

Honey and Adulteration

Published 13 November 2023, with Matt Phillpott.

According to one database of food frauds, over the past 10 years 6% food frauds in the United States involved honey. That jumped to 12% in 2022. In Australia recently a scandal revealed that more than a quarter of all samples were "of questionable authenticity". A survey in the EU said that almost half of the samples they looked at contained stuff they shouldn't have while 100% of honey exported from the UK was adulterated.

Honey is, in fact, the world's third most adulterated food. Why?

Matt: Honey is a bit of a luxury product, so it can be worth a little bit more in terms of money per pot and it's easy to adulterate, and that's one of the key things about it. It's easy to fake it because honey doesn't taste the same. If you get honey from Heather in Scotland or from Manuka in New Zealand, it's very different type of honey and got very different nutrients, different qualities, different taste, different look. It crystallises at a different rate. So some will be completely set by the time it gets into the jar. Others will be very much liquid for a longer period of time. Which means that for adulterating it, it's easier because nobody can be 100% certain when they're eating something that isn't real honey, because it varies so much. I mean, it's largely because of glucose syrup. Corn syrups are also really, really cheap and cheaper than honey to produce. So if you replace one with the other or mix the two, you save a lot of money from the production side, which can then result in more profit.

Jeremy: If people are adding other sorts of sugar to honey, presumably it's not actually a threat to health. Is that right?

Matt: In terms of things like glucose syrup, et cetera, no, there's no actual problem with health other than the fact that you're not actually getting the good qualities of honey. Honey produces a lot more nutrients, a lot more things that are good for you whilst being sweet. While glucose syrup, it's sweet, it tastes nice, but it doesn't actually

provide those same health benefits. So you don't get those health benefits as much. But it doesn't harm your health either. It's not causing harm, but it's not necessarily allowing you to have the benefits of why you might have brought the honey in the first place.

Jeremy: Adulteration with glucose syrup and corn syrup. I mean, those are fairly recent commodities. So how long ago did honey adulteration start?

Matt: Well, honey adulteration goes way back to sort of the classical era. Pliny the Elder talks about honey adulteration, for example, but that was largely a different kind of adulteration. With glucose, that comes in around the end of the 18th century, early 19th century, when they started to manufacture a glucose syrup. So glucose is naturally, you know, is a natural product itself. You can get glucose sort of sugars from sort of flowers and so forth. That's how bees made their honey in the first place. But the manufacture of it was an invention of the industrial revolution, really, and it was also quite often a bit of a byproduct. So there was lots of it around. And not many uses for it initially, so it was a useful liquid to be able to replace honey with, or at least mix into it.

Jeremy: I'm intrigued by ... you mentioned Pliny the Elder. Let's just go back. What were the Romans adulterating honey with then?

Matt: It's mainly starches. So until the 19th century it was mainly some kind of starch that was used. So other kind of substances that would basically create starch. And the idea would be that you dilute the honey and you use this for bulk, for weight in the honey, and also to make the colour look a nicer colour for the honey sometimes as well.

Jeremy: Coming forward. Then when did people start ... I don't know, not noticing, but complaining about ... Or, maybe noticing as well. How did adulteration of honey become a topic of interest?

Matt: It was always known on some level, I think. You know, there'd been a problem with food adulteration in general, going back to Pliny again, it's always been an issue in some form or another. But it is really the 19th century where it really takes off. So in the US, in the UK, there was an increasing amount of urbanisation, a larger population and an increase ... And because of both of those, an increasing amount of people that were not farming themselves and not getting food

from the local area. So there was a lot more transportation of food. And this meant that food became more industrialised at that same time. And it also meant that there was more opportunity for adulteration to happen.

Jeremy: But specifically as far as honey is concerned?

Matt: Yes, so specifically for honey, beekeepers were aware that there was an issue probably before the public were aware that there was an issue, and there was also a lot of confusion. So for the public, if you imagine a jar of honey, sort of clear liquid honey, it will crystallise or can do at some point. It will start to set or get those kind of crystalline bits in it. People generally don't like that. And so that turned into a misunderstanding, that crystallisation was a form of adulteration. It meant that that honey was adulterated. And that was a big problem for beekeepers because it's literally the opposite is usually true, that actually the stuff that wasn't crystallising was more likely to be glucose syrup. There was this misunderstanding in the public, but there was this knowledge that honey was being adulterated and that increasingly changed their habits. So honey from a comb was considered potentially better quality honey than a liquid honey because they thought that it was less likely to be adulterated. So people started to try to buy comb honey more often. But then it was claimed that comb honey could be adulterated as well. So the public began to turn off that as well. And so it was a constant battle to actually show that honey could be pure and what pure honey actually is. So people were concerned about it. Obviously because in this period, it is more of a luxury item. It's not a necessity. Sugar had largely taken over that role. So it wasn't quite the same big issue, but it was still important.

Jeremy: You started off saying that beekeepers became aware of the problem first. So can we assume that it wasn't beekeepers who were doing the adulteration, that it was middlemen or distributors or something like that?

Matt: I hesitate to say definitely that's the case only because the evidence I'm using here comes from beekeepers mostly themselves, most of my research being around two bee journals of the 19th century one in Britain, one in America, and they are very clear that most beekeepers, not all, but the vast majority, they're not adulterating their honey. They are providing pure honey. And it's these

middle men that are then buying honey in bulk from these beekeepers, then adulterating it and then selling it on at a higher amount. The evidence I do know for certain in the US, especially, it does look like that was very much the case. There were certain pockets where this was really, really bad and really, really happening amongst these middle men. In the UK, it's a bit more murky and a bit more ... I don't really know for certain. It's usually the middle men, but it's not always. There are certain beekeepers that are going to be doing these bad practices themselves as well. And beekeepers at the time didn't really like to admit that that was the case.

Jeremy: And is it, I mean, as a consumer, is it always the case that it's cheap honey that's adulterated? Or ...

Matt: Not necessarily unfortunately. Often I think. If you buy a one pound bottle of honey, jar of honey, chances are much higher that it's going to be adulterated. Not 100%, but there's a higher chance that there'll ...

Jeremy: Oh, you mean you mean a pound of money?

Matt: A pound of money, yeah, or the equivalent, a dollar, et cetera. So a really cheap jar of honey, basically that's more likely to be adulterated than an expensive one, but it's not guaranteed because there's in a way more money to be made off, say, a really expensive honey. If you adulterate that, you can make more of that honey and get more money back. So if they can get away with it, then, yeah. More expensive honey, you're more likely to be getting a pure product, so there's no 100% guarantee. But I would say if you buy a really cheap jar of honey, you've got a much higher chance of adulterated honey.

Jeremy: There's also this sort of artisanal, boutique kind of honey thing of, you know, gathered from single flowers in particular parts of the world and so on and so forth. That must be a target for adulteration too.

Matt: It will be ... Again I haven't got the evidence for this, but my feeling is it's less likely to be adulterated to the same extent because those kind of boutique honeys, you expect to get a certain flavor and a certain smell, not necessarily knowing exactly what they'll be, because it does vary, but they will have a different taste than an ordinary bog standard, honey. So you can't just fill it up with with kind of corn syrup or glucose type syrups. You do need to have the vast

majority of that to be real honey. And because it's single, you know, single origin, it's going to be harder to adulterate. Where most of the adulteration still happens is where they're mixing honeys. And so that gives an opportunity to actually adulterate. It's much more difficult when it's a single origin. So yes, I suspect the temptation is there for single origin and it probably does happen. My feeling is if you get a single origin, honey, it's a much higher chance of not being adulterated, that it's safe.

Jeremy: Yeah. And one of the things that ... I mean, preparing for this, I was sort of looking online at examples, and there are many of them, of adulterated honey, but there doesn't seem to be any huge public outrage at the fact that ... I don't know, 46% of European honeys are adulterated, or 100% of honey exported from the UK is adulterated. There doesn't seem to be a sort of public outrage about it, like there was, say, with bits of horsemeat in beef pies in England. Why do you think that is?

Matt: It's interesting, isn't it? I think it is because it's a luxury item. It's not something that everyone consumes. It's not something that you just consume on a daily basis. Or some people do, but the vast majority don't really think about it. It's just, you buy honey occasionally. And where most of the adulterated honey is probably going is in food products, so it's not even the honey that you're buying. So the outcry just doesn't seem to be there. It does surface from time to time, but where it has appeared in the media, it always disappears within a few days. It rarely takes off as a big news item, and I don't know why that is, but it does seem that the interest just isn't there too ...

Jeremy: And how does it affect, as it were, honest beekeepers?

Matt: So in the 19th century, there definitely was an effect. It reduced the cost of honey massively compared to the cost of production. So they would start to increasingly see less money for each jar of honey that they sold. But it also very much had an effect on their reputation. Beekeepers already had the potential issue of bees stinging the public, so there was always that slight difficulty with the public where bee hives were located. And now on top of that, the product they were producing wasn't trusted. So they were losing money, they were losing that trust, and they were also themselves being accused of being the ones committing the adulteration, which,

as I said before, generally wasn't the case for modern beekeeping. I'm guessing it's very similar, except that the issue isn't really as strongly there in modern beekeeping journals and magazines. It's rarely talked about, actually. It's not something that's high on the agenda. There's other problems around maintaining beekeeping and honey bee health and all those kinds of things are much more of an issue. But it should be an issue in a way, because as we were saying, honey is highly adulterated still.

Jeremy: If I were a big Chinese beekeeper, I'm selling to a middleman. The middleman is adulterating it. They're going to have to buy their honey from somewhere. They buy it from me. I don't really care what's happening to my honey, because it's not my honey. I don't have a reputation, do I?

Matt: That is part of the issue as well, is the sort of the industrialisation of that. So by sending the bulk of your honey off to an industry to transform that into a product, it's not your responsibility, it's not coming back to you, although that is changing. You know, more and more often labels require an origin to be there, certainly to the countries where it's created. So there is a trail beginning to fall more and more, but it rarely gets back to that particular farm. And where you do have honey which is clearly labeled as being from a specific farm, chances are probably a lot higher that is completely pure because they do have that reputation that's right there on their doorstep.

Jeremy: And I know sometimes when ... Like in a cold snap or or when the flowers aren't blooming, beekeepers are allowed to feed sugar to their bees. Is that adulteration?

Matt: That's a nice question, actually. And that cropped up in the 19th century, and it still crops up now, of exactly what and when to feed your bees and when not to feed your bees, and when to take honey and when not to take honey. So there's a lot of ... there is a lot of discussion about when is it safe to take your honey. But yeah, it is a potential issue. And it could be seen that some of that sugar, sugar water, could get into the honey itself, although the bees are transforming that.

Jeremy: Well, exactly.

Matt: So in a way the bees will change the consistency, the nature of that sugar, into something else, just as they do with the flowers, with the nectar and the pollen they take from the flowers. So it was an issue in the 19th century. They were uncertain, you know, thinking, is this an issue or is this not now? It's still the same sort of practices, and there are things done to make sure it doesn't get into the honey, because these things can filter in. But the bees are transforming it. So even if that's to some degree the case, as long as it's not all of the honey is coming from the sugar, sugar water, then it's not going to really affect it from being actual honey, because it has gone through quite a lengthy process by the bees themselves.

Jeremy: One of the things I find interesting also is that you started off by pointing out that honey is incredibly variable. I mean, there's an EU definition of what honey is. It includes ... It even has kind of exceptions for specific kinds of honey that don't match its own definition of what honey is. So how much of a problem is that really, that the notion of something called pure honey is actually quite hard to pin down?

Matt: It's really hard to pin down. And because it's so varied, depending on what kind of flowers the bees are visiting, the conditions at the time, you know, is it hot? Is it warm, sunny, dry weather? Has it been raining a lot? That all changes the consistency of the honey and the kind of honey that's being produced. And it's also possible to take the honey off of a hive too early, so it's not fully been transformed into honey. At that point, the bees are still in the process of making it into that, and it comes off and it kind of goes off much quicker usually because of that. And it's not quite ... it's kind of in this middle stage of being a kind of sugary substance and a honey, and it's not quite one or the other. They are all issues that can crop up. Most beekeepers are careful about that, and they do make sure that it has reached the right level and that it is the right time to take it off, and they will only take it off at certain times of the year because of that. But it does vary so considerably that it's really hard. It's really hard to prove, even with modern tests, that something is adulterated because it does vary, the consistencies vary. It's not as if you've got a chart which says it's got this much glucose, this much sucrose, et cetera, et cetera. That's not the case. It's got a lot more ... it varies a lot more.

Jeremy: I read also that some of the adulterators are getting pretty sophisticated and measuring things like the glucose sucrose ratio in

the honey that they're going to adulterate, and then adjusting the adulterant to suit that.

Matt: Yeah, yeah. It's becoming much more sophisticated. And the tests, while they're becoming more sophisticated, are always behind the curve slightly. And that's the case I guess with any kind of adulteration, that the adulterators will always try to find ways to get around the system. They know what the tests are and they know how far they can push it to make that make that work. So it's a constant battle.

Jeremy: Finally, Matt. I mean, you're a beekeeper. I don't know if you have bees at the moment. We've already said don't buy cheap honey, but what are the ways in which you can protect yourself, as far as possible, if you want to buy a jar of honey, from buying adulterated honey.

Matt: So as I've said before, single origin honey is much more likely to be a real product. But your best bet really is if you can get honey directly from a beekeeper, because chances are they will want ... You know, their reputation is literally on stake at that point, where you buy it from them. It will almost certainly be pure honey and possibly even their best honey as well. If you can get it straight from a beekeeper, that's going to be your best chance of pure, good quality honey. And secondary ... yeah. Single origin, organic. The conditions for organic honey is slightly different than often with other organic products, simply because you can't be 100% certain that the bees will take in all their food from organic, you know, from things that haven't been sprayed on and so forth. But you've got a much better quality honey usually there as well. So they're the things that you can do. Buy more expensive honey, I would say is not a guarantee that it's not adulterated in any kind of way. But again, it's a lot less likely to be adulterated.

Transcripts are possible thanks to the generosity of Eat This Podcast supporters. If you find the transcript useful, please [consider joining them](#).