

Soy & Health

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GRAS status for stearidonic acid omega-3 soybean oil

New soybean oil varieties, such as increased omega-3 soybean oil, are now being developed and both Monsanto and Solae recently announced that the US Food and Drug Administration (FDA) has issued a Generally Recognised as Safe (GRAS) notice confirming that stearidonic acid (SDA) omega-3 soybean oil can be used in foods and beverages in the US under the intended conditions of use. The GRAS notice allows the long-chain omega-3 oil to be used at levels that provide 375mg of SDA soybean oil per serving in products such as baked goods and baking mixes, breakfast cereals and grains, fats and oils, milk products, nuts and nut products, snack foods, confectionery, soups and soup mixes.

SDA soybean oil contains 15-30% SDA and 5-8% gamma-linolenic acid (GLA) compared with 0% in conventional soybean oil. The SDA soybean oil is expected to be either added to foods or used as a replacement for non-hydrogenated vegetable oils and provides a convenient, non-fish source of omega-3s, which are known to supply cardio-protective effects and other health benefits.

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Fish oil is the preferred source of omega-3s because of the bioavailability of eicosapentaenoic (EPA) and docosahexaenoic acid (DHA), but alpha-linolenic acid (ALA) in soybean oil is the main source of omega-3s in the US diet as many Americans do not consume recommended levels of fish. Increasing the quality of the omega-3s in soybean oil is, therefore, considered to be important providing a convenient, abundant, renewable source.

For more information visit: http://www.soyconnection.com/pressroom/press_releases.php or to view the FDA GRAS notice visit: http://www.accessdata.fda.gov/scripts/cfn/gras_notices/grn000283.pdf

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Slight change in British attitudes to GM food

The UK Food Standards Agency recently commissioned a survey to measure public attitudes to food technologies, including genetically modified (GM) food, high pressure treatment, gas filled packaging and hypothetical food products that have particular health benefits. The survey found that attitudes to food technologies vary markedly across the public with the following characteristics more common in people with a high level of concern - having less knowledge about food technologies, being older, being female, having a low income, and having a high level of concern about food safety in general. Familiarity with the terminology of food technologies appears to reduce levels of public concern, e.g. 31% are concerned about eating food cooked in a microwave, whereas 57% expressed concern when asked about a magnetron (a less well-known term for a microwave).

On GM, few people hold strong attitudes to GM food, and since 1999 there has been a notable increase in the proportion not holding a definite view. Those who do express a definite view (albeit not necessarily a strong one) tend to regard this technology negatively rather than positively, although in more recent years, there has been a slight increase in public support for GM food. (<http://www.food.gov.uk/news/newsarchive/2010/mar/foodtechbsa08>)

Soyfoods for Haiti Alliance



In cooperation with various soyfoods-related entities, including the US-based World Soy Foundation and the Canadian non-profit Malnutrition Matters, a multi-national SoyFoods Haiti Alliance Relief Effort (SHARE) has been formed. Bridge2Food, based in the Netherlands, is assisting in this enterprise which aims to promote and facilitate the donation and delivery of soy-based foods to Haiti. A number of major companies have provided commitments including Alpro NV, Solae LLC, Vitasoy USA Inc, and WhiteWave Foods. Alpro and Solae have committed financial support for the effort, while considering further options, while Vitasoy and WhiteWave are donating aseptic beverages. These first soyfood donations are being made via "Feed the Children", a US-based NGO with a branch also in Canada. Their mission is to provide food to people in need, in many countries. They also have the capability to collect and warehouse food donations and are working with a variety of recipient organisations in Haiti.

Work is underway to solicit more donations as well as to facilitate logistics and distribution and further donations will be needed for the foreseeable future. These should include protein-rich snacks, ready-to-eat foods, beverages and quick-cook products, as well as cooking oil. Eventually, and on a longer-term basis, donations could include soybeans, soy protein ingredients and micro-nutrient supplements for value-added processing in Haiti. Alliance partners, Malnutrition Matters in North America and Bridge2Food in Europe, are working to solicit and expedite soyfoods donations. The US-based World Soy Foundation is accepting financial donations and can issue US tax receipts.

Contacts: Europe and Asia - Gerard Klein Essink at gkleinessink@bridge2food.com (<http://www.bridge2food.com>); USA - World Soy Foundation via nruby@soy.org (<http://www.worldsoyfoundation.org>); overall initiative - Malnutrition Matters via matters@malnutrition.org (<http://www.malnutrition.org/haiti.html>).

Soyinfo Center publishes new book

The Soyinfo Center is in the process of publishing numerous free online books on the history of soybeans and soyfoods on its website. The latest, "History of Soybeans and Soyfoods in Canada" is now available at <http://www.soyinfocenter.com/books/137>. Alternatively go to <http://www.soyinfocenter.com>. In the upper right corner at "Latest Free Online Books" click "History of Soybeans and Soyfoods in Canada (1831-2010)" where you will be taken to a landing page, which has a brief chronology. Click the large PDF link near the top to open, read, and search the book. You may want to search for particular words in the text of the PDF file, such as your name, or the name of a country, company, etc. Any comments or errors noticed would be warmly welcomed. The book will also be indexed by Google.





3

Solae named as one of most ethical companies in 2010

Solae LLC has been recognised by the Ethisphere Institute as one of the World's Most Ethical (WME) Companies for 2010. Out of a record number of nominations for the award, Solae secured a hard-earned spot on the list for implementing upright business practices and initiatives that are instrumental to the company's success, benefit the community, and raise the bar for ethical standards within the food industry. "Solae is honoured that our pledge to build a corporation on a solid ethical foundation has been recognised with a place on the 2010 World's Most Ethical Companies list," said Cornel Fuerer, Solae's Vice President, General Counsel and Chief Compliance Officer. "We believe the strength of a company starts with a deep commitment to ethics from the top and is sustained with an unwavering dedication to these same high standards from employees at every level. Ethical behaviour is one of our four core values at Solae, and it is important in both our professional and personal lives."

This is the fourth year Ethisphere, a think-tank dedicated to the creation, advancement and sharing of best practices in business ethics, corporate social responsibility, anti-corruption and sustainability, has published the WME rankings, which appear in Ethisphere Magazine's Q1 issue. Through in-depth research and a multi-step analysis, Ethisphere reviewed thousands of nominations from companies in over 100 countries and 36 industries in order to determine the winners. Solae is on the list with other highly reputable food companies including Campbell Soup Company, PepsiCo, and General Mills.

The methodology for the WME ranking includes reviewing codes of ethics, litigation and regulatory infraction histories; evaluating investment in innovation and sustainable business practices; looking at activities designed to improve corporate citizenship; and studying nominations from senior executives, industry peers, suppliers and customers. View the complete list of the 2010 WME companies at <http://ethisphere.com/wme-2010>.



Mixed results for US soyfoods sales in 2009

Soyatech LLC, the leading soyfoods industry intelligence resource, has announced that early results from its annual landmark study 'Soyfoods: The US Market' indicate that the US soyfoods industry had a tough year in 2009. "Our analysis of the data is ongoing," said Joe Jordan, Soyatech's content director, "but early results indicate that sales in key soyfoods categories such as soymilk and tofu contracted in 2009. This confirms anecdotal reports we have been receiving for the last 6 months. Our completed study should provide further insights for companies currently involved in the soyfoods industry as well as those anticipating entering the sector." The full report will be available in April 2010. To pre-order the 2010 edition of the annual report Soyfoods: The US Market, visit the Soyatech Resource Library online at <http://www.soyatech.com/store.htm?catId=9>.

EFSA sets European dietary reference values for nutrient intakes

EFSA's Panel on Dietetic Products, Nutrition and Allergies (NDA) has established dietary reference values (DRVs) for the intake of carbohydrates, dietary fibre, fats and water. The advice provides an important evidence base to underpin nutritional policies, the setting of diet-related public health targets and the development of consumer information and educational programmes on healthy diets. The opinions on carbohydrates, dietary fibre, fats and water were adopted by the Panel after consultation with Member States, the scientific community, and other stakeholders. These will be followed by opinions on DRVs for vitamins and minerals.

The NDA Panel has also published two further opinions on (1) the general principles for establishing dietary reference values, and (2) advice to policy makers on how to translate nutritional recommendations into messages about foods called food-based dietary guidelines (FBDGs). FBDGs can guide consumers on what to eat and help them make healthy dietary choices.

For a summary of the NDA Panel's conclusions visit: <http://www.efsa.europa.eu/en/press/news/nda100326.htm>.



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4

Isoflavones may reduce hot flushes in post-menopausal women

The aim of this Italian study was to assess the efficacy and safety of a standardised compound based on an extract of soy phytoestrogens, with high doses of isoflavones in the management of menopausal hot flushes. A total of 180 women aged 40-65 years with a minimum of five moderate-to-severe hot flushes in the last 7 days at baseline and absence of menstruation for at least 6 months participated in a 12-week prospective, randomised, double-blind, placebo-controlled multicentre trial. After a 2-week run-in period, women received one tablet a day of 80mg isoflavones (corresponding to 60mg of genistein) or a matching placebo. The mean daily number of moderate-to-severe hot flushes decreased in both study groups, but the reduction was greater in the isoflavones arm at 6 (36.2%) and 12 (41.2%) weeks than in the placebo arm (24.0% at 6 weeks, 29.3% at 12 weeks), with a difference of 1.1 (95% CI [-2.0 to -0.06]) (P = 0.038) at 6 weeks and 1.1 (95% CI [-2.05 to -0.15]) (P = 0.023) at 12 weeks. Similar findings were obtained for hot flushes of any intensity. The Kupperman index decreased in both study groups. Relief of hot flushes was greater when time to menopause was ≥ 12 months and in cases of BMI ≥ 27 kg/m². The researchers concluded that daily practice conditions, high doses of isoflavones, particularly genistein, can be used for the management of hot flushes in postmenopausal women not treated with hormone replacement therapy due to their superior efficacy to placebo and very good safety profile

A Ferrari et al, Journal of Obstetrics and Gynaecology Research 2009; Volume 35(6) pp1083-1090
<http://www3.interscience.wiley.com/journal/123195721/abstract>.



Okara may have unique health properties

According to a Spanish study okara, a major by-product of the soymilk industry, which is rich in proteins, may release potential bioactive peptides under physiological conditions. In the study okara protein isolate was digested sequentially with pepsin and pancreatin for 4 hours. On the basis of its relatively high degree of hydrolysis and antioxidant activities (power reduction and radical scavenging activity), the okara protein hydrolysates at the end of the *in vitro* digestion were fractionated by ultra-filtration and the resulting fractions were further tested for angiotensin-converting enzyme inhibition and multifunctional antioxidant activities. In the <1 kDa molecular weight cut-off ultra-fraction the amino acid sequence, TIPLPV, of a peptide from soybean lipoxygenase-1 with a calculated mass 751.48 Da was identified using LC-ESI-MS/MS techniques. According to the researchers, the hydrophobic amino acids present in this peptide, particularly Val at terminal position, may be associated with the relatively high health-promoting attributes tested. The researchers concluded that the consumption of okara protein may exert health benefits on the basis of the bioavailability and bioactivity of the identified peptide.

A Jimenez-Escrig et al, European Food Research and Technology Feb 2010, Vol 230(4) pp655-663.
<http://springerlink.com/content/r21024732g7q08v4/?p=bae8287bce684218ba986bd626be0afd&pi=12>

Soy/zein protein microspheres and controlled nutraceutical delivery

In this study, microspheres (15-25 μ m) of soy protein isolate (SPI), zein, and SPI/zein blends were prepared using a cold gelation method as possible delivery systems for nutraceutical products. Microsphere matrix crystalline structure, swelling behaviour, and nutrient load release kinetics in simulated gastrointestinal fluids were investigated. SPI microspheres showed early burst release of the model nutrient, whereas zein microspheres showed very slow release in both simulated gastric and intestinal fluids. The researchers found that blending of SPI and zein provides a convenient method of adjusting the hydrophobicity and crystallinity of the protein matrix and hence its swelling behaviour and *in vivo* nutrient release kinetics. Diffusion played a major role in regulating nutrient release. The study concluded that SPI/zein microspheres blended at ratios of 5:5 and 3:7 showed near zero-order release kinetics over the test period in simulated intestinal buffer and thus have potential as delivery vehicles for nutraceutical products in functional foods.

L Chen and M Subirade, Biomacromolecules, 2009, 10(12) pp3327-3334 <http://pubs.acs.org/doi/abs/10.1021/bm900989y>



5

Low fat, high fibre diet plus soy protein may inhibit prostate cancer cell growth

According to a recent US study a high fat Western diet and sedentary lifestyle may predispose men to prostate cancer through changes in serum hormones and growth factors. In the study researchers evaluated the effect of a low fat diet on serum factors affecting prostate cancer cell growth by performing a prospective, randomised dietary intervention trial in men with prostate cancer.

The researchers randomised 18 men with prostate cancer who did not receive prior therapy to a low fat (15% kcal), high fibre, soy protein supplemented diet or a Western (40% kcal fat) diet for 4 weeks. Fasting serum was collected at baseline and after the intervention to measure prostate specific antigen, sex hormones, insulin, insulin-like growth factor I and II, insulin-like growth factor binding proteins, lipids and fatty acids. LNCaP cells (ATCC®) were cultured in medium containing pre-intervention and post-intervention human serum to assess the *in vitro* effect of the diet on prostate cancer cell proliferation. Subjects in each group were highly compliant with the dietary intervention. Serum from men in the low fat group significantly decreased the growth of LNCaP cells relative to Western diet serum ($p = 0.03$). There was no significant difference between group changes in serum prostate specific antigen, sex hormones, insulin, insulin-like growth factor I and II, and insulin-like growth factor binding proteins. Serum triglyceride and linoleic acid (omega-6) levels were decreased in the low fat group ($p = 0.034$ and 0.005 , respectively). Correlation analysis revealed that decreased omega-6 and increased omega-3 fatty acid correlated with decreased serum stimulated LNCaP cell growth ($r = 0.64$, $p = 0.004$ and $r = -0.49$, $p = 0.04$, respectively).

The researchers concluded that in this prospective, randomised dietary intervention trial a low fat diet resulted in changes in serum fatty acid levels that were associated with decreased human LNCaP cancer cell growth. Further prospective trials are indicated to evaluate the potential of low fat diets for prostate cancer prevention and treatment.

W J Aronson et al, Journal of Urology, January 2010, Vol 183(1), pp345-350. [http://www.jurology.com/article/S0022-5347\(09\)02317-9/abstract](http://www.jurology.com/article/S0022-5347(09)02317-9/abstract)



Effect of oral isoflavone supplementation on vascular endothelial function in postmenopausal women: meta-analysis

The objective of this study was to evaluate the effect of oral isoflavone supplementation on endothelial function, as measured by flow-mediated dilation (FMD), in postmenopausal women. A meta-analysis of randomised placebo-controlled trials was conducted to evaluate the effect of oral isoflavone supplementation on endothelial function in postmenopausal women. Trials were searched in PubMed, Embase, the Cochrane Library database, and reviews and reference lists of relevant articles. Summary estimates of weighted mean differences (WMDs) and 95% CIs were obtained by using random-effects models. Meta-regression and subgroup analyses were performed to identify the source of heterogeneity.

A total of 9 trials were reviewed. These trials showed that isoflavone significantly increased FMD (WMD: 1.75%; 95% CI: 0.83%, 2.67%; $P = 0.0002$). Meta-regression analysis indicated that the age-adjusted baseline FMD was inversely related to effect size. Subgroup analysis showed that oral supplementation of isoflavone had no influence on FMD if the age-adjusted baseline FMD was $\geq 5.2\%$ (4 trials; WMD: 0.24%; 95% CI: -0.94% , 1.42% ; $P = 0.69$). This improvement seemed to be significant when the age-adjusted baseline FMD levels were $<5.2\%$ (5 trials; WMD: 2.22%; 95% CI: 1.15%, 3.30%; $P < 0.0001$), although significant heterogeneity was still detected in this low-baseline-FMD subgroup.

The study concluded that oral isoflavone supplementation does not improve endothelial function in postmenopausal women with high baseline FMD levels but leads to significant improvement in women with low baseline FMD levels. This trial used isoflavones extracted from soy protein, compressed into tablet form, consumed over the course of three years and it was noted that this form of isoflavone is very different from consuming soy protein or soyfoods.

Shao-Hua Li et al, American Journal of Clinical Nutrition, February 2010, Vol 91, pp480-486, <http://www.ajcn.org/cgi/content/abstract/91/2/480>.



6

Soy intake and type 2 diabetes in overweight Japanese women

According to a recent Japanese study soy intake is associated with lower risk of Type 2 Diabetes in overweight Japanese women. Participating in the study were 25,872 men and 33,919 women aged 45-75yrs, who had taken part in the second survey of the Japan Public Health Centre-Based Prospective Study and had no history of diabetes. Soy product and isoflavone intakes were ascertained using a 147-item Food Frequency Questionnaire. Odds ratios of self-reported, physician-diagnosed type 2 diabetes over 5yrs were estimated using logistic regression analysis. A total of 1114 new cases of type 2 diabetes were self-reported. Intakes of soy products and isoflavones were not significantly associated with type 2 diabetes in either men or all women.

However, among overweight women (BMI ≥ 25 kg/m²), a higher intake of soy products was associated with a lower risk of type 2 diabetes and respectively the researchers found a similar risk pattern for daidzein and genistein intakes. Overall, the researchers conclude that there are no benefits of soy product or isoflavone intake with respect to risk of type 2 diabetes in either men or women but the possible protective association of soy and isoflavone intakes among overweight women deserves further investigation.

A Nanri et al, Journal of Nutrition, 2010: 140(3): 580-586, <http://jn.nutrition.org/cgi/content/abstract/140/3/580>.

Isoflavone intake and risk of lung cancer

Japanese researchers from the National Cancer Center in Tokyo carried out a prospective cohort study in 36,177 men and 40,484 women aged 45-74yrs with no history of cancer at baseline in 1995-1999. Participants responded to a validated questionnaire, which included 138 food items. The researchers used Cox proportional hazards regression analysis to estimate the hazard ratios (HRs) and 95% CIs of lung cancer incidence according to isoflavone intake, which was estimated by genistein content from soy foods. The researchers found that during the 11yrs (671,864 person-years) of follow-up, there were 481 male and 178 female lung cancer cases. In men they found an inverse association between isoflavone intake and risk of lung cancer in never-smokers but not in current or past smokers. A similar, nonsignificant inverse association was seen in never-smoking women. The study concluded that in a large-scale, population-based, prospective study in Japan, isoflavone intake was associated with a decreased risk of lung cancer in never-smokers.

T Shimazu et al, Am J Clin Nutr, March 2010 Volume 91 No 3 pp722-728. First published January 13, 2010; doi:10.3945/ajcn.2009.28161 <http://www.ajcn.org/cgi/content/abstract/91/3/722>.

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7 Nasoya introduces 'beefed up' organic tofu

Nasoya in the USA has launched 'Tofu Plus' - a "beefed up" organic tofu with added nutrients for people looking to lower or eliminate meat from their diet without sacrificing nutrition. 'Tofu Plus' is fortified to provide 20% of the daily nutritional requirements of the vitamins and minerals B-2, B-6, B-12, Zinc, D-2 and Calcium. It is also low in saturated fat, free from sodium and cholesterol, a good source of iron and contains naturally occurring phosphorous. Nasoya have launched this product in response to consumer concerns that tofu may not provide all the nutrients they get in meat. 'Tofu Plus' aims to make this transition easier for consumers. Replacing 3oz or 85g of meat with the same amount of 'Tofu Plus', avoids 6g of saturated fat and 53mg of cholesterol, without any loss of B vitamins, Calcium or Vitamin D. The product comes in two textures: Extra Firm, for a solid, meaty consistency, such as for grilling, baking or in a stir fry; and Firm, for crumbling on salads, scrambling as an egg substitute, or in chilli or dips. (<http://www.nasoya.com>)



New soy isolate from Solbar

Solbar Industries Ltd, Israel, has launched a new, very low viscosity soy protein isolate. Solpro 842, a 90% soy protein, is processed to meet the demands for soy crisps, extruded snacks and cereals. Solbar invested over \$1m and 18 months in the development of a new technology to successfully produce Solpro 842. The result is a soy protein isolate that has consistently low viscosity when subjected to the heat and shear of extrusion while maintaining a bland flavour profile. Solbar is utilising this advanced hydrolysis technology to produce additional new soy isolate proteins for the beverage and protein bar markets. These products aim to satisfy customer's needs for high protein soy ingredients with low flavour profiles and improved functionality. (<http://www.solbar.com>)

Nu-Tek Products launch cultured soy milk powder

Nu-Tek Products (Minnesota, USA) has introduced a cultured soymilk powder made from identity preserved organic beans. The soymilk is fermented with selected probiotic cultures *Lactobacillus acidophilus*, *Bifidobacterium lactis*, *Lactobacillus bulgaricus* and *Streptococcus thermophilus*. The fermentation of soy improves the digestibility of soy protein and isoflavone bioavailability is enhanced due to the ability of beneficial bacteria to convert the isoflavones to more absorbable aglycone forms which are more bioactive and absorbable. The probiotic bacteria also produce metabolites as they ferment the soy substrate. During the fermentation process, all of these metabolites are retained in the spray-dried product. These components are claimed to support improved intestinal health and immune function and include organic acids, cell walls and peptides. The organic cultured soymilk powder contains added calcium which is naturally converted to calcium lactate which is also more readily absorbed by the body. The manufacturers claim that the fermentation process leads to a more nutritionally dense, more therapeutic product with improved texture and flavour. The powder is easily incorporated into dry blends and is said to have a clean taste with applications in nutritional bars, nutritional beverages, medical foods and special nutrition. (<http://www.nu-tekproducts.com>)

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International Workshop: Feed & Feed Additives Regulation in Europe, Radisson Blu Royal Hotel, Brussels, Belgium. <http://www.feedadditiveseurope.com> or e-mail: info@feedadditiveseurope.com.

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Vitafoods 2010, Geneva Palexpo, Switzerland. Visit: <http://www.vitafoods.eu.com/page.cfm/Link=1/t=m/goSection=1>.

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27–30 May 2010

6th Conference of the International Coenzyme Q₁₀ Association, Brussels, Belgium. Visit: <http://www.icqa.org>.

31 May–1 June 2010

5th Practical Short Course: Advanced Oils and Fats Processing for Functional and Nutritional Food Products, Istanbul, Turkey. Visit: <http://www.smartshortcourses.com> or e-mail: oilprocess@scarlet.be.

6–11 June 2010

Processing and Marketing Soybeans for Meat, Dairy and Baking Applications, NSRL, Urbana, IL, USA. Visit <http://ntsoy.nsrll.uiuc.edu/courses/index.html>.

16–17 June 2010

2nd Food Protein Innovation Conference: Proteins for Health & Nutrition, Rotterdam, Netherlands. Visit: <http://www.bridge2food.com/fpi2010.asp>.

11–16 July 2010

International Symposium on Plant Lipids, Cairns, Australia. Visit: <http://www.ispl2010.org>.

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17–21 July 2010

IFT Annual Meeting and Food Expo, Chicago, IL, USA. Visit: <http://www.ift.org>.

22–27 August 2010

Textured Soy Proteins and other Soy Products, Texas A&M University, Texas USA. Visit: <http://www.tamu.edu/extrusion>.

26–27 August 2010

Soy Innovation Africa to Provide Strategic Insights Into Use of the Soybean in Emerging Markets, Cape Town, South Africa. Visit: <http://www.iufost2010.org.za/SoyInnovationAfrica.asp> (in conjunction with IUFOST World Congress, 22–26 August 2010).

4 October 2010

Global Soybean & Grain Transport/Soya & Oilseed Summit, Minneapolis, MN, USA. Visit: <http://events.soyatech.com/conferences/GSGTSOS2010.htm>.

6–19 October 2010

19th International Symposium on the Role of Soy in Health Promotion and Chronic Disease Prevention and Treatment, Capitol Hill, Washington, DC. Visit <http://www.soysymposium.org/>.