

# Episode 74 Mixdown PROOFED

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honey, virus, bees, beekeepers, honey bees, standard, bee, florida, adulteration, varroa, question, doug, queen, swarm, products, colony, jamie, amy, beekeeping, grocery store

## SPEAKERS

Amy, Stump The Chump, Jamie, Guest

### **Jamie** 00:10

Welcome to Two Bees in a Podcast brought to you by the Honey Bee Research Extension Laboratory at the University of Florida's Institute of Food and Agricultural Sciences. It is our goal to advance the understanding of honey bees and beekeeping, grow the beekeeping community and improve the health of honey bees everywhere. In this podcast, you'll hear research updates, beekeeping management practices discussed and advice on beekeeping from our resident experts, beekeepers, scientists and other program guests. Join us for today's program. And thank you for listening to Two Bees in a Podcast. Hello, everyone, and welcome to Two Bees in a Podcast. Today, we are joined by Doug McGinnis, the former owner of Tropical Blossom Honey Company here in Florida, and he is going to be talking with us about creating a standard of identity for honey in the US. In our Five Minute Management, Amy and I will be discussing common viruses in honey bee colonies, and we'll finish today's episode with our question and answer segment.

### **Amy** 01:20

Hi, everyone, welcome to this segment of Two Bees in a Podcast. Today, we have Doug McGinnis, who has been a guest on our show in a previous episode. He is the former owner of Tropical Blossom Honey, based here in Florida, and he is my go-to person for all honey questions. Doug, you have so much knowledge about honey, the history of honey, and, just, so much more. So, thank you so much for joining us today.

### **Guest** 01:46

Well, thank you, Amy and Jamie. I'm glad to be here. It's always nice to come over to the bee lab and see what's going on. And I love being able to talk about honey, it's one of my favorite subjects.

### **Amy** 01:57

So, today, we're talking about the honey standard of identity. And, you know, I guess let's just get right into it. What is the background of having a standard identity for honey, and why is there a need to identify that?

**Guest 02:12**

Amy, to make it very brief, the standard of identity is a legal definition of what honey is. And, you know, you really need a legal definition if you're going to go against someone who has been doing some bad stuff with honey in court, just to be able to put teeth into your allegations. And this has been going on a long time. It really starts way back in the 1970s when the first real good test for adulteration of honey was developed by Dr. Jonathan White. This is the carbon SIRA test that was developed, an isotope ratio that could detect high fructose corn syrup. You know, honey is one of those wonderful precious products that has been adulterated for millennia, so this is not something new. But it's such a thing of high value. And if you want to think olive oil or orange juice, those are two other products that, today, have standards of identity that had been adulterated in the past. But starting in the 70s, we began to have tests so we could identify adulterators and try to get them stopped. But every time we went to court, those cases would be thrown out, because we did not have a standard of identity.

**Jamie 03:54**

So, Doug, I was hired in 2006, and the honey standard that Florida started to try to accomplish was starting shortly thereafter. I remember the Florida State Beekeepers Association and others were getting together to try to create the standard. I was fortunate to be involved in a lot of those initial discussions. And in 2009, Florida adopted a statute where there was a standard of identity for honey defined. So, we were the first state in the US to do so. So, could you tell us about the history of that, what Florida recognizes honey as, and how this is going to inform the effort moving forward here at the national level?

**Guest 04:34**

Certainly, Jamie. You know, the USA is the only major country in the world without a legal standard for honey. But by the 1990s, the industry was motivated to create a standard that would hold up in courts. So, rather than start from scratch, the industry look to the Codex Alimentarius Commission in Europe. And this commission, which really started in the 1920s and has set food standards in Europe for years for many products, including honey, they had a standard that was a good starting point. So, then, in 1997, the USA was invited to comment on revisions to the Codex. And you know, for the first time, we were able to get into the Codex Alimentarius, which by the way, is not law in the USA, and it's only used in international trade disputes, but we were able to get the standard to add a filtered honey into the standard. Before that time, there was no definition of filtered honey, nor was it legal to sell filtered honey in Europe. So, after this process, a group of national industry leaders, including people from the American Beekeeping Federation, American Honey Producers, the National Honey Packers and Dealers, the Western States Packers and Dealers, and the Sioux Honey Association, got together and did a revised Codex standard that would work in the US and brought it to the FDA in 2006. That's as far as it got. So, the FDA said they would look it over, but no further movement occurred. So, some of us in Florida were very frustrated at that point that there was no movement to get this as a USA standard.

So, we had a meeting, and I was so fortunate to be part of that meeting, and it included Bill Rhodes, who was a major commercial producer, and there was also Jerry Latner, Dadant Bee Supply, and a very small producer packer named Nancy Gentry, and we got together in Umatilla with, the then representative, Alan Hayes, to tell him if the USA isn't going to do it, Florida needs to do this. It's very important. We're getting more and more suspicion there's a lot of adulterated honey in the market. So, from that point, the group went to Tallahassee to talk to FDACS and legislators. And we were also joined by Eric Wenger of Barkman Honey company. And after that testimony that we made, Nancy Gentry came back to Tallahassee and actually spent weeks and weeks pounding the pavement trying to get this done. And then in 2009, we became the first state in the nation to have a standard of honey. So, let me just, very briefly, read what is the crux of this standard that we have in Florida, and this is 5K-4.027 seven standard of identity honey in Florida, and it says that honey means the natural food product resulting from the harvest of nectar by honey bees, and the natural activities of honey bees and processing nectar. It consists, essentially, of different sugars, predominantly fructose and glucose, as well as other substances such as organic acids, enzymes, and solid particles derived from the honey collection. The color of honey can vary from nearly colorless to dark brown and the consistency can be fluid, viscous or partially to completely crystallized. The flavor and aroma vary, but are derived from the plant's origin. So, this is just part of a rather simple, but one page, step that we took that was adopted in Florida. So, anything sold in Florida that is labeled as honey must fit this standard. If something is added to the honey, it must state that on the label. So, this began an effort that Nancy took to many other states. And I think there's over a dozen states today that have standards of identity definition. So, the problem here is they all differ a little bit, so this could lead to some problems with interstate commerce if it got that far. But now, we have a method that if there is cases of adulteration, that something would stick in court, and it also applies to cases of misbranding, mislabeling, contamination, etc. When one of those cases come up, we have this legal definition in Florida that would survive a court case.

**Amy 10:10**

Hey, Doug, so, you're talking about how there are over a dozen states that have this standard of identity, and they're all a little bit different? What is the difference between a lot of the states? What is the primary difference?

**Guest 10:23**

Yes, some of them go into quite a bit more detail and more like the revised Codex, where ours was kind of simplified. But the main difference is, for instance, Idaho includes penalty sections and enforcement sections that we do not have. Because when it boils down to anything with the honey standard, it's very hard to get FDA or our state departments to go forward with enforcement, unless there is a compelling case to do so. There's also various things about descriptions. But in many cases, it follows the revised Codex standard that was first done nationally and approved by all the major beekeeping honey organizations back in 2006.

**Jamie 11:20**

So, I've got a lot of questions, though, that are like popping into my mind, and I'm trying to write them down as fast as I can. But one of the things that you had mentioned earlier that really stuck out to me is -- my family and I were fortunate to be able to do a sabbatical in Germany about six or so years ago, and we spent six months there. And when we would go shopping in the grocery stores, you know, we learned, because of the way the EU laws are, that when something is on a package, that's what that something is. Right? And you're talking a lot about how this standard of identity helps in cases of litigation, right, where you have to go to court. But it also, Doug, it's a benefit to the consumer so that when someone is purchasing a jar of honey, they know that's what it is. And I picked that up when I was in Europe in seeing how strict they are about things like that, cheddar cheese or Black Forest ham, they had to be what they said they were and I like this idea because it doesn't only benefit beekeepers in litigation instances, but it also benefits the consumer, those folks who want to eat a product that is actually honey. So, can you speak to that a little bit?

**Guest 12:29**

Yes. You know, our company, Tropical Blossom, sold to Europe for many years. And so, we really had to comply with the Codex Alimentarius for a long time. But the fact is that by 2006, we were seeing a lot of products in the market like diet honey and different honey syrups that were ambiguous. And, you know, the National Honey Board did a consumer study of widespread consumer study in 2005. And consumers were saying things like, over 1/3 of them believe that sugar was added to honey, and even a very substantial majority thought something was added to honey. So, the confusion on the consumer marketplace was at an all time high.

**Amy 13:25**

So, what do you recommend to our listeners when they're purchasing honey? You know, it just kind of blows my mind. I think I heard Jamie say this multiple times that, you know, his story about Germany and how whatever you're eating is labeled what you're eating, right? And so, what do you recommend for the listeners? Now everything gets really confusing.

**Guest 13:45**

Read the label. That's one of the best things people can do. You know, I'm a big fan of Florida honey, I think you'd know that for me. And there are various countries that have their honey being imported into the US. But I always like to do a US product. But pure honey needs to be honey and that's the main thing. If it is labeled as honey, if it has an ingredient, like it's an infused honey, or it has different things put into it, that has to be very important and a very big part of the label face. So, read those labels.

**Amy 14:29**

Okay, so you mentioned pure honey, and I do remember, Doug, you and I, we did a talk together, and, I, on my slide had fun facts, pure honey never spoils. And you were like, "Well, that actually needs to be corrected." So, I'm going to go ahead and let you correct me on air. So, what is that? Is that statement true or no?

**Guest 14:48**

Amy, it is true to a point and it all has to do with the moisture content. Pure honey under 19% moisture will generally have a shelf life, I always tell customers, minimum 3000 years. If it's over 19%, it will quickly become mankind's first alcoholic beverage and ferment and makes us wonderful meat products we have. But it's interesting on the honey standard, that brings up a whole other thing, Amy, because most of the standards, and this was first objected to back in the original Codex revisions, that the Codex had a maximum moisture of 23%. And the US objected to that, because we all knew it would ferment. But, in fact, most standards today around the world and throughout the US have a maximum moisture level of 23%. There's a reason for that. We have high moisture honeys here in Florida. In fact, we're producing them right now, such as mangrove and cabbage palm that will often come in with a moisture content of 21% up to 23%. And so, we didn't want those honeys to be called not honey, because they were not at the proper moisture. And processors would generally remove the excess moisture before marketing them as honey. So, we had to allow that because Florida beekeepers, for instance, make a lot of mangrove and cabbage palm in the summer. So, actually, if you just left that sitting in a barrel, it will probably ferment. If you left 23% moisture in a jar, it would ferment. But the processors take care of that. And it's a big part of the commercial honey for bakeries and things like that. So, it's a funny thing, but yes, honey can spoil. Yes, it might become your favorite meat.

**Jamie 17:01**

So, Doug, I want to circle the wagons back on a comment that you just said a little earlier. If it is true that all the, you know, a lot of the major beekeeping groups nationally came together and revised the Codex and supported this, and you mentioned it went to the USDA and stopped, why is it stopped? Why do we not already have a national standard and what needs to happen to get one?

**Guest 17:22**

Yes. And the FDA often contends that they're sort of anti-standard nowadays. It seems to me that they really feel like the laws that we have already in place, the pure food laws and the laws against contamination should take care of this. In fact, they have. We have made some cases against transshipment. And there was honey gauge in 2013, which is on a totally different subject. But we have not been able to really put teeth into an adulteration case. And just to give you an update, Jamie, I went to my friend Jill Clark, who is the Vice President of Sales at Dutch Gold Honey, a very old honey company, and she's also an Officer of the National Honey Packers and Dealers who has continued this work as all have, ABF, AHP, the Western States, Sioux, we're all still trying to get this stand a national standard passed that would make the state standards, it would bring them to a point that the national standard overruled the state standards. And we kind of need that for standardization of the whole thing. But Jill told me, and this was just last week, the industry has not been able to gain any traction with the FDA. We were able to get the USDA to create and publish a commercial item description for honey. There is no government enforcement of this document. There is also a project with US Pharmacopeia, that's USP, you probably see that on commercials, to create a standard for honey. And we're waiting to see what is going to be published. So, we're still frustrated about a national standard, but luckily, and I've got to give Nancy Gentry, a very small beekeeper with a lot of clout, she's since passed away, and if not for her work, we would not have been able to get state standards made. But the national standard is important. The industry is going to keep working on it.

**Amy 19:35**

Alright, so here's the ultimate question. Where do you see the future of honey headed?

**Guest 19:40**

There's so many different areas there to talk about, Amy. We're seeing, right now, that you've got a differentiation in the market between the very large packers of honey who are buying honey from US beekeepers and also importing a lot of money to keep the competition in the branded market. And then we see this very smaller segment getting larger all the time of side liners and hobbyists creating honey market and farmers markets and things like that, where actually, I try to send people when they want to get the local products. But actually, there's two different sides of that. As long as there is a potential for competition, and to make a cheaper product to conquer your competition, there's going to be the possibility of adulteration. But yet, these smaller side liners and hobbyists are not going to be doing the same kind of testing, the same kind of scrutiny, and are not under the same sort of food laws that the larger packers are. So, I think this differentiation is going to go on for a long time. I love to buy from beekeepers and my local farmer's markets. But I do see the frustration in the market now as the prices go up and down and up and down. And it's no wonder beekeepers are turning to pollination services for their major income.

**Amy 21:25**

Well said, Doug. Is there anything else you would like to add?

**Guest 21:28**

Well, it's a very complicated subject, but this has been going on for decades. It went on when my father was trying to fight adulteration back in the 1970s, it went down on the 1990s. Here we are at 2021, and we still don't have a standard of honey. But I just want to emphasize how important it is. And it will continue to be complicated. Luckily, we have very many more ways of figuring out if honey is adulterated through nuclear magnetic resonance testing and so many better tests, but until we have something that can really put teeth into a court case, we're going to be missing out on what pure honey is on the cheaper end. That's why I always say read the label. When you can get two pounds of honey for, let's say, \$5 at a drugstore, think about it a little bit. But that's just my preference. So, you know, just keep buying, know where your product's coming from, support your local beekeepers, because it's a tough, tough market out there.

**Amy 22:48**

Well said. Alright, Doug. Well, thank you so much for being a guest on our podcast today.

**Guest 22:54**

Great to be here again. I'm happy to do this, Amy and Jamie, and I always like to talk to you all.

**Amy 23:01**

Alright, everyone. That was Doug McGinnis, former owner of Tropical Blossom Honey, based here in Florida. He is our honey expert. Any questions that we receive about honey, we will probably send to Doug. So, thank you so much for listening to today's episode of Two Bees in a Podcast. For more information about this podcast, check out our website, Ufhoneybee.com Welcome to the Five Minute Management. And today, we are going to talk about common viruses. Jamie, let's talk about viruses.

**Jamie 23:54**

Yeah, so, when I found out that that's what we were going to talk about in this Five Minute Management I got a little nervous because the virus world is really exploding in honey bees right now. And there's been dozens of viruses found in honey bees, which leads to obvious questions, which, like, which ones are important and kill bees and which ones aren't and don't? So, I've got a list of things and I'll kind of run through, you know, I could go on and on and on about viruses, but I'm going to try to just kind of keep it short and focused.

**Amy 24:23**

Maybe like five minutes.

**Jamie 24:25**

Yeah, maybe about five minutes. Have I already started the clock incidentally? Am I wasting valuable time?

**Amy 24:33**

No, I haven't.

**Jamie 24:33**

Thank goodness. Okay, well, then I'll take a deep breath and let you push the go button.

**Amy 24:37**

Alright, and go.

**Jamie 24:38**

Alright, so there are some viruses that you are more likely to encounter in honey bees than others. Now, keep in mind, not all viruses present a physical manifestation. In other words, the bee can have a virus without you being able to look at it and know. The first ones I'm going to talk about are some things that you might be able to recognize. Sacbrood virus is a virus that kills developing bees. And it basically kills the older larva, the almost pre-pupal stage. It turns the inside of the body to mush, the outside of their body becomes like a hard, rubbery sack-like structure and so, the inside of that bee will just melt and it looks very similar to American Foulbrood. There's also Deformed wing virus, and like the name implies, that leads to deformed wings on the adult bees and how that happens is Varroa. The mite is a major transmitter or vector of this virus. The mite feeds on the bees while they're developing, transmits this Deformed wing virus to the bees, and, of course, the bees are born with deformed wings. Deformed wing virus also shortens bee lifespan and all kinds of things. There is a virus complex of

closely related bee viruses, and they are acute bee paralysis virus, Kashmir bee virus and Israeli acute paralysis virus. A lot of viruses like these can cause bees to lose their hair, to get a greasy appearance, these are adult bee phenomenon. It can lead to paralysis where the bees are standing still, maybe unable to move, it can also lead to a shaking behavior in bees, bees that are heavily infested with some viruses might crawl out of the hive, crawl away from the hive, trying to get away from the nest. So, those are some of the ones that we can typically see things associated with bees. But there's a lot more. For example, there's iridescent viruses that are poorly understood. There's cloudy wing virus that, like the name implies, can cause the wings to become cloudy in adult bees. There's slow bee paralysis virus that can kill bees when they're about 12 days old or older, you can get paralysis in this virus, etc. There's bee virus X, which we know shortens the lifespan, bee virus Y that currently has, at least as far as I know, no known signs of infection. There's black queen cell virus, again, as the name implies here, it leads to the death of the developing bee, the developing queen, and so if the cell never emerges, you can open it up and the developing queen on the inside of that cell is dead and has turned black. There's filamentous virus, etc. There's more and more and more viruses being found all the time. The ones that you'll hear most about though, are deformed wing virus, again, because of its association with Varroa, Israeli acute paralysis virus simply because it's one folks like to study, Sacbrood virus because it's one we've known about for a very long time, and then a lot of these paralysis viruses, chronic bee paralysis virus, acute bee paralysis virus, slow bee paralysis virus, and on and on and on. Amy, it's a really scary topic to talk about because when you go to bee conferences, folks are talking nonstop about viruses. But the scariest thing about them is while we know we have them and Varroa transmit a lot of them, we don't know what to do about them. You know, there's no bee vaccine. So, a lot of people try to combat the viruses simply by trying to control Varroa. And at the moment, that's about the best thing you can do.

**Amy 28:26**

Well, you know, you've answered that in less than five minutes. And you also answered my question that I was going to take up for the rest of the time, was, what do we do? Is it just keep colonies strong, I guess at this point?

**Jamie 28:38**

Yeah. So, I always give a handful of recommendations anytime I'm talking about virus control. And again, we don't know that all of them are transmitted by Varroa. So, step number one, I always say, control Varroa. We need to do that anyway, but control Varroa, control Varroa, control Varroa. Number two, keep colonies strong, just like what you said. And number three, we have reason to believe that there are susceptible strains of bees and tolerant strains of bees. And so, if you have a virus overwhelming a colony, then you clearly have a susceptible strain. So, you might consider requeening the colony to see if that helps, but generally speaking, most beekeepers try to address it by controlling Varroa under the premise that Varroa, have a good reason to believe that it might be transmitting certain viruses.

**Amy 29:33**

Alright, and there we have it, the common viruses in honey bees.



**Stump The Chump 29:44**

It's everybody's favorite game show, Stump the Chump.

**Amy 29:58**

We are back to the question and answer segment. Jamie, for my first question, this person said that they recently requeened their colony. And before they requeened, they had been queenless for a couple of weeks. So, you know, the population was down, the bees were not really there, there was plenty of space, then, you know, they requeened. The new queen was strong, had a solid laying pattern, and then all of a sudden, there were a bunch of closed swarm cells. And so, this person thinking that the colony was preparing to swarm, and they're just wondering, you know, what's going on? What's happening?

**Jamie 30:34**

Okay, so there's a couple things that could be happening here. Unfortunately, I don't have the benefit of knowing when this is all happening, right? The reason I say that is, if it were happening during a time of year that is swarm season, then I would say, "Well, maybe they won't swarm." I think the premise behind the question is the question is basically saying, you know, they've been queenless and then they requeened. And it's not like they're booming in population, they shouldn't want to swarm. Why are they trying to swarm? And so I would argue, if it's happening during swarm season, bees really want to swarm. And when they want to swarm, they don't always need conditions to be optimum before they swarm. And so you can have, you know, colonies that we think are small or not ready to swarm that can want to swarm. So, one option is that they truly want to swarm. You've got a new queen, she's laying lots of eggs, and the bees like, "Hey, it's the time of year we're supposed to hit the trees. Let's go hit the trees." Alright, so that's one possibility. Another possibility, which is something I see with some regularity, is when colonies ultimately do requeen themselves, you know, they had been queenless, right? They were queenless for a few weeks. So, it's possible that those queen cells are not swarm cells, it's possible that they're requeened cells. Sometimes, it's possible but they're supersedure cells. I see it often enough that when a colony requeens itself and they have that new queen laying, I see it, I will see them make supersedure cells. And I'm like, "What are you guys thinking about? You just have a queen, why are you trying to make a new one?" And so, usually, when I see that, I will go in and remove those, you know, manually. If you don't remove them, it is conceivably possible, number one, that they'll swarm, number two, that they are trying to supersede their new queen, in which case a new queen emerges and will fight the other queen that's in there laying, or third, they'll realize their error and abort those queen cells en route to fully developing. Again, as a beekeeper, what I would do is just remove those cells. So, it's hard for me to know, you know, without knowing all the conditions around your colonies, what time of year it is, which of the two things was happening. Were they trying to swarm? Or were they trying to supersede their queen? But regardless of what the answer is, you know, I personally would remove those cells in favor of the new queen that I already have in that hive.

**Amy 33:00**

Alright, so the second question that we had, this person is a honey packer. They have a small apiary, and they're a little concerned because their prices are a little higher than what you would find at the grocery store. And so, I think this person is asking us if we were them, how would we describe what they do and maybe why their products cost a little bit more than what you could find at your local convenience store?

**Jamie 33:28**

Amy, this is like the first time I have ever received this question.

**Amy 33:33**

Really? That's weird.

**Jamie 33:33**

Yeah, it is. And I always have to tell people when I get questions like this, you know, I've never taken any marketing or business courses, so you're just hearing Jamie's opinion. So, when I was a kid and produced honey and would take it to farmer's markets, right, this is the problem that you have. You, as a local small scale beekeeper, you are usually selling your honey at a price that is above that you could see in grocery stores.

**Amy 34:03**

And you're probably still not making money.

**Jamie 34:04**

Exactly. So, I remember when I was a kid, I think I sold my honey for about \$5 a pound. These days, I would easily sell it for \$10 or \$15 a pound. But you could go to the grocery store and maybe see it for \$5 to \$8 a pound, right? And so, it sounds like this questioner is basically saying, how do I tell my customer that when they go to a grocery store, they're buying honey that's coming from a honey packer, and that's why you can get it cheaper at the grocery store because they're dealing in volume. And that's what I would say. I would say, "Hey, listen, when you go to a grocery store, more often than not, you're dealing with a volume producer, right, some company that's able to buy lots and lots and lots of barrels of honey from other beekeepers, often commercial beekeepers. They will relabel that honey, they'll put it in their own bottles. They'll label it with their label and they'll sell it as honey and it's often just wildflower honey. Right? They're not committing to one type of honey or another. And so, then, you, on the other hand are telling the customer, "But listen, I produced this honey locally. It's got all the floral hints of all the flowers that are in the area that you and I live in. And I'm a small-scale beekeeper, and all of these things contribute to me having to charge more for my honey." And incidentally, the same is true across the board. You often see that at farmer's markets, right? It's, you know, it's just the simple truth. Products are cheaper at big box stores than they are at small stores or local stores. And it's just that kind of reasoning that you have to give them, you know, play on their heartstrings a little bit, or, "Hey, this is local honey, this is our backyard, and I take care of my bees, and I love my bees. And you and I, you know, if you live relatively close to me, my bees might be even visiting your area and it's composed of the type of flowers that you would find on your property." You know, you're having to go

that route to market your honey. But a lot of folks too, who do local honey, they'll go the extra step. You know, when you go to a grocery store, you might see a bottle of honey that's just very generic. Well, you take that extra step. Put a lot of emphasis into the design of your label, the cleanliness of your jar, the sparkle of your honey, you know, those extra things, those extra loving touches that you can do that maybe they can't do at the grocery store or big box store level. And then it would justify, you know, the price that you're asking versus what they could get, perhaps, cheaper if they go and buy it from someone who's able to produce it in bulk.

**Amy 36:37**

Jamie, I'm just imagining you as a businessperson. It's just really funny to hear.

**Jamie 36:43**

Terrible, right? That's why you got to ask me some other questions. I've seen it talked about it enough to think that that's how I would do it.

**Amy 36:49**

Yeah, that's fair, to make your honey twinkle.

**Jamie 36:54**

To pop, to sizzle.

**Amy 36:56**

Exactly. Okay, so for our third question, this is a person asking if there's research coming out on the nutrient contents of different types of honey. So, whether, you know, their nutrients are good for honey bees and/or people.

**Jamie 37:14**

Alright, so a couple things here. We know that honey is principally a carbohydrate source for bees, it is their energy. And this, this is debatable, you know, I'm a scientist, so that makes me skeptical of lots of things. Even a lot of this advice I give, I'm going, "Oh, wait a minute, do we really know that?" But it appears that honey bees need sugar to move, right? That's their energy source, which is why beekeepers can harvest honey and feed back sugar water and the bees seem to be none the worse for it. Now, we could debate that every honey is unique, right? There's, yes, the principal components, sugar and water, that's what's in nectar. But the reason different honeys look different and smell different and taste different is because they're coming from flowers from different sources. And I will give you that. And so, since there are other things in honey beyond just sugar, it is reasonable to believe that bees get more from honey than just sugar. And I will yield the floor, I will certainly open myself to that possibility, in fact, maybe even that likelihood. However, honey bees derive from honey, principally, the carbohydrates that they need to survive. Alright. And I'm sure there may be research in the future that shows there's more to it. Maybe there's research about that now. It's just a little bit outside of what I study. Now, Amy, you asked specifically from the human perspective as well. And the reason you asked human and bees is because when you and I reviewed this question kind of before we

went on the air, we weren't sure if the questioner was asking from a bee's perspective or from a human's perspective. So, from a human's perspective, that's dipping into the realm of what we call apitherapy. And just like the name implies, apitherapy, it's basically human therapy using products derived from honey bee colonies, be it honey or propolis or pollen or royal jelly or venom or whatever. So, in this case, are different honeys beneficial, or more beneficial to humans, than are other honeys? And so, like I said, with bees, principally, what we get from honey, consumption wise, is just sugar. We get the benefit of it tasting different, having different floral aromas and things like that. That's good. Most of what honey has been shown conclusively to do for humans, it comes in the world of topical ointments where honey is used as a wound dressing. I mean, people have been doing this for eons. And there are some honeys like manuka that do have certain constituents that make them better wound dressings than other honey. So, I will say that it does matter from a wound dressing perspective what's in the honey? But as far as can we derive different health benefits from the consumption of honey, that's really outside of my field. And it's in the realm of apitherapy. And it's really something maybe we should consider having someone on as a guest on our podcast to help us dive deeper into that topic.

**Amy 40:40**

Yep, that sounds good. And the other resource that I use pretty often, when someone's trying to find a honey testing lab, I usually tell them to just go to honey.com, because you can find, you know, different laboratories that test honey, they test for lots of different things, actually, and so you'll just have to browse around that website and find a local laboratory.

**Jamie 41:05**

That's right, Amy. That's the National Honey Board's website, and they're always a good resource for all things honey.

**Amy 41:12**

Alright, that is our question and answer. Thanks for listening. Hi, everyone. Thanks for listening today. We'd like to give an extra special thank you to our podcast coordinator, Chelsea Baca, and to our audio engineer James Weaver. Without their hard work, Two Bees in a Podcast would not be possible.