

Horticulture Innovation Australia

Final Report

Mushrooms and Health Global Initiative

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Media Summary

Market research indicates that specific health associations between mushroom consumption and positive health outcomes are of key interest to consumers. The Mushrooms and Health Global Initiative (Initiative) leverages this knowledge to support the Australian mushroom industry's strategic plan to increase the consumption of mushrooms by providing scientific information linking the beneficial effects of mushrooms on human health.

The Initiative is a collaborative project between scientists, nutrition experts, and communication professionals that provides the science to support community awareness and educational efforts. The Initiative systematically works to collect, evaluate and communicate research that links *Agaricus bisporus*, specialty and medicinal mushrooms to improved overall health and well-being through its core components: the *Mushrooms and Health Report*, the Mushrooms and Health website, and the *Bulletin*.

The *Mushrooms and Health Report* is an extensive literature review of the published scientific material on mushroom consumption and human health; the quarterly *Bulletin* newsletter alerts readers to recent research and includes examples of how that research is communicated to health professionals, media and consumers. The Mushrooms and Health Global Initiative website houses these components as a continued resource for the industry, interested researchers, and those in the public domain who seeking detailed technical information.

The Initiative also provides the scientific basis for the development of information packages about the health and nutritional benefits of mushrooms that are shared with the key influencers and the Australian and international community. Examples of these focused activities include:

- ❖ Use of social media; Twitter parties; re-tweets and chats
- ❖ Webinars for health professionals
- ❖ Establishing the Initiative as a resource through industry websites
- ❖ Scientific presentations at professional conferences
- ❖ E-blasts and newsletters to health professionals
- ❖ Partnerships with health organizations and government agencies
- ❖ Videos and interviews with mushroom researchers for use with media
- ❖ Distribution of materials, recipes and taste testing at conferences

As a result of the Initiative's efforts, the *Mushrooms and Health Report* first released in 2008 has been updated bi-annually in 2010 and 2012; 22 issues of the *Bulletin* have been distributed electronically to key industry organizations and interested scientists; and over 80 separate countries have visited the website. Initiative efforts have been extended globally through programs and activities adopted by other mushroom producing countries particularly the United States, Spain, United Kingdom, Ireland, Canada France, Belgium, Poland, Italy, Netherlands and South Africa. This is important because the more news about mushrooms that occurs around the globe, the greater the chance that it will also be news here in Australia.

Going forward the use of the Internet and social media will enable greater global discussion and participation to identify and communicate compelling scientific reasons for consumers to eat more mushrooms. Continued access to the Initiative's

outputs by the industry, media and health influencers will be essential to familiarise consumers with mushroom's health/nutrition benefits so that commercial mushroom producers may experience the longer term financial return resulting from increased consumer demand and the subsequent worldwide consumption of mushrooms.

###

Introduction

The Mushrooms and Health Global Initiative (Initiative) was launched at the International Medicinal Mushroom Conference 4 (Slovenia 2007). It is an international collaborative project that provides the scientific underpinning to support the communication of the health benefits of eating mushrooms. The outcome is to increase the consumption of mushrooms in Australia and elsewhere around the world. Market research indicates that specific health associations between mushroom consumption and positive health outcomes are of key interest to consumers. The Initiative helps identify, validate, prioritize, archive, retrieve, summarize and disseminate mushroom and health information to those in public relations and marketing, to the media and health professionals, who then relay the message on to consumers.

Participation and involvement by all segments of the mushroom industry will be critical to communicate compelling reasons for consumers to eat more mushrooms. The Mushrooms and Health Global Initiative, through its core components – the *Mushrooms and Health Report, Bulletin* newsletters, website and interpretation of the research results/implications for dissemination and use by multiple markets/countries/locales– provides tools to help the industry frequently disseminate consistent messages about mushrooms, nutrition and health.

Technology transfer strategy, methods and activities

To increase consumption, consumers must consider mushrooms an essential, easy, and tasty way to better health. Credible scientific information, translated into easy to understand articles about mushrooms that appear regularly in various communication channels can be instrumental in changing consumers' purchase patterns from "nice to have" to "must have".

The Australian mushroom industry has strategically focused its research/development and marketing investments towards the generation of health information for consumers, with the information based on results from in-depth, peer-reviewed research from around the world. The Australian Mushroom Growers Association's (AMGA) market research indicates that specific health associations between mushroom consumption and positive health outcomes are of key interest to consumers. During focus group sessions held in Melbourne in 2006, respondents in the 20-35 age bracket clearly indicated that they would change their consumption and purchasing behaviour if the industry were able to provide credible information showing the positive benefits of including mushroom regularly in their and their family's diet. The results have been repeated in subsequent quantitative and qualitative research projects in 2009, 2010, and 2011.

The Initiative is brought to life through its core components (the *Mushrooms and Health Report, Bulletin* newsletters, a website and interpretation of the research results/implications for dissemination) and is directed by a global group of industry professionals with expertise in marketing, public relations, communications, food/nutrition and mushroom science collectively functioning as the Mushrooms and Health Global Initiative Team (See Acknowledgements). The Team communicates regularly through e-mail and conference calls and provides a quarterly Timeline update on activities. The Initiative is carefully designed and implemented to avoid duplication of efforts by maximising and leveraging resources.

Mushrooms and Health Report and Published Review

The *Mushrooms and Health Report* (previous project (MU06019) is an abstracted compilation and evaluation of scientific research linking mushrooms and health directed by Dr Peter Roupas and a team of researchers from CSIRO Food and Nutrition Sciences, Australia's largest and most diversified food, research organization. Over 11,000 published papers were screened and 3,000 evaluated for the initial *Mushrooms and Health Report 2008* which has been updated every two years since (2010 and 2012) with the next update planned for 2014. In conducting the extensive literature review, CSIRO critically analyzes peer-reviewed papers on *Agaricus bisporus* mushrooms and certain culinary specialty and nutraceutical specialty mushrooms using the following databases that are then captured in EndNote[®], a common, commercially available bibliographic database that can also be linked to Microsoft Word:

- **PubMed** – a service of the US National Library of Medicine that includes over 16 million citations from MEDLINE and other life science journals.

- **SCOPUS** – an abstract database covering 25 million abstracts from over 14,000 journals across 4,000 publishers.
- **CSIRO Electronic Journals Collection** (4,000 e-journals).
- **FSTA** – the internationally recognised world's leading Food Science and Technology Abstracts database.
- **Web of Science** - 5,700 major journals across 164 scientific disciplines.
- **CABI** - Contains over 3.8 million records from over 10,000 journals, books, conferences, reports, and other kinds of literature published internationally.
- **Cochrane Central** (database of Systematic Scientific/Medical Reviews and Cochrane Collaboration Central Register of Controlled Clinical Trials).
- **Johanna Briggs Institute** (JBI) Library of Systematic Reviews.
- **U.S. National Institutes of Health (NIH) Registry of Clinical Trials.** ClinicalTrials.gov is a registry of federally and privately supported clinical trials conducted in the United States and around the world.

The Report focuses on evaluating clinical trials linking *Agaricus bisporus* mushrooms (common white button, brown/crimini, portabella) to health outcomes related to immune function, inflammatory responses, bone health, blood glucose levels, blood lipid levels (cholesterol, triglycerides, blood pressure levels, cancer prevention, treatment, brain function/dementia, and weight management. Evaluation of mechanisms by which mushrooms or their components (e.g. ergosterol) influence a specific health condition are also reviewed as well as comparing mushroom nutrient composition to Recommended Dietary Intake (RDI) and Adequate Intake (AI) values based on updated information from national nutrient databases.

From the research cited in the *Mushrooms and Health Report*, CSIRO prepared “The role of edible mushrooms in health: Evaluation of the evidence” published in the *Journal of Functional Food*, which was among the most downloadable articles in the July-September timeframe (Roupas P et al 2012).

Bulletin

The *Bulletin*, a quarterly newsletter, includes abstracts of recent mushroom research and provides examples of media-ready interpretation of the research implications for use by multiple markets/countries/locales. These examples serve as a catalyst to spark ideas for media stories, events, or partnerships others can further customize for their specific use. This exchange helps assure frequent dissemination of consistent messages around the globe, which is critical to increase worldwide demand for mushrooms.

Mushrooms and Health Website

The Initiative supports a website that is home to the *Mushrooms and Health Report* and archives the *Bulletin*, the idea bank on how to translate and communicate the science linking mushrooms and health. As part of updating the *Mushrooms and Health Report*, CSIRO provides regular alerts on key scientific published research that are posted on the Research News sidebar link in the website.

Evaluation and measurement of outcomes: Impact and adoption

Analytics on the Mushrooms and Health Website are available only since December 2011. Since that time there have been over 4500 visits to the website. This is a satisfactory number given its highly scientific/medical content and the fact it is promoted mainly to health professionals. Over half of the visits were from North America followed by Oceania/mainly Australia (19%) and Europe (18%). *The Mushrooms and Health Report* is posted on the Initiative's website for continued full access by the mushroom industry: <http://www.mushroomsandhealth.com/mushrooms-health-report-s101/>.

Other mushroom producing countries, particularly the United States, Spain, United Kingdom, Ireland, Canada France, Belgium, Poland, Italy, Netherlands and South Africa, report adopting the following tactics to communicate the health benefits of mushrooms:

- Establishing the Initiative as a resource. The *Bulletin* lists mushroom industry/organizations involved in digital and social media through a combination of consumer and professional-focused sites:

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

Spain

CTICH website
Championonidea website
Asochamprioja Twitter
Asoc Prof Cultivadores
Champiñon de La Rioja,
Navarra y Aragon Facebook
Asochamprioja YouTube

ASOC.PROF.CULT Campiñón
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

- Conducting scientific presentations at professional conferences. The Initiative as an industry and professional resource was described to over 100 attendees during the 18th International Society for Mushroom Science (ISMS Beijing) and 250 nutrition influencers at the International Congress of Dietetics (Sydney).
- Conducting webinars and sending newsletters to health professionals. The *Bulletin* described how research about mushrooms is communicated to health professionals who then take the message to consumers: *The General Practitioner and Practice Nurse Convention and Exhibition was held in Brisbane, Queensland in September. This first event of this type in Brisbane attracted 850 doctors and nurses. Glenn Cardwell gave four workshops on “Superdiets & Superfoods” and two nutrition quizzes, many of the questions featuring mushrooms. The quiz was a surprisingly effective way of giving the mushroom messages. There were three rounds of eight questions, with prizes given out after each round. We were able to sign up 300 new members for the Mushroom Lovers Club.*
- Interviewing mushroom researchers for video use with media: See the collection of videos at:
<<http://www.youtube.com/user/Powerofmushrooms?feature=watch>>
And the now famous (over 1200 views) “Mushrooms – A Journey of Discovery
<<http://www.youtube.com/watch?v=nkf0AGxbIAA&feature=c4-overview&playnext=1&list=TLWNV8aqHqjhY>>).
- Communicating with consumers by social media. The *Bulletin* reported: *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...The concept is simple enough. Each week one blogger enters a mushroom recipe suitable for a different meal.... Recipes are placed on the Tastepotting website, and the winner each week is determined by public vote. ...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. ...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.

Discussion

Participation and involvement by all segments of the mushroom industry are critical to communicate compelling reasons for consumers to eat more mushrooms. Industry organizations, universities and/or other sponsored research centers encourage communication among scientists, indeed an important function. This differs from the supply chain and influencer communications focus of the Initiative. The external communications focus is important because market research shows that a key driver of increased mushroom consumption will be consumer awareness of specific health attributes of mushrooms.

Sharing mushrooms and health information with Australian consumers has resulted in substantial increases in mushroom sales (Alston and Parkes 2012). Many of the mushrooms and health stories that made mainstream media in Australia had their origins overseas. Some of them originated from research undertaken by HAL funded projects in the US or Europe but almost all originate from research that has been identified and highlighted in the Bulletin. This “heads up” allows the Australian team of Cardwell and Rowley to amplify the stories as part of the Mushrooms for Life project.

Mushrooms’ long history as a food source is accompanied by an equally long history of beliefs about their curative abilities in both Eastern and Western medicine systems. Studies on the consumption of mushrooms have been described in the scientific literature for well over 100 years. However, to provide a credible base for public awareness efforts, this very large amount of published information on human health needs to be critically evaluated by a respected independent third party. The Initiative addresses this need through the CSIRO review and evaluation in the *Mushrooms and Health Report*. The *Bulletin* provides specific examples of how this research can be interpreted and customized for different countries and regions.

Finally, the momentum created by the Initiative has resulted in the planning of the first Mushrooms and Health Global Summit to be held in Washington D.C., September 2013. The Summit is a tangible outcome of the Initiative and industry’s strategic positioning to help increase the consumption of mushrooms based on scientific information linking the beneficial effects of mushrooms on human health.

Recommendations

Going forward the use of the Internet and social media will enable greater global discussion and participation to identify and communicate compelling reasons for consumers to eat more mushrooms. Continued access to the Initiative's outputs by the industry, media and health influencers will be essential to familiarise consumers with mushroom's health/nutrition benefits. This information will continue to drive consumer demand and subsequent consumption so that commercial mushroom producers may experience enhanced financial returns and the community experiences improved health outcomes.

Operationally, the Initiative will continue to assess the strength of the science linking mushrooms to health through the *CSIRO Mushrooms and Health Report 2014*; improve distribution of the *Bulletin* and engagement of readers through survey feedback and greater and more active involvement of different countries and regions; identify ways to improve/drive traffic to the Mushrooms and Health website; monitor activities and reach through a quarterly Timeline; and generate a year end report for the Initiative investors.

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