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ISOLATED SOY PROTEIN IN POWDER & LIQUID BEVERAGES

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Cover Design & Bulletin Layout by Ms. Leena Shanbhag

Editorial

Apprehension and uncertainty continues in today's scenario, on placing non-standardised food products (proprietary food products) either manufactured or imported foods on the market due to non-availability of licence from FSSAI.

As the Courts have ruled that product approval process was not as per law, it was removed. It was believed that with that ruling, proprietary foods could be freely made without any difficulty. However, since the licence of a company was linked to the products, a Catch 22 situation has been created wherein if one does not have a product approval then no licence is granted and consequently if no licence is there, proprietary food cannot be manufactured and since the product approval process has been scrapped, no new proprietary foods will get product approval.

A situation has been created which is not healthy at all for industry and for the country. When we make regulations, we need to go beyond considering the effect on some companies but on the whole industry. Authority may feel that some companies may need watching to ensure that consumers get safe foods, but to make the whole industry suffer is not justifiable.

Some people feel that Authority is now trying to make thousands of standards so there will be no proprietary food at all left so there is no need for product approval process. One problem is the task may take several years and secondly when all those existing proprietary foods are made standardised, there will be new proprietary foods as innovative minds can always think of newer products using different ingredients or different ways of making them.

There is a need to get away from thinking of food products as drugs or medicines. Due to this thinking, the concept of product approval was brought in. Actually it should have been applied only where there were novel ingredients were used or some pharmacologically active substances were included which would necessitate ensuring that the products made were safe. For ordinary foods using ingredients with history of safe use for decades should not be subjected to this kind of scrutiny.

We hope that good sense would prevail and regulators would make changes so this problem would be quickly addressed and a solution provided. These products should be examined adequately when they are in the market and ensure that they adhere to safety standards prescribed for any food products.

There should be a proper watch on the trends that these product analyses show. That way safety could be ensured and any undesirable trend could start an action to prevent safety problem in time. We hope that the new year sees good measures that ensure food safety and not just the restrictions on food industry. With season's greetings,

Prof. Jagadish S. Pai,
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ISOLATED SOY PROTEIN IN POWDER & LIQUID BEVERAGES

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ABSTRACT
Isolated soy proteins are high quality plant based proteins, which are used in a variety of healthy beverages. Beverage application recommendations are provided to optimize usage of isolated soy proteins in dry blended, ready-to-drink acid and ready-to-drink neutral beverages.

INTRODUCTION
Soy protein is a high-quality, complete, plant protein that is comparable in protein quality to meat, milk and eggs. Soy protein ingredients are derived from soybeans, the only known vegetable protein that contains all the nine essential amino acids in adequate levels to support human health. Soy protein has the highest possible PDCAAS score for a protein (1.0), which is a measure of protein quality that considers both digestibility, availability of essential amino acids and human requirements.

Proteins have physical roles in beverages that enable a satisfying consumer experience along with providing nutrition and health. Isolated soy protein (ISP) must provide correct functionality for a selected beverage type. A common classification of beverages is by delivery form and by pH of final product.

In delivery form, there are
• Dry blended beverages (DBB)
• liquid ready-to-drink (RTD) products

In terms of pH, they can be classified as
• RTD-Neutral or DBB-Neutral with approximately pH 7
• RTD-Acid or DBB-Acid with approximately pH 5.

DRY BLENDED BEVERAGES
Dry blended beverages are dry powders that are blended with liquid (milk, water, juice) by stirring, or shaking before consumption. DBB span across nutritional market categories, they can be health and wellness supplements, weight management beverages, sports nutrition supplements etc. These products are usually consumed immediately after preparation. ISP is included in the formulations for nutritional or health benefit reasons. Protein can impact the flavour, mouthfeel, density and dispersibility of dry blended beverages significantly.

DBB products require ISP with high dispersibility and wettability, controlled density, controlled particle size, moderate solubility,

and good flowability. Dry beverage powders can be prepared by combining the necessary ingredients in a wet state, homogenizing, heat processing and spray drying. When lipid content is an important factor, wet process method is preferred typically spray drying process. This method of processing generally creates a very high quality product, but it is also very expensive.
Dry blended products are prepared in much simpler operations, usually only requiring a dry mixing system. Dry blended operations will be inexpensive and easily maintained. However, generally the product quality is not as high as spray dried product and the formula will require spray-on fat or a fat powder for any lipid requirements.

Important factors to consider when formulating a dry blended beverage
•Nutrient delivery per serving
•Manner of rehydration, the process mixing available
•Serving size – how much liquid will it be mixed in? Water/milk?
•Type of flavours, sweeteners acceptable
•Vitamin/ Mineral fortifications
•Positioning as nutrition supplement, weight management, energy, recovery product
•Drinking experience desired

Flavour is a very important attribute for consumer acceptance. It will be affected by the proteins selected, rehydration media (water, dairy milk, or fruit juice), colour of the system and certainly the other ingredients.

Mouthfeel is a common problem in DBB and is defined as the physical sensation of the beverage in the mouth. This is characterized primarily by smoothness, grittiness, and viscosity. Mouthfeel is impacted by particle size of powder, shear used during reconstituting beverage, and the reconstitution medium.
Water generally provides the best environment for good mouthfeel with ISP, whereas juice will be more difficult to deliver good mouthfeel due to its low pH negatively impacting ISP solubility. Milk will have an intermediate effect; available calcium ions can be a difficult environment for ISP rehydration.

Dispersibility is the ease with which the powder can be mixed into the recommended make-up liquid, resulting in a homogeneous beverage. This property is often incorrectly assumed to be directly correlated with protein solubility. Highest solubility often results in poor dispersibility and highest dispersibility often results in lowest solubility. Dispersibility is influenced by other ingredients especially presence of fat in product, sugar/ carbohydrates, temperature of the make-up liquid, the ISP percent inclusion in formula, and process such as lipid incorporation, agglomeration, and surfactant application.

A high-protein DBB (25% protein in powder) will cause the powder density to be highly dependent on the density of the ISP. Density is an important powder attribute when considering packaging size. Very low density ISP might pose an issue where the product cannot fit into the package. Very high density ISP makes the package look under filled.

When considering the nutrient delivery and ISP, the expected protein concentration is a critical calculation. As added protein increases beyond 2% (hydrated basis), there will be increase in viscosity which will in turn affect mouthfeel, flavour, and overall liking of beverage. Depending on the drinking experience desired, refreshment or indulgence, the viscosity effect can be good or bad for a given ISP. Recognizing the expected impact and desired outcome will enable to select suitable ISP.

READY TO DRINK BEVERAGES

Some of examples of RTD-Neutral Beverages are soy milks, flavoured milks, entero-clinical feeding - tube or sip, weight loss/ meal replacement, weight gain/ sports supplementation or cream alternatives.

RTD-Acidic Beverages includes beverages like fruit juice fortified with protein, direct acidified beverages with colour and flavour added.

RTD products require ISP with high solubility, good emulsification, low dusting and controlled viscosity. The impact of pH on these relevant functionalities must then be considered. By nature, ISPs have low solubility in the acid (pH 4–5) range.

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FOOD SAFETY: A Microbiological Perspective

By
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Food is the fundamental necessity of our species or any other species on Earth. It has evolved at a fast pace. Raw fruits, vegetables and meat comprised the food of our ancestors. Today a paradigm shift is seen in the food industry.

Burgers, pizza, pasta, processed foods, frozen foods, sweets, confectionary and cakes dominate our food market. Human understanding of food is constantly increasing, new technologies are being developed daily. We are currently in the age of molecular gastronomy and its bizarre creations, where molecular level study is done to create food.

Earth came into existence over 4 billion years ago and the first residents of this planet were the microbes, humans followed 2.9 billion years later. Studies of ancient civilizations indicate the onset of agriculture around 20000 years BC. While practicing agriculture we became cognizant of the concepts of "good food" and "bad food". Around 2000 years BC, the ancient scriptures such as the Vedas put up dietary restrictions and indicated various aspects of fermented foods and food spoilage. The Persian scriptures indicated that Pork is a dangerous meat in hot climate. It became more and more evident that food can give us diseases. Constant wars and uncertainties increased the need for food transportation and storage. Problems of food storage and transportation became apparent. Need for methods to increase shelf life of food products came into the limelight.

"Appertization" the first patented method of food sterilization was developed. It involves the heating of food at high temperatures using steam and then storing in cans. The underlying principles of food safety came to light only in the 18th century when microbiological science was established by Louis Pasteur 'Father of Food Microbiology'. He established medicinal microbiology and came up with the process of pasteurization. Novel techniques for the identification of pathogens in food and ensuring food safety have now taken precedence.

Did you know that micro-organisms multiply by dividing? One bacterium can replicate itself to billions in 10 – 12 hrs. The genetic makeup of bacteria confers them with the ability to survive under harsh temperatures, salinity and pH conditions, making them highly resilient. Some have high tolerance for extremely hot temperatures (hyperthermophiles), while others for extremely cold conditions (psychrophiles). Few of them can also become dormant by formation of spores. Due to these attributes of micro-organisms, ensuring food safety becomes extremely critical.

Foods are classified as high risk foods and low risk foods based on their ability to confer access to microbial growth. Articles of food such as pickled and dried foods with high salt/sugar content, low water activity and acidic pH are low risk, whereas moist, protein rich foods at neutral pH are high risk foods. These include cooked poultry, soups, rice, etc. Foods kept at temperatures ranging from 22 to 40 0C are ideal for bacterial growth. To increase the shelf life, foods are either stored at low temperatures, or

heated to high temperatures and then aseptically sealed in packets or containers.

Where do these microbes come from? Micro-organisms are omnipresent, they are in the soil, the water and the air that we breathe. Birds, insects and rodents also harbour them. If food comes in contact with any of these, they can contaminate it. Sewers and other such unhygienic places are also good source of micro-organisms. Contaminated water used in kitchen or in a food processing plant can lead to spoilage. Similarly, unhygienic process equipments, machinery, unhygienic storage & transportation or contaminated raw material and ingredients can lead to food contamination. Many food poisoning cases have been seen due to food handlers and their unhygienic practices. A simple act of 'not washing your hands' can lead to a food hazard, thus **maintaining hygiene is key to ensure food safety.**

Articles of food can become unsafe for human consumption due to food spoilers or food pathogens. Food spoilers are microbes that do not cause any harm to humans, but they degrade the organoleptic properties of food making it undesirable. These spoilers are usually native to food, but if their number increases uncontrollably, they can cause immediate food spoilage and can also facilitate access to other pathogens. Common indicators of food spoilage are change in the odour, taste and colour of food. Acetobacter, Clostridium and yeast are some of the common food spoilers.

Pathogenic organisms have caused havoc all around the globe. Multiple outbreaks of food poisoning have been recorded. In 1951, Vibrio parahaemolyticus was responsible for over 70% of Japan's investigated cases of food borne gastroenteritis. Toxins from Aspergillus at high concentration cause acute hepatitis. In 1961, about 100,000 Turkey at 500 locations in England were affected due to mould infected peanut meal. Anton Von Leeuwenhoek in 1681, examined his own stools during a bout of diarrhoea and observed large number of Giardia lamblia. He subsequently observed the same in guts of rodents and frogs, but could not associate the disease transmission. Only in 1965, this association was attributed to water borne outbreak of giardiasis in Colorado. Most of the pathogens cause diarrhoea, nausea, vomiting, abdominal pain or cramps, fever and sometimes even death. All this can happen within few hours or few days upon ingestion of infected food. Thus hygienic handling, preparation, storage, packaging, transportation and sale of food is a must.

"Emerging pathogens" are a new class of pathogens, they are either the cause of new illnesses or have been prevalent but cases of associated disease are rapidly increasing. Number of people falling ill due to Listeria is doubling every year. E. coli 0157:H7 have caused major outbreaks. Multi drug Resistant organisms such as Salmonella, Brucella etc. are a cause of many outbreaks. The cases that get reported are just a tip of the iceberg, a major fraction goes unnoticed. In a country like India, the standards of hygiene maintained are very poor and the health implications are also severe.

Establishment of rules and regulations is absolutely vital to provide safe food to all. UK was first to lay down legislation in 1890, followed by US in 1890. Later, US came up with a very comprehensive Food, Drug and Cosmetics Act in 1939. India established laws in the form of PFA (Prevention of Food Adulteration) in 1954 and more recently, The Food Safety and Standards Act in 2006. This act has laid down rules and regulations to ensure food safety at all levels. The FSSR (Food Safety and Standards Regulations) 2011 specifies guidelines on presence/absence of various micro-organisms, contaminants, residues and toxins in food products such as spices, meat and meat products, sea food, milk and milk products, fruit and vegetable products, chocolates, etc.

Microbial quality is now categorized as satisfactory, unsatisfactory and potentially hazardous. FSSR 2011 is constantly subjected to amendments, efforts are being made to benchmark our regulations to the more stringent regulations of US and UK. Food Safety and Standards Act 2006 is doing commendable work considering the size and the population of this nation.

In order to formulate and implement guidelines or regulations, laboratory support is absolutely essential. Establishment and development of methods to detect microbes is crucial. Classical methods involved detection of indicator organisms such as coliforms as culturing and isolating specific pathogens was difficult. Pre-enrichment, selective enrichment & post enrichment steps can be used to overcome the problems of non-uniformity of the matrix, pathogen distribution, injured or stressed pathogen and high concentrations of normal microbiota. Enriched samples are then plated onto a selective &/or differential media, in which colonies are identified by using biochemical and serological methods.

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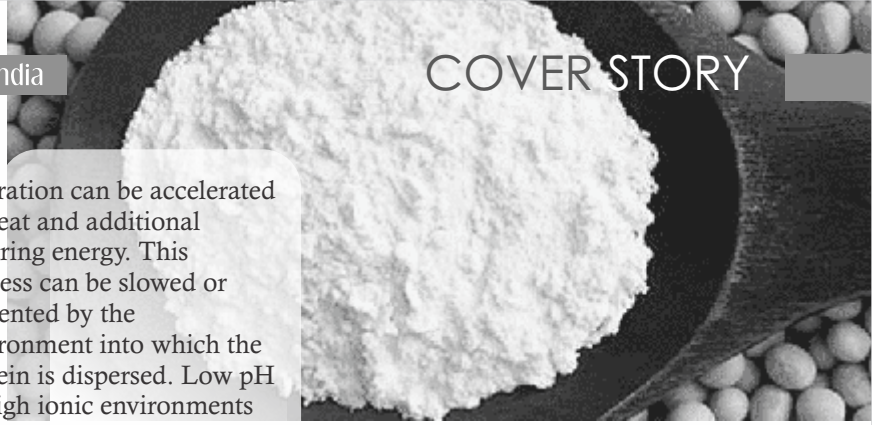

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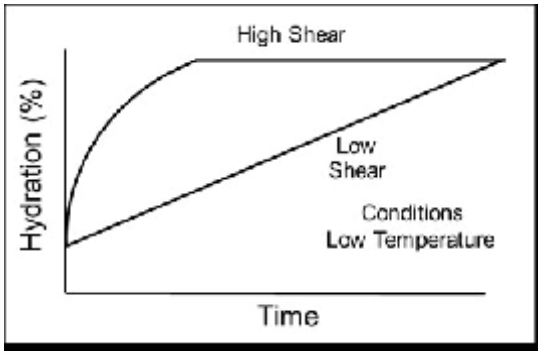


Minerals added to a beverage can carry along soluble ions which can also impact protein rehydration. The principal culprits are the divalent cations calcium and magnesium. Some ISP has been designed for less sensitivity to pH and minerals.

There are four primary steps in the processing of ready to drink nutritional beverages with ISP. These are
• Dispersion/ hydration,
• Homogenization/stabilization
• Thermal processing
• Packaging

ISP must be rehydrated from powder to a similar degree of solubility of that before drying. ISP powder, being a hydrocolloid material, will repel water and prefer to adhere to itself. Thus early process steps must provide sufficient shearing to disperse ISP properly, followed by sufficient time of mixing for water to penetrate and hydrate protein. Hydration is a process of incremental addition of water to a dry protein until a level of hydration is reached beyond which further addition of water produces no change and only dilutes the protein. Maximum association of water with all such sites on the molecule is critical in the achievement of maximum functionality in liquid and semi-solid systems.

Hydration can be accelerated by heat and additional shearing energy. This process can be slowed or prevented by the environment into which the protein is dispersed. Low pH or high ionic environments are to be avoided during dispersion. It is normally better to hydrate under conditions which enable protein hydration; then adjusting the pH or ionic strength of the beverage will have reduced impact.

Standard recommended conditions for dispersing and hydrating ISP-

• ISP dispersed in water between 25-30°C. Increase water temperature to 75-77°C to ensure increased solubility and complete hydration.
• Hydration time should be a minimum of 10-15 min Lower temperature can be used if hydration time is extended.

Some of examples of RTD-Neutral Beverages are soy milks, flavoured milks, entero-clinical feeding - tube or sip, weight loss/ meal replacement, weight gain/ sports supplementation or cream alternatives.
RTD-Acidic Beverages includes beverages like fruit juice fortified with protein, direct acidified beverages with colour and flavour added.

RTD products require ISP with high solubility, good emulsification, low dusting and controlled viscosity. The impact of pH on these relevant functionalities must then be considered. By nature, ISPs have low solubility in the acid (pH 4–5) range. Milk proteins are normally hydrated at lower water temperatures (10-50 °C) to achieve optimum hydration. Milk proteins are smaller in molecular size than soy proteins and are more soluble. Fluidizer nozzle type mixers, liquefiers or powder funnels are suitable for incorporating dry powders into water for hydration. Once proteins are dispersed in water, speed of mixer should be reduced to prevent air incorporation during hydration.

After protein is properly hydrated, remaining ingredients, sweeteners, fat, stabilizers/ emulsifiers, colours, flavours, vitamins, minerals are added and blended to achieve uniform consistency. Minerals added to a beverage can impact protein stability. It is common to add chelating agents to tie up divalent cations, to prevent negative reactions with protein. As water hardness exceeds 100 ppm (as calcium carbonate), the use of chelating agents becomes very important for ISP performance. Phosphates and citrates are preferred ingredients for this. In addition to binding divalent ions, these ingredients aid in protein hydration and enhance suspendability in storage.

Homogenization helps the beverage

Different types of thermal processing and time temperature combinations listed below:

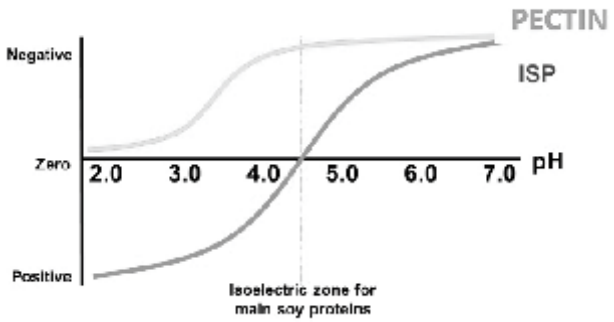
	Temperature/time
High-temperature short-time pasteurization	85–90°C/15 s
Ultra-high-temperature process	129–143°C/3–5 s (ESL)
	137–142°C/4–17 s (shelf stable)
Retorted in-container process	121°C/10 min

achieve uniform fat distribution. The primary objective is to achieve particle size reduction. The outcome is a smoother, creamier body and where required, a whiter colour. Soy protein containing RTD beverages are processed in double stage homogenization with pressures ranging from 2000-2500psi. Very high pressures (above 2500 psi) will disrupt the tertiary and quaternary structure of globular proteins, leading to aggregation and very stable emulsions through the formation of a gel-like particulate network. This aggregation may be desirable for some foods, but would likely not be desirable in beverages.

Thermal treatments kill the pathogenic and food spoilage organisms. The severity of heat processing determines the shelf-life of a product. In certain cases, the point is to reach a commercially sterile product. Heat processing can significantly impact the final product characteristics – such as flavour, colour, nutritional values, and stability. Proteins must be selected for heat stability.

When the soy-based beverage contains fat, it may be necessary to consider stabilizing the fat droplets to prevent fat separation and creaming off. This is achieved by the addition of emulsifiers. Thereafter, the fat phase can be dispersed into the water phase. Emulsifiers increase the stability of the fat emulsion, enhance the colour and impart a smooth and creamy texture whereby the overall mouthfeel is improved. In addition, emulsifiers may function as defoaming agents during processing, a common problem related to soy-based beverages.

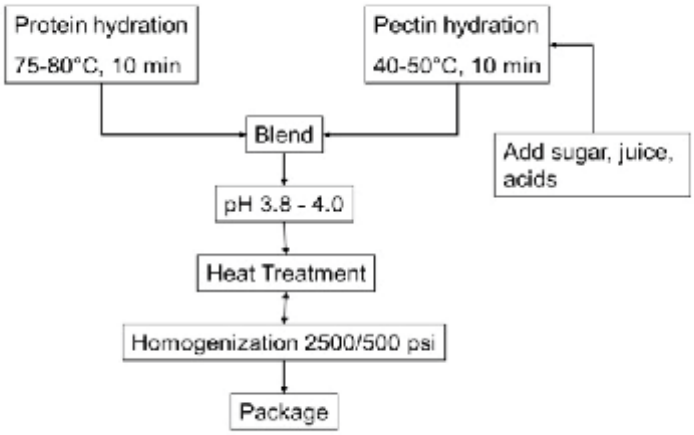
Carrageenan and soy protein molecules react with each other, probably through electrostatic and hydrophobic interactions forming a complex. This reaction, however, seems to be not as strong as in carrageenan–milk systems. This is because for soy products, more carrageenan is usually used to stabilize the final product than the carrageenan dosages for milk systems.



Ideally, while processing RTD-A beverage, the soy protein and pectin will be dispersed and hydrated into the water separately, then the juice is added to pectin solution. Sodium citrate and citric acid are added to control final product pH.

Frequently colours and flavours must be added to create the appropriate consumer appeal. ISPs selected for this application should have good acid pH solubility. High-methoxy pectin is selected for its ability to stabilize protein suspensions. Pectins interact with soy proteins via electrostatic interactions at pH 3.8.

Pectin is a negatively charged hydrocolloid which interacts with



EXAMPLES OF DBB, RTD-A AND RTD-N BEVERAGE FORMULATIONS

	DBB	RTD-A	RTD-N
Ingredients	**% Addition**	**% Addition**	**% Addition**
Isolated soy protein	16	2.4	4.4
Skim milk powder	24		
Water		66.7	84.25
Juice		20	
Vegetable oil			1
Fat powder	5		
Fructose	23		
Sucrose		8	4.8
Maltodextrin	18.3		3.2
Polydextrose	4	2.2	1.5
Soy fiber	5		
Potassium citrate		0.2	0.25
Citric acid		To pH 3.8*	
Flavour	1.5	0.1	0.1
Colour			
High methoxy pectin		0.5	
Hydrocolloid stabilizer / Emulsifier	1		0.4
Vitamin & mineral premix	2.2		0.1
Total	100	100	100

positively charged polymers, like proteins below their isoelectric points. Pectin adsorbs to surface of protein particle creating negatively charged particle. Particles repel each other, creating a colloidal suspension and also pectin increases beverage viscosity. Pectin addition levels increases with protein content delivery in the beverage.

Generally, there are two main types of soy protein containing RTD:
1. Fruit-based products, containing low protein levels (0.5–2.0%). They are wellness and refreshment drinks in which soy is a 'plus'.
2. Fruit-based drinks containing higher protein levels (3–5%) where soy is a predominant ingredient. This could be a heart health claim beverage or a meal replacer smoothie. A higher viscosity than juice is normal.

CONCLUSION

ISPs are the most concentrated form of soy protein available in the market. It is a very versatile ingredient, finding application in different beverage products. Prior to formulating it is important to identify and define the final functionality we wish the ISP to fulfil. It is very critical to select right grade of ISP to achieve desirable product properties and important to consider specific processing steps required for ISP to make a stable beverage.

COMING EVENTS

Aahar 2016
International Food & Hospitality Fair
March 15-19, 2016
Pragati Maidan, New Delhi
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Oils & Fats International Exhibition
OFI India 2016
April 13-14 2016
Hyderabad Intl Conv Centre (HICC)
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Seminar on Regulatory Practices: Difficulties in Compliance
April 18, 2016
Hotel Orchid, Mumbai
Contact: Ms. Ummeayman R., Nutritionist, PFNDAI
E: nutritionist@pfndai.org,
T: 022-23538858

Research in Health & Nutrition

Analysis reveals big costs savings for DHA supplements during pregnancy

Nutra Ingredients USA 30Nov2015

Supplementing pregnant mothers with DHA omega3 could lead to significant costs savings for patients and healthcare systems, according to a new analysis from Australia.

Data from the "DHA to Optimize Mother and Infant Outcome" (DOMInO) trial indicated that DHA supplementation was associated with 15% lower rates of preterm births, and this could result in significant inpatient hospital cost savings.

A regression analysis by Professor Maria Makrides' group at Adelaide University showed that DHA supplementation may generate annual costs savings to the Australian public hospital system of AUS$1551 million (US$1137 million). "There is now an ongoing debate on whether the consumption of adequate amounts of omega3 fatty acids, especially DHA, during pregnancy and breastfeeding, is associated with improvements in maternal and infant health," wrote the researchers in Prostaglandins, Leukotrienes and Essential Fatty Acids .

"Given that the cost of the fish oil supplement is small, if relatively simple interventions like DHA-rich Fish oil supplementation during pregnancy can generate cost savings from a public policy perspective, it may be worthwhile considering implementing programs that encourage DHA supplementation among pregnant women."

The DOMInO trial involved 2,399 women pregnant with only one baby at less than 20 weeks gestation. The women were randomly assigned to receive DHA-rich fish oil capsules (800 mg/d of DHA) or matched vegetable oil capsules without DHA until the birth of their children.

The study found that the number of early preterm birth cases was reduced by 15% for the DHA group compared to the control group, and that DHA supplementation provided a 50% chance of avoiding an additional premature birth. The new econometric analysis found that DHA supplements during pregnancy may decrease inpatient hospital costs by an average of AU$92 (US$67) for singleton pregnancies. For 163,500 singleton pregnancies per year, this would extrapolate to a total potential cost savings to the Australian public hospital system of AUS$1551 million per year (US$1137 million per year).

Longer term benefits

The researchers noted that they did not factor in the longer term benefits of DHA supplementation during pregnancy for healthcare or social costs. "The study found that there was a 15% reduction in early preterm birth through DHA supplementation during pregnancy. Given that preterm births could have long term complications, this study may understate the actual cost effectiveness of DHA supplementation," they wrote. "Additionally, the DOMInO trial sample only included patients that attended public hospitals and therefore, as a robustness check, it would be useful to expand this study to private hospital patients as well.

"Lastly, although there is a general consensus that DHA contributes to improved pregnancy and birth outcomes, there is a lack of agreement on the optimal dose of DHA supplementation. The benefits observed here relate to dose used in the DOMInO trial and further studies will need to determine if similar cost savings can be achieved with other doses. Policy makers will ultimately need to quantify the cost of providing or subsidizing DHA supplements for women separately or together with other supplements, such as folic acid, relative to the savings and improved pregnancy and birth outcomes that potentially result from such supplementation."

Ashwagandha root extract shows sports nutrition potential

Nutra Ingredients USA, 01Dec2015

Supplements of ashwagandha (Withania somnifera) root extract may improve muscle strength, size, and recovery, say results of a new randomized, prospective, double-blind, placebo-controlled clinical study.

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Eight weeks of supplementation with the Ayurvedic herb in combination with a resistance training program were associated with significantly lower levels of exercise-induced muscle damage, significantly greater levels of testosterone, and a significantly greater decrease in body fat, compared with placebo.

Indian researchers also report in the Journal of the International Society of Sports Nutrition that participants in the ashwagandha group also experienced significantly greater muscle size increases in the arms and the chest.

The flagship herb of Ayurveda Ashwagandha has been gaining traction in the mainstream US market with consumers embracing its wide ranging body of health benefits, which include supporting stress, cognitive function, sleep, metabolic wellness, adrenal function, sports performance, and more.

According to a monograph from the American Herbal Pharmacopoeia (AHP), the herb has a history of use in ayurvedic medicine that dates back as much as 4,000 years to the teaching of renowned scholar Punarvasu Atreya, and in subsequent works that make up the ayurvedic tradition. The name of the herb derives from Sanskrit, and means "smells like a horse", which refers to the strong smell of the root which is said to be redolent of horse sweat or urine.

The new study used Ixoreal Biomed's KSM66 Ashwagandha and Kartikeya Baldwa, Director of Ixoreal Biomed, said that ashwagandha root is prominently advocated as an ergogenic aid to improve strength and vitality in traditional Ayurveda texts. "While there are other published studies demonstrating the effectiveness of ashwagandha in increasing strength and stamina, this is the first study using a standardized, branded ashwagandha extract and demonstrating significant effects on muscle strength, size and recovery," he said. "This study also corroborates the findings from a previously published clinical study, showing KSM66 to be effective in increasing natural testosterone production in men."

The researchers recruited 57 young men to participate in their clinical trial. The men were aged between 18 and 50 and had limited experience in resistance training. They were randomly assigned to receive either placebo or supplements of ashwagandha root extract (600 mg per day, KSM66 Ashwagandha) for eight weeks. All the men trained during the intervention period and improvements were recorded in both groups. However, significantly greater improvements were observed in the ashwagandha root group, said the researchers.

Participants in the ashwagandha root group displayed significantly greater increases in muscle strength on the benchpress exercise and the legextension exercise, they said. In addition, testosterone levels were also significantly higher in the ashwagandha group, compared to the placebo group.

"This study confirms previous data regarding the adaptogenic properties of ashwagandha and suggests it might be a useful adjunct to strength training," wrote the researchers. "This study has the following limitations which should lead us to interpret the findings with some caution: the subjects are untrained and moderately young, the sample size of 50 is not large and the study period is of duration only 8 weeks. Research studying the possible beneficial effects of ashwagandha needs to be conducted for longer periods of time and for different populations including females and older adults of both genders."

Commenting on the study's findings, Ixoreal's Baldwa said: "From the scientific literature, we know that the ashwagandha root increases energy production, increases cognitive focus, and promotes balance in the body to increase or decrease key hormone levels to bring them to appropriate levels. These effects are perhaps responsible for the strong results we see in this study."

Brown seaweed extract battles cancer

Nutra Ingredients, 30Nov2015

Health evidence for fucoidan stacks up as a new Australian study finds that the seaweed polysaccharide has potential to battle Helictobacter pylorirelated diseases and gastric cancer through an antiadhesion mechanism.

The in vitro study carried out by scientists from the University of Western Australia showed that fucoidan extracts are effective at dislodging H. pylori bacteria from infected human stomach cancer cells.

"The results show that fucoidans inhibit H. pylori attachment to gastric epithelial cells in vitro. Furthermore, we demonstrated that Fucus B, a secondary fucoidan fraction with high polyphenol content extracted from Fucus vesiculosus, is the most toxic against AGS carcinoma cells," wrote the researchers.

Helictobacter pylori (H. pylori) is a bacteria that colonises the stomachs of half of the world's population. It causes chronic active gastritis which can progress to peptic ulcers and gastric cancer. Effective treatments for infection with the bacteria are limited, with a rising percentage of treatment failures, primarily due to antibiotic resistance. These findings indicate that fucoidan could be an alternative to increasingly inadequate antibiotic treatments.

Best of three
The researchers analysed the activity of three different fucoidan preparations, two of which were derived from Fucus vesiculosus (Fucus A and Fucus B) and one from Undaria pinnatifid. Both Fucus A and Fucus B were highly sulfated fucose polymers. The main difference between the two was that Fucus B's polyphenol content was eight times higher than that of Fucus A (and Undaria).

All fucoidans were toxic to AGS (cancerous) cells and reduced the viable cell count significantly. However, the Fucus B extract exerted the greatest cell cytotoxicity towards AGS cells, which the researchers attributed to its high polyphenol content. This is the first time a fucoidanpolyphenol complex has been investigated in relation to H.pylori.

"Although some research had already been completed on other fucoidan extracts and H.pylori, these earlier studies used fucoidans that had not been well characterised," said Dr Helen Fitton, chief scientist at Marinova the Australian biotech company that supplied the fucoidan extracts and partfunded the study. Maritech's fucoidans are the only certified organic fucoidans in the world, and are extracted using proprietary water-based technology to enable them to maintain the original chemical structure found in nature.

Applying lab findings
The next step is to validate the findings in a human clinical trial. "Given the excellent results achieved in the study, we are currently investigating scope to undergo a human clinical trial in the near future," Dr Fitton told NutraIngredients.

Human studies would need to demonstrate that fucoidan can penetrate the protective mucosal surface of the stomach to bind to H. pylori at a low pH a qualification Dr Fitton is confident would be met. "Fucoidan has been shown to maintain bioactivity at a very low pH and within the colon after passing through the low pH of the stomach. This, in addition to positive results in previous animal model studies, provides great confidence that
fucoidan would assist in H.pylori treatment in a clinical setting," she said.

Chocolate may benefit pregnant women, but further research needed

Confectionery News, 30 Nov 2015

Moderate chocolate consumption may help expectant mothers and their fetuses by reducing stress and providing antioxidants that guard against reproductive diseases and pregnancy complications, say Italian researchers.

A systematic review from the University of Perugia published in the Journal of Agricultural and Food Chemistry has highlighted beneficial effects from chocolate supplementation. However, it warns further research is required, particularly since existing studies have yielded conflicting results.

No negative effects and possible benefits
"Currently it is possible to conclude that consuming chocolate in moderation is good for human health," wrote authors Eleonora Brillo and Gian Carlo Di Renzo from the Department of Obstetrics and Gynecology and Centre for Perinatal and Reproductive Medicine at the University's Hospital. "Chocolate can also be used in the diet of pregnant women because no negative effect was found for either maternal or foetal health. Conversely, favorable effects were observed for mother, fetus, and future child," they said.

Antioxidants in chocolate
Pregnancy complications such as miscarriages and preeclampsia as well as reproductive diseases like endometriosis and polycystic ovary syndrome can be prompted by oxidative stress – an imbalance between pro-oxidants and antioxidants – during pregnancy.

The researchers said scientific research had yet to prove a conclusive link between antioxidant supplementation and preventing reproductive difficulties, but said clinical trials were exploring the link and particularly with antioxidant rich foods like cocoa and chocolate.

The researchers said expectant mothers might benefit from additional caloric intake from the 10th to 13th week of gestation and might prefer foods high in antioxidants due to oxidative stress during this period of pregnancy. "Available scientific evidence suggests that chocolate with a high cocoa content, consumed daily in

modest quantities (30 g/day for 24 weeks), may fit properly into this nutritional strategy without entailing negative consequences in terms of weight during various trimesters," said Brillo and Di Renzo, referring to a 2012 paper by the pair and others.

Blood Pressure Reduction?

The authors' 2012 study also found chocolate supplementation could reduce blood pressure during gestation; however a second study by Mogollon et al. (20 g/day for 12 weeks) found no association. "We believe that the diverging results on blood pressure are due, in part, to the intervention of control: in the first study, women of the control group did not consume chocolate by protocol, whereas in the second study, women in the control group consumed chocolate as in the experimental group but it had a lesser amount of flavanols (400 mg of total flavanols vs <60 mg). It could be that the absence of differences is due to similar effects of the two kinds of chocolate, which had the same nutrients and bioactive components, except for flavanols," said Brillo and Di Renzo.

They added that the first study was over a 27week period whereas the second was for 12weeks. "We hope other studies will be carried out on this topic in order to understand the real effect of chocolate consumption on maternal blood pressure in pregnancy," they said. "…The bioactive constituents of cocoa may contribute to reducing reproductive difficulties through actions directly exerted on the vascular endothelium and circulation," they speculated.

Psychological Health

The systemic review said chocolate as part of a balanced diet can "instil psychological wellbeing to both the pregnant woman (typically during the time of high emotional lability) and the future child. In fact, chocolate consumption in pregnancy seems to reduce the negative effect of prenatal maternal stress on infant temperament," it said.

Di Renzo and Brillo called on chocolate makers to label bioactive compounds and their levels in products so pregnant women can make informed choices.

Multistrain probiotic milk shakes may protect against weight gain: Human data

Nutra Ingredients USA, 01Dec2015

Consuming a milk shake with eight different probiotic strains may protect against weight gain in young healthy men consuming a high fat, high energy diet, says a new study. Scientists from Virginia Tech report that supplementing a high fat diet with the probiotic milk shake resulted in lower body mass and fat accumulation than a placebo milk shake.

On the other hand, the probiotic combination, called VSL#3, did not affect levels of pro-inflammatory cytokines, measures of insulin sensitivity, or endotoxin concentrations, reported the researchers in Obesity.

"Our findings are consistent with prior observations that rodents fed VSL#3 and other single strain probiotic supplements gained less body mass and fat mass during high fat feeding compared to controls," they wrote. "Our findings are also consistent with recent observations that young, healthy subjects consuming a single probiotic strain (Lactobacillis casei Shirota) gained less body and fat mass during a high fat diet compared with placebo."

Gut Health And Obesity

The study adds to emerging body of science supporting the effects of gut microflora on metabolic factors and obesity. A 2005 study by Jeffrey Gordon and his group at Washington University in St. Louis indicated that obese mice had lower levels of Bacteroidetes and higher levels of Firmicutes, compared with lean mice.

One year later and Dr Gordon's reported similar findings in humans: The microbial populations in the gut are different between obese and lean people and that when the obese people lost weight their microflora reverted back to that observed in a lean person, suggesting that obesity may have a microbial component (Nature, Vol. 444, pp. 10221023, 10271031).

A more recent paper from the same group in Science Translational Medicine (Vol. 3, 106ra106) reported that ingestion of probiotic bacteria produced a change in many metabolic pathways, particularly those related to carbohydrate metabolism.

The new Virginia Tech study did not investigate the potential mechanism of action, but the researchers noted that rapid changes to the gut microbiota may affect nutrient absorption, and that probiotic supplementation may reduce the amount of energy harvested from ingested food, which could lead to lower body and fat mass gain. Other possible mechanisms include a reduction in lipid absorption in the gut, or by increasing energy expenditure via different pathways like GLP1 secretion.

Study Details

The researchers, led by Dr Matthew Hulver, head of the Department Human Nutrition, Foods, and Exercise at Virginia Tech, recruited 20 non-obese young men aged between 18 and 30 to participate in

their study. The men were first assigned to consume a calorie-balanced control for two weeks, and were then randomly assigned to receive a high fat diet with or without VSL#3 in a milk shake for four weeks.

The strains of bacteria contained in VSL#3 were Streptococcus thermophilus DSM24731, Lactobacillus acidophilus DSM24735, L. delbrueckii ssp. bulgaricus DSM24734, L. paracasei DSM24733, L. plantarum DSM24730, Bifidobacterium longum DSM24736, B. infantis DSM24737, and B. breve DSM24732.

Results showed that the high fat diet produced average increases in body mass and fat mass of 2.3 kg and 1.3 kg over four weeks, but these values were significantly reduced in the probiotic group with average increases of 1.4 kg and 0.6 kg, respectively.

"The major finding from the present study is that supplementation with the probiotic VSL#3 provides some protection from body and fat mass gain with a high fat diet in healthy, young males," wrote Dr Hulver and his co-workers.

What Next?

Future studies will be necessary to elucidate the mechanism(s) responsible for the potential weight management potential of the probiotic combination, said the researchers.

"Future studies are needed to determine the amount and type of dietary fat as well as the duration of high fat diets on insulin sensitivity and in vitro skeletal muscle metabolism. Future interventions may need to target skeletal muscle metabolism in the fasting fed transition rather than in the fasting state in isolation," they concluded.

Sugar addiction much harder to address than salt

Food Navigator, 01 Dec 2015

Weaning the public off salt is a piece of cake compared to reducing their addiction to sugar, scientists have discovered. Researchers at the US-based Monell Chemical Sense Centre, alongside experts from PepsiCo's global R&D team, showed that people put on a low-sugar diet for three months found vanilla puddings sweeter at the end of the trial. That's hardly surprising.

However, the team also discovered that the level of sweetness most of subjects preferred did not change. "[Our] second prediction, that there would be a parallel change in the sucrose concentration rated as most pleasant, was not supported by the data," the authors wrote in a paper published in the American Journal of Clinical Nutrition. What's more, given free rein in the final month, those in the reduced-sugar group quickly increased their sugar intake to baseline levels and their judgments of sweet taste intensity reverted to pre-diet levels. This means that the "factors that underlie liking for sugar and salt may differ", said the study's co-author Gary
Beauchamp, a behavioural biologist at Monell. The findings could have serious implications for future policy interventions to reduce sugar intake.

What They Found

Men and women aged 21 to 54 were split into two groups, matched for demographics, body mass index and uptake of simple sugars. Those in one group carried on as normal diet wise, whilst the others were put on a low-sugar diet. All participants then rated the sweetness intensity and pleasantness of vanilla puddings and sweetened beverages at the end of each month.

By the third month, the low-sugar subjects rated both low and high concentrations in puddings around 40% sweeter than the control group did. A similar, but weaker, effect was seen for the drinks. But despite the difference in sweetness ratings, three months of sugar restriction did not influence the amount of sucrose most preferred in the pudding, which averaged 32.4% for the reduced-sugar group and 31.2% for those who maintained their normal diet.

Similarly, the preferred level of added sucrose in the raspberry drink didn't differ between the two groups, averaging 13.5% for the reduced-sugar group and 13.9% for the control group. What's more, there was a "rapid rebound" in month five when those on the low-sugar diet were allowed to choose their own foods again. "They quickly went back to their previous sugar levels when given a choice," said Paul Wise, a sensory psychologist at Monell and lead author on the paper. "[This finding] suggests that people may resist changes in the sugar level of their diets."

Policy Implications

That the effect of dietary sugar intake on salty taste perception and preference isn't the same as salt could have repercussions for future policy interventions. The fact that people go hunting for sugar when they've been restricted for a period of time also suggests the addiction might be harder to shift than it has been for salt.

Research published earlier this year in the Academy of Nutrition and Dietetics, showed that if people eat low-salt foods, they don't try and compensate for it later in the day. Scientists at Monell have also previously discovered that both

perception and pleasantness changed when the amount of salt consumed was lowered over several months. In other words, people put on a low salt diet came to like lower levels of salt in their food. This has allowed manufacturers, via national regulations in Europe and the US, to cut salt from products with little or no public backlash.

The issue of over consumption of salt is far from solved, but policymakers have been looking at whether similar interventions can work for sugar. But this latest research suggests those looking to lift what's worked for salt and replicate it for sugar could be bitterly disappointed. "The salt findings formed part of the rationale for the [US] National Academy of Sciences' recommendation to decrease salt consumption by gradually lowering the amount of salt in prepared and restaurant foods," Beauchamp explained. "Modern diets contain a large proportion of calories as sugar, but this same tactic may not work as well to help reduce the amount of sugar that people consume."

The results are likely to be welcomed by the food and drink industry, which has been pushing for a soft touch approach to reduce sugar intake. However, in the UK at least, support for harder interventions is snowballing. This week, an influential group of MPs joined doctors, campaigners and the government's health advisors to call for a sugar tax. Further restrictions on marketing and price promotions are also necessary, said the UK's Health Committee.

Supplements may improve teenage behaviour in school: Oxford researchers

Nutra Ingredients, 23 Nov 2015

Giving nutrition supplements to teenagers may improve behaviour in schools, research from the University of Oxford has suggested.

The researchers gave 196 'typically developing' 13 to 16 year olds one tablet containing multivitamins and minerals and a daily omega3 dose of EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) of 165 mg and 116 mg, respectively or a placebo over 12 weeks.

They saw a deterioration of behaviour for children with low baseline rates of 'disciplinary infringements', but an improvement for children who had high baseline rates. However, the researchers warned that the general level of disciplinary infringements was low in the school, which made it difficult to judge improvements and the conclusions should therefore be treated with caution.

Large-scale research with stratified offending rates was called for, they said. "The relationship between diet and behaviour is complex and poorly understood. Childhood malnutrition has been associated with behavioural problems such as in attention, aggression and impaired socialisation. Individuals with micronutrient and n3 PUFA deficiencies may be particularly prone to such antisocial behaviour and aggression," they wrote in the British Journal of Nutrition.

However, this earlier research typically focused on children with neuro-developmental disorders like attention-deficit hyperactivity disorder (ADHD). This latest study looked therefore at the impact of supplementation among 'typically developing' adolescents. One of the researchers behind the paper, Dr Jonathan Tammam, said he preferred to advocate an improved diet in certain teenagers, rather than supplementation.

"In my opinion, an improved diet is a useful yet perhaps ignored tool which can be used in combination with additional behavioural measures, but not necessarily in isolation. The balance of evidence available from prisons and schools suggests that broad spectrum improvements in nutrition may be an effective tool," he told NutraIngredients.

Method
They tracked changes in blood levels of omega3 and 6 fatty acids and the vitamins and minerals, which at baseline were low. After supplementation omega3 and 6 levels as well as folate, vitamin C and vitamin D levels improved "significantly". Meanwhile iron and ferritin were unchanged. They measured behavioural changes using school disciplinary records as well as Conners' teacher ratings, which are commonly used to measure child behaviour problems.

On the Conners' disruptive behaviour scale, the group given the active supplements improved, whereas the placebo group worsened. During the academic term, school disciplinary infringements increased significantly by 25% in both the supplemented and placebo groups.

When the subjects were split into high and low baseline infringements, the low subset increased their offences whereas the high-misbehaviour subset appeared to improve after treatment. "Thus, when assessed using the validated and standardised Conners teacher tests (but less clearly when using school discipline records in a school where misbehaviour was infrequent), supplementary nutrition might have a protective effect against worsening behaviour," the researchers from Oxford University's department of physiology, anatomy and genetics and department of statistics wrote.

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Food Science & Industry News

Effects of supplementation with coconut on milk production

FOOD NEWS LATAM
DECEMBER 1, 2015

In subtropical, tropical and arid areas, where a significant proportion of meat and milk in the country, the predominant environmental effect on the productive and reproductive performance of cattle is the reduction of energy consumption, reduced weight gain occurs, milk production and reduced conception rates.

The State of Guerrero occupies the 2nd place nationally in surface features dry tropics. Under these weather conditions, about 1.4 million head of cattle are kept. In an effort to avoid the total abandonment of the sector, the Government of Guerrero copra implemented subsidies, while developed programs for the establishment of pastures under coconut thereby allowing other use the floor with the consequent ecological advantage that means, currently this system prevails in most coconut plantations.

Production systems are well defined where the cultivation of coconut combined with grazing animals under palm being different from the traditional way of raising cattle in most of the State territory. According to the State Council of the Coco (CeCoCo), in recent years marketing problems caused by the low demand for copra, high substitution derivatives thereof and increased imports of crude coconut oil, have markedly reduced their culture, even to topple palm to another use the soil, thereby deteriorating ecosystem. From this perspective as noted Cipriano, since the cattle were introduced in Mexico, his upbringing has been extended and is up in recent years that has questioned its impact on the environment, so now the concept of efficiency should be considered the use of resources in a rational way that integrates the elements of the production process with social and environmental aspects.

Fats and oils are characterized by a high energy density and produce low calorie increase in ruminants. This feature makes them an ideal supplement to cattle in order to increase energy consumption and increase milk production, persistence of lactation; especially under conditions of heat stress. Long intervals between calving and first ovulation, characteristic of cows under heat stress could be reduced with supplementation of foods with high energy density (i.e. fats) through its effects on the energy balance of the cows and other sites of action.

Cholesterol is a precursor of progesterone synthesis performed by the corpus luteum and stems novo synthesis or blood lipoproteins. Fat supplementation has been shown to have positive effects on ovarian structures and progesterone concentration in plasma. The availability of copra at the regional level, represents a potential resource, for its nutritional characteristics (65-70% fat) could be exploited in livestock feed. Its high content of saturated fatty acids short chain, do not cause problems on the ruminal fermentation and hydrolysis of triglycerides is slower in saturated fatty acids; Likewise, there is evidence that supplementation with coconut oil, increases the development of the mammary gland of prepubescent sheep , although it is clear that pre-pubertal heifers holstein feed concentrates rich in oil (soy) had no significant effects on the development of the udder.

The dry matter of supplements up to 22.5% of copra are consumed without difficulty dual purpose cows grazing when offered up to 2 kg / day with short periods of habituation. Copra supplementation increased the percentage of fat in milk. The concentration of plasma cholesterol dual purpose cows grazing tended to rise at 7 and 8 weeks of supplementation with copra. The effects of supplementation of different levels of copra is dual purpose cows grazing at the start of lactation deserve investigation.

MAP packaging evaluated to identify cost savings

Food Production Daily, 27Nov2015

A market study by Fraunhofer IVV has evaluated modified atmosphere packaging (MAP) in the retail sector and identified potential cost savings.

Economic pressures in industry mean that packaging has to be designed using the principle of "as little as possible but as much as

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Seminar on Food Safety Risk Assessment in Regulatory Dialogues

Report by **Ms. Ummeayman R.**, Nutritionist, PFNDAI

PFNDAI organised this seminar to begin the regulatory dialogue on Risk Analysis among the industry units and with regulator. Science-based approaches are crucial in replacing the mechanical and kneejerk traditional system with a predictive one. The event was held in December 2015 in Hotel Kohinoor Continental in Mumbai.

Dr. Sesikeran, Former Director of NIN, in his inaugural address stated the importance of risk assessment. When there is moderate consumption of an ingredient it may act as a medicine but over consumption can be a health risk or fatal. Thus the key words to note is 'moderate consumptions', thus one aspect that needs to be known is what is the quantity that is safe to consume and frequency of consumption of the ingredients.

Session on Framing the Regulatory Dialogue was chaired by Mr. V. Mohan, Chairman PFNDAI-Regulatory Affairs. Dr. Lewis J.I, Consultant FSSAI & GB member, PFNDAI in his presentation on Moving Dialogues based on a Risk Framework, stated there is a need to harmonise the structures of FSSAI with that of codex commission and EU commission as we have already moved from PFA to FSSAI which is a modern food law based on risk assessment and scientific evidence as compared to PFA which is based on adulteration and opinion. Thus it is time to move to risk assessment based standards too, and have a risk framework like CODEX. Risk communication is also an important part of regulations, as the consumers should be informed of the levels of harmful ingredients along with the health effects and dosage that would cause these harmful effects.

Dr. Shatadru Sengupta, Sr. Director Legal & Company Secretary, Hardcastle Restaurants, presented 'Framework of Procedures prior to making Regulations under Indian food law'. Food Safety & Standards Act is very positive; however Regulations should be consistent with the Act. The Act gives the responsibility of risk management on the authority and also to carry out risk assessment. Also the risk management methods shall be proportionate and no more restrictive of trade than is required to achieve appropriate level of health protection, regard being had to technical and economic feasibility and other factors regarded as reasonable and proper in the matter under consideration. The act also provides an opportunity to protest at various stages before the enactment of the regulations.

Session on Risk Assessment Application in Food was chaired by Dr. Sesikeran. Dr. Debabrata Kanungo, Chairman of Sci. Panel on Pesticides, Veterinary Drugs & Antibiotics of FSSAI presented 'Risk Assessment RA: The Basic Process'. Risk includes both toxicity and exposure, He gave an insight into Risk assessment, which is the central component of risk analysis

and provides a scientific basis for risk management decisions on measures needed to protect human health.

Dr V. Sudershan Rao, Deputy Director, NIN further expanded on 'Risk Assessment - Food Additives'. He gave an insight into JECFA and how it serves as an independent scientific committee which performs risk assessments, provides advice to FAO, WHO and the member countries of both organizations. He also gave an insight into how JECFA does risk assessment and ADI (Acceptable Daily intake) levels.

Special Lecture was chaired by Dr. Vilas Adhikari, Chairman,


DELEGATES

Conference Committee & member of GB of PFNDAI. Dr. Sesikeran presented the special lecture on 'Nutrient Risk Assessment- arriving at Tolerable Upper limits (UL). Data from various states shows that India is already a micronutrient deficient nation and we need to first bring the nation to the level of normal RDA and then try to restrict their intake levels. It makes no sense in trying to control the levels of various minerals and vitamins without first coming to the levels of RDA. He also gave an insight into RDA which is quantity of a nutrient a healthy individual needs to consume on daily basis for the entire lifetime to stay healthy. This is based on the fact that if intakes are likely to be less than the risk of deficiency disorders go up. By definition itself RDA indicates that this is the minimum level / a deficiency prevention level one needs to take daily, than an optimal level.

Session on Dietary Exposure & Monitoring Safe Intakes was chaired by Dr. Pai, Executive director PFNDAI. Dr. Nimish Shah, Director, Safety & Environ. Assurance Centre, HUL, presented 'Microbiological Risk Assessment for Food Safety wherein he presented the concept of Predictive Food Microbiology, which is to identify the best options (most effective/feasible) for reducing the risk to acceptable levels. Predictive food microbiology is used to know the risk; it is use of mathematical models to predict the effects of factors (temperature, preservatives, water activity, pH etc.) on bacterial behaviour. This is a very useful tool for food industry as it aids in decision making and is better faster and safe.

Dr. Sudershan Rao gave an insight


Dr. Adhikari & Dr. Sesikeran

of 'Dietary exposure assessment: Food Additives & Metal contaminants'. The total diet studies are carried out to know the consumption of contaminants and metals. The results are based on analysis of edible portions and not as per the raw materials and consideration is given to the reduction of chemicals that degrade due to processing at home. He also gave an insight into the various foods consumed in rural and urban regions of southern India and the analysis of contaminants carried out in the NIN study.

Dr. Debabrata Kanungo presented 'Surveillance & Monitoring of Pesticide residues: Are we safe?' wherein he gave an insight into the reasons of pesticide residuals found in food commodities and how the different pesticide residues are monitored in different food commodities.
The conference concluded with the discussion of various aspects of health, monitoring of risk assessment and how regulations can play a positive role in risk assessment. The conference was supported by DSM Nutritional Products and Mondelez India. The souvenir for the event was sponsored by Vista Processed Foods, Marico and Hardcastle Restaurants.


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Dr. Kanungo


Dr. Lewis


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Dr. Sesikeran


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Bones of obese children may be in trouble

Science Daily
December 21, 2015

Studies have shown that obese children tend to have more muscle, but recent University of Georgia research on the muscle and bone relationship shows that excess body fat may compromise other functions in their bodies, such as bone growth.

In a literature review, lead author Joseph Kindler studied how muscle can influence different characteristics of bone geometry and strength in children. The review was published in the journal Current Opinion in Endocrinology, Diabetes and Obesity.

For this particular review, researchers were interested in looking at the geometry of bones -- the measures of size and strength of the bone -- particularly for children and adolescents. Kindler pulled together previously published findings to give an up-to-date look at how muscle influences bone geometry and bone strength during youth. The role of fat in these relationships was also investigated.

Based on the research they gathered, muscle was a strong contributor to bone growth throughout childhood and adolescence. However, this relationship may differ in children with greater body fat. "It's a common understanding that, in children, muscle is a very strong determinant of how bone is going to grow," said Kindler, a doctoral candidate at UGA's College of Family and Consumer Sciences' department of foods and nutrition. "Obese children will tend to have more muscle, so we would suspect that they would also have larger, stronger bones." What researchers found during the review was less clear.

The excess fat that accompanies obesity can be deposited within the muscle. There is emerging evidence that suggests this fat within the muscle may have an effect on how the bone grows, according to the review. Understanding how excess fat, specifically that within the muscle, can influence the muscle and bone relationship in children is still under investigation, but there is clearly a connection, Kindler said. "It's an emerging area of research," he said.

Kindler typically studies the different ways to measure bone -- bone geometry being less studied than the commonly reported bone density. With bone geometry, researchers are able to determine the spatial distribution of the bone and how tightly packed an individual's bone mineral content is in his or her body.

These bone geometric features can tell researchers just how strong a bone is. "These were the skeletal characteristics we were looking for in this review, particularly in children," Kindler said. In the study, they also identified where gaps in research still remain.

"This paper summarizes the literature that's been published. We know that muscle is such an important contributor to bone development," Kindler said. "But it also shows that our understanding of how fat influences these relationships is still unclear."

The authors hope to use the review to identify and fill holes in these research gaps, particularly understanding these problems in children. "One of our major goals is to understand how obesity-related conditions, like the progression of Type 2 diabetes, can influence muscle and bone growth in children," Kindler said.

Because of the potential harmful connection between body fat and bone growth, Kindler recommends that children strive to live a healthy lifestyle through proper diet and physical activity.

Fish oil helps transform fat cells from storage to burning

Science Daily December 17, 2015

Research shows how fish oil can improve fat metabolism in mice

Fish oil transforms fat-storage cells into fat-burning cells, which may reduce weight gain in middle age, new research shows. Fish oil activates receptors in the digestive tract, fires the sympathetic nervous system, and induces storage cells to metabolize fat.

The team explains in Scientific Reports that fish oil activates receptors in the digestive tract, fires the sympathetic nervous system, and induces storage cells to metabolize fat.
Fat tissues don't all store fat. So-called "white" cells store fat in order to maintain energy supply, while "brown" cells metabolize fat to maintain a stable body temperature. Brown cells are abundant in babies but decrease in number with maturity into adulthood.

A third type of fat cell -- "beige" cells -- have recently been found in humans and mice, and have shown to function much like brown cells. Beige cells also reduce in number as

people approach middle age; without these metabolizing cells, fat continues accumulating for decades without ever being used.

The scientists investigated whether the number of these beige cells could be increased by taking in certain types of foods.

"We knew from previous research that fish oil has tremendous health benefits, including the prevention of fat accumulation," says senior author Teruo Kawada. "We tested whether fish oil and an increase in beige cells could be related."

The team fed a group of mice fatty food, and the other groups fatty food with fish oil additives. The mice that ate food with fish oil, they found, gained 5-10% less weight and 15-25% less fat compared to those that did not consume the oil.

They also found that beige cells formed from white fat cells when the sympathetic nervous system was activated, meaning that certain fat-storage cells acquired the ability to metabolize.

“People have long said that food from Japan and the Mediterranean contributes to longevity, but why these cuisines are beneficial was up for debate," adds Kawada. "Now we have better insight into why that may be."

Teaching parents about the importance of breakfast has benefits for both parent and child

Science Daily December 4, 2015

Both in-person and online education are effective in reducing breakfast-skipping and improving nutrition in children, according to a new study in the Journal of the Academy of Nutrition and Dietetics.

A unique benefit of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is the inclusion of nutrition education. In a new study in the Journal of the Academy of Nutrition and Dietetics, researchers report that both online and in-person group education are effective in helping parents reduce breakfast-skipping and improve other breakfast-related nutritional knowledge and benefits.

Studies have shown that eating breakfast compared with breakfast skipping has been associated with a higher quality diet and decreased risk for obesity.

WIC reaches more than 8 million mothers and children each year and has had a substantial influence on the nation's health. In the past, individual and group education relied on clinic visits. However, as technology has advanced and WIC clientele has become more diverse, additional options for nutrition education are needed. In this study, 590 WIC participants from two Los Angeles, CA WIC clinics were randomly assigned to receive in-person group education (359) or online group education (231). Education focused on ways to reduce breakfast skipping and promoted healthy options at breakfast for parents and their 1- to 5-year-old children. Questionnaires assessing breakfast-related knowledge, attitudes, and behaviors were administered before and after education, and at a 2- to 4-month follow-up. All training was conducted in English or Spanish, as appropriate to the participants.

Both the in-person group participants and the online group participants experienced similar improvements. Both groups reported reductions in barriers to eating breakfast due to time constraints, not having enough foods at home, and difficulty with preparation. There was a greater increase in frequency of eating breakfast for both the parent and child in the online group compared to the in-person group. At follow-up, the improvements in knowledge and behaviors were somewhat reduced, but both groups were better informed than at the beginning of the study.

Lead investigator Lorrene D. Ritchie, PhD, RD, Director and Cooperative Extension Specialist, Nutrition Policy Institute (NPI), University of California Division of Agriculture and Natural Resources (ANR), Berkeley, CA, describes the breakfast program. "The goals of the breakfast class were to teach participants why it is important for adults and children to eat breakfast every day, why skipping breakfast can lead to poorer health for children and adults, how WIC foods can be used to make healthy breakfasts, and to have participants set personal goals for eating healthier breakfasts. Additional dietary messages taught in the class were: WIC cereals are healthy cereals and have 6 grams of sugar or less per serving, fruit is a healthy breakfast option, and limit juice to 4 to 6 ounces per day."

WIC researcher, Shannon E. Whaley, PhD, added "Both the in-person and online training sessions were designed to mirror each other, Identical visuals and texts were used in both settings."

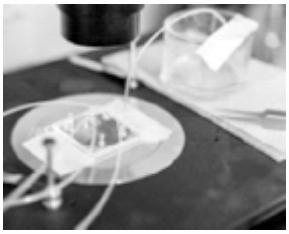
Although both online and in-person education were effective, the authors found that English-speakers and Spanish speakers behaved differently in how they chose to receive their education. Although participants were randomly assigned to the in-person or online group, more Spanish speakers were unable to access online education and/or failed to complete the online

education than English speakers. According to lead author Lauren E. Au, PhD, RD, of NPI, "From the perspective of the dietetics profession, the findings highlight the value of allowing WIC participants the flexibility and convenience of choosing between multiple nutrition education modalities, which could potentially lead to sustained behavior change in this population."

Seaweed capsules may lead to an injection-free life for diabetic patients

Medical News Today 29 December 2015

A microencapsulation method, developed by OIST researchers, can help to overcome major challenges in pancreatic islet transplantation.



Diabetes is one of the leading causes of death. Patients with type 1 diabetes have their insulin secreting cells destroyed by the immune system and require daily insulin injections. Pancreatic islet transplantation is an effective treatment that can dramatically reduce daily doses or even eliminate dependence on external insulin. Insulin producing cells are injected into a recipient liver. After an adaptation period they start to produce sufficient hormone needed by diabetic patients.

However, while the transplantation procedure itself has been greatly improved in recent years, collection, preservation, and transportation of these cells are still very challenging. Research published in Advanced Healthcare Materials by the scientists from the Okinawa Institute of Technology and Science Graduate University (OIST) in collaboration with the University of Washington and Wuhan University of Technology offers a solution for some of these problems.

Production and secretion of insulin occur in the pancreas - an endocrine gland in the digestive system. Cells secreting insulin are clustered in pancreatic islets. Despite their crucial role in organismal wellbeing these islets comprise only a few percent of the pancreatic tissue. The islet transplantation does not require major surgical intervention and is often done under local anaesthesia. It is also cheaper and might be safer than transplantation of the entire pancreas. Unfortunately, so far, only human islets can be transplanted and their supply is but a trickle.

Cryopreservation, or deep freezing, is the method commonly used for the islet preservation and transportation. But it is not completely safe. One might think that storage at temperatures below -190°C is the most dangerous phase. However, the cells are very good at enduring it. It is the freezing process (-15 to -60°C) itself that poses the most challenges. As the cells are cooled, water in and around them freezes. Ice crystals have sharp edges that can pierce membranes and compromise cell viability. This also becomes problematic during thawing.

A multidisciplinary group of researchers led by Prof. Amy Shen, head of the Micro/Bio/Nanofluidics Unit at OIST, developed a novel cryopreservation method that not only helps to protect pancreatic islets from ice damage, but also facilitates real-time assessments of cell viability. Moreover, this method may reduce transplant rejection and, in turn, decrease use of immunosuppressant drugs, which can be harmful to patient health.

The novel technique employs a droplet microfluidic device to encapsulate pancreatic islets in hydrogel made of alginate, a natural polymer extracted from seaweed. These capsules have a unique microstructure: a porous network and considerable amount of non-freezable water. There are three types of water in the hydrogel: free water, freezable bound water, and non-freezable bound water. Free water is regular water: it freezes at 0°C, producing ice crystals. Freezable bound water also crystallises, but the freezing point is lower. Non-freezable bound water does not form ice due to the strong association between water molecules and the hydrogel networks. Hydrogel capsules with large amounts of non-freezable bound water protect the cells from the ice damage and reduce the need for cryoprotectants - special substances that minimise or prevent freezing damage and can be toxic in high concentrations.

Another innovation, proposed by the group, is the use of a fluorescent oxygen-sensitive dye in hydrogel capsules. The porous structure of the capsules does not impede oxygen flow to the cells. And this dye functions as a real-time single-islet oxygen sensor. Fluorescence indicates whether cells are consuming oxygen and, therefore, are alive and healthy. It is a simple, time-efficient, and cheap method of assessing viability, both of individual islets or populations thereof.

Islet encapsulation reduces the risk of rejection of transplanted cells by the recipient. The hydrogel capsule allows small molecules, e.g. nutrients and islet secretions, to pass through the membrane easily, but prevents direct contact between implanted islets and host cells. Encapsulation also may prevent an attack on transplants by the autoimmune response that destroyed the patient's own islets in the first place.

The microencapsulation method can help to overcome some major

challenges in pancreatic islet transplantation, including the scarcity of available islets and the lack of simple and reliable control methods, especially for individual islet assessment. It offers hope to patients suffering from type 1 diabetes to return to a 'normal' life, free of insulin injections.

Limes: Health Benefits, Nutritional Information

Medical News Today: Monday 28 December 2015

Limes are a citrus fruit often used to accent flavors in foods and are a common ingredient in Mexican, Vietnamese and Thai cuisine. They are grown year-round in tropical climates and are usually smaller and less sour than lemons.

The Tahitian lime, also called the Persian lime, is the variety most commonly used in cooking. Key limes are smaller, rounder and more acidic than Tahitian limes and are used in the classic dessert Key Lime pie.

It is a misconception that key limes are grown in Key West, FL. They are primarily grown in subtropical climates such as Mexico, India and Egypt.

This MNT Knowledge Center feature is part of a collection of articles on the health benefits of popular foods. It provides a nutritional breakdown of limes and an in-depth look at its possible health benefits, how to incorporate more limes into your diet and any potential health risks of consuming limes.

Nutritional Breakdown Of Limes

According to the US Department of Agriculture National Nutrient Database, the juice of one lime (approximately 44 grams) contains 11 calories, 4 grams of carbohydrate (including 1 gram of sugar and 0 grams of fiber) and 0 grams of protein as well as 22% of the daily recommended amount of vitamin C.

One teaspoon of lime zest (approximately 1 gram) contains 1 calorie and 4% of recommended vitamin C.

Possible Benefits Of Consuming Limes

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

Vitamin C has been shown to reduce all-cause mortality. Limes are a very concentrated source of vitamin C, a well-known antioxidant.

Heart Health

In a study published by the ARYA Atherosclerosis journal, lime juice and peel was shown to decrease fatty streaks found in coronary arteries, which are indicators of plaque buildup and subsequently cardiovascular disease. A different study showed that low vitamin C levels are associated with increased risk of stroke.

Antimicrobial Activity

Lime juice has antibacterial and antifungal properties. A study published by Tropical Medicine & International Health showed that lime juice inhibited the growth of Vibrio cholerae specifically.

Asthma Prevention

The risks for developing asthma are lower in people who consume a high amount of certain nutrients. One of these nutrients is vitamin C, found in many fruits and vegetables including limes.

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

Boosting The Immune System

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

Healthy Skin

Vitamin C, when eaten in its natural form (in fresh produce as opposed to supplement form), can help to fight skin damage caused by the sun and pollution, reduce wrinkles and improve overall skin texture. Adequate intake of vitamin C (the juice of one lime provides 22% of daily needs) is also needed for the building and maintenance of collagen that provides structure to skin and hair.

Lowering Risk Of Stroke

According to the American Heart Association, eating higher amounts of citrus fruits may lower ischemic stroke risk for women. In one study, participants who ate the highest amounts of citrus had a 19% lower risk of ischemic stroke than those who consumed the least.
How to incorporate more limes into your diet

Quick Tips:
✓ Top any white fish with thinly sliced limes
✓ Combine lime juice with oil and any seasoning for a quick dressing
✓ Squeeze lime juice into water or tea
✓ Top entrees with lime zest or use zest in marinades. Start with this citrus rub.

Potential Health Risks Of Consuming Limes

Wash the peels of limes even if you are not planning on using the peel. Bacteria from the peel can be transferred inside the fruit by the knife in cutting. If zesting the lime, use organic limes if possible.

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

Omega-3 helps ward off rheumatoid arthritis

Medical News Today: Sunday 27 December 2015

If people at risk of rheumatoid arthritis consume more omega-3 fatty acids, found in fish and fish-oil supplements, they can probably decrease their chance of developing the disease, according to research published in Rheumatology.

According to the Centers for Disease Control and Prevention (CDC), "RA causes premature death, disability and a lower quality of life in the industrialized and developing world." It can begin at any age, and it causes fatigue and prolonged stiffness after rest.

Rheumatoid arthritis (RA) is a systemic inflammatory disease affecting multiple joints in the body. It usually presents in the lining of the joints (synovial membrane) but can impact other organs. A higher prevalence of cardiovascular disease (CVD) has been observed among patients with RA.

Pain, swelling and redness are common joint symptoms, and as the lining of the joint become inflamed, cartilage and even bone become eroded, sometimes causing joint deformity.

The exact causes are unknown, but it is thought to be due to a faulty immune response, in which the body's immune system causes inflammation in the tissue that helps joints move. Autoantibodies, or immune proteins, are believed to target the body's tissues and organs mistakenly.

Family history can help predict whether a person is likely to have the autoantibodies that precede the disease's development.
There is no cure for RA, but specific exercise techniques can help to manage it. There is also some evidence that dietary factors may help.

DHA and EPA may suppress protein that regulates immune response

Researchers wanted to know if patients with a higher omega-3 intake would have a lower risk for developing RA. They analyzed self-reported data about omega-3 consumption from 30 people who had autoantibodies for RA and 47 control patients who did not.

Rheumatoid arthritis causes pain, damage and, ultimately, disability.

Just 6.7% of the patients who had the autoantibodies for RA reported taking an omega-3 supplement, compared with 34.4% in the control group. Blood tests also showed that those with the autoantibodies for RA were "significantly more likely" to have lower levels of three essential omega-3 fatty acids than the control patients.

It seems that two of the crucial omega-3 fatty acids, DHA and EPA, may be effective in suppressing a particular protein that regulates the intensity and duration of the immune response.

Principal investigator Jill Norris, PhD, a professor in the department of epidemiology at the Colorado School of Public Health, comments:
"There was a very substantial difference in the blood levels of omega-3 fatty acids between the people who took omega-3 supplements and those who did not."

Norris adds that genetics may also play a role in the ultimate effectiveness of omega-3 in individual patients at risk of developing RA.

Fast Facts About Ra

Around 1.5 million Americans have RA, or 0.6% of the population
Women are three times more likely to have it than men
Prevalence appears to be increasing, particularly among women.

This is the first study to find an association between omega-3 and the autoantibodies that lead to RA among patients who are at risk but have yet to develop the disease. Despite the small number of participants, the results indicate that omega-3 may help protect against RA by preventing its

development during the period before symptoms emerge. Next, researchers hope to track a larger group of patients over a longer period, including those with the RA autoantibody, to see how the disease progresses.

Omega-3 is found in cold-water fish, such as salmon or mackerel, as well as in dietary supplements derived from fish or algae; but food sources alone may not suffice to provide beneficial effects because modern farming practices have lowered the amount of omega-3 in many foods by as much as 40-fold since the 1900s.

The researchers recommend a healthy, balanced diet that includes fish rich in omega-3 fatty acids, as well as 1-3 grams of fish oil a day, for those who may be at risk for RA and perhaps other inflammatory diseases, in order to decrease the risk of developing them.

Butter vs. Margarine: Which Is Healthier?

Medical News Today: Monday 21 December 2015

Butter is a solid dairy product made by churning cream or milk to separate the solid components from the liquid. The solids that disperse form butter. Butter is commonly used in cooking, baking and as a spread for bread and bread-like products.

Margarine was developed as a substitute for butter and is made from plant-based oils such as canola oil, palm fruit oil and soybean oil.

Salt and other ingredients that keep the flavor and texture of the spread acceptable to the consumer such as maltodextrin, soy lecithin and mono or diglycerides are commonly added as well. Oils such as olive oil, flaxseed oil and fish oil may also be used. Some kinds of margarine are meant to be used as a spread only and should not be used for baking or cooking.

Fats And Cholesterol

Trans fat: Trans fat raises LDL (bad) cholesterol significantly while lowering HDL (good) cholesterol. Trans fats harden at room temperature. As a general rule, the harder the margarine, the more trans fat it contains. However, food companies can claim a product contains zero trans fat as long as it contains less than 0.5 grams per serving.

Instead of looking at just the nutrition label, make sure to look at the ingredient label of any processed food for partially hydrogenated oils, a common source of trans fat. If the product contains partially hydrogenated oils, it will contain trans fat even if the label claims 0 grams.

Saturated fat: Saturated fat also raises LDL (bad) cholesterol, but less than trans fats. Butter contains a significant amount of saturated fat, but little-to-no trans fat.

Cholesterol: Cholesterol is found only in animal products, coconut and palm oil. Most margarines contain little or no cholesterol. Butter contains a significant amount of cholesterol. From recent research, we now know that the body creates cholesterol in much larger amounts than what you eat. Cholesterol in food does not necessarily affect your blood cholesterol levels.

Nutritional Breakdown Of Butter

One tablespoon of butter contains 100 calories, 12 grams of fat, 7 grams of saturated fat, 0.5 grams of trans fat, 31 mg of cholesterol, 0 grams of carbohydrates, and 0 grams of sugar. Butter is made of simply pasteurized cream. Sometimes salt is added.

In countries where cows are grass-fed, butter consumption is associated with a dramatic reduction in heart disease risk. Grass-fed dairy products are much higher in Vitamin K2 and omega-3 fatty acids, both of which are incredibly important for the heart. If cows have access to healthier food, you can also get this benefit when you consume other products from the cows - for example, meat, cheese, and milk.

The better fed that cows are, the healthier their butter should be.

Types Of Margarine

Stick margarine

One tablespoon of stick margarine contains 80-100 calories, 9-11 grams of fat, 2 grams of saturated fat, 1.5-2.5 grams of trans fat, 0 grams of cholesterol, 0 grams of carbohydrates and 0 grams of sugar.

✓ Pro: may contain slightly fewer calories than butter

× Con: contain trans fat.

Light Margarine

Light margarine contains a higher percentage of water than traditional margarine, making it lower in calories and fat.

Generally, light margarine contains 40 calories, 5 grams of fat, 1-1.5 grams of saturated fat, 0 grams of trans fat, 0 grams of cholesterol, 0 grams of carbohydrates, and 0 grams of sugar per tablespoon.

✓ Pro: contain less saturated and trans fat than regular margarine

× Con: still may contain some partially hydrogenated oils.

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Different types of margarine contain different amounts of calories and trans fats.

Regulatory & Safety News

GMA debuts SmartLabel to give consumers access to ingredient information

IFT WEEKLY DECEMBER 2, 2015

The Grocery Manufacturers Association (GMA) has announced the launch of SmartLabel—a technology that will enable consumers to have access to detailed information about thousands of retail products.

The new program, created by manufacturers and retailers, enables consumers to get additional details about products by scanning a bar code or doing an online search to reach a landing page with information on ingredients and other attributes of a wide range of food, beverage, pet care, household, and personal care products. More than 30 U.S. food, beverage, and consumer products companies are already committed to using SmartLabel, including: ConAgra Foods, Campbell Soup, Hershey, J.M. Smucker Company, General Mills, McCormick, and Unilever.

Each product in SmartLabel will have a landing page containing detailed information from the manufacturer on ingredients and other product attributes. Consumers will be able to find this detailed product information in several ways: by scanning a QR (Quick Response) code on the package, using a web search, going to a participating company's website, or eventually through an app.

"People want more information and are asking more questions about products they buy, use, and consume, and SmartLabel puts detailed information right at their fingertips," said Pamela G. Bailey, GMA's president and CEO. "SmartLabel is a modern technology that will change how people shop and will help them get answers to questions they have on the products they purchase when they want that information."

Some companies are beginning to offer products using SmartLabel late this year and early in 2016, with projections of nearly 30,000 total products using SmartLabel by the end of 2017. GMA estimates that within five years, more than 80% of the food, beverage, pet care, personal care, and household products that consumers buy will be using SmartLabel.

Companies are projecting that, by the end of 2017, they will disclose via SmartLabel whether 20,000 food products do, may, or do not contain ingredients sourced from genetically engineered (GE) crops, commonly known as GMOs. Current estimates indicate that number could triple once a uniform national standard is set for GMOs.

How to fight oil adulteration?

FOOD NEWS LATAM DECEMBER 1, 2015

NutriSciences Mérieux, a global leader in food safety, has developed the first method to help food makers to combat adulteration of olive oil.

After harvest, main olive oil producing countries face the risk of fraud olive oil which has increased the last year. Earlier this week, the most important Italian newspaper, Corriere della Sera, revealed fraud olive oil on a large scale.

The products of seven major companies of olive oil labeled as extra virgin olive oil also contained significant amounts of oils of lesser quality. The Italian government has launched an investigation into this fraud.

The method developed by Mérieux Nutrisciences "to identify whether the product is bottled extra virgin quality". While some analytical methods used are at risk of being duped by fraudsters. The method of 63 parameters and the state of the technique developed by Mérieux NutriSciences not allow you to be deceived.

Bert Popping, Director scientist and expert in Food Chemistry and Molecular Biology, said: "The method is a cutting edge development using the latest analytical techniques in combination with unique algorithms for processing data Using this precise and reliable method It makes it almost impossible to cheat producers, traders and last not least, consumers."

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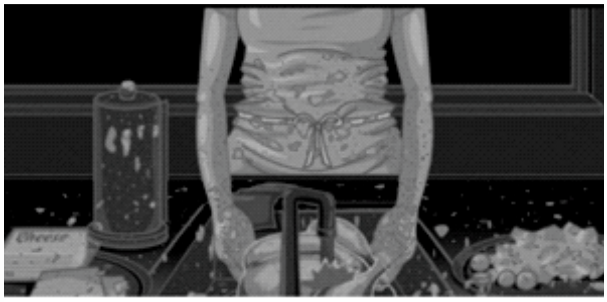
With its advanced analytical developments, Mérieux NutriSciences help restore consumer confidence and allows the actors concerned to assess the quality of the products from their suppliers. Jean-François Billet, Senior Vice President of Corporate Development, said: "Our services are to address all the challenges of safety and quality of foods, including tampering actions affecting the value chain of food in the context. Globalization of the food market, a shortage of some resources and climate impacts is very important for our customers to be able to guarantee the origin and composition of the products. It is also a key to building and maintaining the confidence of end users.

Some of the bacteria that can cause food poisoning

FOOD NEWS LATAM DECEMBER 1, 2015



The number of cases of food-borne diseases remains high with an estimated 1 million people in the UK each year.

The symptoms are not only unpleasant, but include vomiting, diarrhea, abdominal pain and fever. Most foodborne illnesses are preventable. Prevention of food poisoning is everyone's premises product until it arrives at the table. This includes farmers and growers, manufacturers, stores, caterers and consumers. The activities of food suppliers are governed by the law of food safety. Correct home kitchen hygiene and storage.

A closer look of a bacterium that causes food poisoning.

Campylobacter
Campylobacter is part of the normal flora living in the intestines of healthy chickens and other animals. At the factory, when a chicken is killed and gutted, the contents of their intestines, such as Campylobacter, could come into contact with the skin of the bird. This means that the raw chicken meat could be contaminated with Campylobacter.

How to ensure that chicken is safe to eat?
Campylobacter is sensitive to heat so cooking chicken properly will kill and makes the meat safe to eat. If the chicken is served raw, then Campylobacter could survive and be eaten with chicken. After the bacteria have been swallowed multiply inside the intestine of the person and cause the disease known as food poisoning. It takes about three days for the symptoms of diarrhea, stomach cramps and fever develop. The illness lasts from 2 days to one week.

Cross-contamination is the transfer of microbes from raw food prepared and cooked foods can take place through:
• Touching raw or cooked food splashes,
• Touching raw foods or surfaces that have the bacteria and then used for cooked foods.
• Touching raw foods with their hands and then handling cooked foods.

To avoid cross-contamination, it is important to maintain good hygiene in the kitchen such as storage of raw and cooked foods separate, and good personal hygiene by washing hands properly.

Just Mayo gets to keep its name

IFT WEEKLY DECEMBER 23, 2015

According to the Associated Press, after months of negotiations, Just Mayo's maker Hampton Creek says it has worked out an agreement with the U.S. Food and Drug Administration (FDA) that lets the eggless spread keep its name, as long as a few changes are made to its label.

The resolution comes after the FDA sent a warning letter to Hampton Creek in August 2015 saying Just Mayo was misbranded because mayonnaise is defined as having eggs.

Without providing details, the FDA said in statement it worked with Hampton Creek to address the issues cited in its letter, and that it considers the matter to be resolved. As part of the deal, Hampton Creek says Just Mayo's label will make it clear that the product does not contain eggs. The changes include making the words "egg-free" larger and adding "Spread & Dressing." An image of an egg with a pea shoot inside will also be smaller. A definition of "just" as being "guided by reason, justice, and fairness" will be put on the new label as well.

The letter from the FDA had also noted that Just Mayo contains ingredients that are not permitted by the standard of identity for mayonnaise. It also said that the product is not qualified to make implied health claims that it can reduce the risk of heart disease.

Stuart Pape, who specializes in labeling and regulatory issues at the law firm Polsinelli and assisted Hampton Creek, said that the formula for Just Mayo is not changing, and that the other labeling issues have been resolved.

After the initial warning letter was issued, Ivan Wasserman, Partner at Manatt, Phelps & Phillips, LLP, wrote an opinion piece for IFT's ePerspective blog that helped to shed some light on the FDA's move and offers some words of advice to other food manufacturers. Read what Wasserman had to say on the FDA ruling, and share your opinion about the outcome by visiting the ePerspective blog and commenting.

Salmonella may be able to survive for long periods in dry foods

IFT WEEKLY DECEMBER 23, 2015

A study published in the Journal of Food Protection shows that pathogens, like Salmonella, may be able to survive for at least six months in cookies and crackers.

The study was prompted by an increased number of outbreaks of food-borne diseases linked to low-water-activity, or dry, foods.

The researchers used five different serotypes of Salmonella that had been isolated from foods involved in previous food-borne outbreaks. Focusing on cookie and cracker sandwiches, the researchers put the Salmonella into four types of fillings found in cookies or crackers and placed them into storage. The researchers used cheese and peanut butter fillings for the cracker sandwiches and chocolate and vanilla fillings for the cookie sandwiches. After storing, the scientists determined how long Salmonella was able to survive in each filling.

The researcher found that Salmonella survived longer in some

types of the fillings than in others; it didn't survive as well in the cracker sandwiches as it did in the cookie sandwiches. In some cases, the pathogen was able to survive for up to six months in the sandwiches.

"The next steps would be to test all ingredients that are used in these foods," said Larry Beuchat, a distinguished professor emeritus and researcher in the University of Georgia College of Agricultural and Environmental Sciences. If there is a possibility that food-borne pathogens are present in specific ingredients, then the next step would be to stop the use of those ingredients.

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Margarine with Phytosterols

Phytosterols are plant-based compounds that are similar in structure to cholesterol. Because of this, they compete with cholesterol for absorption in the body, reducing cholesterol absorption and therefore reducing blood cholesterol. Margarines with phytosterols contain a blend of oils such as olive oil or flaxseed oil.

Generally, margarine with phytosterols contain 70-80 calories, 8 grams of fat, 2.5 grams of saturated fat, 0 grams of trans fat, 0 grams of cholesterol per tablespoon, 0 grams of carbohydrates, and 0 grams of sugar.

Pro: can help reduce LDL (bad) cholesterol, contain no trans fat

Con: slightly higher in calories and saturated fat than light margarines.

Butter VS. Margarine: Making a Choice

The decision on whether to choose butter or margarine is dependent on the individual and their specific dietary needs.

Maintaining proper nutrition is a personalized undertaking. What makes sense for one person might not be in the best interest of the next.

Quick Tips:

✓ Look for the least amount of trans fat - preferably 0 grams - and be sure to check the ingredient label for partially hydrogenated oils

✓ If buying butter, choose grass-fed when possible

✓ Choose a brand that tastes good to you - if you don't like it, you are likely to use too much to compensate for bland or missing flavours.

Adding butter to foods adds calories you may not necessarily think about. For example, adding a tablespoon of butter to something you eat every day adds 100 calories each day, or 365,000 calories a year.

That being said, butter can be important in a meal because it adds a fat source. Our body requires fat to function. Fat also provides a feeling of satiety in meals; if you eat a meal without a fat source, you are likely to feel hungry again shortly after.

If you have questions about whether butter or margarine is a good choice for you, please consult a registered dietitian.

Should you eat protein before exercise, or after?

SOURCE: Reuters Health-link.reuters.com/sax77q American Journal of Clinical Nutrition, online November 17, 2010.

Eating protein after exercising may help rev up the body's muscle-making machinery, in both young and older men alike, a small study suggests.

The study of 48 men - half in their twenties and the other half in their seventies -- found that in both age groups, consuming a protein drink after exercise led to a greater increase in muscle protein, compared with downing the drink after a period of rest.

What's more, muscle protein increased at nearly the same rate in young and elderly men, the researchers report in the American Journal of Clinical Nutrition.

That suggests that, contrary to some researchers' speculation, older age may not impair the way the body digests and absorbs protein from food, according to the researchers, led by Dr. Luc JC van Loon of Maastricht University Medical Center in the Netherlands.

The study has a number of limitations. Besides its small size, it did not look at actual muscle mass changes over time -- but only short-term changes in participants' muscle-fiber proteins after the protein drink. So it is not clear what kinds of gains older or younger adults might see from having their protein post-workout.

Still, the findings do suggest that exercising before consuming protein may help the body put those nutrients to greater muscle-building use, according to van Loon's team.

And for older adults, they write, exercise should "clearly" be considered as a way to boost muscle-protein buildup in response to food -- and, by extension, to support healthy aging.

The study included 24 older men with an average age of 74 and 24 young men with an average age of 21, none of whom regularly exercised.

The researchers randomly assigned the men to one of two groups; in one, the men rested for 90 minutes, followed by 30 minutes of exercise -- pedaling a stationary bike and performing light strengthening exercises. In the other group, the men spent those additional 30 minutes relaxing.

Afterward, men in both groups downed a drink containing 20 grams of protein, then had their blood levels of various amino acids (the building blocks of proteins) repeatedly measured. The researchers also took a small sample of tissue from each man's thigh muscle, right before the protein drink and 6 hours afterward, to measure changes in the amounts of protein in the muscle.

Overall, van Loon and his colleagues found, muscle protein increased to a greater extent in the exercise group versus the inactive group, and both older and younger men showed similar benefits. It's well known that muscle mass tends to wane as people age, and some researchers have proposed that one reason may be that in older people, the body's muscle-protein production responds less efficiently to protein from food, and also to exercise.

However, the current findings suggest that this may not be the case. "Effective dietary approaches are needed to prevent and/or attenuate the age-related loss of muscle mass," van Loon and his colleagues write.

Based on these findings, they conclude, it's possible that having protein after exercise allows for greater use of food-derived protein for muscle building, in young and old alike.

HMO is the new ingredient in infant formulas?

FOOD NEWS LATAM NOVEMBER 25, 2015

A new study suggests that the way to obesity can be paved with nonnutritive carbohydrate in breast milk, changing popular notions about how and why children grow up to be overweight adults.

Previous research has shown that maternal obesity strongly affects a baby's risk of being overweight, but scientists are not sure how the fat is passed, said Michael Goran, corresponding author of the study and director of the Center for Childhood Obesity Research Keck School of Medicine of USC.

Now Goran and his colleagues have discovered that variations in the complex carbohydrates found in breast milk called human milk oligosaccharides (HMO) are associated with variations in growth and childhood obesity. HMO, a natural component of the breast milk, is known to play a role in

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Microbial quality is now categorized as satisfactory, unsatisfactory and potentially hazardous. FSSR 2011 is constantly subjected to amendments, efforts are being made to benchmark our regulations to the more stringent regulations of US and UK. Food Safety and Standards Act 2006 is doing commendable work considering the size and the population of this nation.

In order to formulate and implement guidelines or regulations, laboratory support is absolutely essential. Establishment and development of methods to detect microbes is crucial. Classical methods involved detection of indicator organisms such as coliforms as culturing and isolating specific pathogens was difficult.

Pre-enrichment, selective enrichment & post enrichment steps can be used to overcome the problems of non-uniformity of the matrix, pathogen distribution, injured or stressed pathogen and high concentrations of normal microbiota. Enriched samples are then plated onto a selective &/or differential media, in which colonies are identified by using biochemical and serological methods.

These conventional methods are time consuming in nature. There is a need for development of advanced, rapid and specific techniques with high sensitivity. Novel techniques have been developed and the detection is based on the use of chromogenic or fluorogenic media. Other advanced detection techniques are based on use of antibodies and nucleic acids. However, all these methods require extensive validation for each batch of kits.

Food Safety can be ensured by implementation of systematic and structured approach of Hazard Analysis and Critical Control Point (HACCP). The first step is enumeration of likely hazards, followed by identification of control hazards. Once the hazards have been identified, we need to determine the control measures that have to be applied.

Minimum/ maximum values for control have to be established. Once the MRL's have been established, physical factor of control has to be measured. Corrective actions in case of deviation need to be established. The process should be reviewed and validated.

Documentation and archiving is critical to maintain tractability. The HACCP approach helps in the prevention of hazards rather than finished product inspection. This system can be used at all stages of a food chain, from food production and preparation processes to packaging, distribution and sale.

Corrective actions can be taken only if we are aware of the hazards encompassing us, thus testing and screening for micro-organisms is highly imperative to ensure the safety and quality of food.

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necessary", said the researchers. They found the lid of some packaging to be 'overdesigned' and suggest thinner barrier materials can be used than ethylene vinyl alcohol copolymer (EVOH) barrier polymer such as PET while protecting the food.

Modified atmosphere packaging (MAP) systems either come in two parts (a base and cover/lid) or in the form of bags. A mix of packaged food products with different shelf lives were bought and analyzed at the Fraunhofer Institute for Process Engineering and Packaging IVV.

Oxygen concentration findings
Sven Sängerlaub, head of the functional materials business unit at Fraunhofer IVV, said they did not expect that the permeability of lids and trays of one packaging could be that different. "Interestingly some products suffer from increased oxygen concentration in the packaging. We assume that oxygen is trapped in the food during processing and thereby carried into the packaging. We always expected such issues but could prove it with our study," he told FoodProductionDaily.

"Our results confirm that MAP treatment is often not enough to exclude all oxygen from the packaging headspace. As mentioned earlier the food contains some oxygen as well. To solve the issue and increase the shelf life the food should be processed in nitrogen or an oxygen scavenger should be applied."

Low concentrations of oxygen were detected for pasta products, baked goods, sausage products, fish, cheese, snack products, and ready-to-eat meals. These products need to be protected against oxidation

and the growth of aerobic microorganisms using MAP systems with nitrogen/carbon dioxide mixtures or nitrogen. Concentration of oxygen in packaging for cashew nuts, chipsticks, lasagne, and the baguette with herb butter was relatively high. Possible reasons for this are residual oxygen after the packaging process or too high oxygen permeability of the packaging.

A very high oxygen concentration (75% volume) was measured in the packaging for fresh meat. In this system the oxygen stabilizes oxy-myoglobin, the pigment responsible for the red colour of meat. The low oxygen permeability of packaging material used for MAP systems was low except for fruit and vegetables which require high oxygen permeability.

The clear difference between the oxygen permeabilities of different parts of two-part packaging systems was unexpected and in some cases the oxygen permeability of the bases was one to two orders of magnitude higher than the lids, a weak point which promotes oxidative spoiling and the growth of aerobic microorganisms, said the researchers.

Polymer Type

The barrier polymer EVOH has low oxygen permeability and is often used for MAP systems for oxygen-sensitive products and fresh meat. Polyethylene (PE) and polypropylene (PP) are used as sealing layers due to good sealing properties. Polyethylene tere-phthalate (PET) and polyamide (PA) increase the strength and stability of the packaging and provide a medium barrier to oxygen.

Sängerlaub said there is a trend to deliver "one solution fits many applications". "If it is considered that other properties such as sealability, runability and production efficiency are of high relevance it becomes clear that sometimes lids are used that are over-engineered. The issue could be seen vice versa: At some application a tray with better barrier properties can lead to a longer shelf life and better product quality."

Carbon dioxide concentration in packaging varied between product groups. The bacteriostatic effect of carbon dioxide inhibits microbial growth. Baked goods had much higher concentrations (>50% volume), because there is an enhanced risk of mould growth. No carbon dioxide was detected in the headspace of packaging for cashew nuts and chipsticks. These are dry products with a low water activity and are less prone to microbial growth and presence of carbon dioxide is unnecessary.

For cost savings the overall packaging processes must be analysed, said Sängerlaub. "One example is to choose the right sealing polymer which enables faster sealing. Another issue is better adapted thermoforming parameter which lead to a more equal thickness distribution and allow therefore thinner barrier polymer layers.

"Some packaging for sensitive food products with short shelf life is overdesigned. An example is the tray for fresh meat with a shelf life of four to 10 days. The modified atmosphere consists of nitrogen and oxygen (e.g. in the ratio 70%/30%). In some cases we found PP trays with additional EVOH barrier. However a PP tray without EVOH is sufficient for fresh meat packed and will keep the modified atmosphere at an acceptable level."

Pixie Dust to 'magically' sterilize stand up pouches and baginbox

Food Production Daily, 26Nov2015

Performance Packaging has launched an alternative aseptic process to sterilize flexible packaging and its contents, avoiding hot filling, retort processing, peroxide or peracetic baths and sprays, irradiation, pulsed light or electron beam irradiation.

The patented process codenamed 'Pixie Dust' features a 'liquid-to-gas' sterilization process and the company, based in Nevada, US, with clients including Russell Stover Candies, RW Garcia, Tom Clark Confections and Baby Gourmet Foods, is now working with various companies to identify additional markets and partners.

Rapid, inline sterilization prior to filling

Rob Reinders, president, Performance Packaging, told ConfectioneryNews, the development is thanks to the work of Dr Joseph Dunn, who joined the firm earlier this year as vice president of research and development and regulatory affairs. He said the company is also creating improvements that predict rapid, inline sterilization prior to filling but he could not disclose any more details due to the competitive nature of the patent process.

"The very nature of our innovative work on improving aseptic packaging technologies dictates that we cannot reveal certain information," said Reinders. "Although we have secured an important patent for our initial achievement, there is still much work to be accomplished regarding future applications for provisional patents as well as full patents. Pixie Dust is a cost-saving alternative to traditional shelf-stable methods.

"We are currently

seeking worldwide partners in the pharmaceutical and food industries to implement this technology that crosses many platforms including device sterilization as well as the foodstuff shelf life extension."
Plastic, glass, or metal objects, can be sterilized Products such as enclosed plastic, glass, or metal objects, can be sterilized within the package, and the method makes aseptic coldfill processes possible.

Industry applications for Pixie Dust include flexible packaging such as standup pouches, baginbox, or any sealed package. According to Dunn, it has dramatically reduced the cost of the sterilization process to one cent (1¢) of agent which can treat approximately 750,000 pouches. In contrast, large volumes of peroxide (such as 250 gallons of high-concentration H2O2 and hot, sterile air are required to sterilize a similar number of form-fill-seal packages.

During tests, Performance Packaging added the organism Bacillus atrophaeus ATCC 9372 spores (which are highly resistant to heat and chemicals such as H2O2) to the package contents. A specific quantity of the Pixie Dust agent was then inserted into the package.

Polyolefin milk bags
After about two days, no viable spores were recovered from any of the treated samples, which included inoculations of 4liter, hot fill baginbox, 55gallondrum bags and 2½ gallon polyolefin milk bags. The corners and gusset fold tests, along with laboratory-scale filling tests of treated pouches revealed no sign of bacterial growth.

"There is no need to irradiate the package and it does not need to be hot filled or require post-pasteurization, since the pouch is already sterile," added Dunn. "The benefits of Pixie Dust include: a low-cost process that features GRAS ('Generally Recognized as Safe") materials process residuals are below the US Food & Drug Administration (FDA) "Threshold of Regulation" sterilization can occur during storage or shipping and is achieved in less than 48 hours at room temperature and use of the pixie dust procedure is smell and taste neutral."

Dunn has more than 30 years of experience in industrial biochemistry and microbiology relating to packaging research. He is also the inventor of the use of pulsed light for packaging sterilization and the author of more than 25 patents related to packaging industry safety processes. Throughout his career, he has worked closely with the US FDA.

Founded in 1995, Performance Packaging is a supplier of flexible and folding carton packaging, including coffee bags, roll stock, spouted and zippered pouches, and premade retortable pouches. Products include surface-printed Low Density Polyethylene (LDPE), CCNB materials to Litho Laminate Bflute cartons, and shrink materials such as PET, OPS, and PVC OPP.

Research in Health & Nutrition

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helping to develop a child's immune system. Tanya Alderete, lead author of USC (http://news.usc.edu/) says: "At 6 months, the highest levels of maternal milk and DSLNT LNFPII were each associated with increased approximately 1 pound of fat mass."

Previous studies on the overall impact of breastfeeding on obesity have shown conflicting results. Many suggested that breastfeeding reduces the baby's risk of developing obesity in childhood and adolescence. When the researchers examined 71 previous reports on this issue, they found that breastfeeding reduces the prevalence of overweight and obesity an average of 10 percent in relation to formula.

"Early life experiences related to the environment and the different forms of power contribute to obesity. But usually we think the risk of obesity after weaning, the time of the introduction of solid foods, drinks first exposures sugary. It is evident that there is something going before weaning, even in babies who are breastfed exclusively.

Ultimately what we want to be able to do is identify which of the HMOs are the most important for the protection of obesity and then use that as a supplement that can give the child breastfeeding and can be added to infant formulas (current infant formula contains no HMO). " Michael says Goran.

Childhood obesity has more than doubled in children and adolescents has quadrupled in the last 30 years, according to the Centers for Disease Control and Prevention of Diseases. The first exposure of the infant nutrition sets the stage, whether to increase or decrease the risk of obesity. HMO accumulate in the colon because not be digested. As a result, they act as prebiotics and play a role in the formation of microbioma intestine of a baby (the population of microorganisms in the gut).

"To our knowledge, no studies have examined how HMOs are affected by the diet of mothers. It would be very interesting if sugar found in

diet or fat intake is related to the HMOs. That's something to look forward explore in future studies. "Tanya concludes.

Top risk factors for child undernutrition in India identified

Medical News Today 18 December 2015

In India, nearly 40% of all children are stunted--of extremely low height for their age--and nearly 30% are underweight.

A new study from Harvard T.H. Chan School of Public Health has now pinpointed the five top risk factors responsible for more than two-thirds of the problem.

The study--the first to comprehensively analyze and estimate the relative importance of known risk factors for child undernutrition--appears online in Social Science & Medicine. Examining an array of 15 well-known risk factors for chronic undernutrition among children in India, the study found that the five top risk factors were essentially markers of poor socioeconomic conditions as well as poor and insecure nutritional environments in children's households.

Specifically, using data on nearly 29,000 children aged 6-59 months from the 3rd India National Family Health Survey, conducted in 2005-06 (the latest data that is publicly available), the researchers found that the five most important predictors of childhood stunting and underweight were:

short maternal stature
a mother with no education
extreme poverty
poor dietary diversity
maternal underweight

Meanwhile, factors such as Vitamin A, breastfeeding, use of iodized salt, improved water and sanitation, and even immunization--all currently high priority interventions in the global discourse on addressing undernutrition--accounted for less than 15% of the cases of undernutrition.

"There is an immediate need to not waste time and resources on short-term and 'doable' interventions," said S V Subramanian, professor of population health and geography and senior author of the study. "While asking people to change behaviors and offering piecemeal solutions might provide some short-term relief, such strategies cannot be substituted for the urgent need to improve food and livelihood security."

Pumpkin Seeds: Health Benefits, Nutritional Information

Medical News Today 14 December 2015

Pumpkin seeds are an edible seed typically roasted for consumption. They are a common ingredient in Mexican cuisine and are also often eaten as an individual snack. The seeds of the pumpkin are also commonly referred to as pepitas, Spanish for "little seed of squash."

This MNT Knowledge Center feature is part of a collection of articles on the health benefits of popular foods. It provides a nutritional breakdown of pumpkin seeds and an in-depth look at their possible health benefits, how to incorporate more pumpkin seeds into your diet and any potential health risks of consuming pumpkin seeds.

Nutritional Breakdown Of Pumpkin Seeds

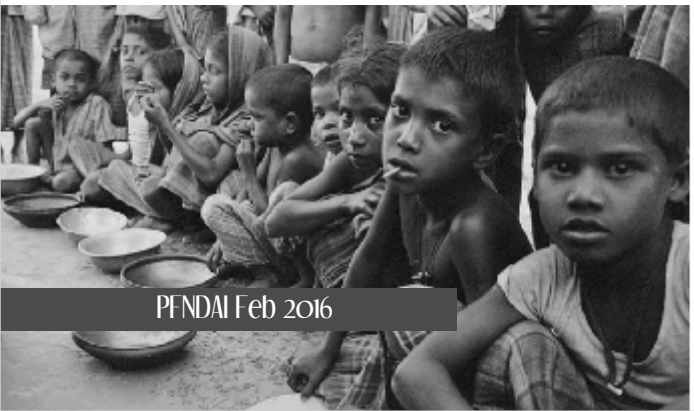
According to the US Department of Agriculture (USDA) National Nutrient Database, approximately two tablespoons of unshelled pumpkin seeds (28 grams) contains 125 calories, 15 grams of carbohydrate (including 0 grams of sugar and 5 grams of fiber) and 5 grams of protein as well as 5% of your daily iron needs. Pumpkin seeds are a source of magnesium, zinc, copper and selenium.

Possible Health Benefits Of Consuming Pumpkin Seeds

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

The Benefits Of Magnesium

Pumpkin seeds are exceptionally high in magnesium, one of the seven essential macrominerals. Two tablespoons of pumpkin seeds contain 74 mg of magnesium, about 1/4th of the daily recommended dietary allowance. Magnesium plays an important role in over 300 enzymatic reactions within the body, including the metabolism of food and synthesis of fatty acids and proteins. Magnesium is involved in neuromuscular transmission and activity and muscle relaxation. Magnesium deficiency, especially prevalent in older populations, is linked to



insulin resistance, metabolic syndrome, coronary heart disease and osteoporosis.

Bone Health
Magnesium is important for bone formation. High magnesium intakes are associated with a greater bone density and have shown to be effective for decreasing the risk of osteoporosis in postmenopausal women.

Diabetes
For every 100 mg/day increase in magnesium intake, the risk of developing type 2 diabetes decreases by approximately 15%. Low magnesium levels can impair insulin secretion and lower insulin sensitivity.

Heart Health
Improvement in lipid profiles has been seen with an intake of 365 mg of magnesium per day.

Heart And Liver Health
Pumpkin seeds are rich in omega-3 and omega-6 fatty acids, antioxidants and fiber. This combination has benefits for both your heart and liver. The fiber in pumpkin seeds helps lower the total amount of cholesterol in the blood and decrease the risk of heart disease, while research to date suggests that omega-3s can decrease the risk for thrombosis and arrhythmias, which lead to heart attack, stroke and sudden cardiac death. Omega-3s may also decrease LDL, total cholesterol and triglyceride levels, reduce atherosclerotic plaque, improve endothelial function and slightly lower blood pressure.

Insomnia Prevention
Pumpkin seeds are a rich source of tryptophan, an amino acid. Tryptophan has been used to treat chronic insomnia because the body coverts it into melatonin, the "sleep hormone." A study published in Nutritional Neuroscience suggested that consuming tryptophan from a gourd seed alongside a carbohydrate source was comparable to pharmaceutical grade tryptophan for the treatment of insomnia.

Having a few pumpkin seeds before bed, with a small amount of carbohydrates such as a piece of fruit, may be beneficial in providing your body with the tryptophan needed for melatonin production.

Pregnancy
It is estimated that over 80% of women worldwide have inadequate zinc intake. Low levels of zinc alter circulating levels of multiple hormones associated with the onset of labor. In addition to this, zinc is essential for normal immune function and prevention of uterine infections. All of these could potentially contribute to preterm birth.

How To Incorporate More Pumpkin Seeds Into Your Diet
Quick tips:

✓ Top salads with pumpkin seeds
Make homemade granola with a mixture of nuts, pumpkin seeds and dried fruit

✓ Brush pumpkin seeds with olive oil, season with cumin and garlic powder and bake until brown and toasted

✓ Make your own pumpkin seed butter (like peanut butter) by blending whole, raw pumpkin seeds in a food processor until smooth.

Risks And Precautions
Seeds have a high fat content so they are prone to rancidity. Keep pumpkin seeds in a cool, dark and dry place to improve shelf life. If stored properly, pumpkin seeds will keep for 3-4 months.

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

EU project seeks algae omega3s
Nutra Ingredients, 03Nov2015

Extracting omega3 from novel algae sources is the mission of a European Union-funded project with multiple partners including the famed nutrition research arm at Wageningen University in the Netherlands.

The PUFAchain project focuses on the "value chain of microalgae" an area of the food-chain that has been attracting more and more interest in recent years due to nutrient stores and sustainability wins.

"The main targeted application is the use of high purified omega3 fatty acids (DHA [docosa-hexaenoic acid] and EPA [eicosa-pentaenoic acid] as building blocks in modern oleo chemistry to gain high value products for nutrition and pharmaceutical applications," the project outline states. It adds: "These stages include biology, cultivation technology and downstream technology" to establish a "concrete exemplary value chain".

150 strains have been preselected and "510 strains will be selected analysed in detail and prepared for upscaling. …best available expertise in the sector in Europe."

Six firms and two research institutions are involved aside from Wageningen that will engage at various points along the whole supply chain. This would encompass "feedstock production and harvesting to oil extraction and purification. Innovative technologies will be combined taking advantage of a complimentary partnership with the best available expertise in the sector in Europe. These processes will be evaluated for their sustainability and scaled up from lab to demonstrative prototype level."

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Nutrela Soya Fried Rice

Ingredients:

50 gm Nutrela Soya Chunks
1.5 tbsp oil
30 gm french beans, chopped
30 gm carrot, chopped
20 gm cabbage, bite sized pieces
10 gm spring onion
300 gm rice, boiled
Pepper, as per taste
½ tsp aromat powder
Vinegar, few drops
1 tsp light soya sauce
1 tsp green chilli sauce

Method:

1. Take a chinese wok and put it on flame.
2. Once it is hot, add oil in the wok.
3. Add chopped ginger, garlic, celery and sauté it for 5 seconds till it gives out fragrance. (Make sure it does not get burnt)
4. Add Nutrela Soya Chunks in the wok.
5. Add french beans, carrots, cabbage and whites of spring onion.
6. Add rice. Once the rice is added, toss it in the wok.
7. Add salt, white pepper, aromat powder, light soya sauce and green chilli sauce.
8. Add a few drops of vinegar.
9. Garnish with chopped onion greens.
10. Serve hot.

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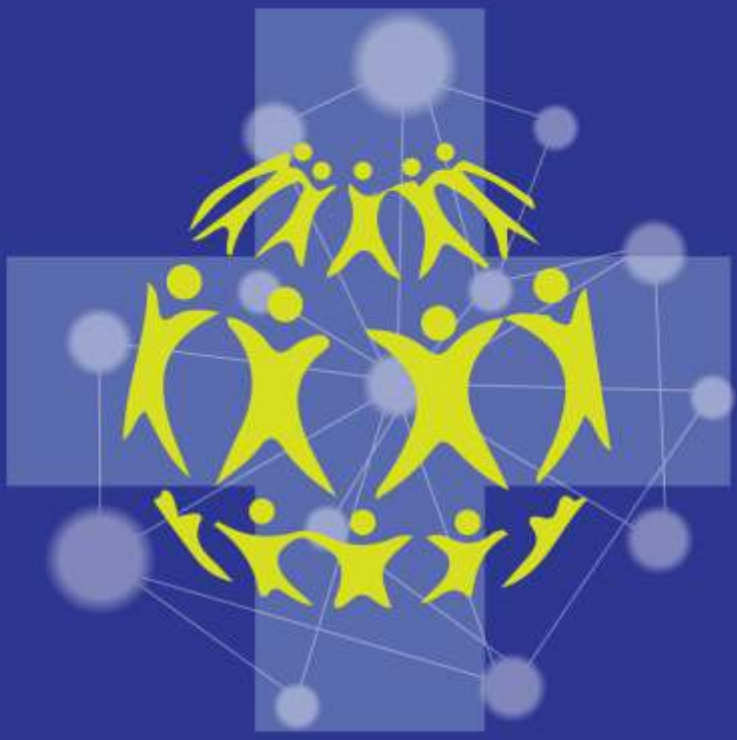

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