai, hides out in many common condiments but is being used more openly in chutneys, simmer sauces and beverages.
- Chocolate and Chile, an age-old combination in Latin America, has moved up the Trend Map® and is now appearing in brownie mixes, women’s magazine recipes and popular lines of chocolate bars, adding warming heat to beloved chocolate.
- Wasabi has become mainstream, evolving from a sushi accompaniment to being a full-fledged flavor profile for snacks, condiments and more.

3. *From the Past*. Bitter flavors have traditionally dominated in medicinal foods due to barks, roots and herbs used to heal. These same ingredients flavor Cocktail Bitters, Italian Amari aperitif spirits and Bitter Beers, all popular today in bar and cocktail culture, and a sign of consumers accepting bitter flavors more easily.

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Mothers Pass on Their Taste for Sugar, Fat

March 23, 2011 **From Food Product Design**

Infants whose mothers consume excessive amounts of high-fat, high-sugar foods when pregnant or breastfeeding are likely to have a greater preference for these foods later in life, according to a new study published in the ***FASEB Journal***.

The findings of the animal study suggests the high-fat and high-sugar diet leads to changes in the fetal brain's reward pathway, altering food preferences.

Researchers at the University of Adelaide studied two groups of rats that were either fed standard "rat chow" or a junk food diet made up of a selection of common human foods high in fat and high in sugar during pregnancy and lactation. After the baby mice were weaned, the pups from both groups were allowed to select their own diets from either the same range of junk food or the standard rat chow. Brains from some of the pups also were collected at different times after birth and measured for the levels of dopamine and opioids and the receptors that the chemicals act upon. They found the group of rats whose mothers had eaten the junk food diet had higher levels of the receptor for opioids after they were weaned. The group also chose to eat more of the fatty foods as compared to the pups whose mothers ate the standard rat chow.

"These results will help us to better help women about diet during pregnancy and breastfeeding for giving their infants the best start in life," said Beverly Muhlhausler, Ph.D., co-author of the study.

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Pizza research highlights challenges of salt reduction

By Paul Gander, 31-Mar-2011 Food Navigator

Research carried out by World Action on Salt and Health (WASH) underlines the high and yet inconsistent salt levels in pizzas worldwide, even from the same brandowner.

WASH, a global network consisting principally of public health experts, conducted the research to coincide with last week's World Salt Awareness Week. It examined salt and sodium content in over 500 pizza products, including those from the larger brands such as Pizza Hut, Domino's, Eagle Boys and Papa John's, sourced both from their own outlets and other retailers.

"It would be a fantastic opportunity for multinational brands like this to implement global salt reduction policies," said Katharine Jenner, campaign director at the UK's Consensus Action on Salt and Health (CASH), part of the WASH network. *"It's been recognised by the World Health Organisation that this is one of the major ways in which the impact of cardiovascular disease can be reduced. We need the larger brands to set an example internationally – one that will then filter down to the smaller national brands."*

But sodium levels were highly inconsistent, with a Hawaiian Pizza from Pizza Hut in New Zealand containing twice the sodium of the brand's same pizza in Canada.

Salt levels in the company's UK pizzas have also been reduced. As WASH project co-ordinator Clare Farrand put it: *"If Pizza Hut can provide the UK with lower-salt pizzas, why can't the rest of the world have them too?"*

Similar inconsistencies were uncovered in Domino's pizzas, with a US-bought Hawaiian pizza containing 0.97g sodium per 100g, compared with 0.4g per 100g in the UK.

In the UK, too, there were significant variations between brands. A Diavolo pizza from national chain Pizza Express was shown to have around three times the sodium of a Tesco's own-brand Mediterranean vegetable pizza.

A spokeswoman for Pizza Express said: *"We take salt content very seriously, and are one of the few high-street restaurant chains to have signed up to the UK government's Public Health Responsibility Deal, specifically the salt reduction pledge."*

According to WASH, some 40 UK-based organisations including the major retailers and brandowners such as Unilever and Nestlé have signed up to this pledge. But far fewer out-of-home brandowners have made the commitment.

Pizza Express explains that, while previous Food Standards Agency (FSA) objectives were couched in terms of individual products, with a 1.2g of salt per 100g target to aim for, the Department of Health is now aiming for a 1g of salt per person per day reduction on 2007 levels by the end of 2012.

The chain claims that one third of its classic pizzas meet the FSA's 1.2g of salt target. But the spokeswoman added: *"A lot of the ingredients used in specific pizzas – such as anchovies, olives and the cured meat in the Diavolo pizza reported by WASH – are naturally high in salt."*

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Study unravels effects of processing on food microstructure

By Nathan Gray, 28-Mar-2011 Food Navigator

The digestibility of foods like pasta – made up of starch in a protein matrix – may depend on the processing method, says new research that shows the importance of mixing on a finished product.

According to a new study published in *LWT - Food Science and Technology*, processed starch-protein foods *"can exhibit a variety of microstructures"*, which may lead to different mechanical properties and starch digestibility. However they said that a relationship between these parameters *"is yet to be resolved."*

"It has been observed that conditions during the development of a dough (e.g., mixing or shearing rates) yield different gluten microstructures, consequently different rheological properties of dough, but the relationship between this microstructure and the bioaccessibility of starch has received little attention so far," explained the authors, led by Javier Parada from the Department of Chemical and Bioprocess Engineering, Pontificia Universidad Católica de Chile, Chile.

"The study shows the importance of mixing and other process factors on the microstructure of foods containing starch dispersed in a protein matrix, hence, on their physical and nutritional properties," they added.

Starch structure

Parada and colleagues explained that different starchy foods (for example pasta and baked foods) elicit different glycemic responses. They explained that several factors have influence on how starch is digested, and therefore its glycemic response, adding that *"one of these factors is the food microstructure."*

"Basically, some starchy foods are composites of starch entrapped in a three-dimensional matrix of proteins or other biopolymeric material (such as fiber) … For example, it is argued that when starch is entrapped in a protein matrix, as in the compact structure of cooked pasta, this microstructure as well as the physical state of starch … may explain the differences in the in vivo and in vitro enzymatic susceptibility of starch," said the researchers.

They said that whilst native starch granules are *"hardly attacked by amylases"*, when gelatinized, they become digestible.

"In fact, starch granules may be present in some foods with different degrees of gelatinization which modulates the extent of the digestion of the starch," explained Parada and co-workers.

Furthermore, the type of matrix may affect the degree of gelatinization of starch, and thus affect the digestion process.

"The capability of gluten to influence the bioaccessibility of starch depends on the matrix that is formed and the degree of interaction with starch," said the authors.

Study details

The new research examined the effect of three processing factors (extent of mixing, cooking temperature and cooking time) on the microstructure of a model dough system consisting of potato starch, wheat gluten and water, and the *in vitro* digestibility of starch in the matrix as well as the relationship between microstructure and starch digestibility.

Parada and colleagues observed that the extent of mixing of the dough determined the structure, which in turn, explained differences in *in vitro* digestibility of the cooked products.

They said found that higher degrees of mixing promoted a higher disruption of the gluten matrix by starch, *"hence the matrix would be weaker to external forces, and then the accessibility of digestive enzymes would be higher."*

"A higher level of mixing of the model dough resulted in starch granules more uniformly dispersed in the gluten matrix, a softer cooked product that was ruptured at a lower strain and stress, and more rapidly available glucose after in vitro enzymatic analysis, suggesting a weaker matrix where enzyme accessibility to starch was facilitated," reported the authors.

They added that the degree of gelatinization, and mechanical properties, of cooked products were also affected by cooking temperature and time, however the *in vitro* digestibility of starch was only affected by cooking temperature.

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'Mouthwatering' sensation not linked to hunger or food images, says study

By Nathan Gray, 28-Mar-2011 Food Navigator

Feelings of hunger, or food associated images, do produce 'mouthwatering' sensations, or increase saliva flow, in the same way that the smell or taste of food does, according to new research.

The study, published in *Journal of Texture Studies*, tested the salivary response of human volunteers to a number of stimuli that have been reported to produce 'mouthwatering' sensations, such as food associated imagery, or feelings of hunger.

The authors explained that the concept of 'mouthwatering' is often used to promote or sell a food product, however *"the physiological basis of this response is unclear."*

"Unlike animals, and in particular Pavlov's dogs, humans are not able to salivate at the thought of food … [However] *in agreement with several studies there was no statistical increase in … salivary flow rates in response to visual images of food,"* said the authors, led by Dr Guy Carpenter from the Salivary Research Unit, at Kings College London Dental Institute, UK.

"One potential criticism of purely visual images of food is that the brain is not convinced that it will receive the food and therefore, no mouthwatering would occur … Certainly during these experiments, none of the subjects said they experienced a 'mouthwatering' sensation while viewing the images," added the authors.

Pavlov's people?

Dr Carpenter and colleagues explained that the *"'mouthwatering sensation' is a common phenomenon thought to occur … at the suggestion of food."*

Famously the Russian researcher Ivan Pavlov conditioned dogs to salivate at the sound of a bell, as the dogs had learned to associate the sound with food. However, the authors said that there are few reports of similar 'conditioning' in humans.

"Previous studies conflict as to whether humans have a conditioned reflex to the sight or thought of food despite being well established in other animals," said the researchers

"Despite its perceived universal occurrence, there appears to be little physiological basis for the phenomena," they added.

It has been suggested the sensation is an increased secretion of saliva released from glands, whilst others believe that it is purely the perception, or a greater awareness, of saliva that is already present in the mouth, explained the researchers.

The new study investigated whether a *"psychic"* salivary reflex exists, by comparing major salivary gland responses to visual stimuli and the handling of foods to other stimuli known to cause saliva secretion.

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A Natural Food Dilemma

April 5, 2011 Food Product Design -*Lynn A. Kuntz*

One of the hottest food-industry trends is the increased interest in products that can be called natural. While the analyses behind the trend could go into innumerable pages, the general consumer perception is that natural foods and beverages and natural ingredients are in some way better: better for your health, better tasting, better quality, better for the earth or better because they hearken back to simpler, better times. Context Marketing recently surveyed 600 more-affluent U.S. consumers to determine which nonhealth product claims were most important in grocery and restaurant products: 57% said they were concerned about safety (the highest-ranking issue), while 50% said a natural label was important.

So, the industry faces a formulation dilemma. What exactly is "natural"?

Organic is definitely a subset of natural. Organic has a very clear definition in the USDA's National Organic Program (NOP). However, the Context survey found "organic" is ranked lower in importance (35%) than natural, and the market bears that out. After nearly a decade of double-digit growth, organics have stalled to a modest 5% rise—and that's on perhaps 5% of the total food market. For three years running, the percentage of U.S. consumers purchasing organic products has held steady in the 38% to 39% range, reports TABS Group, Inc. In our recessionary world, the organic upcharge is a significant issue. Plus, despite the NOP rules, many consumers don't understand organic, and it may even carry the baggage of being too elite, especially given the oft-referenced organic and natural grocer "Whole Paycheck."

Could it be green? Products that affect social, environmental and sustainability issues, like fair trade–certified items, appeal to the socially conscious consumer and are becoming more popular. Sales of U.S. food and nonfood fair-trade products in 2009 reached $1.2 billion, with ready-to-drink coffee and tea products growing by 39%, according to Fair Trade USA and SPINS. But "greenwashing," falsely portraying or overestimating a positive environmental impact, seems prevalent, and fewer than 50% of consumers "don't know how to verify a company's claim that they're 'green,' and that number has declined compared to 2008," according to Mintel.

According to a recent survey of 1,000 natural product consumers by Mambo Sprouts Marketing, 34% were either "not very" or "not at all" confident in current natural labeling, and 65% were very interested in a uniform standard to certify natural products—including ingredients and processes—that are labeled as "natural." Such standards would also be helpful to the product designer to aid ingredient selection. Are only plant- and animal-based products natural? What about the processes used to make various ingredients, including chemical, physical and enzymatic reactions? Just look at the current sweetener controversies to see the tangled web of perceptions, claims and facts.

However, it's hard to see that any standards other than the FTC's "false and misleading" stricture and the definitions that currently apply to meat and flavors will be coming soon. Who will be willing to untie that particular Gordian knot?

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Whey Protein Improves Gluten-Free Bread

March 31, 2011 Food Product Design

WAGENINGEN, The Netherlands—Researchers at Wageningen University have discovered a novel method for making gluten-free bread using mesoscopically structured whey protein. The result is a light and fluffy gluten-free bread with a crispy crust that looks similar to real bread, according to new research published ahead of print in the *Journal of Cereal Science*.

The use of the meso-structured protein is based on the hypothesis that the gluten structure present in a developed wheat dough features a particle structure on a mesoscopic length scale (100 nm to 100 μm). Whey protein particles were prepared by cold gelation of soluble whey protein aggregates during phase separation. The addition of a 2.4% whey protein particle suspension to wheat starch resulted in a dough that could be baked into a leavened bread with a specific volume up to 3.7 ml/g and a bubble size comparable with a normal bread. The relevance for structuring the whey protein into mesoscopic particles was confirmed by tests in which only a

homogeneous whey protein gel or a whey protein solution was used. The protein particle system gave better results after proving and baking compared with these systems.

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Natural Heat-Stable Red Color for Meat Applications

March 30, 2011 Food Product Design

MARKOVCI, Slovenia—Vitiva introduced Bright'nRED HS, an all-natural, heat-stable red color for meat applications. Bright'nRED HS is based on proprietary extracts designed to replace the carmine color. Bright'nRED HS is based on a specially stabilized beetroot extract giving it differentiating product features. By mixing a specific spice extract with beetroot, Vitiva succeeded in matching the exact characteristics of carmine in terms of hue, heat and light stability in various meat products.

"There are certain factors a manufacturer should take into consideration when using the carmine color," explained Ohad Cohen, CEO of Vitiva. "The result of the extraction and of the chemical process involved in the making of the carmine color is a color that is not a 100% natural and recently, the FDA required food manufacturers using carmine to label it namely as 'carmine color' instead of being non-specific as before, mainly due to the potential risk carmine poses as a food allergen. Bright'nRED HS is 100% natural, non-allergenic vegetarian color offering clean label solutions."

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The whole foods movement: 'Age of the unthinkable' for processed foods?

By Caroline Scott-Thomas, 05-Apr-2011 Food Navigator

American consumers are rejecting processed and functional foods and embracing whole foods – and industry needs to react with innovative formulation, according to a presentation at the recent Nutracon conference.

Speaking at the Nutracon conference in Anaheim, California last month, CEO and president of Blue Pacific Flavors Donald Wilkes said that the future of food formulation lies in clean labels and nutritious, whole food ingredients. Wilkes predicts that concern about food from farm to table will intensify, as part of what he calls 'the whole foods movement'. And he suggested that with an increased interest in whole foods and whole ingredients, the supplements industry could also find itself in a difficult position.

"The processed food industry, and anything that has a functional ingredient, is under question from consumers right now, and it's not going away; it's only going to get bigger," Wilkes said. *"…I think today is the age of the unthinkable for the processed food industry, unless the industry reacts."*

Think simple

He urged food manufacturers to move toward simpler products, and to communicate health benefits of foods and supplements within the context of a whole-food based, balanced diet, and an exercise regime.

"So many food manufacturers want to put structure/function claims on food products these days, but it is a barrier to consumption," he said. *"People don't want their diet to be a medicine chest…If you want to talk about health benefits, talk about them as part of health and wellness, rather than death and disease."*

Wilkes said that the large number and broad scope of food and supplement recalls in recent years has been a major factor behind consumers' move back toward whole foods, spurring fear of the processed food industry. Despite the recent passage of the Food Safety Modernization Act, fear of processed foods and food ingredients is not going away any time soon, he said.

Another major driver of the whole foods movement has been consumer advocacy via the internet, Wilkes said.

"The internet is the pulpit for whole foods," he said. *"It educates, but it also misinforms."*

Whole food creativity

Nevertheless, the general model that is emerging for healthy eating is about going back to basics, with whole, healthy foods, colorful plant foods and nutrient-dense foods.

"Companies, even in the ingredients business, can invent…There are ways to deal with it but it needs a certain amount of ingenuity and creativity."

Wilkes cited successful and innovative food brands that have managed to find a way to capitalize on the whole foods focus, including Häagen Dazs, Minute Maid Simply Orange, and Mamma Chia whole chia seed beverage.

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New enzyme aims to take the haze out of iced tea

By Guy Montague-Jones, 04-Apr-2011 Food Navigator

Biocatalysts has launched a new enzyme that it claims can remove haze in iced tea products without affecting flavour.

Biocatalysts claims adding its enzyme to tea extracts reduces cloudiness without reducing flavour

The Welsh enzyme producer said its new product, Tannase 759P, has a number of useful applications in the beverage sector.

Tannese 759P can be employed in wine making, brewing, juice production and coffee drinks - whenever removing the undesirable effects of tannins is needed.

But Biocatalysts said the ingredient is especially useful in the production of iced tea products where it can be used to reduce haziness.

Cloudiness problem

The company said that during infusion, tea becomes cloudy due to the interaction of proteins and polyphenols. Non-enzymatic methods tend to use heat to prevent this happening but that can affect flavour.

Biocatalysts claims that Tannese 759P works instead by hydrolysing the tannins in the tea, overcoming the cloudiness problem without affecting flavour.

Explaining the science at work, a spokesperson said: *"Tannase has the catalytic activity to remove gallic acid moieties from tannins and the polyphenols from tea extract, avoiding the precipitates formation while maintaining the original flavour of tea."*

Enzymes have been used for some time in the tea industry for various purposes related to colour, clarity, cold water solubility, flavour and yield.

Biocatalysts said examples of enzymes used in tea processing include cellulases, pectinases, hemicellulases and tannases.

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Taste cells may work together in 'circuit', suggests review

By Nathan Gray, 12-Apr-2011 Food Navigator

Taste cells may not work individually, like other sensory cells, but together in a circuit that produces a wide array of receptors and transmitters, according to a new review.

The study, published in *Flavour and Fragrance Journal*, reviews the structural and functional diversity of taste cells in the mouth; noting that unlike other sensory cells, such as hair cells or rods in the retina, taste cells differ from each other in terms of structural features. The diverse structures and functions of taste cells found in a taste bud has led researchers to suggest a circuit-based model of taste reception and signalling.

The research may help to provide models that fully understand how tastes are detected and interpreted in the mouth.

"At least three main morphotypes [structurally different types] *are now recognized in mammalian taste buds…Each of them displays specific membrane properties (i.e. ion channels and receptors) as well as intracellular signalling pathways,"* explained the researchers, led by Professor Albertino Bigiani from the Università di Modena e Reggio Emilia, Italy.

The reviewers explained that this poses the question: *"What is then the significance of these three cell types in the context of taste reception?"*

"Although it is not yet possible to draw any definitive conclusion, the emerging view is that functional diversity of taste cells might represent the basis for a 'sensory processing' circuitry designed to detect chemicals, as a whole," they explained.

Taste cells

In recent years, many laboratories have attempted to make sense of the molecular mechanisms that are essential to the ability of taste cells to detect chemicals and to communicate the relevant information to the brain.

Although this research has revealed new data on taste, many aspects of taste cell biology are still *"waiting for an explanation,"* noted Bigiani and colleagues.

One problem is that taste cells do constitute a 'homogeneous' population, as is the case for other sensory receptors: *"Observations clearly indicate that taste cells share similar gross morphology (elongate cells with apical process), yet they differ for many structural features,"* said the researchers.

At least three different cell morphotypes are recognized in mammalian taste buds (Types I, II, and III). Bigiani and co-workers said that differences in structural features *"raise an obvious question: do taste cell morphotypes correspond to functional categories?"*

Review details

"During the last 10 years, by using a combination of different techniques, […] major breakthroughs have been obtained for understanding the functional roles of cell morphotypes in mammalian taste buds," said the authors.

Bigiani and colleagues explained that taste cells are diverse in terms of structure, expressed proteins, and functional properties.

"Functions are somehow segregated inside the taste buds, and it is possible to put forward a working model for the operation of this sensory organ," they said.

"Of course, this model is not a definitive one … In particular, it is not yet clear if this model works also for the detection of the other two taste quality, sour and salty," said the reviewers.

"Even if it is not yet possible to draw a definitive scheme of taste bud functioning, it is tempting to speculate that likely a basic motif of 'sensory processing circuitry' exists in mammalian taste buds, involving segregation of some principal functions to specific taste cells subsets," they added.

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Micro-particles may help to overcome high-protein formulation problems: Study

By Nathan Gray, 07-Apr-2011 Food Navigator

A robust procedure for preparing micro-particles with high protein content may help to produce novel protein rich foods, according to a new study.

The research, published in *Food Hydrocolloids*, investigated a method for producing protein micro-particles using a two step emulsification process. The methods allow the use of various protein sources and concentrations for the particle 'inside', and various stabilizers for use on the particle surface.

The authors, from the department of agrotechnology and food sciences at Wageningen University in The Netherlands, said that using a prefabricated protein structure may help to create products with better sensory properties, and to overcome problems such as proteins sticking together (aggregation) when formulating novel products.

"We have shown that high protein micro-particles, as a possible structure element, could be prepared using a process based on two-step emulsification," said the authors, led by Paul Venema assistant professor at Wageningen.

"Besides the use as a food ingredient, these particles could be useful also for other applications such as encapsulation and controlled release," they added

Protein power

Research has indicated that food products with increased protein content have important health benefits, including strong satiating effects that may be of use for weight control.

Previous studies have also emphasized the importance of proteins in the diets of elderly; is has been suggested that protein intake larger than the recommended dietary allowance (RDA) may help against chronic loss of muscle mass – an important aging-related disease.

However, proteins do not just have nutritional value in foods, but are also important because of their contribution to structure and texture.

As a result of heat-induced protein aggregation, several problems related to food structure and texture may occur in protein enriched foods, said the authors.

"The development of stable and consumer appealing protein-rich foods is a challenging field, in which unwanted protein aggregation plays a prominent role … Current knowledge on protein aggregation in concentrated protein systems, and on ways to control and prevent it, is very limited, hampering development of successful high protein food products," said Venema and his colleagues..

"Ideally, one would like to be able to control the protein content of foods independently from the other important attributes such as sensory properties and stability … A possible route to achieve such uncoupling of protein content from the effects of proteins on structuring is to use prefabricated "protein structure elements". An example to such structure elements can be dense protein micro-particles," they explained.

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Monk fruit sweetener starts to attract big guns in US food market

By Elaine Watson, 08-Apr-2011 Food Navigator

A raft of new food and drink products containing an intense natural sweetener from monk fruit (luo han guo) could hit shelves in the United States this year, according to the New Zealand-based firm driving its commercialization.

While a search of Mintel's Global New Products Database (GNPD) could only identify five US products featuring the fruit concentrate, several of the nation's biggest food manufacturers have requested samples, with many looking to combine it with stevia in a bid to capitalize on its all natural credentials, Paul Paslaski, vice president sales & marketing USA, at monk fruit processor BioVittoria, told FoodNavigator-USA.com.

"We'd be hard pressed to name a major company in the US food sector that hasn't sampled it now, but there is only so much we can make public right now. What I can say is that some of the major food companies are working with our Fruit-Sweetness product so we are hopeful that there will be several launches this year."

Fruit is trusted by consumers

He added: *"The most interest right now is in dairy, juice drinks, and waters. There is also however considerable interest in soft drinks, cereals, biscuits and confectionery including gum. It is a fruit, and has a clean sweet taste. The most compelling advantage over Reb A [from stevia] is that Fruit-Sweetness does not have the lingering bitterness characteristic of Reb A.*

"Manufacturers like the fact that it is from a fruit. Our research also shows that moms trust a sweetener from a fruit."

Around 150 times sweeter than sugar, Fruit-Sweetness secured a letter of no objection from the Food and Drug Administration in January 2010 affirming its Generally Recognized As Safe (GRAS) status as a sweetener and flavor enhancer in a wide range of foods and drinks.

The fruit concentrate, which is heat- and acid-stable and soluble in water, does not have the *"bitter off notes*" associated with some other sweeteners, claimed Paslaski *"We have seen benefits in blending Fruit-Sweetness with Reb A which reduces the Reb A lingering bitterness and gives a more sugar-like sweetness profile without having to use erythritol."*

As for the price, a lot depended on acidity, he said. *"In a neutral pH product like a chocolate milk you get a tremendous amount of sweetness, which makes it very cost effective. In a more acidic application, you'd need to use more but in combination with stevia it can work out to be very cost effective here too."*

According to Mintel's GNPD, new US launches containing monk fruit concentrate include two cereals from Kashi, a whey protein meal replacement drink from Biochem, Fruity Dophilus probiotic drink mix sachets from Enhanced Nutrition Concepts and a table top sweetener from Swanson Health Products.

Scott Martling, global business development director at product development firm the International Food Network, predicted a lot of interest in the US given that demand for natural sweeteners in general was "*skyrocketing*". Consumers, meanwhile, had "*come to expect low sugar products that are also natural"*.

Growing interest in Europe

While luo han guo is not yet approved for use in Europe (BioVittoria is "*working towards a regulatory submission for the EU*"), food manufacturers have already approached experts at UK-based firm RSSL keen to experiment with samples in the event that it does get the regulatory thumbs up.

Fruit-Sweetness is produced via a patented process from fruit cultivated using BioVittoria's patented plant varieties.

The intensity of the sweetness in the extracts is directly proportional to levels of a compound called Mogroside V in the flesh of the fruit.

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Food Safety & Regulatory News

Ready-to-eat meat products low in carcinogens: Study

By Emma Edwards, 24-Mar-2011 from Food Navigator

Published in Meat Science, the study investigated the amount of heterocyclic amines (HCAs) in a number of commonly consumed RTE meat products. Found in meat that is fried, grilled or cooked at high temperatures, HCAs are carcinogenic compounds which have been found to increase the risk of stomach, colon and breast cancer when consumed in large amounts.

From the eight RTE meat products selected by the research team at Kansas State University, pepperoni had the least HCA content (0.05 ng/g), followed by hot dogs and deli meat products (0.5 ng/g). However, fully cooked bacon (1.1 ng/g) and rotisserie chicken meat (1.9 ng/g) contained all five types of HCAs tested. Significantly higher levels of HCA were recorded for rotisserie chicken skin at 16.3 ng/g.

"These results can be used along with dietary assessments to estimate HCA exposure due to consumption of RTE meat products," concluded the research team.

Lower HCAs

The lower HCA content in some of the samples may be *"because of the higher water content in the ready-to-eat products. More moisture prevents many HCAs from forming."*

J Scott Smith, professor of food chemistry Kansas State University explained further; ""*Hot dogs and deli meat may have low HCA levels because they are manufactured at low temperatures."* He continued; *"The low HCA levels may also be from ingredients that are added to the meat and prevent HCAs from forming while the meat is cooking."*

Overall the amounts of HCAs in RTE products in this study compare favourable to the findings of studies into cooked meat products which reported concentrations of up to 35 ng/g in cooked beef and 330 ng/g in cooked poultry. These findings build on a previous study, carried out by Smith, which found that adding certain spices and marinades before cooking can reduce HCA content in cooked meat.

Study details

The study focused on eight types of RTE meat products; beef hot dogs, beef-pork-turkey hot dogs, deli roast beef, deli ham, deli turkey, fully cooked bacon, pepperoni and rotisserie chicken.

Each product was prepared as a consumer; hot dogs and bacon heated in a microwave, pepperoni on a pizza either oven cooked or microwaved, the chicken and deli meats used as purchased from a local store.

The meat was then analysed to determine whether it contained five different types of HCAs according to nanograms per gram (ng/g).

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FDA to Review Link Between Food Colors, ADHD in Kids

March 28, 2011 **from Food Product Design**

The U.S. Food and Drug Administration's (FDA) Food Advisory Committee will hold a public meeting March 30-31, 2011, to determine if there is sufficient evidence to establish an association between the consumption of synthetic color additives in food and hyperactivity in children. The committee will decide whether to recommend warning labels on foods with the coloring.

Last year, the Center for Science in the Public Interest (CSPI) sent a letter to FDA urging the agency to ban synthetic food coloring because scientific studies do not provide convincing evidence of safety, but do provide significant evidence of harm.

According to a background document released prior to the Food Advisory Committee meeting, FDA's review of published literature concluded that a causal relationship between exposure to color additives and hyperactivity in children in the general population has not been established. However, for certain susceptible children with Attention Deficit/Hyperactivity Disorder and other problem behaviors data suggests their condition may be exacerbated by exposure to a number of substances in food, including, but not limited to, synthetic color additives. Findings from relevant clinical trials indicate that the effects on their behavior appear to be due to a unique intolerance to these substances and not to any inherent neurotoxic properties.

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Denmark warns over online sports supplements

By Jess Halliday, 01-Apr-2011

The Danish Food Administration has issued a warning on a range of sports and nutritional supplements sold on Swedish- and Gibraltar-registered website, as it says they contain substances that may affect the central nervous system.

Sublimsport.dk and Sublimsport.com offer a wide range of supplements, many of which are said to originate from well-known brands. However the Danish regulator has identified the presence of Tribulus terrestris L, Huperzin A, or the combination of caffeine and synefrin in some, which it says may affect the central nervous system, as well as cause other ill-effects.

Tribulus terrestris L, for instance, can also affect the liver, while Huperzin A can cause acute muscle tremors and incontinence, even in small doses. Caffeine and synefrin, meanwhile, may also cause cardiovascular disease and osteoporosis, the authority says.

This is not the first time the Danish Food Administration has warned about these substances. However although the websites – especially Sublimsport.dk – are aimed at Danish consumers, they are out of its jurisdiction since they are registered in other countries.

For its part Denmark operates a registration scheme for dietary supplements sold in the country, through which the products tested for illegal substances. It has a website listing registered supplements at www.altomkost.dk/Kosttilskud/forside.htm

The Swedish and UK authorities have been informed about the problem with Sublimsport websites but the issue highlights the problem of policing supplements sold via online channels. Such incidences can have a negative effect on the respectable side of the dietary supplements industry, even though they source with care and traceability.

NutraIngredients.com was unable to contact Sublimsport.com for a comment on how the substances came to be in the products and measures it will take, as the telephone number listed on the website did not work. No immediate response was received to an email enquiry.

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FDA Panel Opposes Warning Labels for Food Colors

March 31, 2011 Food Product Design

The U.S. Food and Drug Administration's (FDA) Food Advisory Committee on March 31 voted 8-6 against recommending warning labels on foods with synthetic color additives; however, the panel did call for more studies to determine if there is a link between food colors and hyperactivity in children.

As reported by *Reuters*, FDA will consider the committee's recommendations in the next few months and decide how to respond to the Center for Science in the Public Interest's request to either ban food coloring or mandate warning labels.

The International Food Information Council (IFIC) released a statement supporting FDA's decision: "It was not surprised by the FDA Food Advisory Committee's determination that artificial food colors do not cause hyperactivity in children. The scientific evidence currently does not show that food colors cause or exacerbate hyperactivity or other behavior problems in the majority of children."

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FDA Wants More Calorie Counts on Menus, Vending Machines

April 4, 2011 Food Product Design

The U.S. Food and Drug Administration (FDA) is seeking public comments on two proposed regulations regarding calorie labeling on menus and menu boards in chain restaurants, retail food establishments and vending machines.

The menu labeling rule proposed on April 1 applies to chain restaurants and similar retail food establishments. Consumers would see calories listed in restaurants and similar retail food establishments that are part of a chain with 20 or more locations doing business under the same name and offering for sale substantially the same menu items. Examples of these establishments include fast food establishments, bakeries, coffee shops and certain grocery and convenience stores. Movie theaters, airplanes, bowling alleys, and other establishments whose primary purpose is not to sell food would not be subject to this proposed regulation. The proposal also invites public comment on whether additional types of food establishments should or should not be covered by the new rule. A companion rule proposes calorie posting for food sold in vending machines.

The Affordable Care Act requires the disclosure of calorie and other nutrition information in certain food establishments and for certain foods sold in vending machines. Additionally, on menus and menu boards, statements would be posted concerning suggested daily calorie intake and indicating that additional nutrition information is available on request. Under the proposal, the information would be displayed clearly and prominently on menus and menu boards, including menu boards in drive-through locations; and for individual foods on display.

Under the proposed rules, operators who own or operate 20 or more vending machines would post calorie information for food sold in a vending machine, unless certain nutrition information is already visible on individual packages of food inside the machine.

State and local governments could not impose any different nutrition labeling requirements for food sold in restaurants, similar retail food establishments and vending machines covered by the federal requirements. Restaurants, similar retail food establishments, and vending machine operators that are not covered by the federal requirements could voluntarily register to be covered under the federal nutrition labeling regulations.

Comments on the proposed rule for menu labeling are due on or before June 6, 2011. Comments on the proposed rule on vending machines are due on or before July 5, 2011. Electronic comments can be submitted at www.regulations.gov. Written comments can be sent to Division of Dockets Management (HFA–305), Food and Drug Administration, 5630 Fishers Lane, Room 1061, Rockville, MD 20852. FDA plans to issue final rules before the end of 2011.

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European Parliament Narrowly Approves Health Claim for DHA and Baby Food

Source:Food Ingredients First 4/7/2011 ---

Proposals to allow producers to claim that adding the fatty acid DHA to baby food "contributes to the normal visual developments of infants up to 12 months of age" were backed by the European Parliament, when it rejected a move to block them.

DHA (docosahexaenoic acid) is a fatty acid naturally occurring in breast milk. Many baby milk formulas include it as a synthetic additive. Manufacturers applied for permission to make the health claim for DHA added to baby food, including follow-on formulae, for infants from 6-12 months.

The European Food Safety Authority (EFSA) gave a favorable opinion on the application, and the European Commission proposed to add the health claim "DHA intake contributes to the normal visual development of infants up to 12 months of age" to the list of permitted claims. Parliament has until 21 April 2011 to block the claim, if it so wishes.

In the vote, the resolution opposing the plan did not achieve the necessary qualified majority of votes (388), so it was not passed. The vote was 328 votes in favour, 323 against, and 26 abstentions. So in effect, the European Parliament has approved the plan, under which the health claim can be introduced.

The rejected resolution, drawn up by Glenis Willmott (S&D, UK), Daciana Sarbu (S&D, RO), Nessa Childers (S&D, IE) and Karin Kadenbach (S&D, AT) and tabled by the Public Health and Food Safety Committee for a plenary vote, said that there is no scientific consensus on the effect that DHA-fortified formulae has on infants, that more research is needed on the possible effects, both beneficial and harmful, of DHA supplements and that the health claim could be misleading.

To authorise a health claim, a strict procedure must be followed, including its addition to the relevant Annex of the "Regulation on nutrition and health claims". Parliament and Council may block such implementing measures under the "regulatory procedure with scrutiny". EFSA is responsible for assessing applications by food business operators and evaluates claims on the basis of "generally accepted scientific evidence".

The regulation on the authorisation of the health claim would enter into force 20 days after its publication in the Official Journal of the European Communities. Member States would have to enforce the relevant rules to prevent it being exploited in exaggerated claims to boost sales.

The consumer group,the European Public Helath Alliance (EPHA) said that "A strong political signal has been sent today to the European Commission on the question of the authorisation of health claims, with 328 MEPs supporting the objection to the DHA claim. EPHA welcomes the strong position taken by a majority of MEPs but regrets the lack of qualified majority needed in order to adopt the resolution."

Lacking scientific evidence, the rejection of the claim was strongly recommended by the World Health Organisation, UNICEF, health professionals, children, families, consumers' organizsations and others, the group claimed.

Monika Kosinska, EPHA Secretary General said "Despite the lack of qualified majority, MEPs have sent a strong message about the need to consider health claims very carefully. If marketing were not effective, companies would not invest in it. Therefore, we need to proceed very cautiously when authorising claims aimed at vulnerable groups".

MEPs also expressed concerns about the appropriate balance between industry interests and the public interest. Glenis Willmott MEP (S&D, UK), initiator of the Motion for a Resolution stated "It is particularly worrying that the European Commission has seemed resistant to even consider the very valid concerns that have been raised by health and medical organisation. The food industry has been lobbying very hard on this claim, not just in the European Parliament over the last few weeks, but targeting the European Commission and scientific establishment for years".

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Class action lawsuits set to 'explode' in health claims arena

By Elaine Watson, 01-Apr-2011

A potent combination of lawyers on the make, a rise in activism from consumer lobby groups and food manufacturers pushing the envelope with more aggressive health claims is set to prompt an "*explosion*" in class action lawsuits in the coming years, according to legal experts.

The Yo-Plus case was not prompted by FDA or FTC

Speaking to NutraIngredients-USA.com after General Mills lost its bid to derail a class action lawsuit over digestive health claims for Yo-Plus yogurts at the Eleventh Circuit Court of Appeals , Seattle-based attorney Ken Odza said lawyers that had made a fortune out of asbestos and pharmaceutical lawsuits were now turning their attention to the food industry.

Odza, who heads up the food liability practice at law firm Stoel Rives, added: *"I think these kind of cases are going to explode.*

"The Yo-Plus case is pretty unusual in that it wasn't prompted by an investigation by the FDA (Food and Drug Administration) or the FTC (Federal Trade Commission). Usually you see a warning letter rapidly followed by a class action piggy-backing off of that as half of the work has already been done."

Claims, immunity, kids ... and big pots of cash for lawyers?

Marc Ullman, a partner at New York-based firm Ullman, Shapiro & Ullman LLP, added: "*Without commenting on the specifics of this case, I'd say class actions in this area are becoming more common.*

"Firms that have some kind of interaction with the FTC or state regulators regarding claims almost inevitably then get a follow on from consumer actions like these, especially if they are high-profile companies making aggressive claims in areas such as immunity or kids."

Meanwhile, it was "*procedurally easier*" to file such suits in certain states, he added. "*California and New Jersey come to mind."*

And in many cases firms did a simple cost-benefit analysis and chose to settle, regardless of the merits of the suit, he said.

And the ultimate winners? Every case was different, stressed Ullman, but cynics might observe that "*these cases often end up being resolved with relatively low value coupons going to supposedly injured consumers and big pots of cash going to lawyers."*

Blame the overzealous marketing department?

However, Timothy Blood, managing partner at San Diego-based law firm Blood Hurst & O'Reardon and co-lead counsel for the Yo-Plus class action against General Mills, argued that overzealous marketing departments at food companies were to blame for the rise in legal action by "*pushing the envelope and making more aggressive claims than ever before.*

"I've been involved with more food false claims cases in the last couple of years than I've ever had in my career," said Blood, who has been involved in a clutch of high-profile prosecutions against food companies including Dannon and Wrigley.

"I don't know whether it is the bad economy that's making companies more aggressive or a lack of regulation by the FDA. General Mills claims Yo-Plus yogurts improve your digestive health but our contention is that the clinical studies it is citing to support this claim do not show that."

FTC resources limited

He added: *"The FDA has very little ability to do anything in this area, and they rarely exercise what little authority they have. The FTC has been more active in this area, however, because of resource limitations, they only handle a very small portion of false advertising matters.*

"I don't know if General Mills will settle but we're preparing to go to trial," added Blood, who said he was "*actively investigating and prosecuting a number of cases against food manufacturers relating to false advertising of food and drink products"*.

If things went according to plan, a trial date for the case – which was filed two years ago in Florida - was expected before the end of this year, he predicted.

General Mills, which is separately being prosecuted over cholesterol-lowering claims on its Cheerios breakfast cereals, said: *"As a standing practice, we don't comment on pending litigation."*

Making the case for a class certification

General Mills began marketing Yo-Plus –a yogurt supplemented with probiotic bacteria, inulin and vitamins A and D – on a digestive health platform in summer 2007.

The class action was filed in Florida in March 2009 on behalf of plaintiff Julie Fitzpatrick, who consumed 24 four-packs of Yo-Plus without discerning any improvement in her digestive health and argued that General Mills had violated the Florida Deceptive and Unfair Trade Practices Act by making false and misleading claims.

Her action noted that the National Advertising Division of the Council of Better Business Bureaus (NAD) had challenged some of General Mills' claims about Yo-Plus in December 2008, although it did leave the firm "*free to promote the fact that its product contains an ingredient which has been shown to help regulate digestive health*".

In January 2010, federal judge Paul Huck ruled that a class certification was merited.

General Mills immediately appealed on the grounds that shoppers all bought Yo-Plus for different reasons, at different times, at different prices, with different results, and could not be grouped together as a class.

However, the appeals court last week sided with Huck, marking an "*important victory that allows consumers to hold companies accountable for false advertising through the use of a class action lawsuit*", claimed Blood.

Spate of class actions

Dannon recently agreed to a settlement in a class action lawsuit prosecuted by Blood Hurst & O'Reardon involving its probiotic yogurts Activia and DanActive, while Wrigley agreed to cough up a large sum to settle a class action challenging claims made about its Eclipse fresh breath gum.

Wrigley said it stood by its science but settled *"to prevent further distraction to its business"*, while Dannon also admitted no wrongdoing in its settlement.

It was possible that the FTC was looking into Yo-Plus, but this was not revealed until such investigations were pretty advanced, noted Blood. *"By law they are forbidden from indicating whether they are investigating a company until very late in the process. So the FTC may be investigating General Mills, but we would not know that unless General Mills told us."*

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Nano-biosensors to boost detection of foodborne pathogens - research

By Rory Harrington, 01-Apr-2011

A nano-based biosensor that could be used for early stage detection of foodborne pathogens such as E.coli and salmonella is under development by scientists in the US.

Nano-based biosensor under development at Kansas State University

Researchers at Kansas State University are using carbon nanofibres (CNF) as part of the biosensors to detect the bacteria, an application which could have a huge take up in the state's huge meat processing sector, they said.

Jun Li, associate professor of chemistry, and doctoral student Lateef Syed, said they chose CNFs because they are able to form an array of tiny electrodes even smaller than bacteria and viruses. When these microbial particles are captured at the electrode surface, an electric signal can be detected.

The associate professor said the technology could be brought to market in around two years.

Work started at NASA

Prior to his arrival at the university in 2007, Li spent seven years at NASA Ames Research Center conducting research into nanotechnology. The current project is an extension of the work he began at the California site.

"The biosensors rely on an array of nanoelectrodes," he told FoodProductionDaily.com. *"We have a unique way of growing CNFs of ~100 nm in diameter vertically from a pre-patterned electrical circuit."*

He added the CNFs and the circuits underneath are encapsulated with silicon dioxide (SiO2) to provide electrical insulation and mechanical anchoring. Excess SiO2 is removed by mechanical polishing and reactive ion etching so only the very end of the CNF tip is exposed.

"This embedded CNF nanoelectrode array chip is then packaged with counter electrodes and reference electrodes in a microfluidic chip through which the sample solution can be passed through", said Li.

In-line monitoring

The team aims to calibrate the system to detect specific pathogens. The final system should be able to detect 1 bacterium in 100 mL water (the EPA standard) in less than an hour without going through polymerase chain reaction **(**PCR) or culture.

"A goal is to integrate this technology into a hand-held electronic device for pathogen detection so that we can use this device for in-line monitoring of water quality or food quality at industrial processing sites," said Syed. "*We have some preliminary results that indicate this technology is feasible."*

Li indicated there was flexibility in the way the technology was applied.

"For applications that do not need to push the detection limit, a simple handheld device can do the work.For applications requiring monitoring water quality in a manufacturing line, the sample collection module can be used which continuously concentrate water sample for automated detection," he said. *"For food processing, industry, other sample collection and preparation modules are needed before detection."*

The project was initially supported Canadian-based company Early Warning Inc., which provided the K-State research team with $240,000 for two years as part of the developmental work. Recently, the US Department of Homeland Security Center of Excellence for Emerging and Zoonotic Animal Diseases, or CEEZAD, have come onboard.

"Kansas is a leading state in meat production and the poultry industry," said Sayed. *"Any outbreak of pathogens in these industries causes huge financial losses and a lot of health risks. We want to prevent these outbreaks by detecting pathogens at an early stage."*

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EFSA sweetens industry with positive sugar replacement health claim opinions

By Shane Starling, 13-Apr-2011 Food Navigator

Intense and bulk sweetener suppliers are basking in the glow of positive sugar replacement health claim opinions issued by the European Food Safety Authority (EFSA) last week.

EFSA's Panel on Dietetic Products, Nutrition and Allergies (NDA) issued 442 health claim opinions, about 80% of which were negative, but nutrient replacement claims including sugars, fats and starches fared better than most.

The NDA found a host of sugar replacers worthy of dental and glycaemic response health claims, albeit with *"excessive consumption"* laxative warnings for the bulk (polyol) sweeteners.

An Ajinomoto spokesperson said: *"Given the benefits for everyone of maintaining a healthy weight, the challenges to public health of overweight and obesity, and the challenges to food and beverage manufacturers of producing sweet products that people enjoy while reducing the sugar content, being able to communicate the genuine benefits of products which replace sugar with low calorie sweeteners is important".*

Communications

Beneo Group vice president of regulatory affairs and nutrition communication, Anke Sentko, said ongoing communication efforts, which included the establishment of the Beneo Institute, had played their part in earning the positive opinions.

"That the role of functional carbohydrates in helping to maintain dental health as well as to follow a low-glycaemic diet was accepted by the panel is as we believe – next to the sound science – also a result of the intense explanatory work since 2009 and a finally constructive dialogue on all levels," Sentko said.

French supplier Roquette's global SweetPearl project manager, Valérie Le Bihan, concurred EFSA's opinion was a boon for sweetener suppliers.

"The positive opinion from EFSA is a real step forward in the recognition of the nutritional benefits of polyols," she said. *"It also comforts Roquette in our strategy involving many efforts in clinical studies on polyols and dental health."*

Caroline Sanders, global marketing and communication director at Tate & Lyle Specialty Food Ingredients, said: *"This confirmation is an important step to allowing Tate & Lyle's food and drink manufacturer clients to communicate the health benefits of our ingredients, in turn allowing consumers to make more informed purchasing decisions."'*

Comparative claims

Beneo said such discussions had led to an acceptance of 'comparitive claims', which EFSA had initially indicated would not permissable under the 2006 nutrition and health claims regulation (NHCR).

"It shows that a solution was found out of the trap of the 'comparative or replacement claims discussion' in which many macronutrients, like e.g. health beneficial carbohydrates, were caught since 2009 when EFSA raised an eligibility issue with these type of claims in the context of the NHCR," Beneo said.

"The Beneo Institute considers this evaluation as a step in the right direction for the whole Health Claim Regulation and will continue to explain those product health claims that are still pending."

The opinion

The NDA found sugar replacers can decrease tooth demineralisation if four foods-drinks are consumed daily to reduce plaque pH but not below 5.7. Xylitol, sorbitol, mannitol, maltitol, lactitol, isomalt, erythritol containing products must include *"excessive consumption may produce laxative effects"* disclaimer.

The same range of sweeteners were also found to reduce post-prandial blood glucose response, but products bearing the claim must carry the same laxative warnings if polyols were used.

Starch, fats

Other replacement opinions included switching digestible starch with resistant starch in baked goods to reduce post prandial glycaemic responses and replacing saturated fatty acids (SFAs) with monounsaturated fatty acids (MUFAs) and/or mixtures of polyunsaturated fatty acids (PUFAs) to help maintain normal blood LDL cholesterol concentrations.

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Consumers check biscuit and cake labels less than other categories, poll

By Helen Glaberson, 14-Apr-2011 Food Navigator

Consumers are less likely to check labels of biscuit, cake, chocolate and confectionery compared to other food categories, according to Harris Interactive, due to the perception that they are indulgence opportunities.

"Many do not look at labels on these products because nutritional content seems to matter less to consumers on categories which are considered a treat," claims Geraldine Padbury, senior consultant in consumer research at Harris Interactive.

The consultant presented the findings from two surveys her firm undertook in relation to consumers' usage and understanding of food labelling at last week's annual conference of the Biscuit, Cake, Chocolate and Confectionery (BCCC) trade section of the UK industry body, the Food and Drink Federation.

The first survey interviewed 1,079 online and investigated consumer's general attitude to food labelling. The second one, involving 1,342 was conducted especially for the BCCC conference - *Working Together for a Healthy Future* - and looked specifically at various food categories.

The poll devised for the conference found that 54 per cent of participants checked labelling of cakes and 52 per cent checked pizza labels, as opposed to the 69 per cent of consumers who checked the labels of dairy products and 67 per cent of those that checked the labels of canned foods.

Females more likely to check labels

Gender differences were also found in terms of label checking behaviour. Females are consistently more likely to check or read labelling compared to males, but only marginally so, according to the analysis.

This gender difference was most significant for breakfast cereals, with 70 per cent of females reporting label reading in this category compared to 63 per cent of males.
Females are also significantly more likely to check labelling on confectionery and sweets (11 per cent compared to 7 per cent for males) and savoury snacks (16 per cent compared to 11 per cent for males).

Age was another factor in label checking behaviour. According to Harris Interactive, participants aged between 16 and 24 and 25 to 34 are significantly more likely to scan labels on cakes and confectionery or sweets.

Those aged between 25 and 34 are significantly more likely to read labels on chocolate, while consumers aged between 16 and 24 are significantly more likely to look at labels on biscuits.

Progress made by industry

On a wider scale, Padbury said there was general consensus that good progress had been made in regards to product labelling and reformulation, with a reduction in salt and fat in products.

85 per cent of those polled welcomed industry efforts. However, 75 per cent of respondents in the general survey said that food manufacturers should do more to reduce salt, saturated fat and calories wherever possible.

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Awareness of nutritional labelling impacting bread sales, analyst

By Jane Byrne , 08-Apr-2011 Food Navigator

The decline in sales of white bread and hike in sales of brown bread in the UK is a reflection of how consumers there are opting for loaves with more dietary fibre and nutrients, claims a market analyst.

According to new figures from Kantar Worldpanel revealed this week, sales of sliced white loaves in UK supermarkets fell by 1 per cent in 2010, while brown bread sales increased by 6 per cent and seeded batches by 9 per cent.

Mahinthan Kathirgamanathan, analyst at Kantar Worldpanel, said that nearly 65 per cent of brown bread was bought by people over the age of forty-five.
The declining sales figures for white bread are an indicator of the extent to which shoppers are studying nutritional labelling and how this is having a significant impact on buying behaviour, argues Michael Hughes, an analyst with market research firm Datamonitor.

He told this publication that consumers are increasingly demonstrating a willingness to cut down on groceries previously considered a part of the staple diet in the country.

However, Hughes points out that while sales of white bread have declined, revenue figures are still considerably higher than the brown bread market, *"meaning it will be sometime until brown bread sales surpass those of white."*

This is borne out by the Kantar data, which shows that brown bread still only accounts for around 27 per cent of the 12 million loaves sold each day in the UK, compared to 66 per cent (or 7.9 million sales) for white bread.

Meanwhile, a recent report by IBIS World, evaluating the bread manufacturing industry in Australia, predicts that sales of breads that have been enriched or fortified with nutrients are growing by 10 to 15 per cent a year.

Traditionally, most Australian consumers based bread purchasing decisions on taste, quality, packaging, price and use-by-dates, but the report outlines how shoppers there are now making bread choices based on health properties.

The research also reveals that the increase in demand for specialty breads including focaccia, sourdough, panini will be an additional growth driver over the next five years.

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FDA to research effects of multiple labeling statements

By Caroline Scott-Thomas, 14-Apr-2011 Food Navigator

The Food and Drug Administration (FDA) is seeking industry comments on a proposed agency-led study to evaluate how consumers respond to multiple nutrition labeling statements on food packages.

The FDA has sharpened its scrutiny of front of pack (FOP) nutrition symbols and claims particularly in the past two years. Following widespread criticism of the allocation of the Smart Choices program's green check mark to sugary cereals in 2009, the agency said it intended to develop *"standardized, science-based criteria"* on which FOP nutrition labeling must be based.

The agency said in this latest proposal for research into the area that many food products carry multiple symbols and nutrition statements on-pack, but most previous research has singled out just one type of labeling statement and its effects on consumer perceptions and purchasing behavior. Although this approach helps to pinpoint the influence of each particular labeling type, the FDA noted that consumers are faced with multiple labeling statements in the grocery store.

Therefore, the agency claims that it may be useful to examine consumers' responses to combinations of labeling statements, how different characteristics of those statements interact with each other, and whether or how these statements affect use of the Nutrition Facts panel.

"Results of the study will be used primarily to enrich the Agency's understanding of how multiple claims and other labeling statements on food packages may affect how consumers perceive a product or a label, which may in turn affect their dietary choices," the FDA said in a Federal Register notice.

Examples of nutrition symbols that have been proposed or are already in use include nutrient-specific labeling, such as Guideline Daily Amounts; calorie labeling; summary symbols (like Smart Spot); summaries combined with nutrient-specific disclosure (like 'Sensible Solution: Good Source of Calcium, Good Sources of 8 Vitamins and Minerals'); and claims about how products are grown or made.

The FDA also gave examples of different types of nutrition label statements, including health claims, nutrient content claims such as 'low fat', and structure/function claims. These three types of claims are regulated differently but all of them must be truthful and not misleading.

The FDA's proposed study would be a controlled randomized experiment based on a 15-minute web-based survey of 4,000 English-speaking US adults.

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