

- Matt Baum: [00:06](#) Hey this is Matt Baum, and welcome to another episode of the Ministry of Hemp podcast, brought to you by ministryofhemp.com, America's leading advocate for hemp.
- Matt Baum: [00:17](#) Today on the show we are going to get into some more science; we're going to talk about extraction. First we're going into what we're trying to extract, and then we're going to talk about one of the ways to extract it. This is actually going to be a multi part series that happens in a few episodes but before we do any of that, my other life, I'm a massive nerd and I host a show all about that, called The Two-Headed Nerd! podcast.
- Matt Baum: [00:44](#) So when I heard that hemp as being sent to the International Space Station to be studied, I had to learn more about hemp in space.
- Speaker 1: [00:55](#) Yes it came from outer space, to fill the world with terror, to bring you unforgettable suspense.
- Matt Baum: [01:04](#) Now don't be alarmed, there's no mutant strain of space hemp coming to take over the planet and destroy humanity, yet. But, there is some really cool stuff coming going on, on the ISS, that's the International Space Station right now, and I found just the person to talk to about it. My new friend.
- Annie Rouse: [01:23](#) Annie Rouse, and I am co-founder of Anavii Market, and Anavii Market was one of the collaborators that helped to send hemp seeds up the International Space Station.
- Matt Baum: [01:36](#) You're going to hear from Annie in the next episode as well. She is involved in so much cool hemp stuff.
- Matt Baum: [01:43](#) Okay and let me ask you why are we sending hemp seeds to the International Space Station? I'm not trying to sound like, "I'm a taxpayer, dammit," and I mean that, I'm curious, what are we doing with it?
- Annie Rouse: [01:54](#) Well, that is a very good question, tax dollars has nothing to do with this.
- Matt Baum: [01:58](#) That's good, that's good.
- Annie Rouse: [02:01](#) So we were working, Anavii Market's based in Lexington and there's a company also based in Lexington called Space Tango. They do a lot of research on commercializing and doing R&D on applications that can be manufactured in space so that it can be used here on Earth.

Matt Baum: [02:21](#) Okay

Annie Rouse: [02:21](#) So they're one of the very few companies in the world who has access to do research on the International Space Station, and conveniently are also based in Lexington, so we teamed up early last year and started talking about this possibility of sending hemp seeds into space to really look at the biomedical aspects of it, but we're interested, of course, in any sort of biological, chemical or genetic change that occurs when the seeds are susceptible to microgravity.

Matt Baum: [02:52](#) So let me ask you, what are you expecting to happen, I guess, up there? When you say biomedical research, what kind of biomedical research can they do in space that they can't do here? Here being Earth, I guess.

Annie Rouse: [03:05](#) So yeah I mean it's actually pretty remarkable when you start digging in to it because you're up in microgravity and you're removing the one constant that we have here on Earth. [inaudible 00:03:17] situation. So in the past, Space Tango, who's done research for instance, they're doing work right now with retina implants, where they actually have found that the success rates of these retina implants improves like 8-fold when they manufacture and develop these retina replacements in microgravity.

Matt Baum: [03:38](#) That is amazing.

Annie Rouse: [03:39](#) And that in [inaudible 00:03:41] can not be replicated on Earth for more than like 17 seconds, so these retina implants have to be made in microgravity conditions.

Matt Baum: [03:50](#) Oh my God. So, but if they bring them back to Earth, they'll be okay?

Annie Rouse: [03:55](#) They're okay.

Matt Baum: [03:56](#) It's just the actual implant as it's been made there?

Annie Rouse: [04:00](#) Yes.

Matt Baum: [04:00](#) So were looking, well not we, but I guess they are looking for similar type results. I know that soybeans were grown up there and I know there were some other... sunflowers were grown and they acted differently. Now of course the experiments are going on right now and I'm sure you can't give away anything

but are they noticing anything, any different behavior in the hemp seeds?

Annie Rouse: [04:24](#) So we just sent the first launch up, of the hemp seeds in early May, so we won't really know if any changes had occur until they come back to Earth, [crosstalk 00:04:38]-

Matt Baum: [04:38](#) I apologize for the weird audio but Annie's internet connection was cutting in and out. Basically they put the seeds in these little cubes is what she's saying.

Annie Rouse: [04:46](#) ...[crosstalk 00:04:46] hemp seeds are just sitting in those cubes. And initially we're going to assess the stability of them and see if anything happens when they go up into space and they come back down. Now once we analyze that stability we'll grow it out, see if there's any changes compared to the control that never left Earth and we'll extend the research further, doing things like germinating the seeds potentially breeding them out up in space, and it could be something like a cannabinoid comes out in a higher concentration when susceptible to microgravity or maybe the protein profile changes or any sort of nutritional profile, and the tensile strength. We really don't know which is quite exciting, but we also have some hunches as to as what we might think may happen based on previous research that Space Tango has undertaken.

Matt Baum: [05:44](#) Okay so maybe I'm missing something here, but are they literally just sending the seeds into space and holding them there for a while, and then bringing them back to Earth?

Annie Rouse: [05:55](#) Yes, in this specific research project, yes.

Annie Rouse: [06:01](#) It's always the initial step. You know, you want to make sure that there's not something that's just like: "Whoa!" like, now with [inaudible 00:06:08] if they were stable.

Matt Baum: [06:10](#) "We unleashed a monster type thing!"

Matt Baum: [06:16](#) I did go straight to horror movie when I pictured it germinating, and I'm like: "Oh my God!"

Annie Rouse: [06:21](#) [inaudible 00:06:21] die, you know and [crosstalk 00:06:24].

Matt Baum: [06:24](#) So step one send them into space, see what happened and then bring them back, see what happens when they're germinate. Is step two actually grow hemp in space?

Annie Rouse: [06:32](#) Well likely step two would be germinating them in space

Matt Baum: [06:35](#) Well obviously you don't have fields and whatnot on the ISS but-

Annie Rouse: [06:39](#) It's a little more difficult, but there have been projects in the past where they've incubated a couple of different seeds. [inaudible 00:06:49] at a time in smaller containers. So we would be able to bring those back down to Earth, test this out, potentially could plant them if they make it, and see what those changes might be. There likely will be something that happens just when something germinates. They had a really weird worm project that they did, where they took these, some type of worm, and they split it into thirds. And the head grew back a tail, and the tail grew back a head, and the middle section grew back two heads.

Matt Baum: [07:22](#) Whoa! A monster! I knew it!

Annie Rouse: [07:28](#) Better yet, the offspring of that two-headed worm had two heads.

Matt Baum: [07:34](#) Oh man.

Annie Rouse: [07:34](#) There was an epigenetic change that happened so it could be that we create a brand new genetic species of cannabis or of hemp that has a feature that we are [inaudible 00:07:47].

Matt Baum: [07:46](#) But they blew that worm out the airlock, right? It's not coming down to Earth and then like, [crosstalk 00:07:53], okay good. I know where that goes.

Annie Rouse: [07:57](#) Yeah, it's the start of a horror movie.

Matt Baum: [07:59](#) So what's the best case scenario? Did you guys have an idea of something that might happen or something you were hoping would happen, when this is taken to space?

Annie Rouse: [08:08](#) Yeah, I mean we're always hoping for improvements. Improve- [inaudible 00:08:11] cannabinoid profile, improvements in the nutritional profile and anything in that regard that, when we bring it back to Earth, it may help the farmer get a return or improve their planting protocols, or whatever it might be, or a processor maybe to improve the extraction process or the processing process. You know, fiber decortication, or whatever it might be.

- Annie Rouse: [08:34](#) So any improvements, but also things that are not good may also be beneficial just for understanding the plant more, and understanding the chemical makeup of the plant, because this plant really were in an age where we've manipulated pretty much every other species on planet Earth at this point, and mostly chemical manipulation. And the cannabis plant, the hemp plant have been really untouched, and have evolved entirely with man-kind so it's really a very unique opportunity to look at it in a different kind of manner and mindset than something like soy or corn, which aren't so virgin as a material as hemp would-
- Matt Baum: [09:20](#) Of course, yeah.
- Matt Baum: [09:23](#) I'm not going to go into the whole politics of genetically modified organisms or GMO's here, but what Annie is saying is really important because hemp truly is one of the only crops out there, right now, that truly has not been modified. I mean when corn was first grown it was blue and black; carrots used to be purple; literally everything you eat is genetically modified in some way. But hemp, because it's been illegal to grow for so long, is about as close to its original natural state as it can possibly be.
- Matt Baum: [10:04](#) So how long do we have to wait? When does the hemp come back to Earth?
- Annie Rouse: [10:09](#) So the hemp would be back to Earth in about mid July, and we'll take it back to Lexington, and they'll run some assessments in the lab there at Space Tango, and then also in some of the hemp fields in Kentucky, we'll actually plant out the seeds with our partners, Atalo Holdings, and then we'll see the difference.
- Matt Baum: [10:33](#) That is very cool.
- Annie Rouse: [10:33](#) In the past they've done these experiments before with like lavender and valerian root and barley, and at least with the lavender and valerian root the plants were almost stunted, it seemed like, in growth so, that may happen, we'll find out.
- Matt Baum: [10:53](#) We'll have to bring you back and find out, because now I've got to know what happens from here. And if we don't hear from you then it'll be on the news that something took over, you know, there's a large green monster-type thing.

- Matt Baum: [11:03](#) Annie, thank you so much you're always wonderful and, like I said, I'm going to keep everybody posted on this because this story is just too unbearably cool.
- Annie Rouse: [11:11](#) Oh it definitely is, we're excited to see what happens with it and excited for the future of hemp in space. [crosstalk 00:11:19] we need to expand to the next planet so-
- Matt Baum: [11:29](#) Yeah, absolutely. It's just crazy to think that while politicians all over the united states are trying to fight the legalization of hemp because they see it as a Trojan horse for marijuana, or they don't even understand what hemp is. It's being studied in outer space right now. If you go outside and look up at the right time, you can see a blinking light that is the International Space Station. And they are studying hemp seeds in space, right now. Because this is coming and this is going to be legal, whether a lot of people like it or not.
- Matt Baum: [12:18](#) Next up I want to get into the first of what's going to be three parts really, talking about extraction. CBD is a huge part of the hemp market at present and extraction is how they get the CBD out of the hemp plant itself, but there's a few different processes that go into extraction, but before we get into that, let's talk about what is being extracted from the hemp plant.
- David Chadwick: [12:49](#) My name is David Chadwick. I'm the president CEO of leading edge farm.
- Matt Baum: [12:54](#) Before David got involved in the CBD world, he was a radio frequency engineer and
- David Chadwick: [13:00](#) His mother got very sick.
- David Chadwick: [13:02](#) She was in a home under hospice care. She didn't walk anymore. She was getting bed sores. She was also on Coumadin, which thins out the skin, so she got [inaudible 00:13:14] very easy, very painful. The medicine they gave her for the pain was worse than the condition, and the ointments and creams I gave her for her skin, it was great for keeping it moist, but it didn't help it heal, and it wasn't just her, it was all the seniors in the home that had the same type of condition. I just thought that was ridiculous that at this day and age, we didn't have a topical medication to help with the pain and for the healing of the skin. That impacted me and a couple of years after she passed, I was introduced for the first time in my life to cannabis.

Matt Baum: [13:53](#) That's when David did what any engineer would do and went to the lab, learned how to isolate cannabinoids or cannabinoids. Am I saying that wrong?

David Chadwick: [14:04](#) No, that's correct.

Matt Baum: [14:05](#) Cannabinoids. Okay, fair enough. I've heard it said both ways, and I'm not sure who's right. Could you talk to us a little bit about cannabinoids? What are we trying to extract to make CBD exactly?

David Chadwick: [14:19](#) Well from the cannabis plant, it contains different chemicals or as you mentioned, cannabinoids that have different therapeutic properties. There are two methods of extraction. One is to do it as an isolate, which is an isolated cannabinoid, or it is the general extraction that includes all the cannabinoids and terpenes within the plant.

Matt Baum: [14:46](#) Okay. An isolate would be that, like the one, the second one would be the full spectrum is what you're talking about where they take everything out.

David Chadwick: [14:54](#) It can be full spectrum or it can be broad spectrum.

Matt Baum: [14:59](#) Gotcha. But an isolate goes for one specific cannabinoid that they're trying to extract. What would be like the most popular one that you see in an isolate?

David Chadwick: [15:08](#) Right now? I think the the most popular one is a cannabidiol or CBD.

Matt Baum: [15:17](#) Okay, and that is going to affect you in a sense where like most CBD does, where it helps with anxiety, helps with sleep, helps with mild pain relief, and stuff like that. Right?

David Chadwick: [15:27](#) Oh, absolutely. There's got to be about 20 or more identified therapeutic benefits of CBD.

Matt Baum: [15:35](#) Okay, and when we get into full spectrum or broad spectrum, what are the cannabinoids that are being extracted there? We don't have to name them all if there's a million, but you know.

David Chadwick: [15:44](#) The full spectrum is all cannabinoids and terpenes that are included in the plant. That ranges from THC, CBD, CBG, CBN, et cetera, et cetera, et cetera.

Matt Baum: [15:58](#) Gotcha.

David Chadwick: [15:58](#) There's over [inaudible 00:16:00]. Then what's commonly referred to as broad spectrum extraction is everything but THC.

Matt Baum: [16:08](#) Okay. What are the benefits of the two, basically? If we say, "This one has everything plus THC, and this one has everything minus THC." What are the major benefits there?

David Chadwick: [16:19](#) With THC it's a very good analgesic. It also reduces vomiting, nausea. It helps to suppress muscle spasms, and it also stimulates appetite. With CBD, it also is a very, very strong analgesic. It's antibacterial, anti-diabetic, anti-anemic, anti-epileptic and anti-inflammatory and on and on and on.

Matt Baum: [16:53](#) Sure. Sure. Let me ask ... you said ... you named a few of them. One of them was CBG. I heard a lot of people talking about CBG when I was recently at the northern Colorado Hemp Expo. What is CBG, and is there a specific benefit for CBG that's different than CBD?

David Chadwick: [17:12](#) There sure is. Specifically CBG has been identified as a very good agent, as an antibacterial. It's also a really good anti-inflammatory, and it's also used to combat growth in tumors or cancer cells. There's also a lot of research coming out right now and it's for use of CBG as a bone stimulant as well.

Matt Baum: [17:40](#) When you say a bone stimulant, like to encourage bone growth actually?

David Chadwick: [17:44](#) Correct. Promotes bone growth.

Matt Baum: [17:46](#) Wow. What are some of the other major cannabinoids you should be looking for in a full or broad spectrum CBD oil that you're taking.

David Chadwick: [17:57](#) There's about five that I look for. That would be be CBN, CBC and CBCA.

Matt Baum: [18:07](#) Okay, and real briefly, what CBN, CBC and CBCA, what are the differences there? Just, I mean, broad differences. You don't have to go into molecular structure or anything.

David Chadwick: [18:18](#) Sure. One of the indications for CBN is it's great for ... as a sleep aid. Also, for suppressing muscle spasms.

Matt Baum: [18:30](#) Okay.

David Chadwick: [18:30](#) Which are the other indications, for the others. CBC is also good with pain relief. It is an anti-inflammatory, but it's also been shown as indication with inhibition of cancer cells as well.

Matt Baum: [18:50](#) Wow, and then CBCA. What does that one do?

David Chadwick: [18:53](#) CBCA. Very strong antibacterial and antifungal.

Matt Baum: [19:00](#) All these cannabinoids or cannabinoids, depending on how you want to say it, they basically work together to do several different things, and you said that they've been shown ... there's real research that's finally coming out now. Do you feel comfortable saying that we can point to this research and there is a scientific leg to stand on for this stuff?

David Chadwick: [19:20](#) Oh, very much so. The international community is bringing forward results of studies that have been done in some very noteworthy institutions confirming this. Thanks to the internet, there is an abundance of reliable information folks like us can use to help us in picking a direction for the type of products and medicines that we're developing.

Matt Baum: [19:49](#) What website do I go to to find that information, for you guys specifically?

David Chadwick: [19:53](#) Oh, for us? Our website is LeadingEdge.com and the website for our products is Lencura.com.

Matt Baum: [20:06](#) Awesome. I'll make sure to get links to those in our notes as well for anybody that wants to check this out. David, I realize this is a crash course, and there's a lot more we can go into, but I appreciate your time today, and just sort of laying out what we're trying to get in this process. Thank you so much!

David Chadwick: [20:23](#) You're welcome, Matt.

Matt Baum: [20:25](#) Now that we know what we're trying to get out of hemp, it's time to talk about extraction, the process of extracting those cannabinoids from the hemp plant itself. Now it's time for part one of our extraction series where we focus on lipid extraction.

Eric Knutson: [20:43](#) All right. My name is Eric Knutson. [inaudible 00:20:46] I work with Functional Remedies. I am the National Sales Manager, Director of Retail Sales for our channel, which is an awesome

purple label that can be found in natural health food stores around the country.

- Matt Baum: [21:01](#) Now, Eric, today we are discussing extraction, extracting the actual cannabinoids from the hemp plant. Now you guys do it a very certain way. Can you tell me about it? Like what? What do you guys do there?
- Eric Knutson: [21:15](#) All right. The Art of lipid infusion.
- Matt Baum: [21:17](#) There it is.
- Eric Knutson: [21:18](#) Lipid infusion is basically utilizing fats from, in our case, we use organic coconut oil, and essentially it's allowing the fat from organic coconut oil to draw the beneficial nutrients from the plant. Now the cannabis plant has fat-friendly compounds to it, right? Essentially under low pressure and low heat conditions, those phytonutrients release from the plant and can be absorbed by organic coconut oil.
- Matt Baum: [21:50](#) Okay. Is this like a low and slow cooking type thing where you just ... is there temperatures or does it have to be hot, cold?
- Eric Knutson: [21:56](#) Sure. Yeah, absolutely. There's temperatures involved. For for us it's under the boiling point of organic coconut oil.
- Matt Baum: [22:05](#) Okay.
- Eric Knutson: [22:08](#) Without giving away too much of our proprietaries-
- Matt Baum: [22:12](#) Sure. I get it.
- Eric Knutson: [22:14](#) We call it a low temp, which ... it's in that 200 degree range. How about that?
- Matt Baum: [22:20](#) Yeah, there's a lot of fat in coconut oil and it'll burn otherwise.
- Eric Knutson: [22:23](#) Right, and plus when you, when you get too high of a temperature, you start burning off other plant compounds.
- Matt Baum: [22:30](#) That makes sense.
- Eric Knutson: [22:31](#) Everything burns off at a certain temperature variance. For us, we want to utilize heat to do decarboxylate and make compounds like cannabinoids, bioavailable.

Matt Baum: [22:47](#) Sure.

Eric Knutson: [22:47](#) But we also want to preserve other parts of the plant like polyphenols and flavonoids and chlorophylls, et cetera that offer some nutritional benefit to the plant, and can come over in the lipid infusion process.

Matt Baum: [23:03](#) How long does it take if you take the plant and just throw it in the low temperature, coconut oil [inaudible 00:10:09]? Like how long are we waiting?

Eric Knutson: [23:11](#) Yep. Keep in mind it's low pressure and temperature.

Matt Baum: [23:15](#) Okay.

Eric Knutson: [23:15](#) Right. Let's say that it's under 15 pounds of pressure just for fun, and it goes into this infusion vessel.

Matt Baum: [23:23](#) Is it like a pressure cooker, literally?

Eric Knutson: [23:25](#) Yeah. Sure.

Matt Baum: [23:26](#) Okay.

Eric Knutson: [23:27](#) If you were doing this at home you could utilize a pressure cooker.

Matt Baum: [23:29](#) Just coconut oil, some hemp and my pressure cooker and boom.

Eric Knutson: [23:33](#) Yeah. We also use a little bit of water in the process because there are water-friendly molecules in the plant that need water to carry over. Right?

Matt Baum: [23:44](#) Is that because different cannabinoids are water-friendly, while others aren't or does it just aide the process altogether?

Matt Baum: [23:51](#) are in the war or water friendly while others aren't. Or is it just a the process altogether?

Eric Knutson: [23:52](#) I'm going to zoom it out to phytonutrients in general.

Matt Baum: [23:55](#) Okay.

Eric Knutson: [23:56](#) Right? I think cannabinoids are definitely fat-friendly. Then here's other phytonutrients in the plant that are water-friendly too.

Matt Baum: [24:06](#) Make sense. Okay.

Eric Knutson: [24:08](#) For us to get a whole plant representation, we use both fat and water to draw the beneficial nutrients.

Matt Baum: [24:15](#) Gotcha. Okay.

Eric Knutson: [24:16](#) Yeah, if you were doing this at home, it is like a pressure cooker. We've got these beautiful custom built vessels that are made out of stainless steel, and they're made to be optimally friendly for our volume scale.

Matt Baum: [24:30](#) I'm picturing something like a brewery is what I'm seeing in my head.

Eric Knutson: [24:33](#) Sure, sure. Yeah. It's smaller than a huge brewing tank and it's, it's bigger than a pressure cooker that you would find at home. Yeah, it's actually a pretty quick process. Like it's under an hour.

Matt Baum: [24:47](#) Oh wow.

Eric Knutson: [24:49](#) It happens in that low pressure, low heat scenario. Boom! The plant phytos get absorbed in the coconut oil.

Matt Baum: [24:58](#) See now I had talked to some other people that said they did lipid extraction as well, but it took them a very long time because they were literally just ... It sounded to me, and I could be wrong, and I'm not naming them, so they can't be upset, but it sounded to me like they literally just put hemp in it and they wait. Would that work as well or ...

Eric Knutson: [25:19](#) Hemp in what?

Matt Baum: [25:21](#) Just like low temperature. Let's say coconut oil, for example.

Eric Knutson: [25:23](#) Sure.

Matt Baum: [25:24](#) Without any pressure and without any temperature, would you just be waiting longer?

Eric Knutson: [25:28](#) Yeah. The people had been making a weed butter for a long time.

Matt Baum: [25:31](#) Right, right.

Eric Knutson: [25:35](#) It's interesting. The longer you wait, you can actually watch THC turn into CBN. It's interesting like-

Matt Baum: [25:45](#) Real quick, CBN.

Eric Knutson: [25:47](#) CBN. It's another cannabinoid.

Matt Baum: [25:49](#) Okay. CBN is one that you can only get certain ways, like I won't work in like CO2 extraction. Right?

Eric Knutson: [26:02](#) ... I do know that you can take THC and overheat in time make CBN.

Matt Baum: [26:08](#) Really?

Eric Knutson: [26:09](#) But otherwise and I've heard CBN is really an awesome sleep tonic.

Matt Baum: [26:13](#) Yeah, yes, I've heard that as well.

Eric Knutson: [26:14](#) People have said, "Hey, if you do this process too long you're going to be putting people to sleep."

Matt Baum: [26:20](#) You're going to knock everybody out.

Eric Knutson: [26:22](#) But yeah, essentially I think that pressure piece, it's really helpful and it aids in the release from the plant.

Matt Baum: [26:29](#) Just like putting ribs in a pressure cooker, you're going to cook your barbecue ribs in 45 minutes instead of four hours basically.

Eric Knutson: [26:35](#) Right, yeah, it's a very clean and very gentle extraction method, because the metrics which we achieved at low pressure and low heat. You know I say low because people are like "Oh okay, so if it's not like a intense pressure or an intense high heat or ultra cold scenario." Like I've heard CO2, it's like -80 degrees celsius, that's really cold.

Matt Baum: [27:01](#) That's super cold. Yeah.

Eric Knutson: [27:03](#) Super cold.

Matt Baum: [27:06](#) So relatively low heat, relatively low pressure is what we're looking at.

- Eric Knutson: [27:11](#) Yeah. I think for me I like to classify it as it's able to preserve the nutrients, more of a nutrient profile than let's say like a -80 degree celsius situation.
- Matt Baum: [27:26](#) Gotcha. And this is a full spectrum like plant. Like lipid extraction will go full spectrum, pull everything out that you need.
- Eric Knutson: [27:35](#) Well, you know it's interesting because when we say full spectrum right, the true definition of full spectrum is a complete profile of the plant right. So I think there's a lot of in the industry people throwing around full spectrum.
- Eric Knutson: [27:54](#) "Yeah as long as you have cannabinoids and terpenes."
- Matt Baum: [27:57](#) "It's full spectrum right."
- Eric Knutson: [27:58](#) "Yeah we got full spectrum, its full".
- Matt Baum: [28:01](#) Do you prefer the term broad spectrum, is that better?
- Eric Knutson: [28:05](#) Well it depends on what you're classifying it. If I'm looking at, lets use one of the big brands where they're using a CBD isolate and they're mixing in a custom blend of terpene, I know some people would say yeah that's full spectrum. The way I have looked at the industry and looked at products like that, if you're formulating and you're taking certain compounds from the plant like an isolate and a terpene and you're making your own special product, I call that a broad spectrum, by definition.
- Matt Baum: [28:44](#) Gotcha.
- Eric Knutson: [28:46](#) If it's full spectrum, complete, as close to the whole plant as possible, so cannabinoids and terpenes, those are the best parts of the plant right, that's what everybody's after, that's what makes a product really work in the body. What about all those added beneficial nutrients, there's over 600 phytonutrients in the Hemp plant right. We're just capturing cannabinoids and terpenes, I think there's a lot of room for everyone talking about a full spectrum end product to encompass those other phytos.
- Matt Baum: [29:24](#) Yeah, that makes perfect sense.
- Eric Knutson: [29:25](#) And I think it's kind of hard to test for polyphenols and flavonoids without spending a lot of money. A formulator wrote

in and said, "Hey you know, you've got an anti-oxidant profile in Functional Remedies." It's like "Really, we do? That's awesome."

Matt Baum: [29:45](#) Because some of the phytonutrients.

Eric Knutson: [29:48](#) He had the ability to test for that. So my vision and what I want to promote in the industry is if we're going to be calling something full spectrum product then let's definitely include the terpenes and the cannabinoids, but let's also talk about the mineral profile. Because every farm is going to have different minerals in the soil. Let's talk about chlorophyll. Is the oil that you're using green? That's green from the plant. What about polyphenols and flavanoids, those are great for amino acid production in the body. So it's almost like a Hemp multivitamin.

Matt Baum: [30:34](#) So let me bring it back to lipid extraction. Is there a benefit to lipid extraction that you see that you don't think exists in other forms of extraction?

Eric Knutson: [30:45](#) For one, it's unique. I think you're capturing more of the representation of the plant. Like when you taste a lipid infusion, I feel like you can taste where it's coming from. You can taste the quality plant.

Matt Baum: [31:01](#) Like more of that earthy kind of flavor.

Eric Knutson: [31:04](#) I like to think of it as fresh squeezed orange juice. Let's paint this picture. If you're juicing from a fresh squeezed orange and that orange is big, beautiful, its juicy, it's sweet, your orange juice is going to be really delicious.

Matt Baum: [31:19](#) Right, it's amazing, it's sweet, it's citrusy.

Eric Knutson: [31:21](#) But let's say that the orange is like unripe and grown from a crappy variety and it doesn't have any taste. And you know yeah, it's fresh squeezed orange juice, sure it sounds good.

Matt Baum: [31:35](#) But it's a crappy naval orange.

Eric Knutson: [31:36](#) Then you taste it and you're like "Argh, what? No, I don't like this." So I think lipid is going to feature the plant specifically a lot more. So if you're growing a really good plant and you've got some premium genetics and you've got good soil and it's all organic. The true representation is going to be coming through in the oil.

- Matt Baum: [32:02](#) Just like cooking food. Like chefs that look for products that represent what they are but are based on how they were raised, based on where they came from, if they're proteins, what they were fed. In your opinion lipid extraction represents a better version of the best hemp that's out there?
- Eric Knutson: [32:21](#) Well, I think it goes to artisan right. It goes to an artisan thing. If we didn't grow premium plants on our farm, if we were sourcing from all over the place and our goal was to homogenize and create products. Then yeah, a concentrate like a CO2 or an alcohol extraction would probably serve us a lot better. But because we have these premium plants that we want to feature the beneficial nutrients from those plants and really feature the plants themselves. We can utilize lipid extraction with some confidence and say "Hey, this is an awesome product, unique extraction method on the shelf and really you're going to receive the full experience from the plant that were growing."
- Matt Baum: [33:07](#) So let me throw a sommelier term at you. Would you say that there is a terroir to your hemp flavor that only comes from your farms?
- Eric Knutson: [33:16](#) Sure, yeah it sounds good. I don't even know if I can say it brother.
- Matt Baum: [33:23](#) It's a French word that literally means like the flavor of the earth. Like certain regions produce certain grapes for wine, you know what I mean?
- Eric Knutson: [33:30](#) That's awesome. Terroir.
- Matt Baum: [33:33](#) If you guys need a writer, let me know man, okay?
- Eric Knutson: [33:37](#) Yeah. Yes. So absolutely in that sense that you're getting a little flavor of our farm in the product, absolutely. And I think that that's something that's going to position Functional Remedies in the future. It's like as more and more Hemp companies come in to this and we're all using full spectrum to define our products, whether they are or not. Functional Remedies is going to have that edge of like "Hey you can taste our farm, you can taste the clean in our products. And lipid extraction is how we're presenting such an awesome plant to you."
- Matt Baum: [34:15](#) Thank you Eric for your time and that was just about everything you need to know about lipid extraction. And I'll tell you what, he's right when you taste this, you really do taste the grassy

citrusy Hemp itself. Now that's not a flavor that everyone wants, so I get it if you need to add something to it to mask it, but personally, I think it's pretty delicious.

Matt Baum: [34:45](#) On the next episode we're going to be talking about the history of Hemp in America and it's going to tie directly into Hemp history week, which you can find more information on ministryofhemp.com, so look for that.

Matt Baum: [34:58](#) Thank you to everyone that has been sharing the show and reviewing the show on iTunes, it is a huge help if you want to share this information. And thank you to everybody that has called in to our Google Voice line. You can call us at any time at 402 819 6417. And you will be able to find that phone number in the notes for this show as well. I would love to hear from you and I would love to answer your questions about Hemp right here on the show.

Matt Baum: [35:29](#) You can hit us up on Twitter @ ministryofhemp or Facebook\ministryofhemp you guessed it.

Matt Baum: [35:35](#) And let us know what you think about the show or ask us a question, whatever you want. I envision an entire show coming up where all we do is answer your questions. Thanks again to Annie and David, Eric for helping out on this episode and of course there will be links to all their websites in the show notes. And a complete written transcription. And thank you for tuning in, listening, downloading and rating this show. For now, take care of yourself, take care of others and make good decisions will you. This is Matt Baum and the Ministry of Hemp signing off.