



# 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.

**NOVEMBER 2013 ISSUE #24**

Mary Jo Feeney, Editor [info@mushroomsandhealth.com](mailto:info@mushroomsandhealth.com)

## ► Table of Contents

News from the Initiative - Mary Jo Feeney.....	1
Mushroom Research.....	2
News from Australia - Glenn Cardwell.....	7
News from Spain - Maria Luisa Tello Martin.....	9
News from the United States - Heidi Gengler.....	10

## News from the Initiative - Mary Jo Feeney

One hundred years ago, mushroom nutritive value was known for what it did not provide rather than what it did contribute. According to the 1913 *Journal of the American Medical Association*: "Even the most nutritious mushrooms are of little real nutritive value. Their chief claim to dietetic recognition lies in their use as food accessories and dietary condiments. In no way can they substitute for the substantial meats or the familiar vegetable products ordinarily consumed by man." (*JAMA*. 1913; 61(6):414-415).

Scientific studies on mushrooms and health may have been scarce a century ago - but research has expanded significantly since then. This can be seen in the Mushrooms and Health Global Initiative's (Initiative) [Mushrooms and Health Report 2012](#), authored by the Commonwealth Scientific and Industrial Research Organisation (CSIRO), which evaluated almost 1,100 papers of the most recent references found through thorough strategic electronic searches of medical, scientific and technical literature based on the mushroom varieties and health conditions. You'll find over 600 of these references in the 2012 report which will be updated mid-2014 with even more research citations. In the meantime, to keep readers current on mushroom health and nutrition research, the *Bulletin* abstracts selected published papers. In the past year alone (since 2012), the *Bulletin* has referenced more than 30 studies.

Of course, research can't stay only in the pages of scientific journals – it has to be communicated often and consistently in a variety of ways if consumers are to benefit from these discoveries. That is why each issue of the *Bulletin* features ways different countries are working to frequently communicate the nutrient and health benefits of mushrooms to consumers. This continual communication can help increase the worldwide consumption of mushrooms.

Read how Spain took to the radio to explain activities around Mushroom Passion Days and how Australia hosted a "thank you" lunch for influential food writers and bloggers. If you're wondering about the source of that 100 year quote from the *Journal of the American Medical Association*, it was 'unearthed' by a presenter at the Mushrooms and Health Summit described in the report from the United States.

The *Bulletin* provides ideas on how to communicate mushroom research.

All these are examples of how mushroom research from a variety of investigative disciplines can be communicated to influencers who then multiply the messages through various media channels.

## Mushroom Research

### ► ***The role of edible mushrooms in health: Evaluation of the evidence most downloaded article.***

This review paper by Roupas, P, Keogh, J, Noakes, M, Margetts C and Taylor P has maintained its "Top 10" status (i.e. most downloaded papers in the journal) since it was published a year ago in the *Journal of Functional Foods*. It has been downloaded 519 times in the last quarter and has already been cited by 9 other papers in the fields of functional foods, pharmacy and cancer prevention. The review paper was prepared by CSIRO at the request of the Mushrooms and Health Global Initiative.

### ► **Vitamin D mushrooms improve memory in mice**

Bennett L, Kersaitis C, Macaulay SL, Münch G, Niedermayer G, *et al.* [Vitamin D<sub>2</sub>-enriched button mushroom \(\*Agaricus bisporus\*\) improves memory in both wild type and APP<sub>Swe</sub>/PS1dE9 transgenic mice. \*PLoS ONE\* 8\(10\): e76362. doi:10.1371/journal.pone.0076362.](#) This is an Open Access article.

Read about vit. D mushrooms and memory in mice and inflammation; mushrooms and weight control and diet quality; and bioactive properties of various mushrooms.

Vitamin D deficiency is widespread, affecting over 30 percent of adult Australians, and increasing up to 80 percent for at-risk groups including the elderly over the age of 65. The role for Vitamin D in development of the central nervous system is supported by the association between Vitamin D deficiency and incidence of neurological and psychiatric disorders including Alzheimer's disease (AD). A reported positive relationship between Vitamin D status and cognitive performance suggests that restoring Vitamin D status might provide a cognitive benefit to those with Vitamin D deficiency.

Mushrooms are a rich source of ergosterol, which can be converted to Vitamin D<sub>2</sub> by treatment with UV light, presenting a new and convenient dietary source of Vitamin D<sub>2</sub>. The investigators hypothesised that Vitamin D<sub>2</sub>-enriched mushrooms (VDM) could prevent the cognitive and pathological abnormalities associated with dementia.

Two month old wild type (B6C3) and AD transgenic (APP<sub>Swe</sub>/PS1dE9) mice were fed a diet either deficient in Vitamin D<sub>2</sub> or a diet which was supplemented with VDM, containing 1±0.2 µg/kg (~54 IU/kg) vitamin D<sub>2</sub>, for 7 months. Effects of the dietary intervention on memory were assessed pre- and post-feeding. Brain sections were evaluated for amyloid β (Aβ) plaque loads and inflammation biomarkers using immuno-histochemical methods. Plasma vitamin D metabolites, Aβ<sub>40</sub>, Aβ<sub>42</sub>, calcium, protein and cholesterol were measured using biochemical assays.

Compared with mice on the control diet, VDM-fed wild type and AD transgenic mice displayed improved learning and memory, had significantly reduced amyloid plaque load and glial fibrillary acidic protein, and elevated interleukin-10 in the brain. The results suggest that VDM might provide a dietary source of Vitamin D<sub>2</sub> and other bioactives for preventing memory-impairment in dementia. This study supports the need for a randomised clinical trial to determine whether VDM consumption can benefit cognitive performance in the wider population.

### ► Wood ear mushrooms inhibit beta-secretase in vitro

Bennett L, Sheean P, Zabara D and Head R. [Heat-stable components of Wood Ear mushroom \*Auricularia polytricha\* \(Higher Basidiomycetes\), inhibit \*in vitro\* activity of beta secretase \(BACE1\)](#). *International Journal of Medicinal Mushrooms* DOI:10.1615/IntJMedMushr.v15.i3.20 pages 233-249.

Consumption of mushrooms has been linked with protection against dementia, including Alzheimer's disease (AD), by several biological pathways including inhibiting beta-site APP-cleaving enzyme (BACE1), which is responsible for releasing toxic  $\beta$ -amyloid peptide in the brain. The researchers investigated the capacity of several medicinal mushroom species—*Auricularia polytricha* (wood ear mushroom), *Agaricus bisporus* (button mushroom), *Flammulina velutipes* (winter or enoki mushroom), and *Lentinus edodes* (shiitake mushroom)—in the regulation of BACE1.

Mushrooms were subjected to a generic food-compatible processing method to detect process-stable or process-modified products; the effects of processing were interpreted to infer the chemical classes associated with bioactivity. Previously the researchers have shown that in addition to enzyme inhibition, in the presence of the BACE1 proenzyme, heteropolymeric species such as heparin can activate BACE1 by modulating access to the catalytic site. Both inhibitory and activating components of the various mushrooms were observed. Only BACE1 inhibitory species were detected in unprocessed and processed forms of *A. polytricha*, whereas the dominant extracted species from *A. bisporus*, *F. velutipes*, and *L. edodes* were activators of BACE1. It is not known whether activating species were masking the presence of inhibitory species in *A. bisporus*, *F. velutipes*, and *L. edodes*. Inhibitory species were attributed to hispidin-derived polyphenols, whereas activating species were attributed to soluble polysaccharides and possibly low-mass Maillard products produced during processing. Larger molecular BACE1-activating species are unlikely to be bioavailable to brain in contrast with possible brain bioavailability of smaller, lipophilic hispidins.

### ► *Agaricus bisporus* extracts and cholesterol lowering

Gil-Ramirez A, Clavijo C, Palanisamy M, Ruiz-Rodriguez A, Navarro-Rubio M, Perez M, *et al.* [Study on the 3-hydroxy-3-methyl-glutaryl CoA reductase inhibitory properties of \*Agaricus bisporus\* and extraction of bioactive fractions using pressurised solvent technologies](#). *J. Sci Food Agric.* 2013 Feb. 13. doi: 10.1002/jsfa.6102 [Epub ahead of print].

*Agaricus bisporus* mushrooms were able to lower cholesterol levels in hypercholesterolaemic rats and it was suggested that dietary fibre might inhibit cholesterol absorption. However, *A. bisporus* extracts were also able to inhibit the 3-hydroxy-3-methyl-glutaryl CoA reductase (HMGCR, the key enzyme in the cholesterol biosynthetic pathway) and this might also contribute to the observed lowering of cholesterol levels in serum.

Using an *in vitro* assay, methanol-water extracts from *A. bisporus* were able to inhibit up to 60% the HMGCR activity depending on cultivation conditions, strains, etc. The potential inhibitors were not statins; they might be  $\beta$ -glucans able to scavenge the substrate and impair the enzymatic reaction. They were present during all mushroom developmental stages and similarly distributed through all the tissues including the parts discarded as a by-product.

Accelerated solvent extractions using 1:1 ethanol-water as pressurised solvent (10.7 MPa, 25°C, five cycles of 5 min) were more effective in the extraction of the HMGCiR inhibitor(s) than supercritical fluid extractions (9 MPa, 40°C) using CO<sub>2</sub> with 10% ethanol.

According to the investigators, mushroom cultivation and two extraction procedures were optimised to obtain fractions from *A. bisporus* with high HMGCiR inhibitory activities to design novel ingredients for hypocholesterolaemic functional foodstuffs.

► **Vitamin D<sub>2</sub> enhanced mushrooms effect on vitamin D status in adults**

Stepian M, O'Mahony L, O'Sullivan A, Collier J, Fraser WD, Gibney MJ, Nugent AP and Brennan L. [Effect of supplementation with vitamin D<sub>2</sub>-enhanced mushrooms on vitamin D status in healthy adults](#). *Journal of Nutritional Science* 2013 Vol 23 e29. This is an online journal and the article is published under Open Access conditions.

The aim of the study was to investigate if daily consumption of vitamin D<sub>2</sub>-enhanced mushrooms increased vitamin D status in free-living healthy adults or affected markers of the metabolic syndrome. Vitamin D deficiency is emerging worldwide and many studies now suggest its role in the development of several chronic diseases. Due to the low level of vitamin D naturally occurring in food there is a need for supplementation and use of vitamin D-enhanced products. Ninety volunteers (aged 40-65 years) were randomly assigned to one of two 4-week studies: mushroom study (15 µg vitamin D<sub>2</sub> or placebo mushroom powder) and capsule study (15 µg vitamin D<sub>3</sub> or placebo capsules). Consumption of vitamin D<sub>2</sub>-enhanced mushrooms increased serum 25-hydroxyvitamin D<sub>2</sub> (25(OH)D<sub>2</sub>) by 128 % from baseline (3.9 (sd1.9) nmol/l; P<0.05). Serum 25(OH)D<sub>3</sub> increased significantly in the vitamin D<sub>3</sub> capsule group (a 55 % increase from a baseline of 44.0 (sd17.1) nmol/l; P<0.05). Vitamin D status (25(OH)D) was affected only in the vitamin D<sub>3</sub> group. Plasminogen activator inhibitor-1 was lowered by vitamin D<sub>2</sub> intake. Vitamin D<sub>2</sub> from enhanced mushrooms was bioavailable and increased serum 25(OH)D<sub>2</sub> concentration with no significant effect on 25(OH)D<sub>3</sub> or total 25(OH)D.

► **Vitamin D mushrooms and immune response in rats**

Babu, US, Balan KV, Garthoff LH and Calvo MS. [Vitamin D<sub>2</sub> from UVB-light exposed mushrooms modulates immune response to LPS in rats](#). *Journal of Molecular Nutrition & Food Research* 2013. DOI:10.1002/mnfr.201300286.

Poor vitamin D (vit D) status is linked to increased risk of infectious diseases, thus there is need for vitD-rich foods. UVB-exposed mushrooms synthesize vitD<sub>2</sub> but knowledge of bioavailability and function in immune response is lacking.

One hundred rats were fed one of five diets—control, 20 IU vitD<sub>3</sub>/day; no vitD<sub>3</sub>/day; 5% unexposed mushroom, 2.4 IU vitD<sub>2</sub>/day; 2.5% UVB mushroom, 300 IU vitD<sub>2</sub>/day; and 5% UVB mushroom, 600 IU vitD<sub>2</sub>/day—for 10 wk and challenged with either saline or the endotoxin LPS. Blood and tissues were collected at 3 h postchallenge. Plasma 25-hydroxyvitamin D (25OHD) levels from UVB-exposed mushroom fed rats were significantly elevated and associated with higher natural killer cell activity and reduced plasma inflammatory response to LPS compared to control diet fed rats.

Microarray evaluation of rat spleens for changes in inflammatory gene expression

showed significant upregulation of proinflammatory genes after LPS compared to saline controls in all groups. However, compared to control rats, upregulation of the proinflammatory genes was markedly reduced in the groups fed vitD<sub>2</sub>-enriched mushrooms. Rats fed UVB-exposed mushrooms had significantly higher plasma total 25OHD levels that were associated with increased innate immune response and anti-inflammatory effects.

► **White button mushroom weight loss clinical trial**

Poddar KH, Ames M, Hsin-Jen C, Feeney MJ, Wang Y, Cheskin L. [Positive effect of white button mushrooms when substituted for meat on body weight and composition changes during weight loss and weight maintenance – A one-year randomized clinical trial.](#) *Appetite*. Dec. 1 2013 Vol. 71:379-387.

Reducing energy density (ED) of the diet is an important strategy for controlling obesity. This 1-year, randomized clinical trial examined the effect of substituting mushrooms for red meat (mushroom diet), compared to a standard diet (meat diet), on weight loss and maintenance among 73 obese adults (64 women, 9 men). The subjects completed anthropometric measurements and 7-day food records four times during a standardized weight loss and maintenance regimen.

At the end of the 1-year trial, compared to participants on the standard diet, participants on the mushroom diet (n=36) reported lower intakes of energy (mean±[SE]=−123±113kcal) and fat (−4.25±6.88g), lost more pounds and percentage body weight (−7.03±3.34lbs, 3.6%), achieved lower body mass index (−1.53±0.36), waist circumference (−2.6±3.5in.) and percent total body fat (−0.85±0.53), and had lower systolic and diastolic pressure (−7.9 and −2.5mmHg); their lipid profile and inflammatory markers also improved.

After initial weight loss, subjects following the mushroom diet maintained that loss well. Those who completed the full 12-month trial still weighed a mean of 7lbs less than baseline. Thus, encouraging adults to substitute mushrooms for red meat was a useful strategy for enhancing weight loss, weight maintenance, and health parameters.

► **Mushroom consumption and diet quality**

O'Neill CE, Nicklas TA and Fulgoni III VL. [Mushroom intake is associated with better nutrient intake and diet quality: 2001-2010 National Health and Nutrition Examination Survey.](#) *Journal of Nutrition and Food Science*. Sept. 16 2013. *J Nutr Food Sci* 3:229. doi:10.4172/2155-9600.1000229. This is an Open Access article under terms and conditions of attribution.

The association between mushroom consumption and nutrient intake or diet quality has not been reported. The purpose of this study was to determine the associations between these variables in a nationally representative sample of adults. Dietary intake was determined using a 24-hour recall on adult 19+ year (N=24,807) participants of the National Health and Nutrition Examination Survey 2001-2010. Mushroom consumption was defined in two ways: 1) intake of food codes (n=281) including mushrooms and 2) intake of food codes (n=32) designated as "mushrooms". Sample weighted, covariate-adjusted least square means ± SE were determined and compared using t-tests (p<0.01). Diet quality was calculated using the Healthy Eating Index-2005 (HEI).

For consumer definitions 1 and 2, respectively: among consumers, mushroom consumption was 20.6 ± 0.75 g/d (n=2,399) and 39.5 ± 2.6 g/d (n=460).



For definition 1: mushroom consumers had higher ( $p < 0.01$ ) intakes of energy, protein, thiamin, niacin, folate, copper, selenium, and sodium, and lower intakes of total and added sugars. HEI-2005 was higher among consumers  $52.4 \pm 0.4$  v  $51.3 \pm 0.2$ . For definition 2: mushroom consumers had higher ( $p < 0.01$ ) intakes of protein, fiber, vitamin E, riboflavin, niacin, vitamin C, total choline, copper, potassium, selenium, and sodium than non-consumers. Mushroom consumers had lower ( $p < 0.01$ ) intakes of added sugars and a higher ( $p < 0.01$ ) total HEI-2005 score ( $54.6 \pm 0.9$  v  $51.4 \pm 0.2$ ) than non-consumers.

Mushroom consumption was positively associated with higher intake of many nutrients, but lower intake of some nutrients to limit and better diet quality; health professionals should encourage the addition of mushrooms to the diet, especially in ways that are prepared with lower levels of sodium.

#### ► **Mushrooms' anti-inflammatory effect**

Gunawardena D, Bennett L, Shanmugam K, Kerry K, Williams R, Zabaras D, *et al.* [Anti-inflammatory effects of five commercially available mushroom species determined in lipopolysaccharide and interferon- \$\gamma\$  activated murine macrophages.](#) *Food Chemistry*, 148 (2014) 92–96. October 14, 2013, available online.

Inflammation, a well-known contributing factor to many age-related chronic diseases, may be suppressed by the use of functional foods with anti-inflammatory properties. Edible mushrooms are attracting attention as functional foods since they are rich in bioactive compounds, but their anti-inflammatory properties and the effect of food processing steps on this activity has not been systematically investigated. In the present study, White Button and Honey Brown (both *Agaricus bisporus*), Shiitake (*Lentinus edodes*), Enoki (*Flammulina velutipes*) and Oyster mushroom (*Pleurotus ostreatus*) preparations were tested for their anti-inflammatory activity in lipopolysaccharide (LPS) and interferon- $\gamma$  (IFN- $\gamma$ ) activated murine RAW 264.7 macrophages. Potent anti-inflammatory activity ( $IC_{50} < 0.1$  mg/ml), measured as inhibition of NO production, could be detected in all raw mushroom preparations, but only raw Oyster ( $IC_{50} = 0.035$  mg/ml), Shiitake ( $IC_{50} = 0.047$  mg/ml) and Enoki mushrooms ( $IC_{50} = 0.099$  mg/ml) showed also potent inhibition of TNF- $\alpha$  production.

When the anti-inflammatory activity was followed through two food-processing steps, which involved ultrasonication and heating, a significant portion of the anti-inflammatory activity was lost suggesting that the anti-inflammatory compounds might be susceptible to heating or prone to evaporation.

#### ► ***Cordyceps militaris* (L) bioactive molecules and properties**

Reisa FS, Barros L, Calhelha RC, Cirićb A, van Griensven L, Sokovic M and Ferreira I. [The methanolic extract of \*Cordyceps militaris\* \(L.\) Link fruiting body shows antioxidant, antibacterial, antifungal and anti human tumor cell lines properties.](#) *Food and Chemical Toxicology* Dec. 2013, Vol. 62, 92-98.

This work sought to reveal new interesting bioactive molecules that could be isolated from *Cordyceps militaris* (L.) Link, recognized as a medicinal and edible mushroom. Hydrophilic and lipophilic compounds were analysed by chromatographic techniques coupled to different detectors. The methanolic extract of *C. militaris* was tested for its antioxidant, antibacterial, antifungal and anti-proliferative properties in different human tumor cell lines. Mannitol (2.01 g/100 g dw) and trehalose (24.71 g/100 g) were the free sugars found in *C. militaris*. Polyunsaturated fatty acids (68.87%) predominated over saturated

fatty acids (23.40%) and  $\delta$ -tocopherol was the only isoform of vitamin E detected (55.86  $\mu\text{g}/100\text{ g}$ ). The organic acids found in this mushroom were oxalic, citric and fumaric acids (0.33, 7.97 and 0.13  $\text{g}/100\text{g}$ , respectively). p-Hydroxybenzoic acid was the only phenolic acid quantified in this species (0.02  $\text{mg}/100\text{ g}$ ); although cinnamic acid was also found (0.11  $\text{mg}/100\text{ g}$ ). The methanolic extract of *C. militaris* proved to inhibit lipid peroxidation, have reducing power and scavenge free radicals. This extract also revealed strong antibacterial and antifungal properties. Finally, the *C. militaris* extract was able to inhibit the proliferation of MCF-7 (breast), NCI-H460 (non-small lung), HCT-15 (colon) and HeLa (cervical) human carcinoma cell lines.

#### ► Mushroom wastes as prebiotics

Chou W-T, Sheih I-C, Fang TJ. [The applications of polysaccharides from various mushroom wastes as prebiotics in different systems.](#) *Journal of Food Science* 2013, 78:M1041–M1048. doi:10.1111/1750-3841.12160.

The bases or stipes of mushrooms are normally discarded as low-economic value animal feed and compost. There are no known reports on deriving polysaccharides from these mushroom wastes for use as prebiotics. This study showed that the relatively low concentration (0.1% to 0.5%) of polysaccharides from *Lentinula edodes* stipe, *Pleurotus eryngii* base, and *Flammulina velutipes* base can enhance the survival rate of *Lactobacillus acidophilus*, *Lactobacillus casei*, and *Bifidobacterium longum subsp. longum* during cold storage.

The polysaccharides had synergistic effects with the peptides and amino acids from a yogurt culture to maintain probiotics above 107 CFU/mL during cold storage, and they also had significant protective effects on these probiotics in simulated gastric and bile juice conditions to achieve beneficial effects in the host. These results showed that mushroom wastes, which are cheaper than other sources, could be an alternative source of prebiotics. As a practical application, using the bases or stipes of mushrooms as prebiotics is less expensive than other food sources. The mushroom wastes can enhance the survival of probiotics during cold storage and also can improve the tolerance of probiotics in simulated gastric and bile juices.



### News from Australia - Glenn Cardwell

#### ► Sunlit mushrooms

Researchers at the University of Sydney were assigned to determine how much sunlight was required to generate the daily requirement of vitamin D in a serve of mushrooms. The study was conducted in July, mid-winter in Australia, and the study results were released in early September, generating a lot of media interest, including radio interviews. About 1-2 hours of midday, winter sun is needed to stimulate the mushroom to produce 10 mcg (400 IU) in a 100g serve. The smaller button mushrooms needed only an hour, while the larger cup mushroom took about two hours to reach 10 mcg/100g. There was some slight browning and water loss in the mushroom, but this didn't affect the eating qualities.

In anticipation of the publicity, Mushroom Ambassador and Celebrity Chef Fast Ed, and dietitian Glenn Cardwell recorded a [short video](#) about sunlight, vitamin D, food and mushrooms. They explain that mushrooms have the potential to be a simple, delicious and effective way to get vitamin D into the diet when personal

exposure to sunlight is limited. About the same time one major supermarket chain released vitamin D mushrooms in the state of New South Wales, Australia. For those without access to vitamin D mushroom in the shops, putting them in the sun is a viable alternative.

Putting mushrooms in the midday winter sun for 1-2 hours generates 10 mcg (400 IU) of vitamin D per 100g serve.

As the study results on sunlit mushrooms were released to the general media, we distributed similar information through our research update e-newsletter, Talking Research, to our database of health professionals.

The results were more widely publicized through a focused public relations campaign. The approach involved an initial consumer survey to establish attitudes around vitamin D and profile the problem. The research outcomes were then presented as an effective solution to the identified problem. The campaign delivered 144 pieces of media coverage – television, radio and print - with a reach of 23.2 million people. The approach was also supported by efforts in a range of social media to further reinforce the vitamin D and mushroom health message.

#### ► Dietitian promotion

The August edition of the Dietitians Association of Australia newsletter included the second mushroom promotion on the health benefits of mushrooms. The newsletter goes to all 5000 plus members of the Dietitians Association of Australia.

#### ► [powerofmushrooms.com.au](http://powerofmushrooms.com.au)

Updated information on health and nutrition has recently been uploaded to our website. This will again be updated when we receive the new CSIRO *Mushroom and Health Report* in mid-2014.

As there have been many questions about both the gluten and glutamate content of mushrooms, we have created a [handout sheet](#) for the health shows that we attend.

#### ► Food writers

Mushroom promotion to health writers and bloggers a big success.

Each year we invite all the main food writers and bloggers to a 'thank you' lunch in Sydney, where most of the food media are located. Mushroom Ambassador and Celebrity Chef Fast Ed, and dietitian Glenn Cardwell related the latest health and nutrition information about mushrooms, while another Celebrity Chef Luke Mangan's team created a mushroom themed lunch shown in the photo. This was another wonderful opportunity to discuss mushrooms,





health, flavour, weight control and vitamin D. The event was a great success on a wet day in Sydney especially as each attendee received light exposed mushrooms to pep up their vitamin D levels.



## News from Spain - Maria Luisa Tello Martin

### ► IUNS 20th International Congress of Nutrition. Granada (Spain) September 15-20, 2013

The 20th International Congress of Nutrition (ICN) was organized under the auspices of the International Union of Nutritional Sciences (IUNS) by the Spanish Society of Nutrition (SEÑ). This Congress provided a broad platform to discuss experiences gathered at multinational and global levels in the fields of nutrition research, human nutritional requirements, role of nutrition in the promotion and prevention of chronic non-communicable diseases and nutrition education, as well as in the composition of foods and the role of bioactive food components on health and well-being at different food cultures. Likewise, food safety and consumer protection and food production and environment sustainability are major aspects related to food science and nutrition worldwide that are approached.

The Congress discussed topics related to the fungi kingdom.



Therefore, a comprehensive congress under the theme "Joining Cultures through Nutrition" to convey nutrition and healthy lifestyles for everyone in a sustainable environment was planned. The scientific program included 6 plenary lectures, 32 special lectures, 4 debates, 90 parallel symposia, 38 sponsored symposia and 16 Satellite Symposia.

The response to the proposed scientific program was very encouraging. In addition to the invited lectures, about 3570 submissions were received, 96 percent of which were accepted. 347 correspond to invited speeches for Parallel Symposia, 193 were selected to be presented as Oral communications and 3223 as e-posters.

As an important part of global nutrition, mushrooms were in the Congress as well. ASOCHAMP (Spanish Mushroom Growers Association) was there with the European Campaign for mushroom promotion. Several of the works presented in the Congress discussed topics related with the fungi kingdom. For further information check the webpage of the [20th International Congress of Nutrition](#).

### ► Mushrooms on Spanish media

To celebrate the 25<sup>th</sup> anniversary of ASOCHAMP (Spanish Mushroom Growers Association) and the 10<sup>th</sup> anniversary of CTICH (Mushroom Technological Research Center) the 6<sup>th</sup> October the radio program “No es un día cualquiera”



of the Spanish national radio channel (RNE) was held in Autol (Logroño-Spain). Certainly the mushrooms took the starring role of the whole program. The mayor of Autol, the CTICH director and the ASOCHAMP president were invited to the program to explain the activities that will take place in the next months around these anniversaries. The most important event will be through the 4<sup>th</sup> Mushroom Passion Days. During 3 days (from the 1<sup>st</sup> to the 3<sup>rd</sup> of November) mushroom conferences, contests, games, cooking and tasting, will be carried out.



### News from the United States - Heidi Gengler

#### ► Positive feedback from Mushrooms and Health Summit

More than 150 researchers; academics; and health, nutrition, government and industry professionals representing at least 90 organizations joined together at the September Mushrooms and Health Summit to discuss the growing body of research supporting mushrooms' health and nutrition benefits. Speakers shared research and facilitated a critical dialogue about future research needs and the potential dietary role of mushrooms.

Feedback helps measure results. Ninety-seven (97) percent of attendees said they increased their knowledge on the health and nutrition aspects of mushrooms.



## Mushrooms get social

### Australia

Power of Mushrooms website  
My Mushrooms blog  
Mighty Mushroom Twitter  
Mushroom Lovers Club Facebook  
Power of Mushrooms YouTube

### Canada

Mushrooms Canada website  
Mushrooms Canada blog  
Mushrooms Canada Twitter  
Mushrooms Canada Facebook  
Mushrooms Canada Pinterest  
Mushrooms Canada YouTube

### Italy

Italian Association Fungicoltori (AIF) website  
Italian Association Fungicoltori (AIF) info@fun.go.it email  
Funghincucina Twitter  
Funghincucina Facebook  
Funghincucina Pinterest

### Netherlands

Champignonidee website  
Champignonidee Twitter  
Champignonidee Facebook  
Champignonidee Pinterest  
Champignonidee YouTube  
Champignonidee Google+

### South Africa

SAMFA website  
Fresh Mushrooms Twitter  
MushroomsSA Facebook

### Spain

CTICH website  
Championidea website  
Asochamprioja Twitter  
Asoc Prof Cultivadores Champiñon de La Rioja, Navarra y Aragon Facebook  
Asochamprioja YouTube  
ASOC.PROF.CULT Champiñón DE LA RIOJA Google+

### United Kingdom & Ireland

More to Mushrooms website  
More to Mushrooms Twitter  
More to Mushrooms Facebook

### United States

Mushroom Info website  
The Mushroom Channel blog  
Mushroom Channel Twitter  
Mushroom Channel Facebook  
Fresh Mushrooms Pinterest

Summit communications included a live stream video for media, [press release](#) and media outreach, live tweeting, blogging, and an onsite mushroom growing room (shown in the photo on the previous page) that encouraged social media. Organizers used JoinSpeaker technology to gather input on future research topics in real time throughout the two day meeting; top results included vitamin D, ergothioneine, bioavailability and blendability.

Participant feedback is important for this type of meeting in order to evaluate and measure results. Based on Summit evaluations, 97 percent of attendees said they increased their knowledge on the health and nutrition aspects of mushrooms and nearly half were interested in conducting mushroom research in the future. Summit content will inform upcoming events, messages, and research priorities for the Mushroom Council.

Visit [www.mushroomhealthsummit.com](http://www.mushroomhealthsummit.com) to view the program agenda, speakers' presentations and bios and videos from the event.

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](mailto: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
- 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
- Juan Valverde, Food Science Programme Manager, Monaghan Mushrooms Group, Ireland
- 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
- Ignace Deroo - Belgium
- José Antonio Jiménez Hernandez - Spain
- Kent Stenvang - Denmark
- Elizabeth O'Neil - Canada