

Our Hen House Podcast: Transcript for Episode 680, Interview with Shannon Falconer

Jasmin Singer: Welcome to Our Hen House, Shannon!

Shannon Falconer: Thanks, Jasmin! I'm very happy to be here.

Jasmin: I'm very happy to talk to you. And did you say you're in Austria right now?

Shannon: I am, yes. We have a lab based in Vienna, which is where I am.

Jasmin: Wow. Very interesting. So excited to dig in here. Let's just start, if it's okay with you, by telling us what Because Animals is and what products it is working on producing.

Shannon: Yes, of course. So Because Animals is a company making cultured meat specifically for pet food, and we started with making cultured mouse for cats, mouse being the ancestral diet of the cat. Although people are, of course, used to feeding their cats and dogs— chicken, beef, seafood— these are actually the main allergens for our cats and dogs.

And, of course, they're included in pet food because those are part of what comes out of the human food supply chain. But, in making cultured meat, we really saw this as an opportunity to grow the protein source and fat source that's most evolutionarily appropriate for our pets, hence why we're focusing right now on mouse. And then the next will be duck for dogs.

Jasmin: Amazing! When can my cat get a sample of the mouse...Oh wait, I was supposed to ease into that question. I wasn't supposed to just ask at the beginning, but it's like you're saving all vegans who have cats and have these horrible, ethical objections.

That's amazing. You're really solving that problem!

Shannon: Yes, we are! We are, definitely. That's what I'm doing day in, day out, working on solving that problem. So, we are working very aggressively to have a product available for consumers in Q2 of 2024.

Jasmin: Oh, so great! So cool.

And we just had Andrew Knight on Our Hen House talking about some really cool studies that have come out recently about dogs and cats and veganism.

And obviously, we've long known that dogs aren't obligate carnivores, but I think there's been some confusion around cats, specifically. So we have been waiting on the edge of our seats.

And although my cat's favorite food is Impossible Burger, which is not something I feed her on purpose, but anytime it's in the house, wherever she is, she's like, "Rrrawwrrr!" and she like goes to wherever it is.

Shannon: Really? Wow.

Jasmin: Yeah. It's kinda fun. Yeah.

Shannon: Yeah. That's amazing.

Jasmin: So what specific types of foods are you producing for dogs and cats, and why did you choose these, as opposed to the meats more commonly found in standard pet food? Why mouse and why duck?

Shannon: What we are really focusing on right now is thinking about...okay, you know, for cats...

Feral cats, for example, who are certainly the way (cats were) when cats evolved. Cats evolved eating mice and small birds and insects, and, by and large, most cats that are feral, that's what they still eat if they're not living in a feral colony that's tended to by a human, feeding them conventional commercial pet food.

So we decided that...of course, a mouse-based cat food does not currently exist on the market, but the reason for that is not because it's not a good food for them, especially given that that's what our cats evolved eating. It's because the supply chain for the human food industry focuses on meat, such as chicken and beef, and various types of fish. And pet food is an industry that basically uses those components of the human food supply chain that are no longer fit for human consumption. So the vast majority of meat— the chicken, beef, various fish—that's found in pet food is made from either, or both, the 50% of the animal that humans don't want to eat, as well as what are referred to as "fallen animals."

These are animals that die in transit due to dehydration, suffocation. And if an animal dies before it is slaughtered, it cannot be sold into the human food supply chain. All of this, basically the remnants, or these components of the slaughtered animals, they more or less are sort of heaped together and sent to something called a rendering facility.

By the time they make it to this rendering facility, this flesh is very, very heavily contaminated. And so, at the rendering facility, it's subjected to very, very high heats and high pressures in order to sterilize this otherwise heavily contaminated meat.

And in the sterilization process, a lot of those essential nutrients that cats and dogs both require that they would otherwise get from the meat. Many of those essential nutrients are lost. The taurine, for example, is one of them, right? So taurine, a very, very water-soluble amino acid; it's largely lost in that rendering process. And this is also why when you look at the ingredient label for your cat's food, you will see a long list of vitamins, minerals, supplements that are added to back to the cat food.

This would be referred to in the industry as the pre-mix. So these are those essential nutrients, and taurine is in there. When it's actually added to commercial pet food, the irony is that the taurine, that essential nutrient that everybody thinks about when they think, "Cats cannot be vegan because they go blind," which is absolutely the case, if they're not getting all of the nutrients they need. That taurine that goes back into commercial pet food, it's actually largely a synthetic form of taurine. So most of those essential nutrients that cats need in the wild that come from meat, when they're being fed a commercial diet, those nutrients are largely from a synthetic source, anyway.

The meat itself is really there. What the meat is providing, in terms of nutrients, it's providing protein. But as for those other core components like vitamin D, arachidonic acid, various B vitamins, and of course, as I mentioned, taurine, those are added back in synthetic form.

So with our cultured meat, we focus on mouse as opposed to chicken or beef. Although consumers are used to seeing those ingredients, they've been shown, and they are known medically, to be the main allergens for cats and dogs.

So the first thing that a veterinarian will do if a client brings their cat or dog to the vet, say, for example, with some kind of dermatological issue or gastrointestinal issue that they suspect is related to some kind of an allergen, is to swap out the protein source. This will often be a protein source that is less common, so certainly not chicken, and it actually is, often in certain hypoallergenic diets, it's also even soy protein. So, in making cultured meat, because there was no reason necessarily, to focus on chicken or beef, especially given what we know in that this is problematic for a number of cats and dogs, we decided that we would focus on mouse because this is the native prey diet of cats.

For dogs, sort of following that similar thread of logic, I suppose, we initially thought of a native prey source, which might be rabbit or duck. They tend to eat a wider variety of things, including things that are not meat, than cats. So we have a bit more flexibility with dogs.

But for cats, we really wanted to focus on mouse.

Jasmin: Besides Impossible Burgers. I get it. *both laugh*

That's so interesting. So, are animals harmed in the production of these products?

Shannon: When we initially take a...for example, mouse, when you take an initial biopsy or a sample of tissue from a mouse, which is what we did with the cell line that we're using for our mouse, we basically adopted three mice that would've otherwise been used for research purposes.

So we adopted them, and they lived out their long, happy, healthy lives in a plush mouse house in one of our scientific director's homes. They lived a long life. They lived almost two years, which is actually quite a long time for these particular mice. We took some tissue samples from their ears, sort of like an ear piercing.

We did have them anesthetized, so they were not awake when they had this piercing, and then they were given painkillers when they woke up. It's something that wouldn't have been comfortable if they were awake. But we did minimize that as much as we could. But I think, importantly, we'll never have to

go back to any mice again. So that tissue, then, serves as the basis for all of the cultured mouse that we will grow henceforth.

So depending on the types of cell lines that people use when they're making cultured meat, there are definitely opportunities and ways to grow cultured meat, whereby you take a sample from an animal and then you never go back to that animal again. That's the route that we're going.

Jasmin: So, taking into account that most of our listeners aren't scientists, though I can think of a few, can you walk us through the process for how all this happens?

So you get the sample and then what?

Shannon: So in order to never go back to an animal again, cells need to basically be able to continue to grow forever, indefinitely. And there are two ways to achieve this. One is folks can either work with...when I say folks, I mean companies working on cultured meat, for example...can either work with something called an immortalized cell line. So this immortalized cell line, these cells do continue to grow indefinitely. In the industry, this is actually what most cultured meat companies are working with. Definitely not all, but most. And so what happens, in order to create this immortalized cell line, is that there's a mutation that occurs. Because our cells, naturally, don't continue to grow forever indefinitely, right?

They, our cells, sinesse, or they die. So in order to make cells continue to grow this way, they have to have a mutation in a gene. By definition, if there's a mutation in a gene that allows a cell to continue to grow indefinitely if that mutation existed inside of a body, that would be considered cancer, right? You have a cancerous growth or something, a cell that's now started to grow very, very aggressively and uncontrolled.

I will say that, to date, nobody has ever gotten cancer from eating cancerous cell lines, and so scientifically we don't believe that that happens, right? This is not something that can happen.

For us at Because Animals, in any case, we do see this as being probably a pretty big stumbling block for a lot of consumers. Despite the fact that it is absolutely the case that when consumers are eating slaughtered animals from slaughterhouses or farms or whatever, for sure they will, at times, be eating cancerous cells, right?

So it doesn't necessarily mean that that animal had cancer, sort of this rampant growth of a tumor or something. Our cells, for any of us, at any given moment have these mutations and then our bodies will clear them. But the point is, it is absolutely the case that people, when they're eating meat, are eating cancerous tissue to various degrees. But people don't really know this and they don't really think about it. And we at Because Animals decided this was going to be possibly a big marketing challenge and something that's fairly significant for consumers to wrap their heads around.

So we are not using any cell lines that could ever be considered cancerous. So we are not using immortalized cell lines. We are not using any cell lines either that had mutations in them, whether or not they occurred spontaneously or were directed. We just don't use them. So instead we're using something called a pluripotent stem cell.

Pluripotent stem cells are basically...in any body, there's a single population of cells that continue to grow indefinitely, which are these pluripotent stem cells until those pluripotent stem cells start to become a certain type of cell. So, we all start with these cells that have the capability to turn into anything.

They can turn into heart cells, muscle cells, skin cells, fat cells. And so these are the cells that we are working with, the stem cells. We grow them up and then from there we then create an environment whereby these cells can turn into the tissue type that we're interested in. So for us, we're very focused right now on animal fat because that is such a vital nutrient, for cats in particular.

Basically, after obtaining the cells from the animal and specifically from there, we are using stem cells. We then grow them in something called a bioreactor. And basically, bioreactor is sort of a complicated term for a vessel that holds a blend of nutrients. And if we think about our body as a vessel, that is mostly liquid. And so there's a vessel that has mostly liquid and it's running across these cells, we control for temperature and gas exchange, and the cells, they grow in a way that's very, very similar to how cells would grow in a body because they're being fed all of the nutrients that they would be fed inside of a body. And they grow and then we harvest that material.

And I'll say that this idea of growing cells in a bioreactor, we've been doing this as a society for a long time. Well, maybe in relative terms not a long time, but for example, growing yeast for beer. These yeast cells are grown inside a bioreactor. Growing bacterial cells for probiotics. These bacterial cells are grown inside a bioreactor. Um, and so now we are applying the use of bioreactors to grow animal cells. And from there we know genetically this is meat, we're of course just generating that meat in an alternative way. It's not a meat alternative, right? Cultured meat is not a meat alternative. It's meat. We're just growing it in a way that is different from the conventional raising and slaughtering of animals.

Jasmin: Yeah, I have been waiting for this day for so long.

I remember in 2010 on Our Hen House interviewing Peter Singer about like, what is the future? And he said...By the way, no relation to me, though I do call him dad, I'm not sure he appreciates it *both laugh*...but he said cultivated meat. I don't know if he used those words. He might have said lab-grown meat at the time. Here we are!

And I have been working in veganism for long enough, on one hand, I'm so excited that we're here and on the other, I am worried about the marketing situation we're gonna be in, the PR situation that we're gonna be in, and you mentioned that briefly.

Can you speak a little bit more about that and how you think we're gonna deal with this sort of collective eww factor?

Shannon: I don't know how we're gonna deal with it, in short.

I know, at least I have an idea, as to how we're going to deal with it at Because Animals, which is that we are basically going to say—Look, in many respects, this meat is more pristine than what people would be getting from an animal because we don't have those spontaneous mutations or mutants, and we do have a very homogeneous population of cells that has a very, very, in terms of its cell line, the genetic material, it's very stable. And so versus what you're getting from an animal, which is at any given time, you would be consuming cancerous cells.

But furthermore, the important thing to think about is that, of course, the way that meat is produced conventionally, is that these animals are raised in, basically, manure, and then they're slaughtered. And it has been shown in different studies where, at a grocery store, take samples of a thousand different types of meat before it's cooked, and then try to culture out anything that might be on that meat. And in a hundred percent of cases, the resulting bacteria is fecal bacteria. And this is no big surprise, right?

Because, of course, as these animals are raised in their own feces, this is going to arise. And this is exactly why meat has to be cooked. Because if you don't

cook it, the chances of getting E. coli or salmonella are pretty good. And that's because those are fecal bacteria.

So in our instance, when we're growing cultured meat, there's no manure, there's no fecal matter around, right? We grow it in a way that's very, very clean. And this idea of, "Ah, but I don't want to eat something that's grown inside of a lab." Well, in reality, once we get towards commercial production, we're not actually growing this in a lab.

We're producing it in a production facility in the same kind of production facility that grain is produced in, that milk is produced in, that any product that you buy from a grocery store is produced in. So I think people, somehow, have this impression that the food they eat is quote/unquote very, very natural. When in reality, as soon as you step away from the fruit and vegetable section... I think we really need to reconsider what we define as being natural.

Jasmin: Yeah. And I sometimes worry too about, in the fruit and vegetable section, like what's actually on them? You know, what's on the fruit and vegetables? Not that I really care that much about that. But we have genetically manipulated everything.

So what kind of safety testing is there to make sure these products are safe for animals? Do you actually test on animals?

Shannon: We haven't tested on animals. I mean, certainly our cats, we've offered cats the mouse meat to see if they like it, and they do.

We haven't done any sort of standard, typical safety testing on animals largely because we're sort of applying some common sense here. The types of testing that we're doing is cell line stability, something referred to as stereotyping, ensuring that these cell lines are not cancerous cell lines, there are no abnormalities with our cell lines.

Okay. So those things are checked, great. So genetically this would just be like, it is identical. It is meat animal, animal meat. And then the inputs, when we grow the cells and we feed them, we feed them very, very, defined ingredients. So we know exactly, we are feeding them vitamins, minerals, and amino acids. These are all things that you could buy at a health food store, for instance, right? So these are just nutrients that any kind of cell needs to grow. And then in the end, we're looking at the output. Are these cells producing anything in terms of toxic metabolites?

In reality, no. Because these are also mammalian cells that were growing, right? So if they were producing something toxic, they would kill themselves. And so there's a lot of common sense that we can apply and rely on what we already know scientifically, as I say, in terms of ensuring cell line stability, ensuring that the nutrients we feed those cells are also nutrients that we know are all feed grade or food grade, and we know that they're healthy. And in the end, also running a test to ensure that there are no microorganisms that have contaminated our meat growth, and there are no pathogenic bacteria or yeast, or viruses. And so we look at that too.

So, I saw an announcement, it was flashed on my phone this morning. Upside Foods, it seems, just received the first FDA no-questions letter for approval of their cultured chicken.

Jasmin: So amazing.

Shannon: Yeah, the safety piece, that's something I think that a lot of people were really concerned about because it's lab-grown. Immediately there's this assumption that there's something that's bogus going on, when in reality, scientifically, this is really not the case.

Jasmin: We have a really loud shower radio in the house and my wife was taking a shower and NPR was on, and I heard that about Upside Foods and I was like, "Ahh!" And I shot out of my office and I'm standing, listening, my ear at the door of the bathroom. It was so weird.

With Upside Foods, getting the go-ahead from the FDA for their cultivated meat for humans, does that mean that both humans and animals will soon be able to buy and eat it?

Shannon: No, typically the way GRAS, or generally recognized as safe, applications work is that it is very specific to that company making that product because it is their process and it's their cell line. These things are very specific to the company. And so even though there could be a company next door working on growing cultured meat as well, that doesn't mean that their cultured meat is not GRAS-approved. It only applies to the company that submitted it, to Upside, for instance. But it does say, "Okay, this is similar to Just receiving the approval in Singapore two years ago." What these approvals do is they provide a nice confirmation that we, collectively as an industry, are on the path forward.

There are some guidelines that are starting to be put into place in terms of how these things are evaluated. And I think for the longest time, that was the hurdle.

"There are no guidelines. How do we evaluate it?" And the great thing about hearing of Upside's approval is that clearly now there's a precedent, there are guidelines. So there's a path for regulators to look to when other companies submit for their approval process.

But generally, in terms of pet food versus human food, the approval processes are different. Although cultured meat for pet food does happen within the FDA, it's at the level of the Center for Veterinary Medicine. So, it's not quite the same body within the FDA that would evaluate pet food as human food.

Jasmin: That was actually my next question. I am curious if there are different regulatory requirements for getting pet food on the market as opposed to getting human food on the market. It sounds like there are.

Shannon: The process is similar, at least in the US, in terms of it would be a GRAS application. There are a couple of ways that one can seek approval for a new pet food ingredient. But yeah, we would also be looking at a GRAS application. The processes are generally very similar, I believe, between the human and the pet, but the governing bodies are different.

Jasmin: Interesting. So you say on your website that animal-based meat is better for dogs and cats than vegan diets.

I know we started talking about this at the beginning, but I want to go back to it because a lot of vegans dispute that, though obviously, most people in the mainstream are totally on board.

So can we go back to that? I'd love to know what your position is on that.

Shannon: So my position on this is that cats and dogs, humans, every type of organism that is alive, it subsists, we all subsist, based on having a very specific nutritional profile, not an ingredient profile. So the idea that cats need meat is inaccurate.

The much more accurate way to phrase that would be cats require taurine, arachidonic acid, and vitamin A. These are ingredients that in nature, out in the wild, when you can't actually derive them synthetically, in the wild, the only single source of these nutrients is an animal.

So in the wild, it is the case that cats need to consume another animal in order to obtain all of their nutrients. And that's because plants do not produce taurine, or at least it's been documented that maybe some algae do, but not in the quantities

that cats need. Vitamin A, what we would refer to as preformed vitamin A...So you know, you and me, we can eat a carrot and that beta carotene that makes the carrot orange, our bodies have the enzymatic capability of converting that carotene into vitamin A. Dogs have that capability too, but cats don't have that enzymatic machinery. So first of all, it would be a rare day to see a cat eating a carrot, but even if they did, their body would not be able to convert that carotene into vitamin A.

Again, out in nature, the only source of preformed vitamin A tends to be animal sources. So I think this is where definitions get hazy and vegan, not vegan and frankly, I try never to use the word. It's very messy because when we're thinking about cats in the wild, yes they do, they need to eat other animals in order to obtain all their nutrients.

But when we think about commercial cat food, we can and do successfully feed cats a cat food that contains no animal ingredients, and that's because the nutrients that they do need, we've been able to derive from synthetic sources. Now there are a couple of caveats to this though. This idea of feeding cats a vegan commercial diet.

The biggest problem from a nutritional...as long as that food has been manufactured in a way that is nutritionally complete like it has all of the nutrients the cats need in the right proportions, then check! No problemo! The challenge though is that cats, a lot of times it could be difficult for them to find that interesting or appetizing to eat because for cats, in particular, the main driver of taste tends to be animal fat.

So it's not necessarily animal protein, it's animal fat, in many instances. And plant-based fats are different than animal-based fats and what really drives cat taste or palatability is animal fat. I have seen even commercial pet foods by some of the big commercial pet food players in the space, their hypoallergenic diets, actually, of course, they're not marketed as vegan or animal-free, but they actually contain no meat, some of them.

What they do include is fish oil, largely again, because we're talking about the fat. But the meat itself, meat is not something that cats require, strictly speaking, it's the nutrients that come from meat, typically, well absolutely in the wild, that they need.

Jasmin: We just tried Evolution Diet with our cat. She was not having it. She was like, where is my Impossible Burger? *both laugh* I don't know why I keep going back to that, but it mocks meat, you know, so...

Needless to say, she'll sign up to be animal tested on for the mouse meat. *Shannon laughs*

So how did you get into this work? It's such an interesting field. What is your background?

Shannon: I'm a biochemist by training. But before that happened, I grew up with three dogs and three cats. They were sort of my siblings, my best friends and I stopped eating meat in my early teens and then started volunteering at animal rescues, and then I did that throughout my adult life.

But yeah, I'm a scientist by training. And then while I was working as a postdoctoral research fellow at Stanford University...It's this incredible place in the world, right, where anything and everything is possible. And that's really when I decided that I would apply my scientific training to do what is really most important to me, which is taking animals out of the supply chain and just generally creating a better world for non-human animals.

And so, at first, I thought I would do something related to the human food industry because humans are the main consumers of animal-based products. But then, I was thinking I would like to have more options for myself, but really I have a lot of options and I'm very fine.

The challenge though is that I'm pretty hamstrung when it came to feeding my cats, and dogs too but cats are a bigger deal, right? And in this instance, I'm sort of forced to support this industry that I otherwise don't by buying meat-based foods.

And when I started talking about this with a few people, their reactions were, "I don't know that it's gonna make much of a difference because it is just the leftovers of the human food supply chain."

But then as I started to understand more deeply and this argument that's often made, which is, "Ah, pet food is a sustainable industry because it's just using the leftovers."

The rendering industry is a \$25 billion industry. And so, it's not as if these quote/unquote scraps would go to waste otherwise, right? Or they would just go into the garbage. The pet food industry is absolutely buying this from the animal agriculture industry. And in the absence of the animal agriculture industry being able to sell all of this otherwise unsellable meat to pet food, the reality is that

the animal agriculture industry as we know it could simply not exist. The economics would not make sense.

Basically by forcing the animal agriculture industry...if folks actually turn to actually feeding their cats and dogs either cultured meat, plant-based, or something other than slaughtered meat-based diets, now suddenly the whole economics of the industry are thrown into the air, and that makes it really difficult for this industry to continue as it's been doing.

And pet food is largely a white space, right? There are very, very, very few companies focused on pet food. Nonetheless, we know that, at least from an environmental perspective, more than a quarter of the devastating side effects of the animal agriculture industry, in terms of deforestation, water, and fossil fuel use, are directly attributed to the foods that people feed their cats and dogs.

So 25 to 30% of that, that's a huge percentage. And if we think about the relative number of players within that 25 to 30% versus the 75% in the human food sphere, it's clear that we need folks focused on pet food.

Jasmin: So true. And I have to tell you on my end, I mark clips that you say when I think that they could be good quotables, the little pieces that we put on social media, and I have done it so many times because everything you're saying is I stuff people aren't discussing enough.

Especially regarding what you just talked about, how people consider pet food a sustainable industry and that's not a full story. It's not accurate.

This is the future. You mentioned that this will be coming out next year. You said Q2 of 2024.

Shannon: Yeah. We're pushing for 2024.

Jasmin: Okay. Amazing. So you mentioned, when you were just talking, that regarding your profession, this is something that's particularly important to you.

Can you tell me a little bit more about why that is and what your story is?

Shannon: Growing up with three dogs, three cats, developing a very close relationship with animals at a young age.

I mean, I've had my rescues or fosters my entire life. I know this is the case for many people, so I'm not unusual in this way, but for me, I'm much more

comfortable around non-human animals than human animals. And so those instances of animal cruelty or considering the way that generally humans treat animals. Whether or not (they're) cats and dogs or farmed animals. For me, it makes no difference.

I find this a very, very emotionally triggering situation in the world, and frankly, I don't see how as a human species, we are still in this place of treating animals the way that we do. Nonetheless, here we are.

So yeah, how did I get here? Generally speaking, our treatment of one another, yeah, but definitely non-human animals is absolutely unconscionable. There are a lot of folks who do care about it and who are looking to change the status quo, but from my perspective, not enough.

And what we do know, sadly, is that just, banging our fists against the wall and saying, "This is cruel, this is inhumane. We shouldn't do this!" It doesn't change people's behaviors and, if anything, a lot of folks just become angry and resistant to it and hostile and defensive.

And so really, the only option, as I see it, at least at this point in time, the best option seems to be to give people more choices in terms of their food. You know, not ask them to make lifestyle changes because people don't like making lifestyle changes, right?

So, let them live the way that they want to live, but give them products to choose from so that we don't have to fight about this and they don't have to make any compromises. This is what we've seen, this seems to be the more effective path.

Jasmin: Yeah. Well, I have a couple of follow-up questions about that, and I think I'll save it for our bonus content. But, Shannon, this is really a breath of fresh air to hear about all of this.

Can you tell our listeners where they can find, Because Animals and how they can stay up to speed? I'm sure everyone is just as eager as I am to get their hands on this mouse meat.

Shannon: Cool. Yeah, becauseanimals.com is our website and if you go there, you can read all about Because meat and how we're growing our cultured meat. Or, you know, Instagram and Facebook, Twitter. We haven't really been extremely active on social media as of late but that will definitely pick up once we get closer to launching our commercial product.

Jasmin: Amazing. Well, thank you so much for joining us today on Our Hen House, Shannon. It's been a real pleasure and I really look forward to staying on top of the incredible changes that Because Animals will inspire.

Shannon: Thank you very much for having me, Jasmin, and thanks to all your listeners!