

Episode 156 PROOFED

Wed, Mar 27, 2024 11:48PM • 36:17

SUMMARY KEYWORDS

bees, pollination, cranberry, pollen, beekeeping, larvae, beekeeper, subs, commercial beekeeping, colonies, dye, bogs, feed, mite, question, leo, crops, bee, food, patties

SPEAKERS

Amy, Jamie, Guest, Stump The Chump

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 another episode of Two Bees in a Podcast and today, Amy and I are really excited to be joined by Leo Rukin, who is a commercial beekeeper here in Florida. The name of his business is Florida Raw, LLC. And we're excited, Leo, that you're joining us because we really want to talk about commercial beekeeping, introduce that concept to beekeepers around the world, and they can get a glimpse at how we do it here in Florida. So thank you for joining us on the podcast.

Guest 01:16

Thank you for having me.

Jamie 01:17

Leo, one of the things that we always do when we have a new guest on the podcast is we always ask those guests to tell a little bit about themselves and how they got into beekeeping in the first place. So could you share a little bit about yourself, how you started keeping bees, if it's been in your family, if it's brand new to you, etc.?

Guest 01:34

I grew up around all different types of farming growing up, and my family bought and sold honey. It was one of our businesses. And they still do that today. So I was around a lot of beekeepers because of that as well, and I just kind of liked it. One of the things that always stuck with me is I'd be hanging out on my friend's blueberry farm, and they would have bees. One day I asked my dad, what was that about? And he's like, oh, the beekeepers drop off their bees and they get paid. They hang out on the farm for a month, and then they pick them up. And I was like, well, that sounds great because I already like

hanging out on farms, I like bees, so if someone will pay me to do that, that sounds great. So that's honestly kind of, just growing up in beekeeping and around farming, it seems like a good place for me.

Amy 02:20

Very cool. So can you tell us a little bit about your operation?

Guest 02:24

Will do. So we are about 60% pollination and 40% honey, and so what happened was when I stopped going to school, my family is like, very big into education for generations going back. So that was probably the first person to not finish your college degree in quite some time. And so they were like, okay, if you don't want to go to college, here are three beekeeping outfits that you can work for for the next two to three years before you start yours. And one of them was Billy Rhodes, one of them was the Harveys, and I forget the third one at this time, to be honest. But I was kind of a thick-headed kid, and my dad was like, these Harvey guys work so hard that like everyone thinks they're crazy and people will quit. And I was like, well, let me do that. And those guys focused on a lot of pollination. They were kind of the ones that trained me. So then when I got into business, I was focusing on pollination, probably because that's what I had really learned. You make a lot of honey while you're doing pollination. And then we kind of still get the chance to make most of our honey here. Like, we have all of our bees in Florida in the fall when we make our fall crop, and we have all of our bees in Florida when we make our spring crop, which is two of our three crops anyhow. Then, we have to keep bees specific for orange, and then we make honey when we're in pollination too. So it all kind of like compiles so we do get both. But the reason I fell into more pollination was because I chose to learn from an operation that was involved in a lot of pollination.

Jamie 04:04

Well, Leo, I think that's a cool story. I've often heard people describe beekeeping as a craft. And like in crafts, people are taught better as an apprentice, right? You actually go and find a mentor and work with them. I think exactly what you did is, of course, one of the best ways to get into commercial beekeeping. You didn't jump straight in. You guys had some experience from your past managing a lot of colonies. Then you went and worked with someone so that you could learn the tricks of the trade and now you're out on your own doing it. The pollination that you meant mentioned, off the air, you'd mentioned that you're probably about 60% pollination, about 40% honey. Well, one of the things that you use your bees to pollinate is cranberry. Well, they don't grow cranberries here in Florida. So this is a very interesting thing that I'd like to know more about. Could you tell us about using your colonies for cranberry pollination? When does cranberry bloom? A little bit about how it's grown? Do you take all your colonies to it or is just a fraction used for cranberry pollination?

Guest 05:06

So we take 2400 hives to cranberry pollination, approximately. Sometimes, a little more, but our base number is 2400. Sometimes, we'll bump it up another 800 or 1000 hives on occasion, but we really like the 2400 number because then that keeps hives at home, as well, to make more hives and make honey and different things. So I'm gonna go with the number 24. Cranberry pollination is up north, we're migratory. So we migrate twice a year, once to California and once to cranberries in Wisconsin. So I'll focus on Wisconsin because that was the question. I fell into cranberry pollination because it was always on the list from the people that trained me as well. And then I also had a good friend that went

up there, and he basically got there, and was like, hey, you gotta come check this out. It's like 70 degrees during the day. I was like, that sounds awesome. So we started by sending two loads up there. And it's kind of like a notoriously tough pollination, it's in June and July. So it's very hot, it's kind of a tough time of year for bees in general. Cranberry doesn't have a lot of protein in the pollen. It's not a very high protein. There's not a lot of substance there. So if you want to come out with good bees, you have to subsidize their pollen intake and sometimes feed depending on the time of year. But we generally try to choose bogs that have as much natural nectar as you can, and some cranberry guys go out and they cut down all of any flower they see to try to get the bees to just go to the cranberry bogs. And some guys actually leave it be. The people that we work for are very progressive. So there's like clover all around the bogs, there's basswood in the woods, and kind of what they found is that it really just overall keeps the bees closer, it doesn't keep them out of their bogs. They actually get a better pollination if they promote other flowers around the bogs too. So that's kind of how I fell into it. I had a friend that just said it was 70 degrees up here, and at the time, it was like 101 degrees where I was at in South Florida. So we sent two loads, and we drove up there, me and one of my guys, to load them up. And when we got there, we were just like, oh, this is amazing. So then, we just kind of amped it up and started sending more bees by the following year. We were able to, actually, three years later, we did it for three years with two loads, and then we bumped up to the 2400. We're kind of still always working at it and transitioning. I think we would like to purchase something there. And then at that point, we would ship all of our bees there, hang there until about September and wait for the first frost. So we would do cranberry pollination, then we would leave and sit in some nectar north of there and then go home because it's a little easier on the bees to ship them versus the way we're doing it now. We ship them right in June 1, and we're out of there mid-July. And that's a very hot time to ship bees across the country. But they do all right with it. But they would do better if I could hang back for another month and a half.

Jamie 08:21

This idea of taking bees to pollinate something in a bog is very interesting to a lot of people. Could you just describe that just a little bit?

Amy 08:29

Yeah, what's a bog?

Guest 08:30

Right. So, we load these bees up in Florida. We put like 432 to 500 on a semi-truck, and then we ship the semi-trucks into these bogs. The bogs are probably one of the most beautiful agriculture you'll see. It's essentially like a swamp that they've cultivated and controlled. The bogs we work on are around 800 acres each, and so it's 800 acres of cranberry beds. So it's like an intricate road system that goes through these swamps, and you have to stay on the road or you end up in a swamp. They're big water-holding ponds, when it's all controlled, they pump out of these bogs and hold their water. So you kind of will drive through these really beautiful wet areas. Sometimes, you'll do a mile-long drive with 16 feet of road, with 8 feet for two vehicles. And then you're just like in the middle of a lake. You kind of feel like you're on a boat but driving the bee truck and then you pop out into the bog. And instead of the lakes, it's these beds of cranberries and we put out about two to three beehives per acre, depending on what the farmer wants. And we put them where they ask us to put them so we'll spread out. 800-acre bog, we'll take, 1600 hives spread out evenly where they asked me to put them. We'll collect them up about

a month later, load them back up on the semis and take them home. And that's the gate for cranberry pollination.

Amy 10:13

I want to know how many times your trucks have gotten stuck. He's like, a lot.

Guest 10:21

We're a lot better at it now than we used to be. We used to get stuck a lot. And it almost seemed like it was fun, I think.

Jamie 10:31

Jeez.

Guest 10:32

Now, we pick a lot better locations. But our equipment, we choose a truck that's very capable. We run 450s and 550 4-wheel drives. So they're very capable off-road and then we run off-road forklifts. So if we do get stuck, we're usually able to just hook up a tow rope real quick, and get out of there in a couple of minutes. I've yet to call a farmer.

10:59

for

Jamie 11:00

Well, Leo, let me sneak one more question in before Amy asks hers. Amy, if you don't mind, sorry.

Amy 11:05

That's fine.

Jamie 11:07

Because this cranberry thing is fascinating to me. Remember, we have a lot of listeners from around the world who use bees strictly for honey production. So this idea of using bees to provide pollination services is a little odd to them, moving bees from Florida to Wisconsin, which is not just right down the road is potentially a little odd to them. I'm curious, since you've been there a few years, what's the price per colony that you've seen over the last few years for pollinating cranberries? Because our listeners might not know that, hey, you're getting paid per colony have these in there. So what's the price per colony that you've seen over the last few years, and what's the density of colonies per acre that cranberries need?

Guest 11:54

The price for a colony is usually about \$85 a hive. It's kind of one of the last pollinations. The density is two hives per acre, I believe is what they're doing. Each person is a little different. There's the standard of two hives per acre. But then as you get to know your grower more, if he sees that you have really strong bees, he might reduce the amount of bees that he orders. So they'll taper it to their needs a little bit. But most guys, I think, are just going with two hives per acre.

Amy 12:28

That's awesome. So, Leo, I'm thinking about the timeline, because I know as you mentioned, you are migratory. So you go out to California for almond pollination. I assume that's what you go out to California for and that's usually in January/February for us, right? And then you bring your bees back to Florida, and then you bring them up to Wisconsin in the summer. Is that the timeline of your route?

Guest 12:51

That's correct.

Amy 12:52

Very awesome. The other question I have, so I'm still like on this cranberry kick, right? I'm super excited because I feel like if I were you, and maybe you feel this way, I'd be super proud every Thanksgiving when there's cans of cranberry because you've worked to help make this happen. You've helped to put cranberry on people's tables at Thanksgiving here in the United States, which is, I feel like that's something to be proud of.

Guest 13:17

Right. It is. It really is. I mean, anytime that I see cranberries or almonds, I definitely feel a connection and feel like it's fun to have done my part to bring those products to the store.

Amy 13:32

So, Leo, I've seen that you've done some YouTube videos. I was really excited to see that just because I know that you were sharing your experiences with the public about just being a commercial beekeeper, what your operation involves, and so that was really kind of cool to see.

Guest 13:49

Well, we try to have as much fun as we can. To be honest, I think as you can tell, a lot of my decisions are just like -- of course, they have to make sense on paper as well -- but I think all beekeepers do this, it's a cool job because you can taper it to what you want to do. Like, do I want to be up north in the summer and do I want to be here making honey? And those types of things.

Amy 14:15

Do you feel like that's an important part of your operation as far as just sharing your knowledge?

Guest 14:20

Well, I feel that the YouTube videos, for me, trying to do that, like, I definitely wanted to share the knowledge and share the experience of being a Florida migratory beekeeper because I think it is a really cool way to make a living and like not everybody is -- there are a lot of indoor careers that are pushed towards people. Not a lot of people are like you should become an electrician or you should become a farmer or you should do these other things. But some people should and they can do very, very well with it. And so that was kind of why I started doing those videos. I'm not very good at making them so I was paying for a service and he did one year of it. And that was kind of the idea, really, to just kind of show people what we do and try to get people to think it's cool, maybe influence some kids to get into beekeeping because it is a lot of fun and a good career.

Jamie 15:12

So, Leo, this question is actually very near and dear to me because I know commercial beekeeping is not without peril and distress and strategy. So I'm curious, from your perspective, because all commercial beekeepers talk with one another and you all know what the other is doing, what are the biggest challenges you feel the whole industry faces, the commercial beekeeping industry? And then as an added question, I'm curious how you would answer this for yourself. So again, what do you think are the biggest challenges in commercial beekeeping? And then what are your own personal biggest challenges in the industry that you run?

Guest 15:49

I think that the biggest challenges are mites and lack of floral sources. I think that they're connected, really. I think that the mites are probably the biggest player on being a thorn in my side, for sure. And they are in a time right now where they're a little harder to deal with than they have been in the past. But there's a lot of good people working on it. And I think beekeepers are becoming more aware and instead of just kind of like doing things on schedule, and not really knowing the effects we're having, I think a lot of the beekeepers like myself are getting more like data-orientated on what we're actually doing, mite rolls throughout our operation before and after treatments on a regular basis, and just kind of trying to understand the mite more because that really is the biggest enemy. Sometimes, you have to factor in, if you're in springtime, and you're making a lot of bees, you're also going to be creating mites. So even if you're treating, you could still have a little higher mite load just because the fact that you have so many bees in the boxes, too. Just kind of understand the mite better because I think that's the number one. That's what's killing the bees, for the most part, is the mites. So that's the biggest toughy out there.

Amy 17:24

Yeah, definitely. And you also mentioned floral sources. I don't know if we've mentioned this yet in the podcast, but you are in a couple of different counties. So you're in a couple of different areas in South Florida. Something that we've heard recently is just the lack of land and development that's happening. And so do you feel like that is also a factor? Is lack of land also an issue?

Guest 17:47

Not for us, really. There's plenty of people that like to support bees, and they've got plenty of space and plenty of flowers.

17:53

Sounds

Amy 17:53

Sounds good. Is there anything else that you wanted to add, Leo?

Guest 17:56

That's it, really.

Jamie 17:58

Leo, that was great. I really appreciate you taking some time to come share with our listeners about your beekeeping operation. It's very inspirational. And I hope folks around the world can really take some nuggets of truth that you are willing to share and allow that to permeate their own strategy to keeping bees, so thank you so much. Good luck with your continued business growth, and I appreciate you joining us.

Guest 18:20

Thanks for having me. You guys have a great day, Amy and Jamie.

Amy 18:26

So, Jamie, I, personally, love talking to migratory beekeepers. I love learning the routes that they have across the nation, especially when it comes to pollination. And most of the time, it is for pollination so that they can work with growers and the growers can produce the crop and, of course, that ends up on our table. Normally, a lot of times, when we are talking about the United States, we're talking about almond pollination because that's huge in our industry. But cranberry pollination is such a niche, specialty crop. And I was really excited to learn about cranberry pollination. I didn't know what a bog was before we had discussed that. Let's talk a little bit about migratory beekeeping and how far that actually is. So, when we're talking about trucking bees from Florida to Wisconsin, like Leo mentioned, how far is that? I mean, how many stops do you have to take for that?

Jamie 19:17

Well, he probably takes quite a few stops. Actually, these guys are professionals. He just mentioned that he put, what was it, 400 and something to 500 and something colonies on the back of a semi-truck. So for our listeners around the world, we, in the US, and I know it's common in Europe, and in some places like Australia, it's popular to move bees all around the country for the purpose of pollination. And he said, for example, he moves his bees from southern Florida, specifically, to Wisconsin. Well, for our US listeners, that's about 1300 miles. For our listeners from around the world, that's about 2000 kilometers. So he's throwing, 400, 450, 500 colonies on the back of a truck and they're trucking them 2000 kilometers to get to Wisconsin from here. For California, that's about 2500 miles or 4000 kilometers. So it takes a few days to get bee colonies going that far. And there's quite a lot involved in the process. But it's very common to truck bees around the nation. You heard, Amy, what he said about cranberry prices, right? He's gets about \$85 a colony. He also said it's one of the latest pollinated plants that they go to. And what he means by that is, by the time he gets his colony to cranberries, they've probably already gone to two or three or four other crops. They're picking up pollination, essentially, rent each of those stops, and by the time they get to cranberries, he said, 2400 colonies, he's putting them out at \$85 a colony, you do the math. And so you multiply that by four or five different crops and think about the fact that he also does honey production. He's moving his bees far, but he's moving bees far because it's profitable.

Amy 20:55

Right. It's profitable. But there are always those underlying costs as well. So I want to transition a little bit over to this stocking density. This is a question that I've been receiving pretty often, actually. So just how many colonies per acre? And I feel like it's pretty standard, and you can disagree with me if I'm incorrect, but it's pretty standard for two to three colonies per acre. Various crops, depending on crop.

Jamie 21:19

So it does vary by crop. There was a really neat book by Daniel Mayer and Keith Delaplane years ago, "Crop Pollination by Bees." And I've heard rumors that he's redoing that, so maybe it's out or will be coming out at any point now, but in it, they had chapters listed alphabetically by crop, so apple, avocado, things like that. They were exploring the literature to see what research has shown the number of colonies needed for each of those crops per acre. To our listeners from around the world, I apologize. In America, we still use acres. But you're right, it is about two to three colonies per acre for a lot of crops. And so he mentioned that it was about two colonies per acre. For cranberries, that's roughly, very roughly about one colony per hectare. So for every hectare of cranberries grown, it takes about one colony to pollinate that. So you can do the math.

Amy 22:06

Very cool. All right. Well, if you are in the United States, and you had cranberries for Thanksgiving, you can thank a beekeeper.

Jamie 22:24

Yeah, I think that that was one of the coolest points you made, Amy, while you were with him. If you're a beekeeper, especially a commercial beekeeper, and you know the crops that you're using to provide pollination for, you can know when you get that food at the table, that that's dependent on your bees. And that's, of course, why beekeepers are so important. So it was really neat to hear him share that, really neat to hear you make that point.

Stump The Chump 22:53

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

Amy 23:04

Hello, and welcome back to the question and answer time. So we are on the continuation of talking about pollen subs and honey bee nutrition. So for this segment, the first question, Jamie, that we have - - I'm just going to read the question and then, I'll summarize afterwards. But would the process of bees using dyed pollen subs for brood food change the appearance of dye in the brood mass? So would changing dyed pollen sub into brood food erase the color of the dye? Tell me why someone would want to dye their pollen subs for any reason. I'd love to hear.

Jamie 23:39

Yes. So, Amy, this goes back to a presentation I did for the stay-at-home beekeeping series, which is an online monthly series managed mainly out of Auburn University, but with collaborators from other land grant universities and USDA labs in the southeastern US. I was giving a talk on the science of using pollen subs, and in that talk, I explained a particular research project that we undertook, in which we were asking the question when pollen subs disappear in a hive, where do they go? The reason we were asking this question is we wanted to know if bees use pollen subs the same way they use pollen. And how do they use pollen? Well, adult bees eat pollen, adult bees feed pollen to developing workers and drones, and then they will store it as bee bread. So if bees use pollen subs the way that they use pollen, we would expect to find pollen subs in adult bees, immature bees, and bee bread. The way that Emily Nordyke, a former master's student in our lab looked at that is she dyed the pollen subs and looked in adult bees and in brood and in bee bread for evidence of dyed pollen subs. The premise

being, if we found dyed pollen subs in these three areas, then we'd have reason to believe bees were using it the same way they use pollen. Well, guess what? We only found the dyed pollen sub in adult bees. So we concluded from that, that they don't use pollen sub the way that they use pollen. It looks like only adult bees use it. It's not stored as bee bread and it doesn't go into the feed fed to larvae. So the questioner is then saying, well, what if it's possible that when the adult bees took in the pollen sub that's dyed, that in the adult bee, it lost the dye before it was passed on to the immature bee? And that's an entirely feasible possibility. So maybe we're saying they don't feed pollen subs to larvae just because our dye isn't transferred from pollen sub to adult bee to larvae. So we tried to control for that by having sugar patties that we dyed. And we ended up finding dyed larvae in the colonies that we provided dyed sugar patties. So the adult bees were eating the dyed sugar patties and feeding that to the larvae and the dye was not being broken down in that transition from patty to bee to larva. And we also found dyed bee bread because the bees were moving that sugar patty into the bee bread as they were packaging the pollen that was coming into the nest. So this leads me to believe that the dye is stable in the gut of the bee as she takes it from a patty and takes it and passes it on to the larvae. Long story short, we have reason to believe that if the bees were giving pollen sub to larvae, we would have seen it. We don't think the dye would have broken down because our positive control patties, the sugar patties, we were, in fact, seeing that dye in the larvae. Now, we could still be wrong. You could argue that there's a biochemical reaction that happens with the dye in pollen subs that doesn't happen with the dye in sugar patties. But, often the simplest explanation is the best, and at the moment, we're running with the idea that they're not, in fact, passing pollen subs to the bees. And that is not an artifact of the dye breaking down but it's just an artifact of the fact that bees aren't passing it to larvae. Okay, so there's the short answer and the long answer. The short answer is yes. And the long answer is a typical Jaime answer, which is long. But let me set the stage this way. Again, going back to this presentation that I give, the science of using pollen subs, one of the grand conclusions of the multiple research projects that we do here is that I question the efficacy of pollen subs in general. And because of that, my general recommendation is, if I were a commercial beekeeper, until we know more, I probably wouldn't change my approach to using pollen subs very much because if I felt like I was getting a positive benefit using them, I would probably continue to use them until there's even more data. Although, I feel like the data growing, at the moment, is pretty substantial. I still feel like bees do get a little bit of benefit from pollen subs, and certainly, under some environmental conditions and management strategies, they may be beneficial. The only difference is if I were a commercial beekeeper, I would always want to know if they worked, so I'd hold back 10% or so of my colonies that didn't receive the subs so that I can have something to compare the colonies that did receive the subs to, just to make sure that I'm actually getting my money's worth out of feeding these subs. Alright, so that's point one. But point two, the individual says, can the average home beekeeper be a successful beekeeper without using pollen subs or supplemental feeding? The answer is an overwhelming yes. In fact, I would argue that most hobbyists never have a reason to feed a pollen sub. Now, the individual did say "supplemental feedings" so I'm going to make sure that I'm not reading too much into pollen subs, and them saying, well, maybe the sugar syrup thing is an issue too. So let me just say this again. I don't think the average hobbyist beekeeper will ever need to use a pollen sub. If you're getting a lot of diversity and pollen color throughout much of the production season coming into your colonies and bees seem to be doing just fine, then you're probably okay. But in contrast to that, I would say the average hobbyist beekeeper will need to feed carbohydrates to their bees. If not, most years, at least some years. What do I mean by that? I feel that the average hobbyist beekeeper is going to have to feed their bees sugar syrup at some point. Maybe they don't have enough food stored in fall to survive

winter, you're going to need to feed sugar syrup. Maybe they didn't have a great spring, and they're running out of food in summer and can't get to the fall nectar flow, you're going to need to feed sugar syrup. So the average hobbyist is going to need to feed sugar syrup at some point in a colony's life. But the average hobbyist, in my opinion, is not going to need to feed a pollen sub at some point in the colony's life. Alright,

Amy 27:28

Alright, so for our second question, so the person is wondering, as just the average home beekeeper, if you were just a beekeeper, and let's say that you are a hobbyist beekeeper who hives in your backyard, can you still be successful as a beekeeper by not feeding? All right. I think that's great advice. I'm laughing because you prefaced by saying that the short answer is yes. But also, you have the long answer and if you didn't have long answers, this podcast would be way shorter than it actually is.

Jamie 28:16

I guess. But, Amy, too, I think, one of the benefits of our podcast is we try very hard to put the science behind it. So it's easy to just say yes or no or maybe. But I want to make sure folks understand the reasoning behind what I say. And it also gives them the opportunity to disagree with my answer. Some people say, gosh, I don't care what you say, I've seen overwhelming evidence that these things are beneficial so we need to use them. So I just like to provide some of the reason behind. This is one of those that's a clear yes or no answer to me. But it's important to know why it's clear to me. So yeah.

Amy 31:21

So, for our last question, the question is do drones eat pollen or bee bread? We know that drones get kicked out at some point, especially during times when they're dearth, or I guess up north where they have snow and wintertime. But are the drones eating the pollen as well? Yes.

Jamie 31:38

Yes. So, I think this goes to a larger question about the idea that bees add pollen to immature bees' food, and so let me back up and kind of answer this question the long way, right after we just had that dialogue about it. So we know when a queen lays an egg, out of that egg will come a young larvae. That young larvae feeds on brood food or royal jelly, more specifically, that nurse bees produce in glands in their head. So the nurse bees are producing royal jelly, every larva gets royal jelly the first 24 to 72 hours of their life. Around 48 to 72 hours, the nurse bees will transition away from feeding workers and drones royal jelly and to feeding workers and drones brood foods. So just very quickly, the nurse bees have two sets of glands in their head, hypopharyngeal and mandibular glands, that produce different components of the food that they feed their young. So the ratio of the hypopharyngeal gland to mandibular gland secretions is the difference between royal jelly and brood foods. So the larvae that they want to make queens, they will continue feeding royal jelly, the larvae that they want to make workers, or the larvae destined to become drones will start receiving brood food, which is just a different ratio of hypopharyngeal to mandibular gland secretions. So as the worker and drone larvae age, that brood food is diluted with pollen and nectar increasingly so that when the larvae are very old worker larvae and drone larvae, they are getting a high proportion of nectar or honey and pollen in their brood foods. So, yes, developing drones are fed pollen or bee bread mixed in their larvae the same way workers are fed pollen or bee bread mixed into their food as they age. So as I talk about

increasingly bees mixing in pollen into the food that the developing workers and drones are fed, there is this kind of general idea bubbling up. Do bees really put pollen into worker and drone food? And the research literature says yes. I mean, I've seen the literature. There's not a ton of literature on this topic, but there is literature on this topic where scientists have seen this. So it's definitely mixed into the brood food of workers and drones. But I will say it's also a topic that's open-ended at the moment where there's more work that can be done. And the reason it is of interest to me is because we often try to look at pesticide exposure that worker and drone larvae have while developing, and if they get it, it would probably be coming into the nectar or the pollen that's mixed into their food. So it is an important topic. So at the moment, we defer to yes, it is being mixed in their food, but it's definitely an area that needs to have more research.

Amy 34:38

Yeah, Jamie. I mean, it's definitely true. There's always, like you mentioned, and you've mentioned a couple times now, nutritional research on bees is just such a great opportunity to get into. There's just so much potential for growth in what we're finding out about honey bee nutrition. So it'll be exciting to see where honey bee nutrition changes in the next decade or two, or even less than that, I think. All right, everybody, those are the questions that we have for the Q&A for today. We may or may not sprinkle in more nutrition questions in our future Q&As, but if you have other questions, or if you have any comments about our episode, please feel free to let us know on our email or on one of our social media pages. Hello, everyone. Thanks for listening to today's episode. This episode was edited and produced by our podcast coordinator Mitra Hamzavi. Thanks, Mitra.

Jamie 35:41

Visit the UF/IFAS Honey Bee Research and Extension Laboratory's website, Ufhoneybee.com, for additional information and resources for today's episode. Email any questions that you want answered on air to honeybee@ifas.ufl.edu. You can also submit questions to us on X, Instagram, or Facebook @Ufhoneybeelab. Don't forget to follow us while you're visiting our social media sites. Thank you for listening to Two Bees in a Podcast.