

EPISODE 248

[INTRODUCTION]

[00:00:10] AVH: All right everybody, welcome to paleo magazine radio, my name is Ashleigh VanHouten, I'm your host and today, we're talking shrooms. Mushrooms, medicinal ones, legal ones, sorry to disappoint at this point, if you were hopping we were going down another route today, maybe another time.

A long with let's say coconut oil, bone broth, matcha and all of this other products that have actually had proven health benefits and have been used for ages across many different cultures but due to sort of marketing and social media surges are often deemed fads. Mushrooms are kind of the next thing, right? You're reading all of these articles that are saying like mushrooms are the next health super food and mushrooms are the new thing.

But they've been used to treat and prevent illness and boost health and vitality for way longer than Instagram has known about it. That's what we're talking about today and it's worth mentioning that another company doing great things in the sapped is called Four Sigmatic, I interviewed their awesome founder Taro in an earlier episode, that's Episode 155, if you're interested in going back and checking it out and learning more about that company and what they do.

They make a lot of premixed mushroom coffees and chai and different sort of mushroom blends, super food powders you can put in your smoothies. I have a lot of products from them that I use pretty regularly and it's great. This isn't endorsed by the podcast, it's just me saying I like this company and I did interview them so checkout Episode 155 if you want to learn more about that.

But today, I'm speaking with Jeff Chilton, he is the founder of Nammex and they've been producing high quality mushroom extracts since 1989 so way before social media decided to make it cool. The company specializes in medicinal mushroom products and is a major supplier of organically certified mushroom extracts to nutraceutical and nutritional supplement companies.

Today, I pick his brain, a lot about how they process the mushrooms, the best way to do it to make sure that we're getting all the benefits because as we all know, from the buying anything in the health and supplement industry in America that it can be pretty murky and even intentionally misleading and it turns out that there are a lot of powdered mushroom products out there that don't even contain the ingredients that they say they do so it's a whole thing apparently.

We're going to talk about that, we're going to talk about the different kinds of mushrooms, how and when to use them and for what, how much you need to do it, how long you need to do it, we talk about just sort of delicious every day normal mushrooms that you can just put in your salads and in your food and why those are beneficial.

Stick around, hopefully you learn a little something but before we dig in, here is a bit of information about our show sponsor, Bonafide Provisions who is another company that is doing something amazing that's been done and used and used to our benefit for way longer than the recent kind of bone broth fad but they're doing it the right way. Bonafide Provisions is a family owned company, they are founded by a clinical nutritionist and they make real certified organic bone broth where our ancestors did it the way it's been done for hundreds of years using only bones, no filler stocks, slow simmering for 18 to 48 hours.

They don't use high heat processing and they use no preservatives to make it shelf stable. You're going to want to eat this stuff pretty soon after you thaw it but you will, it won't last long, trust me, whenever I get it, it's gone very quickly. They freeze it at the peak of freshness and you can try their chicken, beef or turkey flavors as well as my favorite, their frontier blend which also includes lamb and bison which is yummiier in my opinion.

The bone broth, it can make a perfect comfort cup in the morning instead of coffee or tea, a great replacement if you're trying not to do the caffeine thing but you want to ramp up your nutrients, you can use it in your cooking, super versatile,, they also have a line of soups that combine bone broth and organic vegetables, they've got flavors like butternut squash and chicken vegetable, totally doable for your whole 30 this month or just for being healthy.

You should get on it and because you're smart and you listen to this podcast, you get a discount if you use the code, 'onlybones' at checkout so go to bonafiedprovisions.com and order now.

[INTERVIEW]

[0:04:38.1] JC: I literally lived with mushrooms for 10 years. I was, I would go around, I was head grower ultimately production manager and I go through our houses that were growing mushrooms every single day, each house, each warehouse has a crop in it and that crop ultimately produces 20,000 pounds of mushrooms. I was seeing that in every single stage of this 90 day cycle that each house was on so mushrooms and I are very friendly and we know each other very well.

[0:05:13.3] AVH: You never get tired of eating mushrooms?

[0:05:17.1] JC: No, actually –

[0:05:17.7] AVH: After all that time.

[0:05:19.9] JC: No, in fact, you know, some people say yeah, you probably never eat another [inaudible] again, it's like no, I love [inaudible] the button mushroom, a lot of people, I think button mushroom is so bland. I think the button mushroom is a wonderful mushroom, great flavor, I still buy it because I like to put that on any kind of steaks that I have, any time I'm eating a steak, I'm frying a big pan of mushrooms to go with that steak and my favorite mushroom is shitake and I eat mushrooms probably at least three times a week and when I eat mushrooms, I just don't eat a small little portion.

I eat a lot and I'll eat maybe a half a pound of mushrooms at a sitting. No problem.

[0:06:01.7] AVH: They're really low calorie, right? It's not like it's something you're going to get fat eating too many mushrooms, right?

[0:06:09.2] JC: Well, you know, that's a great point because this is what's so interesting about mushrooms is that back in the 70s, when I was getting into the mushroom growing world. The

classical nutritionist thought mushrooms were nothing more than a garnish or something you'd put in to flavor.

The reason they thought that was because they were low calorie. In other words, the nutritionist are like it's got no calories, it's not a real food. But the fact of the matter is, mushrooms have a good complement of protein, anywhere from 20 to 40%, high quality protein, good amino acid profile, they're mostly carbohydrates but those carbohydrates are actually the kind of carbohydrates that we want.

A lot of mannitol, one of the major parts of that carbohydrate or whatever it's called, beta glucans and the beta glucans make up the cell wall of the mushrooms and those are the compounds that give mushrooms their aminological activity. In those carbs that we're getting from the mushroom, we're getting these amino stimulating beta glucans, mushrooms are also high in B vitamins, B3 niacin, [inaudible], minerals would be potassium and phosphorous.

I mean, mushrooms are a really good food and I encourage people, before they even supplement, I just say, well, start eating mushrooms, put them into your diet. Here's something that's really cool that I love it's sort of a paleo thing is in the 17th century in England, mushrooms were called poor man's meat.

You're out there wild crafting and here's this big mushroom and you're like, man, look at that, I mean, you probably been to places where they have maybe a mushroom burger or something where they just slice a big portabella or something fried up on a bun. Anyway, it's like poor man's meat because it's a big meaty thing. Mushroom's - a good mushroom is solid, very fleshy, it is like a big slab.

[0:08:09.1] AVH: I feel like some people, when it comes to just eating regular mushrooms, it's like, there's, people don't feel ambivalent about mushrooms, they either love them or they really can't get behind the texture. What are some ways, if we want to get the health benefits of just regular kind of mushrooms you get at the grocery store but we're not like huge fans.

Is it just kind of like I tell people when I want to put liver on their diet, it's like just chop that up and try to hide it? Hide it.

[0:08:36.7] JC: You're talking about one of those meats that I do not eat.

[0:08:39.6] AVH: Liver is delicious. If you can convince me to eat a ton of mushrooms, I should be able to convince you need a little bit of liver. Talk about nutrient dense, right?

[0:08:50.0] JC: You know, we used to do it at the dinner table when I was growing up is that they have us put mustard on it just to hide the flavor and people would just kind of like, chop it up and put it down their lap and put it in a napkin and try to dispose of it. Here's something really important about mushrooms is that with a lot of people, problem is, the way they cook them. They cook them on too low a temperature and what happens is when you cook mushrooms on a low heat, the moisture comes right out of them and the next thing you know, you got a pan full of water and a lot of water log. Soggy, slimy mushrooms.

You have to cook mushrooms on high heat that keeps the moisture in and what I like to do, I mean, hot pan, I will brown a size of them, if I got an [inaudible] chopped up, don't chop it too thin, keep it medium, eight to a quarter inch or something like that but I like it brown, both sides and so when I finish cooking them, I like to cook them for up to 10 minutes is like, when I finish cooking them, they will be nice and brown, very evenly on both sides, there's no water, they are absolutely not slimy.

The texture is actually quite good, a little bit crunchy even. The key is just the way you cook them. Otherwise, I've heard so many times, too slimy for me. No, my mushrooms I use are never ever slimy.

[0:10:14.5] AVH: This is a really good point because most times, when I'm talking to people who are chefs and cooks and whatever, most of the issue that novice at home cooks have is that we're often cooking with too high of a heat so we're oxidizing the cooking fat that we're using, we're kind of searing the outside before the inside's cooked and all these things because we're in such a rush to finish eating.

That's definitely something that I think I've done with mushrooms too is like, I've erred on the side of not hot enough and then I'm getting these soggy mushrooms. That's a good tip.

[0:10:46.3] JC: Yeah, try it Ashleigh, because I think you find that it makes a big difference. And then if you're just eating the mushrooms alone without putting them in something else, put a little bit of salt, a little bit of pepper. I mean, that's all you really need, it's great, it's really flavorful. The one mushroom I highly recommend everybody is shitake mushroom.

That mushroom's got a fabulous flavor, it's in most supermarkets if you're in a metropolitan area, shitake, fresh shitake, is wonderful and it also has really great medicinal value.

[0:11:13.9] AVH: Okay, awesome, I'm into it. You obviously, as you've explained, you've been around mushrooms for a long time, you've had this company since the late 80s, way before the latest wave of sort of mushroom companies and products and this sort of current health trend that we're seeing with supplementing with powdered mushroom and mushroom extract.

I know that medicinal mushrooms are not a new thing but are you seeing personally and with your company and uptake in interest and perhaps a new audience for this stuff?

[0:11:44.5] JC: My God, mushrooms right now are trending so much, every time you turn around, there's another article that's been written about mushrooms, it's being called a new superfood. Yes, our company in the last four years, especially in the last few years, we've just been working as hard as possible, to keep up with demand. I mean, we are producing a tonnage of our products to keep up because you got companies big and small that want to utilize mushrooms, that is just not a supplement, they are putting mushrooms in chocolate.

They're putting mushrooms in drinks, they're putting mushrooms in almost anything that you can think of. The demand is unbelievable. You know, to some degree this happens in this whole natural products industry, you have what I call the flavor of the month. Mushrooms are kind of in that category right now but I think as much as anything else - look, my company started, Nammex, my company started in 1989.

I was walking around a natural foods expo in Los Angeles with a [inaudible] mushroom in my hand, trying to convince herbal companies that mushrooms have been used in traditional Chinese medicine for thousands of years and they needed to put one in their product line and

they just looked at me like, I don't know what that is you got, it looks like a piece of wood, interesting piece of wood but why should we put out a mushroom product if there's no demand for it.

I spent the whole 90s writing articles, books, trying to educate people of the benefits of mushrooms. I'd known about mushrooms obviously since the 60s and 70s and I know the benefits and what a good food they are. It's really a matter of time and you know,, it's like anything, it all of a sudden it pops up and everybody thinks, man, it just came out of nowhere.

No it didn't, it's been there for quite a while, slowly building and it's just kind of a matter of education and getting people to understand this food a little better and look, the other part of it is the world is shrinking and we've got a lot of Asian influences now and more so than ever and Asia, they eat at least 12 different mushrooms, you go to their marketplace and you've got just a complete selection and you go out to a meal, whether it's a lunch or a dinner. There is going to be a couple of plates that will be pure mushrooms of some sort and then there will be other dishes where there'll be some mushrooms as part of the dish.

It is just a common food in Asia and it's finally made its way to the west and we're just slowly waking up to that fact. You can expect to have more and more mushrooms. People eating more and more mushrooms in the west here and I got a good thing because there's so many benefits to mushrooms.

[0:14:30.9] AVH: Speaking to the idea that it's kind of this growing or it's just sort of resurfacing as a trend, I think the people tend to – I'm thinking about sort of social media and trendy kind of reading and stuff that people do that folks oftentimes tend to have a mistrust or like an initial knee jerk reaction to things becoming popular really quickly and judging it as sort of a fad or it's just like the latest thing that looks cool on Instagram and these things are all pointless.

Just because coconut oil and matcha and mushrooms and all these things find the surge in popularity doesn't mean that they aren't valid and that they don't work. Just because it becomes popular on Instagram for a minute, doesn't mean that it's a pointless, transparent trend. These, as you've said, these mushrooms have been around for a lot longer than we have and people

have been using them medicinally and for health for a lot longer than we've known about it or a lot longer than it's been on Instagram.

I think that we need to, as you've said, just kind of do our research, educate ourselves and maybe don't judge things just because they are popular on social media.

[0:15:36.7] JC: Yeah, let me make another point here and that is like right now for example, if you look out there at the landscape of natural products and if you tune into different things and you'll see - you've probably heard of the chaga mushroom. Well, right now, chaga is like what I would absolutely call a flavor of the month. Unfortunately, it is being - the benefits of chaga are being exaggerated tremendously, it's called the king of mushrooms by some companies.

There's literally nothing they would tell you that chaga does not do. It's a panacea and this is something that is not helpful at all and people need to be very careful when they see this types of information out there by companies that are just trying to jump on the bandwagon and make a profit with some of these things. Chaga is not the king of mushrooms, chaga doesn't do everything. It's a good medicinal mushroom, absolutely, it's not an edible mushroom, it's not something you're going to fry up or anything like that.

But it has got its place, it is good for certain things and I say, especially for people with stomach issues but please, please, please, do not pay attention to the hype that comes up around some of these products. I see it all the time, I've been in this industry for almost 30 years. I see it all the time, I really do not like that type of hype, exaggeration and advertising. Please don't pay attention, please don't pay attention to it.

[0:17:12.7] AVH: Yeah, I mean, nothing's a cure all for anything. I mean, we can say, sleep comes pretty close but nothing fixes everything for everybody. Again, it just goes back to doing your research, listen to your podcasts, reading your articles and kind of maybe experimenting a little bit with yourself but yeah, don't take anything at face value.

I have some questions about the growing and harvesting of these mushrooms. For your company, do you have like one farm where – or do you source them from different places all over the world or how does that work?

[0:17:44.6] JC: Here's something that's really interesting about mushrooms. That is, I can grow shitake mushrooms as an example and I can take them to the market and I can get \$5 a pound for my shitake mushrooms, fresh. Mushrooms are 90% water. When you dry that pound of shitake mushrooms out, now instead of a pound, you got a 10th of a pound because it's 90% water.

You have to sell it for 10 times as much money so now,, that dried pound of shitake mushrooms that you were getting \$5 for it, you have to get \$50 for that same pound. Nutritional supplements are sold as dry powders. Nobody is going to pay you \$50 a pound for that dried shitake. What I'm saying here is that you cannot grow mushrooms in the United States and put them into the supplement market because the supplement market wants dry powders and the economics do not work for that.

There are no actual mushroom products that are grown in the United States and sold at the market. Instead, people grow different product and we can get into that later but what – as a mushroom grower, I understand that because I was in the business for a long time. I know the economics of it.

In 1989 when I started my business, I went to China. During the 90s, I visited China, went to conferences, I went to farms, I went to processing factories, I went to research institutes, I learned so much about medicinal mushrooms, that's where it all started, that's where it all going on in a serious major way. I made all sorts of connections there including with companies that I could contract with to grow mushrooms for me and process them into extracts for me.

That's what we do, we grow our mushrooms and we process our mushrooms into extract powders, in China before we bring them over. In 1997, I took OCIA which is one of the larger organic certifiers with me to China, 1997, we did the first organic certification workshop for mushrooms in China. 1997.

All our mushrooms that have been certified by high quality German certifiers. That's where it all happens for us, we are - in China, interestingly enough, they grow 85% of the world's mushrooms. Think about that for a second, 85% of the world's mushrooms. All of our products

are grown and processed over there. Actually, here's the deal, everybody's like, "My God, China. I would never touch anything that came from china or anything like that."

Well, there's a lot of herbs and a lot of things that that's the only place you can get them but basically, before our products leave China, they have to be tested for heavy metals, they have to be tested for microbes, they have to be tested for pesticides. After all, they're organically certified. Once they arrive in the United States where we have our warehouse, we retest them. Every single lot of our product is tested twice before we sell it.

We literally cannot sell our product unless it meets the standards that are out there in the industry. Nobody's going to buy our products if they don't meet heavy metal specifications or if there's pesticides in them or anything like that.

We are very concerned and we feel like the quality control and testing is important. We test all of our products twice.

[0:21:26.1] AVH: Taking the example of shitake. If you bring me a pound of fresh shitake and I put it in my dinner and I eat it, or I ingest the relative amount of dried shitake in a smoothie. Is one or the other more healthy? Why would we want to pay a premium to get this dried powder when we could just eat it fresh?

[0:21:52.5] JC: Well, I would say, a couple of things, One of which is, the other thing I didn't bring up about mushrooms, mushrooms are very high in fiber. Mushrooms will feed the microbiome. Mushrooms actually have a compound called [inaudible], it makes mushrooms a little less digestible. They're not digested in our stomach, they actually are digested down in our small intestines.

When you eat mushrooms - now, you're going to – it's just like eating anything in terms of okay, we were able to chew everything the way we're told we should to get everything out of it, well we would be chewing a long time. Mushrooms like a lot of foods, they will get benefits from them, absolutely get benefits from them but we actually grind up mushrooms into a very fine powder, all of that surface area that we've got there. That's something that will give us benefits by taking less of them for example.

I mean, we could take a gram of dry powder rather than 10 grams of fresh mushrooms, that gram of dry powder would have more benefits for us in terms of the medicinal compounds and actually eating that mushroom. Because we can access that dried powder as much more, let's just call it bio available than eating those mushrooms.

We still get the benefits of eating mushrooms but not to the same degree with a supplement.

[0:23:18.1] AVH: Okay, all right. If people want to – they've got their own sort of little backyard garden and they want to add some mushrooms to the list, is it easy to grow your own mushrooms because I don't really hear about people doing that very often?

[0:23:32.2] JC: Wow, there's lots of people out there that are growing mushrooms at home, as a hobby. It's not the cheapest way to actually purchase mushrooms, it's kind of expensive but if you're interested, you can buy what's called mushroom spawn and here's what's interesting about mushrooms is let me just give you a little bit of an overview of this organism that we call a mushroom.

Mushroom's actually a plant part of this fungal organism. You know, with like a tree, you've got roots, you've got the stems, you've got the leaves, you've got the flowers, you've got the fruit of that tree. Everyone of those is a plant part. For example, taking ginseng, okay, actually consuming the root. Now, with the mushroom, that is one plant part and that works as it starts with a spore. Mushrooms don't have seeds, they have spores, that spore will germinate into a very fine filament called a hypha. This hypha, when we get multiple spores, that germinate together in an area, they will grow together and form a network.

That network is what is called mycelium and that mycelium is what we would call the body of that fungal organism. It's out there, it grows through the ground and it's consuming all sorts of organic matter. That fungal mycelium is what keeps all of this woody cellulose type debris, whether it's straw or branches or leaves or anything. That's what helps to basically break that down ultimately to humus that all of this plants can utilize again.

Mushrooms are a primary recycler. That's what this mycelium does, it's out there and it's going along, it's recycling all these matter and why it's doing that, it's building up energy in its cells and when the conditions are right which out here means, okay, from summer, now it's fall, it gets a little bit cooler, we get a lot of water, perfect temperature and the conditions now for a mushroom to grow.

In the fall, that mycelium with its reserves of food is built up, produces a mushroom and then that mushroom will come up, it will mature, it will then produce spores and now we've got this lifecycle that is completed. Think of it again as three different plant parts, spore, mycelium and mushroom and like any other herb, each one of those plant parts will have different compounds in it that are medicinal.

The fact is, it's when you're looking for a mushroom product in the market place, it may have one or other, you may look for a mushroom supplement and there may not be any mushroom in it, it might just be that mycelium and that's something that I know about, I talk about this when I saw you at Paleo f(x) but that's a big issue out there and especially for people who are paleo because there's a lot of products in the marketplace right now that are actually just mycelium and they grow out this mycelium in a laboratory on sterilized grain.

At the end of the process, they take that mycelium and mycelium, if you look at it and if you were to see it, it's just a very white fuzzy mould like growth. Are you familiar at all with the product called tempe?

[0:27:07.3] AVH: Yes.

[0:27:09.2] JC: Well, you know what tempe is?

[0:27:09.9] AVH: Isn't it like soy or it's like tofu?

[0:27:14.3] JC: You know, it's great, I mean, a lot of people know –

[0:27:17.1] AVH: Not my wheelhouse, I'll tell you that.

[0:27:19.1] JC: No tempe, okay, it's a soy product, a tempe is actually cooked soybeans with a fungus mycelium growing on it. When you're eating tempe, you're actually eating mycelium. Interesting, right? Well, that's the food product. Well, people in the United States because you can't grow mushrooms, they will grow out mycelium like shitake mycelium or [inaudible] mycelium, they'll grow it out on cooked grain and then at the end of the process, they'll actually cut up that grain, put it in a dryer and then they'll grind the whole thing to a powder, grain and all.

Then they will put it into the marketplace and they will call it mushroom. A lot of products out there, if you look at the label, the front label will say, shitake mushroom, [inaudible] mushroom and it will say on the label made with 100% organic mushrooms. If you turn it over, if you're lucky, if you turn it over to supplements facts, it will say mycelium and if you look in the other, in the fine print, it might say myceliated rice or myceliated oats or something like that.

What they don't tell you is that actually, there's no mushroom in there at all, it's actually just mycelium that's been grown on grain and in 2015, I did a very large study and that study, I analyzed 95 different products including dried mushrooms, including our extracts and 40 different products that I bought off the internet that were these myceliated grain products. What I found was that the majority of those products were starch because of the grains that were in there and mushrooms do not contain starch.

Mushrooms actually interestingly enough, they will produce some glycogen and that's where sometimes you hear all mushrooms are more like humans than plants. Well, on certain level, mushrooms are kind of like us, they produce glycogen, we produce glycogen. Mushrooms have this small amount of glycogen which is under 5%.

All of these products that I was analyzing was this myceliated tempe like grain had anywhere from 30 to 60% starch and the beta glucans which are the important compounds were on average, 6% in a mushroom it's 25 to 60% beta glucans. It's just the absolute opposite of what you're expecting to get.

But the label is telling you this is a mushroom product, it's not a mushroom product, this is kind of like a one of those little industry secrets that they keep – that they don't tell people, especially

if you listen to these companies that are selling those products, they're just talking, our organic mushrooms – that's all they talk about is mushroom. If you are paleo and having been an exhibitor at Paleo f(x) for three years now, I have people that come up and say, mushrooms, I love mushrooms and I ask them, well that's great.

What brand are you taking? They tell me the brand and I say you know, I hate to tell you this but you're eating a lot of grains with that product and it's mostly grains. They can't believe and are actually shocked and well they should be.

[0:30:37.0] AVH: You'd think that would be like a lawsuit waiting to happen if someone is actually like severely celiac and takes it, there could be some adverse reactions and some issues there.

[0:30:47.7] JC: Well yeah, absolutely. I mean, I consider to be pretty much unethical. It's kind of like what I call a bait and switch where they're saying that they're selling you a mushroom, I mean, what is a mushroom? It's kind of like, these companies actually keep claiming we're selling mushroom, what is a mushroom. I know what a mushroom is, it's that stem with a cap on it, that's a mushroom, mycelium is not a mushroom but they keep claiming that but I say, what about the grain?

They don't want you to really know about that. They'll say, all that grain has been consumed and is part of that product still because most of what that product is is starch. For your listeners out there, look, please look at your labels very closely. The worst part about it is that there's actually companies selling so called mushroom products where they do not even put the fact that it's mycelium in these products or that there are grains in the products. There's products out there where these grains are completely hidden, they're not being listed on the labels and that is absolutely against the law.

[0:31:57.7] AVH: What kind of labeling should we be looking for then to make sure that we know we're getting the right stuff?

[0:32:03.0] JC: I mean, the very first thing that you need to know is what I mentioned earlier which is that if it says manufactured in the USA or 100% grown in the USA, you can be

absolutely sure that that product is a myceliated grain product. Because that's all that they can produce in the United States unless it's been wild crafted.

If it's been wild crafted and one of the mushrooms that you could probably be more comfortable about would be chaga. There's a lot of companies, small and large now that sell chaga and not really so much the ones that sell it in a bottle or capsules and all that. But, the ones that sell the actual chaga chunks, the actual mushroom, there's a lot of that out there, you can look at them and go yeah, this is absolutely chaga.

For most of the others, no, I mean, if it says made in the USA, you can be very certain - and if you're at all uncertain just give the company a call and just ask them if they grow, mycelium on grain and if that is part of their production and a lot of them will say, "Oh yeah, no we grow mushrooms here." And it's like well, show me the houses that produce these mushrooms. I mean as a mushroom grower I have seen these companies out there and again they talk mushrooms and they claim mushrooms but if you actually go and visit their facility you would not see a single mushroom there.

I mean some of them might have small little rooms of mushrooms but a real mushroom farm where you have to have hundreds of people that are actually harvesting - mushrooms are still harvested by hand so that is one of the bottlenecks. Now the Agaricus mushroom, the button mushroom, we got ways to produce that in the United States that you can make a business out of it, again as a fresh product.

But once you dry these things out it doesn't work and that is why they produce this myceliated grain tempe like material, it is very, very cheap. It is all done in a laboratory. There's nothing natural about the process. They actually grow this stuff out in plastic bags. So they cook the grain in a sterilizer, they inoculate it with a live mycelium and it grows out in a sterile room, sterile air, no actual lighting and at the end of the process they just dry it right into a powder and sell it as mushroom.

[0:34:37.4] AVH: So your products utilize all three parts of the mushroom, right?

[0:34:42.8] JC: Well no, we do not put mycelium in our products. No, absolutely not. But mycelium it does not have the same compounds than the mushroom does. The mushroom is the part of this organism that produces all of the major compounds and here is one that you can tell immediately, Reishi mushroom. Reishi mushroom is bitter. The Reishi mushroom is like a factory for producing compound sulfide [inaudible] which is very important for the Reishi mushroom.

These are compounds that help our liver, they clean our blood, they also have immunological properties [inaudible] set ratio part from all the others which makes Reishi to me the premium in this little mushroom but it's bitter. It is absolutely bitter. If you were to take one of these other products and open up the capsule and taste it, it would be bland. You will not taste any bitters at all and this is just one of the ways that you can actually test whether you got one.

The other way which is very simple is iodine reacts with starch. So you can take a capsule of these set of products. Put two or three capsules into a quarter or a cup of water, stir it up really good, drop in 10 drops of iodine that you just buy from the pharmacy, drop that, put the drops in there, if there is starch in there it will turn black. Absolutely black, iodine reacts with starch that turns whatever it is black. Try that with a genuine mushroom product all you will see if the color of the iodine.

Unless you got like sometimes our extracts are very, very dark and so that makes it a little more difficult where some of the others where it is not so dark. Putting the iodine and let me tell you, it's just iodine when there is no change at all. Mushrooms do not have starch and that is where we've been able to unmask these products and let me tell you –

[0:36:38.5] AVH: Okay I just want to ask a quick question before I get in over my head because I am trying to understand. So the mycelium part of the mushroom is not the nutrient dense, it is the unnecessary part that does not need to be included in these powdered supplements but many companies are literally only using the mycelium part and touting them as a mushroom supplement. Is that accurate?

[0:37:05.1] JC: That is accurate and here is how you should think about the mycelium too. The mycelium is like the root system. So that is like the root system. In nature, it's in the ground or it

is in a piece of wood and that is actually what is bringing the nutrients up to the mushroom just like the root system of a tree, it would be bringing nutrients up to build a tree or to produce the fruit on that apple tree you have that root system –

[0:37:31.5] AVH: It's important to the mushroom but the mycelium is an important part of the mushroom system for the mushroom but not for us.

[0:37:38.8] JC: That is absolutely right. The mycelium, the fact that they can grow it in a laboratory is one thing but mycelium has never been used in any sort of traditional Chinese medicine or anything like this that the mushroom has been used. And the fact is, is that like with the Reishi mushroom, the mycelium does not produce these important compounds that we get in the mushroom. So that is really the issue.

The mushroom is really where the important compounds are being manufactured and the mycelium is simply nothing more than a root system which is applying nutrients to produce that mushroom. I mean think about it in the sense too like somebody is growing some plant and they harvest the plant and they sell you the dirt, the roots and the dirt around the roots because that's the thing with these products it is not just like it's pure mycelium. No, they are selling you the grain that this mycelium has been feeding on.

[0:38:38.3] AVH: Okay, can you walk us through then how exactly you guys take the fresh mushroom and turn it into the powder that we're purchasing, extracting the compounds for the mushroom, how does that work so that we know we're getting the health properties that we're hoping we're getting from these products.

[0:38:59.2] JC: Well traditionally mushrooms, like a lot of Chinese herbs, have been extracted with hot water. So what we do for our mushrooms is that the mushrooms will be dried. Then they'll go to the extraction facility and those dried mushrooms will be put into very large stainless steel tanks and cooked at 80 degrees celsius under pressure for about three hours. And then that liquid will be concentrated down into a syrup and we will keep all of that mushroom powder that we've been cooking in this syrup.

And that powder filled syrup will then get piped to what's called a spray dryer which then dries that liquid and again, you know think about this liquid as it's pretty syrupy kind of liquid because it has been concentrated down from all of these water that's cooking all of these mushroom powder. Once we've done it for three hours then we concentrate it. So we remove a lot of the water down until you get a syrup and then that syrup is sent to a spray drier which dries out the syrup which at the bottom of this spray drier it comes out as a very fine powder.

And that is a very common technique for extraction that's been used in Asia for a long time and what we say is we've got one kilo of mushrooms that goes in and one kilo of powder that comes out. If we want to make a more concentrated extract, what we'll do is we will put, let's just say 10 kilos into our extraction vessel and then we'll cook that two times with water. Take the fluid off each time, add more fluid, cook it again and then it is a mushroom like a Reishi or a Chaga.

Which has certain compounds that are not very water soluble but instead are alcohol soluble then we'll cook it once with alcohol and so we'll have that fiber, that mushroom fiber cooked three times and each time we draw off the fluid that's been cooked with, at that point we consider that mushroom fiber to be spent and besides we can't put 10 kilos into one kilo of final product. So now at this point, we concentrate all the fluid down, it goes to the spray dryer.

It comes out a fine powder but now all of that fiber has been filtered out of it. So it is just the pure extraction fluid from the alcohol and the water that we use in that process and that's what we would call a more concentrated extract. And the reason for concentrating extracts is just like if you were to take one gram of mushroom powder that haven't been extracted, that is not very much, Ashleigh. That is not going to provide you with many benefits just a straight mushroom powder that hasn't been processed.

And there is not going to be a lot there, maybe you'd have to take five grams of it. Well, nobody out there is going to take 10 capsules of some product. That is just not how it works. So with an extract, the idea is that you are getting more, all of the benefits of that mushroom that has been put into a smaller volume of material. So now it is a 10 to one, let us say having to take – well instead of one gram of this powder, you can actually take a 100 grams.

But because it is concentrated, now you could take one gram of that concentrate and you're getting 100 grams of the dried material. So this is really the key behind it all, it's like a concentrate will give you the benefits of a smaller amount. So you don't have to take it – now you can take two capsules instead of 10.

[0:43:03.5] AVH: How do we know and I know this is a very high level question and it depends but how do we know how much of any particular mushroom we should take to get the benefits because I find one of the ways the supplement industry can be misleading is they introduce these new super foods or they position turmeric as the new thing that's going to solve all of your problems and just sprinkle turmeric on your food when in reality these scientific studies are saying that you have to have a full cup of turmeric a day in order to reap the benefits.

So how do we know that we're not just wasting our money buying these supplements because we are not taking them in high enough doses that it is actually doing anything.

[0:43:42.7] JC: That is actually a great question because that is the issue that is out there in the supplement industry is that there is so many supplements on the market where they tell you to take two capsules and those two capsules are going to do you absolutely nothing and you think about it for a second you go, "Why am I asked to take two capsules?" Let's say 500 milligram capsules a day and there's 60 capsules in this bottle.

Well this is actually they are selling you a month's supply and that's why it's all based upon and that's not a very good way to do it. The fact is that the other side of that is there are so few actual clinical trials out there that can give us guidelines because so many of the tests out there for any natural product would be either in tests that were done in [inaudible] or it might be done in the experimental animals but to do a human trial is very expensive.

So there is not very many good ways to know the exact amount you should take. Now I got a study that was done by a physician who was actually trained in traditional Chinese medicine as well that he is also a standard physician and he's been in [inaudible] and places like that and he did a paper on Reishi for example where he looked at all of the traditional literature and all of the records to see okay, how much are these traditional Chinese medicine doctors actually giving people as a therapeutic dose.

Well, he came up with a number. He came up and found, "Okay from everything that I looked at..." he says, "Two to five dried grams are equivalent of the mushroom powder." So equivalent meaning if it is five grams and you got a five to one extract, well then that would be only one gram you need to take. So I use that as my guideline and then whenever I can find scientific literature that actually has a clinical trial and there's a couple of real interesting papers out there on Lion's Mane.

That were clinical trials that were done in Japan and Japanese are really great researchers that I trust their work a lot. For example, in this particular study and it was a clinical trial with 30 70-year olds and they had a controlled group which was good and they gave them all a battery test because this was all about cognition and memory. They get them all battery of tests and then for the next 30 months, one group got three grams of Lion's Mane powder.

And it's really interesting, just mushroom powder that was all. Three grams and the other group didn't get any and then after three months they had them take the test again and the group that was taking the Lion's Mane did a lot better than test than the controlled group and what was interesting though was that then they basically stopped taking the lion's mane and they tested both groups again in 30 days after they stopped taking the Lion's Mane.

And the group that did so well with the lion's mane, they drop back down to the standard after stopping taking the Lion's Mane. That to me was really interesting test and the nice thing about it is they gave us kind of a bit if a guideline. Okay with three dried grams of Lion's Mane or equivalent, we can see some benefits here. So those are the kind of things that we look for but boy, you know it is so hard and I sympathize with anybody that wants to take a supplement.

And figure what one is a good supplement, a quality supplement what one you're just wasting your money on. Some of them are just outrageously expensive and some people are taking three or four or whatever supplements is just like, "Wow it can be a big expense every month." So it is very difficult. What I would say is with mushrooms, it is very important they're extracted that is really important just especially in terms of supplements used because you don't want to be taking five to 10 capsules of something a day.

So I would look for extracts. Also one of the things that we do is we test every single batch that we make. We test it for beta glucan. Beta glucans test the important compound in mushrooms that is showing all the immunological activity and that is really why people are taking mushrooms as part of the immunological benefits that it has. We tested beta glucans so every single batch we can tell you yes, this particular batch has 25% beta glucans or 40% beta glucans.

So our customers and again, my company sells raw materials to other companies that put out our products and add in their own label. At least the companies that buy from us they know because of our analytical work, they know that what they're getting has what they should be getting in that particular mushroom extract product.

[0:48:46.8] AVH: Another question in a similar vein and this is something as someone who experiments a lot with different supplements, it is a question that I always have and I don't know if you've come across any research with mushroom supplements specifically. But do you know if the body can build up a tolerance to things like certain mushroom extracts where eventually you may have to take more and more to get the same positive benefits.

Or is it a matter of, as with most supplements you cycle in and out so that your body doesn't become too accustomed to them?

[0:49:15.4] JC: Well you know what? With mushrooms I have never seen anything that would say that you would build up a tolerance so you should stop for a while and then starting again. The thing about mushrooms is that you really need to look at mushrooms as a preventive medicine. There is something that you want it to be taking in a regular way and they are going to be sitting in the background. If somebody says, "Yeah, I just got this great mushroom supplement yesterday and today I feel wonderful."

You're like, "Well there is a good example of placebo," no. It is something that sits on the background. It is there working for you and you have to really look at it in a really long term way and go, "Okay, over this past six months or year that I have been taking this has my health improved in any way? Is my immunological, my immune system stronger, am I getting tired less? Are those benefits that are supposed to be there with the mushroom?"

Is that working for me or do I just feel the same? Some people and certainly from a lot of the reviews that we get on our products, some people, the benefits they get are amazing. Even to us they're amazing. Other people are like, "Well I don't really feel it," there's nothing wrong with that. I mean everybody reacts differently to different herbs. So some people may get benefits, some people may not, again, a lot of times we really want to believe.

We really want to believe that this whatever it is because so and so that's selling it to me and I really want to believe that this is going to be good for me and so sometimes that belief alone will give you benefits. But I think you really have to look at it in sort of a longer term and a longer term view and go, "Okay, I have been taking this for a while and I don't know, I haven't seen it's the same," so -

[0:50:59.6] AVH: Yeah, everyone always like the concept of the sexy pill that will fix everything or the one quick answer that will make you fitter and healthier but it seems to be over and over again that it is the idea of consistency and sustainable, healthy, proactive health practices that really make the difference right? There is really no quick fix but that's okay.

[0:51:24.8] JC: Well yeah as you well know, I mean let's face it, the foundation of our health really is going to be diet, what we're consuming and the other would be how happy we are. If we live in a smog filled place or do we live in a place that has fresh air. Do we have a good supply of fresh water? I mean all of those things play into our health and again, diet and your environment to me, those are like really the foundation and if those are good, a lot of times you really don't need supplement.

And so that's where, to me, figure out your diet and see if you're going to get everything you need out of that diet and if you are, you probably don't need to be looking for supplements. If you got some issues then sure, have a look, talk about that, maybe go to a naturopath or a clinical herbalist or something, have that talk with them, see what they have to say and then maybe you want a supplement but don't spend your money on supplements if you are already feeling healthy and you got a very good solid foundation and diet.

[0:52:28.1] AVH: Right, one of the words that I hear used a lot in relation to mushrooms and mushrooms supplements is adaptogen. Are all mushrooms adaptogens or only some of them and how does that work?

[0:52:39.8] JC: Well you know what? It is interesting because adaptogen was a huge term back in early 90s. It was like wow, you adaptogen people were talking about the concept. It was such a cool concept and now as it has come around because it has dropped away after 2000. I didn't hear the word adaptogen for years and years and years and all of a sudden it's back up. Adaptogens really are herbs that can promote harmony and balance and I would say, generally, speaking are all mushrooms adaptogens? Well let's just say definitely the major medicinal mushrooms I would consider them adaptogens for sure.

That again gets back to this whole idea of sitting in the background and they are definitely considered harmony herbs and herbs that can basically balance out who you are. And I think in my opinion, this is really what disease is all about. Disease is trying to maintain that harmony and balance and we sort of get out of balance one way or the other. Well that is when we're at dis-ease. So adaptogens I think are – it is an interesting term.

It is non-specific and that's when I'm saying don't expect the mushroom to cure your cold in a day or anything like that. It's non-specific. It is not going to be right away I am going to take your cold away. No, it doesn't work that way. So in that sense and that's another definition for an adaptogen. It is not something that's going to immediately address some certain symptom that you might be having. No, the adaptogen is just there. It is working in the background.

It is working properly, it should be helping you out if you have immunological issues or if you are tired all the time or you lack energy, things like that. The adaptogen should be helping you there.

[0:54:28.7] AVH: Right, okay so for those of us who are interested or involved in this world, we hear some mushrooms mentioned more than others over and over again. So Chaga, Reishi which you mentioned, Cordyceps, Ashwagandha. Again, this is a general question, it depends but for people who are just looking for general health, like you said preventative measures, what are the mushrooms that maybe they should look at supplementing with first?

[0:54:57.9] JC: Well I would say absolutely Reishi mushroom. Reishi mushroom is head and shoulders above all the others. It's got not just a – you know in our test which is really interesting because we are running beta glucan tests on all of our products and we've got about 10 or 12 different mushrooms. The two mushrooms that came out the tops in beta glucan interestingly enough was Reishi and the other one was Turkey Tail.

And I thought wow, this is really interesting because those are highly considered especially Reishi. So to me absolutely Reishi because it not only has the beta glucans which are so important but it also has these Triterpenoids. Reishi is the premier one, if you are going to hit one particular mushroom, Reishi in China that has all sorts of mythologies built up around it and the people especially if they're aging and as your immune system starts to weaken, people get right on Reishi and they are taking it the rest of their lives and that's really one that's considered the good luck herb.

The mushroom of immortality, they have all sorts of it's in their art, it's everywhere. So I would say Reishi is definitely the one. The other one that can really be helpful is if you enjoy eating mushrooms, start eating shitake. Put shitake into your diet. That is another one that's a really good one. Cordyceps also. Chaga, I wouldn't say Chaga. I think Cordyceps is definitely a better one to do. Cordyceps is great fatigue, great for energy, something where you're just feeling run down.

Start taking some Cordyceps and seeing how that's good for you. The other thing too, we talked a little bit about dose, you know what? People don't always follow what it says on the package because all they're doing is saying, "Okay yeah, here is your month's supply. Take two capsules." It's just like so many miracle products. It's like man, to get the benefits you have to take more than that of this product. You personally try to find out how high quality product and then go, "Well I am going to try this amount and let us just see how that works for me."

And if it works good that's like, "Oh man so much going on back down," or nothing's going on, well try a little more but yeah, those are the ones that I would recommend. I definitely recommend Reishi, Cordyceps, shitake with your diet absolutely and those too, if you are looking at okay you want to try and enhance your memory or cognition, give Lion's Mane a try.

And remember, three grams of the Lion's Mane seem to be a workable amount and that gave people benefits in the study.

[0:57:37.5] AVH: Okay, this is very helpful and actually makes me feel good because of all the mushrooms I've tried, I have noticed personally the most benefit from Reishi. I was taking it, supplementing with it like in the evening because I had heard that it helped calm your nervous system and relax you a little bit.

[0:57:54.5] JC: Yes.

[0:57:55.1] AVH: I saw the improvement in that so that's great. That means that I guess my body is responding to it. It wasn't complete placebo because I had not heard this news until I started taking it and started feeling that. So that's exciting. What's the most popular product that you are selling though? What are people grabbing up these days?

[0:58:14.6] JC: Oh my God, we cannot keep Lion's Mane in stock and we are literally producing lion's mane extract by the ton and we cannot keep it in stock. Everybody and his brother wants Lion's Mane now and this was I think it was four years ago, we were selling close to nothing in Lion's Mane. Nobody wanted Lion's Mane but now there has just been so much publicity and buzz about Lion's Mane that everybody wants it and probably too, the whole new let's just call it concept of nootropics.

And Lion's Mane has been targeted a lot as a nootropic and a natural one. So yeah, a lot of people have picked up on Lion's Mane. The top four for us are definitely Reishi, Lion's Mane, Cordyceps and Chaga. Those are the top four right now and Lion's Mane out in front of Reishi close behind and then Cordyceps being right there and then Chaga.

[0:59:16.5] AVH: Well, Jeff I am going to start closing this up here because I could keep you all day. We can always do a part two because I know we could probably talk about this or we could talk about it forever. I appreciate that and I appreciate you giving some really kind of practical advice and information for us because this stuff, you can really get into the weeds with it and it can be overwhelming and then people are like, "Well I don't even want to mess with this because there's too much."

But you gave us a lot of information that I think will empower people to help them make decisions. So that is very helpful and I appreciate it and before we end off here, can you direct people to where they can go online to learn more, maybe connect with you and then find your company?

[0:59:52.8] JC: My company is Nammex and you can get to us at nammex.com. We have a ton of information there, Ashleigh. I mean we've got - so deep in information, people could learn so much from there. I got my white paper on there that I was telling you about the study I did in 2015. I've got some fabulous slide shows on there that will take you through the whole process of growing mushrooms from start to finish, information on these myceliated grain products that I was talking about.

I mean there is just a lot of info so please come to nammex.com. Nammex is a raw material supplier to other companies. We do have a site called realmushrooms.com and that's where you can purchase your products if you're a consumer, you can purchase our products at realmushrooms.com. We put them out in pouches and in castles and so if that's what you are interested in then definitely go to realmushrooms.com. So either one of those it will be great.

[1:01:00.8] AVH: Awesome, cool and one last thing, this is on topic but it is something that I just read about recently and I am sure you already know about it but is there – I just read this article about the largest mushroom or mushroom growth in the world, you could see it from space. Does this ring a bell to you at all?

[1:01:17.0] JC: Oh yeah, you know what they're talking about? They are talking about an organism, a fungal organism in Oregon and what they're talking about is the size of the mycelial colony, the underground part of this. So they found this huge mycelial colony where this thing has been there for hundreds of years growing and as long as – you know the thing with mycelium is as long as it's got nutrients, it will just continue to grow.

It will stay down and that's why if you've ever gone mushroom hunting, the mushroom hunter will always swear you to secrecy and if you ask the mushroom hunter, "Well where do you find those?" "I am not going to tell you." Because if the mycelium is in one spot as long as it has

nutrients the mushrooms will keep growing there year after year. So that's where that whole thing came from. It is just a mycelial colony, it is in Oregon. It is a very large organism.

[1:02:06.1] AVH: That's pretty cool. Such a complex, interesting – I guess it is not an animal but it is not a plant either? I mean fungus is one thing.

[1:02:12.6] JC: Well exactly, it is a fungus and it's got its own kingdom list but I guess it's between animals and plants and so yeah, I think about this is we're only aware of it pretty much because we see a mushroom come out or maybe well you know what? If you have mold on your bread or something, that is a fungus too, right? So we're only aware of a certain instances. We don't see it working out there which is decomposing everything because it is underground for the most part.

[1:02:38.5] AVH: So weird, so cool. I'm glad there's experts like you out there who can enlighten us. So anyway Jeff, thank you again for your time and yeah, we'll do part two another time. Maybe I will ask the internets to ask me some questions to pass along to you and we'll do it again.

[1:02:55.5] JC: Awesome, that will be fantastic. Well thank you so much Ashleigh, I really enjoyed talking to you. Thank you so much for having me on.

[END OF INTERVIEW]

[1:03:04.8] AVH: All right that's it for today. I hope you learned a little something because that's always my goal really and that is literary the only reason I exist in podcast form is for us to learn a little something, so I hope you did.

Thanks again to Bonafide Provisions for sponsoring the show. I truly think that a daily bone broth habit first of all is not the worst habit you could have but also really helps keep the sickness at bay during the winter and just makes you feel better and more nourished just making sure you get all those vitamins and minerals that you especially need when your immune system is really working hard and it's tasty. So check out Bonafide organic slow

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And whether or not we can fix what’s wrong with the meat industry and our approach to eating meat in general, some really huge ethical, sustainable, moral, health topics to be covered in this discussion, so it is a good one. It is an important one and don’t miss it. Make sure you are subscribed to Paleo Magazine Radio and I will see you here next week and have a great week.

[OUTRO]

[1:04:35.8] AV: The intro music for Paleo Magazine Radio is a song called Stronger performed by Alter Ego and I hope you love it.

[END]