



MUSHROOMS AND HEALTH GLOBAL INITIATIVE BULLETIN

An ISMS Global Initiative to increase the worldwide consumption of mushrooms through the collection, evaluation and dissemination of scientifically validated information.

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► Table of Contents

News from the Initiative - Mary Jo Feeney.....	1
Mushroom Research.....	2
News from Australia - Glenn Cardwell and Chris Rowley.....	6
News from Canada - Brittany Stager.....	8
News from the United States - Heidi Gengler.....	9

News from the Initiative - Mary Jo Feeney

► Mushrooms and Health 2010 Report – your resource for mushroom health information

Mushrooms, a part of the human diet for millennia, belong in their own biological kingdom. Different from plant foods, mushrooms are worthy of investigation as to their own specific influence on human health. The majority of research has been conducted *in vitro* or with animal models. Researchers are now venturing into human studies that suggest mushrooms have great potential in promoting long-term human health for their effects on blood lipids, blood glucose, immune function, modulation of cancer cells and satiation.

For a summary of the human trials carried out to date, see Table V in the [Mushrooms and Health 2010 Report](#). These studies have generally been small observational studies, or studies without appropriate placebo or other matched controls, and therefore larger, double-blind, placebo controlled human studies are required before clear effects on human health outcomes can be confirmed. However, in general, the growing amount of data suggests that the mushrooms and mushroom extracts tested are safe and generally well-tolerated.

For additional abstracts and summaries of the science linking mushrooms and health, visit the [Mushrooms and Health](#) website and click on the [Mushrooms and Health Report](#) tab.

You also might want to read "[Mushrooms – Seriously underrated as a health and wellness ingredient](#)" on Euromonitor International's Global Market Research Blog. Written by analyst Emily Woon, the article notes that although fungi are popular with consumers due to their culinary versatility, they remain woefully underappreciated as a health food and functional ingredient source.

Mushroom Research

► Pulsed UV light increases vitamin D2 levels

Koyyalamudi SR, Jeong, SC, Pang G, Teal A, and Biggs, T. [Concentration of vitamin D2 in white button mushrooms \(*Agaricus bisporus*\) exposed to pulsed UV light](#). *Journal of Food Composition and Analysis* 24 (2011) 976–979.

Enrichment of vitamin D2 in *Agaricus bisporus* white button mushroom (WBM) using continuous UV light needs a longer exposure time, which can lead to discoloration. This study evaluated the use of a Xenon pulsed UV light source, on the yield of vitamin D2 in freshly harvested button mushrooms and mushroom slices after exposure to 2.5, 3, 6 and 9 pulses of UV light at an average dose of 1.150 J/cm² energy per pulse. Vitamin D2 content increased proportionate to the number of pulses of UV light. There was no difference in the vitamin D2 content of mushrooms between 200 g and 500 g punnets for the corresponding number of pulses. Mushrooms in the top layer showed significantly higher amounts of vitamin D2 content than those in the bottom layer of a 500 g punnet. A single layer of sliced mushrooms (about 5 mm thick) showed higher amounts of vitamin D2 content than sliced mushrooms packaged together after pulsed UV light exposure. Vitamin D2 content achieved in whole and sliced mushrooms ranged between 1148 and 13,000% DV/serving. Discoloration of whole or sliced mushrooms was not observed. The authors state that pulsed UV light provides a highly effective method for increasing vitamin D2 levels in *A. bisporus* white button mushroom.

Pulsed UV light provides a highly effective method for increasing vitamin D2 levels in *A. bisporus* white button mushroom.

► Compositional effects of commercial UVB light compared to sunlight

Simon RR, Phillips KM, Horst RL and Munro IC. [Vitamin D mushrooms: Comparison of the composition of button mushrooms \(*Agaricus bisporus*\) treated postharvest with UVB light or sunlight](#). *J. Agric. Food Chem.* 2011, 59, 8724–8732. [dx.doi.org/10.1021/jf201255b](https://doi.org/10.1021/jf201255b).

This study compared the compositional changes in mushrooms exposed to sunlight with those occurring after commercial ultraviolet (UV) light processing. Button mushrooms were processed in the presence or absence of UVB light with a third group exposed to direct sunlight. Mushroom composition was evaluated using chemical analyses. Vitamin D concentrations were 5, 410, and 374 µg/100 g (dw) in control, UVB, and sunlight groups, respectively. On a dry weight basis, no significant changes in vitamin C, folate, vitamins B6, vitamin B5, riboflavin, niacin, amino acids, fatty acids, ergosterol, or agaritine were observed following UVB processing. Sunlight exposure resulted in a 26% loss of riboflavin, evidence of folate oxidation, and unexplained increases in ergosterol (9.5%). According to the study, compositional effects of UVB light are limited to changes in vitamin D and show no detrimental changes relative to natural sunlight exposure. The findings provide important information relevant to the suitability and safety of UVB light technology for vitamin D enhanced mushrooms.

Compositional effects of UVB light are limited to changes in vitamin D and show no detrimental changes relative to natural sunlight exposure.

► Wild mushrooms' fatty acid profiles and hypertension benefits

Mujić I, Zeković Z, Vidović S, Radojković M, Zivković J, Gođevac D. [Fatty acid profiles of four wild mushrooms and their potential benefits for hypertension treatment](#). *J. Med. Food* 2011 Aug 24. [Epub ahead of print].

Among determinants of the fluidity of erythrocyte membranes and rheologic properties of blood is the lipid composition of the membrane, which is

This study investigated the ability of mushroom lipids from European edible wild mushrooms to modify the fluidity of erythrocyte membranes.

dependent on lipids in the diet. The investigators determined lipid profiles of four European wild edible mushrooms, and the ability of mushroom lipids to modify the fluidity of erythrocyte membrane, using gas chromatography-mass spectrometry, gas chromatography-flame ionization detector, and electron paramagnetic resonance spin probing technique. Lipids from two species – *Macrolepiota procera* and *Collybia platyphylla* – provoked an increase in erythrocyte membrane fluidity. The investigators suggest that the introduction of these and other wild mushrooms with similar lipid profiles to the human diet could be very beneficial in the treatment of hypertension and other cardiovascular diseases related to decreased fluidity of erythrocyte membranes.

► **Polysaccharide structures and immunomodulatory effects of two related species**

Smiderle FR et al. [Polysaccharides from *Agaricus bisporus* and *Agaricus brasiliensis* show similarities in their structures and their immunomodulatory effects on human monocytic THP-1 cells.](#) *BMC Complementary and Alternative Medicine* 2011; 11:58. doi:10.1186/1472-6882-11-58. This is an Open Access article which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

The study chemically determined the carbohydrate composition of semi-purified extracts from 2 closely related and well known basidiomycete species, *Agaricus bisporus* and *A. brasiliensis* and investigated their effects on the innate immune system, particularly on the *in vitro* induction of pro-inflammatory cytokines, using THP-1 cells. Mushroom polysaccharide extracts, prepared by hot water extraction and precipitation with ethanol, were analyzed by GC-MS and NMR spectroscopy. PMA activated THP-1 cells were treated with the extracts under different conditions and the production of pro-inflammatory cytokines was evaluated by qPCR. According to the study, semi-purified polysaccharide extracts of *A. bisporus* and *A. brasiliensis* (blazei) were found to contain (1–6), (1–4)-linked α -glucan, (1–6)-linked β -glucan, and mannogalactan. Their proportions were determined by integration of 1H-NMR signs, and were considerably different. *A. brasiliensis* showed a higher content of β -glucan, while *A. bisporus* presented mannogalactan as its main polysaccharide. Semi-purified polysaccharide extracts from both *Agaricus* species stimulated the production of proinflammatory cytokines and enzymes, while the polysaccharide extract of *A. brasiliensis* reduced synthesis of these cytokines induced by LPS, suggesting programmable immunomodulation.

Polysaccharide preparations from the closely related species *A. bisporus* and *A. brasiliensis* show major differences in composition.

► **Safety assessment of mushroom β -glucan**

Chen SN, Han FH, Chen S, Wu JF, Lu CL, Soni MG. [Safety assessment of mushroom \$\beta\$ -glucan: Subchronic toxicity in rodents and mutagenicity studies.](#) *Food Chem. Toxicol.* 2011 Aug 12. [Epub ahead of print].

Mushroom β -glucan, a polymer of β -(1,3/1,6)-glucan, has been claimed for its health benefits. This study assessed the safety of mushroom β -glucan as a dietary supplement and food ingredient using subchronic toxicity and mutagenicity studies. In the subchronic toxicity study, Sprague Dawley rats (12/sex/group) were administered (gavage) mushroom β -glucan at dose levels of 0, 500, 1000 and 2000mg/kg body weight (bw)/day for 90days. Compared to the control group, administration of β -glucan did not result in any toxicologically significant treatment-related changes in clinical observations, ophthalmic examinations,

The no observed-adverse-effect level for mushroom β -glucan was determined as 2000mg/kgbw/day, the highest dose tested.

body weights, body weight gains, feed consumption and organ weights. No adverse effects of the β -glucan on the hematology, serum chemistry parameters, urinalysis or terminal necropsy were noted. Mutagenicity studies, evaluated by gene mutations in *Salmonella typhimurium*, *in vitro* chromosome aberrations and *in vivo* micronucleus test in mouse, did not reveal genotoxicity of β -glucan. Based on the subchronic study, the no observed-adverse-effect level (NOAEL) for mushroom β -glucan was determined as 2000mg/kgbw/day, the highest dose tested.

► **Agaricus blazei Murill effect on ulcerative colitis and Crohn's disease**
Førland DT, Johnson E, Sætre L, Lyberg T, Lygren S, and Hetland G. [Effect of an extract based on the medicinal mushroom *Agaricus blazei* Murill on expression of cytokines and calprotectin in patients with ulcerative colitis and Crohn's disease.](#) *Scandinavian Journal of Immunology* Volume 73 Issue 1 first published online Dec. 5, 2010. There is free access to this article. doi: 10.1111/j.1365-3083.2010.02477.x.

AndoSan, an immunomodulatory extract from the medicinal mushroom *Agaricus blazei* Murill (AbM) has shown to lower blood cytokine levels in healthy volunteers after 12 days' ingestion, suggesting an anti-inflammatory effect. This study investigated whether AndoSan had similar effects on cytokines in 10 patients with ulcerative colitis (UC) and 11 patients with Crohn's disease (CD) who consumed 60 ml/day of AndoSan. Plasma and faecal calprotectin, a marker for inflammatory bowel disease (IBD), was also measured. Baseline concentrations for the 17 cytokines measured in the UC and CD patient groups were largely similar. Faecal calprotectin was reduced in the UC group. Ingestion of an AbM-based medicinal mushroom by patients with IBD resulted in anti-inflammatory effects as demonstrated by declined levels of pathogenic cytokines in blood and calprotectin in faeces. According to the investigators, consumption of an AbM-based medicinal mushroom extract by patients with irritable bowel disease for 12 days resulted in no side effects. They suggest further studies on additional biological parameters and potential improvement in the clinical outcomes in these patients.

► **Effects of portabella mushrooms on collagen-induced arthritis**
Peterson S, et al. [Effects of Portabella mushrooms on collagen-induced arthritis, inflammatory cytokines, and body composition in dilute brown non-agouti \(DBA1\) mice.](#) *Functional Foods in Health and Disease* 2011; 9:279-296. This is an Open Access article.

The study investigated the health benefits of portabella mushrooms (PM) (brown *Agaricus bisporus*), on collagen-induced arthritis (CIA) and associated complications (loss of lean mass, increased fat mass and inflammatory cytokines). The researchers investigated CIA pathogenesis, body composition and plasma levels of IL-6, TNF- α and sICAM1 in DBA1 female mice fed either the AIN76 diet or the same diet fortified with 5% lyophilized PM (n=19-20/group). Ten mice/group were immunized with 100 μ g bovine collagen type II on day 42 of the protocol, followed by 50 μ g lipopolysaccharides on day 62, and euthanized on day 73-74. Cytokines were measured by ELISA. Compared to baseline diet, PM had: no protective effect from CIA since all collagen-immunized mice developed severe edema, bone erosion and mononuclear cell infiltration in paws. In mice with and those without CIA, feeding a PM-fortified

diet resulted in higher percent of body fat. After CIA induction, PM provided some beneficial effects: a smaller reduction in lean mass and absolute thymus weight; a higher fat mass loss; and lower plasma TNF- α levels. PM-fortification did not alter plasma IL-6 and sICAM1 regardless of CIA status; but it increased *in vitro* IL-6 secretion by mitogentreated spleen cells. The authors state that the data suggest that PM may reduce plasma TNF- α , attenuate lean mass loss and thymus atrophy associated with arthritis, and protect spleen cell function assessed by IL-6 secretion. However, PM-fortification did not attenuate overall CIA pathogenesis which may be due to lack of effect on plasma IL-6. Decreased TNF- α without alterations in IL-6 may reduce the risk of other conditions associated with chronic inflammation such as cardiovascular disease.

► ***Agaricus bisporus* protects against hepatic steatosis in ovariectomized mice**

Kanaya N, Kubo M, Liu Z, Chu P, Wang C, et al. (2011) [Protective effects of white button mushroom \(*Agaricus bisporus*\) against hepatic steatosis in ovariectomized mice as a model of postmenopausal women](#). *PLoS ONE* 6(10): e26654. doi:10.1371/journal.pone.0026654. This is an Open Access journal.

Nonalcoholic fatty liver disease (NAFLD) includes various hepatic pathologies ranging from hepatic steatosis to non-alcoholic steatohepatitis (NASH), fibrosis and cirrhosis. Since estrogen provides a protective effect on the development of NAFLD in women, postmenopausal women are at higher risk for developing NAFLD. This study found that white button mushroom (WBM), *Agaricus bisporus*, has protective effects against liver steatosis in ovariectomized (OVX) mice (a model of postmenopausal women): Dietary WBM intake significantly lowered liver weight and hepatic injury markers; pathological examination of liver tissue showed less fat accumulation; and animals fed WBM powder had improved glucose clearance ability. The protective effect observed was found to be mediated through the suppression of fatty acid biosynthesis, as indicated by microarray data. The researchers have not yet identified the phytochemicals responsible for the “anti-liver steatosis” effect of mushrooms. Their previous work showed that CLA is an active component with anti-aromatase activity (to reduce estrogen); but the CLA-containing fractions did not show strong inhibition of *ELOVL6* and *FAS* gene expression in HepG2 cells. Treatment with CLA did not decrease liver weight and accumulation of fat in the livers of OVX mice suggesting that CLA is not the active component in the inhibition of the fatty acid biosynthesis pathway in liver. Ergosterol, an important sterol in WBM and a vitamin D2 precursor, was not able to inhibit the expression of *ELOVL6* and *FAS* in HepG2 cells in *in vitro* studies (data not shown), suggesting that the active chemical(s) may be another sterol or oxidized sterol. The human equivalent of doses used in this study needs to be determined. The average WBM intake in mouse studies is approximately 260 mg/day (average food intake 2.2g/day, WBM diet 120 g powder/kg diet). The human equivalent dose (based on body surface area) is equal to 42 g WBM powder for a 60 kg person – considered a therapeutic dose. This is a proof-of-concept study; therefore, the liver protective effect could be achieved probably with lower levels of WBM for women consuming a regular diet.

Agaricus bisporus has protective effects against liver steatosis in an animal model of postmenopausal women.



News from Australia - Glenn Cardwell and Chris Rowley

► Health professional education

The plan to get into the minds of health professionals around the country continues with gusto. We were able to influence 250 practice nurses at two very successful events in Perth, Western Australia, and Adelaide, South Australia. Practice nurses run medical practices around the states. In addition to our workshops, our excellent cooking staff (see photo) offered tastings from a range of mushroom recipes. The mushroom cookbooks and posters were very popular at both events. Events to educate health professionals around the country will continue with the allocation of funding for a further three years. This has given us the confidence to plan more events for health professionals who give out nutrition advice. One aspect of our success is that we are getting many more unsolicited articles in both conventional and electronic media on mushrooms and health. Tracking back we see that all the writers have been to our events and used the background information we provide.



Around the time this *Bulletin* comes to you, we shall be sponsoring two vitamin D seminars in Melbourne and Sydney, along with another at the General Practitioners Conference and Exhibition in Sydney. All of them will feature vitamin D research pioneer Dr Michael Holick from Boston University.

► Vitamin D mushrooms

We have been speaking about the ability of mushrooms to be a source of vitamin D for the past three years around Australia. In September 2011, after vigorous and extensive testing and development, the first vitamin D mushrooms went on the market in Sydney, followed by Melbourne in October 2011. With around half of the Australian population having insufficient vitamin D, the mushroom can play a key role in the solution.

► Mushrooms Go Pink for breast cancer research

For a second year, the mushroom growers have collaborated to generate funds for breast cancer research. This year the industry has entered into a partnership with Cancer Council Australia, which has provided access to Pink Ribbon Day materials to use in promotional activities. As a result



Vitamin D mushrooms were introduced into the Australian market in September.

"Pink Ribbon" branded materials have been made available to retailers to use throughout the month to attract consumer attention to Breast Cancer Awareness Month, leading into Cancer Council's Pink Ribbon Day on Monday 24 October. The event will raise \$50,000 from growers, providing much needed funds to support valuable breast cancer research, prevention and support services. Growers see this as yet another way that they can help the community. While mushrooms may be "pink" for just one month, good health is something that is taken seriously every day of the year.

There are three published studies showing that women who eat mushrooms regularly have half the risk of breast cancer compared to those that don't eat mushrooms. These findings have encouraged more research into the potential role of the mushroom in breast cancer. Mushrooms Go Pink events have been held around the country and has its own website (<http://www.mushroomsgopink.com.au/>) that includes research and nutrition information.



► Health professional newsletter

Each quarter we produce an e-newsletter for the health professionals who have signed up through our events. This is a wonderful, simple and low cost way to spread our message. The last edition covered the recent studies on ergothioneine, an essential powerful antioxidant that can only come from the diet. We know ergothioneine is essential because it has a blood transporter and an ergothioneine-free diet causes cell oxidation in animal studies. Ergothioneine is found in meats, oat bran, legumes and mushrooms. Very little is found in vegetables or fruit. Therefore, the mushroom is a very important source of ergothioneine for the vegetarian. The newsletter also features a video recipe and some quick links. It is designed to be read in about three minutes.

► Fungi Foursome defend Mushroom Masters trophy

In 2010, the United States (U.S.), Canada and Australia came together to contest the inaugural Mushroom Masters – a recipe competition contested by teams of food bloggers from each country. Over the four weeks of September 2011, Australia again took on the best from the U.S. and Canada and successfully defended the title won in 2010.

The concept is simple enough. Each week one blogger enters a mushroom recipe suitable for a different meal. Week one was breakfast; next was lunch; then dinner; followed by an appetizer. Recipes are placed on the Tastepotting website, and the winner each week is determined by public vote. This year, Australia's Fungi Foursome, won two weeks, with Canada and the U.S. taking out one week each.

The mushroom is an excellent source of the antioxidant ergothioneine.

What did the Mushroom Masters deliver for mushroom lovers? For starters, (pardon the pun) it delivered twelve delicious recipes to a worldwide audience through Tastepotting. It helped build even stronger relationships with some very enthusiastic bloggers who are talking to tens of thousands of devoted readers every day of the year about food. The competition also helped drive traffic to the three mushroom industry websites, with thousands of page views recorded by consumers looking at the recipes on offer.

From an Australian viewpoint, the Fungi Foursome had a great time; we gave our international mates a gentle ribbing over our wins and congratulated them on those rare weeks when they managed to outvote our team.

Next year, Australia will be back, with more great recipes and a team designed to take on the world. There are already plans to expand the competition in 2012 to other mushroom industry teams and make it a truly global event that brings mushrooms to an even wider audience. More teams and more countries to beat sounds like a great challenge to us. Because let's face it, as Mushroom Masters champions no-one quite creates innovative mushroom recipes like Australian food bloggers.

A big thank you to our Fungi Foursome, who dished up some real mushroom treat; Alana from [A Morish Distraction](#); Ellie from [Kitchen Wench](#); Christie from [Fig & Cherry](#) and Jennifer from [Delicieux](#).



Thank you also to the teams at [Mushroom Council](#) and [Mushrooms Canada Tastepotting](#) for their hard work and dedication to making the 2011 Tournament a great success. We look forward to some friendly, fungi fun in 2012 when our Fungi Foursome will again take on the world.

News from Canada - Brittany Stager

► Canadian mushroom growers go PINK

During October, breast cancer awareness month, Canadian mushroom growers joined forces with the Breast Cancer Society of Canada to support research for the prevention, early detection and treatment of breast cancer. For every pound of mushrooms sold in the PINK, Canadian mushroom farmers made a contribution to the Breast Cancer Society of Canada. "This was the first time we, as an industry, came together to contribute to a social cause," says William Stevens, Executive Vice President of Mushrooms Canada. "To date, fundraising goals have exceeded expectations with Mushrooms Canada making an additional donation directly to the Breast Cancer Society of Canada for every person who "Likes" the Mushrooms Go PINK Page on Facebook (to a maximum of \$1500).



For every pound of mushrooms sold in the PINK, Canadian mushroom farmers made a contribution to the Breast Cancer Society of Canada.

To ensure a consistent look through the entire campaign, Mushrooms Canada created generic point-of-purchase materials including recipe tear-off pads for members to offer retailers. Other outreach activities included contacting influential food bloggers to donate a recipe and photo to the campaign. In return, bloggers received credit whenever their recipe appeared – giving them further exposure to social media channels. In addition, APEX, a public relations company, secured media outreach including national and daily papers, television and radio coverage of the PINK campaign. For more information, visit www.MushroomsGoPINK.ca.



For every package of PINK mushrooms sold, Canadian Mushroom Farmers will make a contribution to the Breast Cancer Society of Canada.
www.MushroomsGoPINK.ca

Simple Sautéed Mushrooms
Heat 1 tbsp of olive oil in large skillet. Add sliced mushrooms, sauté 2-3 minutes or until starting to brown. Add garlic, rosemary & thyme; sauté 2-3 minutes until tender & fragrant. Serve as a side with your favourite meals, or mix with other meals like chicken or pasta for a great added taste and texture.



Breakfast, Lunch & Dinner

- Toss sliced mushrooms into omelettes, frittatas & quiches.
- Make the most of your salads by adorning them with fresh mushrooms. Mushrooms add, flavour & extra nutrients.
- Grill portabella slices or chunks along side your meat and serve as a burger topping or as a side dish with your steak. A classic combination!



Sandwiches & Wraps
Sliced fresh mushrooms give lovely crunch & a flavour boost to sandwiches & wraps. In fact, a grilled Portabella mushroom makes a great sandwich "filler" itself! Just layer the mushroom between two slices of whole grain bread and top with some cheese, herbed mayonnaise or some more fresh veggies.





News from the United States - Heidi Gengler

► Bringing the benefits of mushrooms to life at the American Dietetic Association's Food & Nutrition Conference & Expo

The American Dietetic Association's annual Food & Nutrition Conference & Expo (FNCE) attracts more than 8,500 registered dietitians, nutrition science researchers, policy makers, culinary professionals, health care providers and industry leaders. For the Mushroom Council (Council), FNCE is a critical opportunity to personally interact with its top tier of nutrition influencers, who are known to be extremely receptive to learning about mushrooms and health, and understanding the Council's nutrition research. This year's conference took place in San Diego, CA, September 25-27, where the Council expanded its network of influencer contacts by hosting a booth (see photo) on the expo floor and connecting with key leaders.

New this year, the Council sampled a mushroom recipe at the booth and participated in "NuTrivia" – an annual attendance-driving educational game hosted by a prominent nutrition magazine that encourages booth traffic through interactive trivia, incentives and signage throughout the expo.



Conferences and exhibitions offer opportunity to personally interact with top tier of nutrition influencers receptive to learning about mushrooms and health.

The Council's trivia question asked attendees to think of two ways they can use mushrooms in a dish to meet health objectives and the featured recipe, Mushroom Tacos with Salsa Verde, brought the answers to life. The blended taco filling, consisting of 75 percent mushrooms and 25 percent ground beef, demonstrated how one can cook with mushrooms to (1) Add more vegetables to a dish and increase volume of a meal; and, (2) Swap mushrooms for higher-calorie ingredients in a dish to bring nutrients (like vitamin D and B vitamins, potassium and antioxidants) to the plate, but reduce the calories, sodium, fat and cholesterol.

Over the course of the conference, the Council met one-on-one with nearly 30 influencers across relevant target areas (such as media, weight management, vitamin D, food and culinary professionals) to discuss joint opportunities in the coming year. More than 880 attendees opted into the Council's database of health influencers (ten percent more than in 2010) and we estimate that upwards of 1,500 guests visited the booth to learn about mushrooms' nutritional profile. Extended detail is available on the Council's [blog](#) and photos are available on [Facebook](#). Click on [Mushroom Tacos with Salsa Verde](#) for the full recipe and visit www.mushroominfo.com for additional recipes and information.

Be sure to visit the Mushrooms and Health website <http://www.mushroomsandhealth.com/>

Send what's happening in your country to communicate the benefits of mushrooms to consumers, shoppers, households, doctors, health professionals and the media to info@mushroomsandhealth.com.

Note: The *Bulletin* provides links to other sites for your convenience and information. These sites contain information created, published, maintained or otherwise posted by organizations independent of the Initiative which does not endorse, approve, certify or control these sites and does not guarantee the accuracy of the information contained on them.

► **Initiative project team**

- Greg Seymour, President, ISMS General Manager AMGA, Australia; Manager, Mushrooms and Health Global Initiative
- Bart Minor, President, Mushroom Council, United States
- John Collier, Group Research and Development Manager, Monaghan Mushrooms Ltd, Republic of Ireland
- Mary Jo Feeney, Mushrooms and Health Global Initiative Operations Manager, Bulletin Editor, United States
- Glenn Cardwell, Accredited Practising Dietitian, Nutrition Impact P/L, Australia
- Chris Rowley, Communications Consultant, Australia
- Heidi Gengler, Vice President, Edelman Public Relations, United States

► **Strategic communications group**

Members of the Strategic Communications Group strengthen the Initiative's communication capability and develop a local public relations presence in each country whose industry is contributing financially to the project. Members of this group help facilitate stories about mushrooms and health appearing in their local media, monitor mushroom nutrition and health research, liaison with scientists, media and other influencers, and provide feedback to the Initiative. They include:

- Michal Slawski - United Kingdom
- Franz Schmaus - Germany
- Francois Marche - France
- Ignace Deroo, Evy Detroch - Belgium
- José Antonio Jiménez Hernandez - Spain
- Kent Stenvang - Denmark
- Dick Roodhuyzen de Vries - Netherlands
- Elizabeth O'Neil - Canada