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## **‘Vitamin D mushrooms’ – a food-based solution to Aussies’ vitamin D deficiency: world-first research**

**Leah Bramich,  
Chief Executive Officer,  
Australian Mushroom Growers  
Association (AMGA)**



**(00:20-00:43)**

**What is the Australian Mushroom Growers Association or AMGA?**

The Australian Mushroom Growers Association is the national peak industry body that represents commercial mushroom growers around Australia. So for the past 64 years, we've advocated for the best interests of mushroom growers, which ah, can be anywhere from government policy, through to research and development in support of the industry, and marketing programs.

**(00:44-01:13)**

**What is the role of the AMGA, how many mushroom growers are there in Australia, & where are they based?**

So the Australian Mushroom Growers Association primarily supports growers of *Agaricus Bisporus*, which is your little Button, your Cup and Flat, and the Swiss Brown and Portobello. They're all the same variety of mushrooms.

There are 43 growers of *Agaricus Bisporus* here in Australia, ah, primarily in the Victoria, South Australia, and New South Wales States, closely followed by Queensland and Western Australia.

**(01:14-01:27)**

**How many species of mushrooms are there worldwide, & how many are being grown in Australia?**

There are tens of thousands of species of fungi, or mushrooms, that are grown worldwide. However, only a handful of those are actually edible.

**(01:27-01:42)**

**What is the most widely consumed mushroom in Australia?**

Ninety-five per cent of the mushrooms that are consumed in Australia is the white mushroom Cup, which is your medium-sized, common white mushroom that you purchase from supermarkets.

**(01:43-02:02)**

**How many tonnes of mushrooms per year do Australian growers produce & what is their farm gate value?**

Collectively, growers produce 61,000, just over 61,000 tonnes of mushrooms in a year with a farm gate value of \$408 million. So, when you put that into perspective, of only 43 farms, most of the farms in Australia are very big operations.

**(02:03-02:34)**

**What are the health benefits of eating mushrooms?**

Well, mushrooms being not a plant, not a vegetable, and being fungi, have a really unique combination of vitamins and minerals, which really do make them a nutritional powerhouse.

So, all you need to remember is that mushrooms have A, B, C, and D – antioxidants, which is really good for your body; beta-glucan, which is good for lowering blood cholesterol; chitin, which is good for your tummy; and perhaps the most exciting vitamin of all, is the mushroom's ability to produce vitamin D.

**(02:35-03:15)**

**What are the major findings of the new nutrition research AMGA has completed with FOODiQ Global?**

The recent nutrition research which we've completed with FOODiQ Global, is truly exciting, because what they've been able to show is that mushrooms have an ability to produce vitamin D if you just pop them out in the sun for 15 minutes. This is really important, because one in four Australians are actually vitamin D deficient, and that number actually increases during the winter months.

Through the dietary modelling that FOODiQ have performed, they've been able to show that just 75 grams of mushrooms, or three little white Cup mushrooms, consumed four times a week, can provide the average Australian adult with a hundred per cent of their vitamin D needs.

**(03:16-03:26)**

**What is your message to Australian adults regarding vitamin D supplementation & mushrooms?**

Aussies spend so much money on vitamin D supplements per year, when all they need to do is eat mushrooms!

**(03:27-03:54)**

**How are mushrooms classified?**

So under the current Australian dietary guidelines, mushrooms are listed in the vegetable category, but they're not a vegetable, they're not a plant. They're biologically different to plants, being fungi.

So we believe that mushrooms should be separated from a biological perspective, but also to be highlighted for the unique combination of macro and micronutrients, which are just not available in ordinary fruits and vegetables.

**(03:55- 04:37)**

**What certification programs must commercial mushroom growers supplying major retailers and independent supermarkets comply with?**

Commercial mushroom growers and other food producers that supply major retailers and independent supermarkets must comply with global standards of food safety. Now these certification programs include rigorous record keeping on farm, strict safety protocols on farm, testing of both farm and product, and growers are also subject to snap auditing processes as well. So these protocols need to be, ah, very strict protocols on farm, that are part of their ongoing, year-round processes.

Now this is a good thing for Australian consumers, because they can be assured that the product that they're buying from major retailers and independent supermarkets, is safe, and of the highest quality.

**(04:38-05:09)**

**Is mushroom foraging worth the risk?**

There are thousands of varieties of mushrooms that grow in Australia, and only a handful of those are actually safe to eat. It is very difficult for you to identify what's safe and what's not.

Some of the mushroom varieties that grow in the wild are toxic, and some look like ordinary, store-bought mushrooms. So unless you're a trained mycologist, it's very difficult for you to differentiate between what's safe, and what's not.

**Foraging is just simply not worth the risk.**

**(05:10-05:24)**

**What is your message to consumers regarding the safety of mushrooms?**

Be confident in the mushrooms that you buy from the local supermarket, because they undergo global standards of food safety certification, and they are safe to eat, and of the highest quality.

**Dr Flávia Fayet-Moore**  
**Nutrition Scientist, Space Nutritionist &**  
**CEO, FOODiQ Global**



**(05:25-05:51)**

**What is dietary modelling?**

Dietary modelling is when you want to know the potential or theoretical effect of changing a component of a diet on the total nutrient of the diet. So for example, if you're adding a food, or taking it away, what effect does that have in that total diet?

**(05:52-06:19)**

**What was the major finding of your new, dietary modelling research?**

So the current dietary guidelines in Australia is actually inadequate in vitamin D. So we asked the question, what would happen to the diet if we added vitamin D mushrooms to the vegetables food group? And we found that we were able to meet the vitamin D intake of all Australians with just four serves a week of vitamin D mushrooms, without adding any excess calories, and helping reduce sodium intakes.

**(06:20-06:46)**

**Why is vitamin D so important?**

Vitamin D is essential for bone health. It helps with calcium reabsorption from the diet that helps deposit in our bones and make them really strong. But there's so much epidemiological evidence of populations around the world, where having low vitamin D status results in higher risk of infectious disease, of diabetes, cardiovascular disease, metabolic syndrome, and cancers.

**(06:47-07:08)**

**How many Australians are vitamin D deficient?**

In Australia, almost one in three Australians are vitamin D deficient. So that's levels under 50 micromoles per litre. Around the world, on average, one in two people are vitamin D deficient.

It's a big problem, and we need to find a solution for it.

**(07:09-07:31)**

**How many Australians are getting inadequate vitamin D from their diet?**

Ninety- per cent of Australians get inadequate vitamin D from their diet, which is not surprising, because there's so few food sources of vitamin D.

So, if you're not getting it from the sun, and you're not eating many eggs or fish, then you probably need to be supplemented with vitamin D.

**(07:32-08:10)**

**How have global dietary guidelines successfully met a person's vitamin D requirements to date?**

All the guidelines around the world are inadequate in meeting vitamin D needs, because most of them assume that we're going to be getting from our sun. But we know that there's many restrictions on how much sun exposure you can get, from cancer risk, to spending time indoors all day, or to your skin colour, because if your skin colour is very dark, you actually naturally block the UV, and don't produce vitamin D.

And the guidelines have tried to increase fish intake, to increase egg intake, to model fortified foods, to try to meet those dietary vitamin D requirements. And all of them have been unsuccessful to date.

**(08:11-08:32)**

**Where do mushrooms currently sit in the dietary guidelines?**

Even though we see mushrooms as vegetables, and that's how they sit in the dietary guidelines, they're actually not a plant. They're not a vegetable. They're a fungi. They are their own biological kingdom. And because of this, they have unique culinary, health, and nutritional properties.

**(08:33-09:17)**

**How many sources of vitamin D are there?**

So vitamin D, there's two main sources. You can get it from animal foods, because the animal has converted the vitamin D for you, and when you eat it, you absorb it. And the other one is fungi.

So mushrooms and yeast have a natural ability, just like our skin when they're exposed to UV light, to produce vitamin D. And they produce substantial amounts of vitamin D. So, for example, your fish and your eggs are anywhere around five to seven micrograms. When you put mushrooms in the sun, or UV expose them, they make anywhere from 18 to 25 micrograms. So that's almost double the international recommendations, and it blows all the other food sources out of the water!

**(09:18-19.36)**

**What are 'vitamin D mushrooms'?**

It's just your common Button mushrooms, Swiss brown, Portobello, Flat that you buy in a supermarket. If you put them in the sun for about 15 minutes, it'll produce more than a hundred per cent of the requirement for every single Australian.

**(19:37-10:01)**

**What nutrients do mushrooms have?**

Mushrooms do have the same nutrients that you'd expect in vegetables, like folate and potassium. But then they have seven additional nutrients that are found across all the food groups – from selenium, copper, phosphorus, and four different B vitamins, in levels of more than 10 per cent of our daily requirements.

**(10:02-10:24)**

**How does the "mighty mushroom" fit into different diets?**

So mushrooms fit into every single dietary pattern out there, from gluten-free to vegan, to flexitarian, to low salt. So it's an amazing "mighty mushroom" that helps meet all the different diets that we have, while adding the vitamin D that is so important for health.

**(10:25-10:52)**

**How can vitamin D mushrooms help solve our nation's vitamin D deficiency?**

Mushrooms that have vitamin D, that have been exposed to UV light, not only have a large amount of vitamin D, but research shows that it can actually increase vitamin D levels in the blood. So it's a really nice addition to solving the vitamin D deficiency problem in Australia.

And from the research that exists, it's as effective as a vitamin D supplement, in increasing vitamin D levels in the blood.

**(10:53-11:31)**

**Why are mushrooms the perfect space food?**

Mushrooms have the ability to grow in microgravity. So unlike plants, they don't need gravity to go straight. They thrive in space. They can make the vitamin D. But also, the ability to lower salt is quite important in space, because having too much salt in the diet, increases the bone loss in space, because there's no gravity to keep our bone strong. So not only does it provide the vitamin D, and all the B vitamins and nutrition for explorers, but it also is a countermeasure to that bone loss that happens in space, by lowering the salt of the astronaut meals.

**(11:32-12:01)**

**How do mushrooms support a circular economy?**

So mushrooms grow in a substrate. And the substrate can, um, use waste products to grow. So that's why it's relevant to space. But when the mushroom growing is done, that substrate can be reused in plant agriculture as compost. So that's why mushrooms are very sustainable, because they have the ability to also help with that circular economy. And the waste product is repurposed in plant agriculture.

**(12:02-12:30)**

**Why should nutritionists and dietitians keep the 'vitamin D mushroom' top of mind?**

Nutritionists and dietitians need to keep mushrooms front of mind, because vitamin D mushrooms is a very feasible and food-based solution to address vitamin D deficiency in Australia.

And vitamin D deficiency is a serious public health issue, because it has many different consequences on health, from cardiovascular disease, which is the number one killer in Australia, to diabetes and cancer.

**(12:31-13:00)**

**What is your message to the policy makers who are revising the dietary guidelines?**

My message for policymakers and the people revising the dietary guidelines, is to remember to consider UV-exposed mushrooms, or vitamin D mushrooms, because they provide a food-based solution, that has nutritional benefits, health benefits, culinary benefits, that can actually meet the targets of vitamin D requirements in Australia, and address the public health issue of one in three Australians being vitamin D deficient.

**Chris Tolson,  
General Manager, Premier Mushrooms,  
The Hawkesbury Valley**



**(13:18-13:43)**

**Introduction**

Hi, my name's Chris Tolson. I'm a fourth-generation mushroom farmer out in the Hawkesbury, about an hour and a half outside of Sydney.

I'm proud to be a part of the White Prince Group that supports all segments of the food the industry. from major food retailers right through to local green grocers and independent restaurants.

**(13:44-14:07)**

**How many tonnes of mushrooms does your farm produce each week?**

The site I'm standing on currently produces about 30 tonnes of mushrooms per week. That's the equivalent of one semi-trailer a night.

The White Prince Group produces about 220 tonnes of mushrooms per week. That's roughly seven semi-trailers of mushrooms a night. So quite a reasonable size operation.

**(14:08-14:24)**

**What measures are in place to ensure the safety of mushrooms?**

Australian mushroom growers who supply food service and major retailers are required to undergo food certification. This is to ensure that we deliver a safe food product to the end consumer.

**(14:25-14:48)**

**How and where are mushrooms grown?**

Mushrooms are grown right around Australia on vertical farming systems. Ah, this allows to have a lower environmental impact, using less land space. Ah, being indoors also allows us to control the three key points for mushroom growing, which is moisture, airflow, and air temperature.

**(14:49-15:24)**

**Can you reflect on the low environmental impact of mushrooms?**

Mushrooms are the food of the future because they're incredibly sustainable. We're able to grow on limited land area, in highly energy efficient rooms. We're able to utilise a circular economy, by taking waste products from other agriculture industries, producing this highly nutritious product available year-round, and then circling back our compost back into the agricultural streams we originally sourced from, and being able to produce a food that quickly, being ready to demand all year-round, with a highly nutritious food, is top notch in my eyes.

**(15:25-15:40)**

**Can you share some interesting facts about mushrooms?**

A mushroom is able to double in size in 24 hours. A mushroom is approximately 90 per cent water. And a mushroom's gills are actually pink as it's growing, not brown.

**(15:41-15:56)**

**What are the most commonly grown Australian mushrooms available in supermarkets?**

Ninety-five per cent of Australian mushrooms are the wider Agaricus bisporus. Ah, it's both the Buttons and the Flats [holds up different mushrooms]. The difference between the two is actually only three days grow time.

**(15:57-16:14)**

**How do mushrooms generate vitamin D?**

Mushrooms have the unique ability to generate vitamin D. This can be done by exposing them to sunlight for 15 minutes, or buying specially marked packs already super-charged with vitamin D from your local retailer.

**(16:15-16:23)**

**How long do vitamin D mushrooms last in the fridge?**

Mushrooms having been exposed to the sun to super-charge with vitamin D, still are able to last well over a week in the fridge.

**(16:24-16:45)**

**What are the different mushroom flavours?**

We find that the flavour difference has a lot to do with the size of the mushroom. So these two mushrooms are actually the same variety, ah. But we find the difference with the smaller ones, it's a lot more mild of a flavour, while the big open ones have a more robust, fuller flavour.

**(16:46-16:55)**

**How do you prepare mushrooms for consumption?**

Mushrooms are safe, ready to eat, out of the box, both raw or cooked. There is no need to wash or peel.



# OVERLAY

TIME CODE	DESCRIPTION
<b>Animation</b>	
17:01 – 19:00	Animation: Two-minute ultimate guide to tanning your mushrooms
<b>Mushrooms in the sun</b>	
19:00 – 19:08	Close-up panning shot of mushrooms in light on plate in sun
19:08 – 19:13	Close-up below shot of mushrooms in light on plate in sun
19:13 – 19:20	Mid-shot of mushrooms on plate in sun
<b>Vision of mushroom farm</b>	
19:20 – 19:34	Birds eye view drone vision of mushroom farm
19:34 – 19:40	Close-up time lapse of 2 mushrooms growing
19:40 – 19:44	Close-up of Georgia inspecting mushroom mulch
19:44 – 19:47	Wide-shot of farmer picking up mulch for mushrooms
19:47 – 19:48	Mid-shot of farmers discussing mulch
19:48 – 20:31	Close-up of farmer looking at mushrooms and mycelium bed
20:31 – 20:34	Mid-shot of lights turning on in mushroom growing room
20:34 – 20:41	Close-up of Chris inspecting mushroom beds with a torch
20:41 – 20:49	Mid-panning shot of Chris inspecting mushroom beds with a torch
20:49 – 20:56	Close-up of farmer picking mushrooms from mushroom bed
20:56 – 21:00	Extreme close-up of farmer picking mushrooms from mushroom bed
21:00 – 21:06	Mid-shot of farmer picking mushrooms from mushroom bed
21:06 – 21:16	Close-up of farmer picking mushrooms from mushroom bed
21:17 – 21:18	Extreme close-up of mushroom bed
21:18 – 21:23	Close-up of farmers picking mushrooms from mushroom bed and opening up mushroom
21:23 – 21:29	Close-up of mushroom punnets
21:31 – 21:37	Close-up of mushroom box being transported through farm
<b>Dr Flávia Fayet-Moore, Nutrition Scientist, Space Nutritionist &amp; CEO, FOODiQ Global, COFFS HARBOUR</b>	
21:37 – 21:40	Close-up of mushrooms on weighing scale
21:40 – 21:44	Close-up of mushrooms on cutting board
21:44 – 21:49	Close-up of Portobello mushroom on cutting board
21:50 – 22:10	Extreme close-up slow pan of various mushrooms on cutting board
22:10 – 22:28	Close-up panning shot of various mushrooms on cutting board
22:28 – 22:32	Close-up of Dr Fayet-Moore picking up mushrooms
22:32 – 22:39	Mid-shot of Dr Fayet-Moore sautéing mushrooms in butter in frying pan
22:39 – 22:47	Extreme close-up of Dr Fayet-Moore placing mushrooms into frying pan
22:47 – 22:55	Close-up of Dr Fayet-Moore sautéing mushrooms in frying pan
22:55 – 23:04	Extreme close-up of Dr Fayet-Moore sauteing mushrooms in frying pan
23:04 – 23:13	Close-up of Dr Fayet-Moore sautéing mushrooms in frying pan
23:13 – 23:21	Mid shot of Dr Fayet-Moore sautéing mushrooms in frying pan

<b>23:21 – 23:28</b>	Close-up of Dr Fayet-Moore plating mushrooms
<b>23:28 – 23:35</b>	Panning shot of mushrooms plated with omelette
<b>23:35 – 23:40</b>	Close-up of Dr Fayet-Moore cutting up onion
<b>23:40 – 23:44</b>	Extreme close-up of mushrooms in bowl
<b>23:44 – 23:53</b>	Close-up of Dr Fayet-Moore tossing mushroom salad bowl
<b>23:54 – 24:09</b>	Panning extreme close-up of mushroom salad
<b>24:09 – 24:24</b>	Mid shot of Dr Fayet-Moore looking at mushroom research
<b>24:24 – 24:34</b>	Close-up of Dr Fayet-Moore looking at mushroom research
<b>24:37 – 24:48</b>	Extreme close-up of Dr Fayet-Moore looking at mushroom research
<b>24:48 – 25:09</b>	Close-up of Dr Fayet-Moore smiling and reading research
<b>25:10 – 25:15</b>	Close up of wooden mushroom figures and cup
<b>25:16 – 25:25</b>	Rear shot of Dr Fayet-Moore walking through parkland towards the beach
<b>25:26 – 25:46</b>	Mid shot of Dr Fayet-Moore walking towards the beach
<b>25:47 – 25:54</b>	Wide shot of Dr Fayet-Moore walking
<b>25:55 -26:12</b>	Close up Dr Fayet-Moore with mushroom grower & chef looking and smelling mushrooms in mushroom bed
<b>Leah Bramich, Chief Executive Officer, Australian Mushroom Growers Association (AMGA)</b>	
<b>26:13 – 26:24</b>	Mid-shot of Leah holding a box of mushrooms
<b>26:25 – 26:32</b>	Close up of Leah holding mushrooms in box
<b>26:33 – 26:38</b>	Mid-shot of Leah working on her laptop
<b>26:39 – 26:45</b>	Close up of Leah working on her laptop
<b>26:46 – 26:49</b>	Close up of mushroom box
<b>26:50 – 26:54</b>	Close up of Leah typing
<b>26:55 – 26:59</b>	Mid shot of Leah looking at her laptop
<b>27:00 – 27:03</b>	Close up side shot of Leah
<b>Chris Tolson, General Manager, Premier Mushrooms, THE HAWKESBURY VALLEY</b>	
<b>27:04 – 27:07</b>	Wide shot of Chris walking through mushroom farm and talking to staff member
<b>27:08 – 27:10</b>	Rear shot of Chris walking through mushroom growing room
<b>27:11 – 27:13</b>	Rear shot of Chris climbing on mushroom beds and inspecting mushrooms in growing room
<b>27:14 – 27:16</b>	Mid shot of Chris looking at clipboard walking through growing room
<b>27:17 – 27:19</b>	Close up of Chris looking at mushroom bed
<b>27:20 – 27:28</b>	Close up of Chris looking at button mushroom
<b>27:29 – 27:33</b>	Extreme close up of Chris holding a mushroom
<b>27:34 – 27:36</b>	Mid shot of Chris holding two mushrooms
<b>27:37 – 27:47</b>	Close up of Chris standing in mushroom growing room
<b>27:48 – 27:57</b>	Close up of Chris standing in mushroom room
<b>27:58 – 28:02</b>	Mid shot of Chris in the kitchen and picking up mushrooms from box
<b>28:03 – 28:06</b>	Extreme close up of mushrooms in box and Chris picking up a mushroom
<b>28:07 – 28:09</b>	Side shot of Chris cutting up mushrooms
<b>28:10 – 28:14</b>	Close up of Chris in the kitchen
<b>28:15 – 28:18</b>	Close up of mushroom cooking in frying pan
<b>28:19 – 28:23</b>	Mid shot of Chris flipping mushrooms
<b>28:24 – 28:31</b>	Close up of Chris plating up mushrooms
<b>28:32 – 28:38</b>	Extreme close up of mushrooms on plate

<b>28:39 – 28:45</b>	Side close up shot of Chris eating mushrooms on toast
<b>Georgia Beattie, CEO of Australia's largest organic mushroom farm, Bulla Park &amp; AMGA Director, MELBOURNE</b>	
<b>28:46 – 28:49</b>	Wide shot of Georgia climbing into tractor
<b>28:50 – 28:52</b>	Side mid-side of Georgia looming at mushroom bed
<b>28:53 – 28:54</b>	Mid shot of mushrooms on mushroom bed
<b>28:54 – 28:55</b>	Mid shot of mushrooms on mushroom bed
<b>28:56 – 28:58</b>	Side close-up of Georgia looking at mushrooms
<b>28:59 – 29:00</b>	Close-up of mushrooms
<b>29:01 – 29:02</b>	Rear shot of Georgia walking on mushroom farm
<b>29:03 – 29:04</b>	Side mid-shot of Georgia entering mushroom growing room
<b>29:05 – 29:06</b>	Side mid-shot of Georgia looking at mushrooms in mushroom bed
<b>29:07 – 29:08</b>	Close up of flat mushrooms on tray
<b>29:09 – 29:10</b>	Side mid shot of Georgia smiling
<b>29:11 – 29:19</b>	Close up of mushroom burger
<b>29:20 – 29:29</b>	Close up of mushroom pasta
<b>OUTRO</b>	
For more information regarding this VNR, please contact:	
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ends#