Sidedoor S2 Ep. 11 The Hungry, Hungry Hippo Baby Final Transcription

[MUSIC]

Tony Cohn: This is Sidedoor, a podcast from the Smithsonian, with support from PRX. I'm Tony Cohn.

[MUSIC]

Erin Stromberg: We're going to go down this door. Sorry.

Tony Cohn: The side door?

Erin Stromberg: Yes, the Sidedoor.

[LAUGHTER]

Tony Cohn: We recently visited the Smithsonian's National Zoo in Washington, D.C. for a pretty surprising reason.

Erin Stromberg: Since they do have a very large arm span, we stay back several feet from their enclosure mesh.

[ERIN TALKING TO THE ORANGUTAN]

Erin Stromberg: Hi! Do you see their equipment? Yeah! They've got equipment!

Tony Cohn: Long arms plus a very curious nature means that orangutans love trying to steal things from outside of their cage. Producer, Justin O'Neill, and I are about to watch a keeper take a milk sample from one of the Zoo's orangutans.

Erin Stromberg: So, she's actually already, uh, presenting her nipple to me. She does know what I'm asking. She knows what this tube is for. When you work with very intelligent animals, they pick up on things like this. So, I ask her to present her chest. And I just use my fingers to manually express the nipple into this little test tube vial. Good girl.

Tony Cohn: Four orangutans hover three feet away from Producer, Justin O'Neill, and me. One has her chest pressed against the cage's wire mesh, and the other three are just watching, and making really, loud raspberry noises.

[RASPBERRY SOUND MADE BY ORANGUTAN]

Erin Stromberg: That's…

[RASPBERRY SOUND MADE BY ORANGUTAN]

Erin Stromberg: Kiko wants to make sure that I'm aware that he also likes peanuts.

[RASPBERRY SOUND MADE BY ORANGUTAN]

Erin Stromberg: That's Iris to be aware that she also likes peanuts.

[RASPBERRY SOUND MADE BY ORANGUTAN]

Erin Stromberg: Literally, Peanut Gallery.

Tony Cohn: The National Zoo's ape expert, keeper Erin Stromberg, gently pulls on the right nipple of Batang, a 20-year-old Bornean orangutan, and the first orangutan to give birth at the zoo in 25 years!

Erin Stromberg: Batang, can you switch sides? Good girl!

Tony Cohn: Erin milks Batang until she's collected at least one milliliter of milk, which they'll send to the lab to study. Then, she rewards Batang by squirting some grape juice into her mouth. It kinda looks like what a high school football coach might do for a star quarterback after a touchdown. But Batang isn't the only orangutan interested in a sweet treat. Batang's baby, Redd, also wants a little snick snack.

Erin Stromberg: But Batang has to be willing to let him have some. Can he have a little? Can he have a little?

Erin Stromberg: Good girl, Batang.

[SQUIRT SOUND]

Tony Cohn: The 11-month-old orangutan Redd is about the size of a teddy bear, and, as his name suggests, he's covered in red hair that sticks out in all directions, as if he's full of static electricity. And Redd is super cute!

Erin Stromberg: I've definitely been labeled as I'm now the milker in the ape community, which I'm not sure if that's a good thing or a bad thing. Um, it's definitely become my calling card. Maybe I should put it on a business card, um, "Grade A Milker." That is my title.

[MUSIC]

Tony Cohn: Batang has plenty of milk for Redd; enough that she can feed him and donate some to science.

[MUSIC]

Tony Cohn: But, what happens when zoo animal mothers can't feed their babies? As it turns out, each species' milk is a unique cocktail, developed over millions of years and suited to help them survive. So, this time on Sidedoor, what's so special about milk? And what does it have to do with a world-famous hippo?

[MUSIC]

Tony Cohn: We've got those answers, after a quick break.

[MUSIC]

Tony Cohn: The night before we planned to record my lines for this episode, I got an email from Justin, my Producer, with a little homework assignment.

Tony Cohn: The assignment was to find a video of Fiona, the baby hippo.

Justin O'Neill: Right.

Tony Cohn: That we can react to, but…

Justin O'Neill: No. Well, yeah.

Tony Cohn: Ok.

Justin O'Neill: Our favorite.

Tony Cohn: Our favorite.

Justin O'Neill: Yeah. So, let's take a peek! We're going to look at your video first, Tony.

[MUSIC]

Tony Cohn: Great.

[MUSIC]

Justin O'Neill: And, I'm just going to…

[MUSIC]

Tony Cohn: There are two specific parts.

[MUSIC]

Justin O'Neill: Alright.

Tony Cohn: There are two specific parts. Ahh! There she is! Ok.

[MUSIC]

Justin O'Neill: So, we've got Fiona crawling…

[TONY'S LAUGHTER]

Justin O'Neill: Into a tub. What are you…? What? What?

[LAUGHTER]

Tony Cohn: Just wait. I'll tell you my two favorite parts in this video in a second.

[MUSIC]

Tony Cohn: Look at the zookeeper!

[LAUGHTER]

Tony Cohn: Look at the zookeeper running away!

[MUSIC]

Tony Cohn: With over 225,000 followers on Facebook, and 11,000 on Twitter, Fiona the hippo has taken the world by storm. You may not know Fiona by name. But, if you're an avid Twitter or Instagram user, you've probably seen her before. She's the clumsy, water-loving baby hippo who always seems to be walking around with a huge grin plastered above her two chins.

[MUSIC]

Tony Cohn: At 9-months-old, she's just one fifth the size of an adult, but she's got enough personality for a whole bloat of hippos. And yes, that is what a group of hippos is called. They go by other names too, but bloat is definitely the most fun.

[MUSIC]

Tony Cohn: Baby Fiona is a happy, healthy hippo today. But, when she was born, she weighed just 29 pounds. Now, compare that for a second with a normal baby hippo, which weighs between 60 and 100 pounds at birth. So, Fiona's health was fragile.

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Barbara Henry: Because Fiona was born six weeks premature, just like a human baby, things happen in the womb and the baby grows. And so, we didn't know where she stood for her digestion and what she could and could not digest. Um, we feel like she still had six weeks to cook.

[MUSIC]

Tony Cohn: That's Barbara Henry, the Cincinnati Zoo's lead nutritionist who was part of the team that cared for Fiona in the early days.

[MUSIC]

Tony Cohn: So little Fiona's support team did something they never want to do. They took her away from her mom, Bibi, and tried to raise her by hand. Now, Fiona was tiny, so she couldn't suckle her mother. And, because she wasn't nursing, Bibi stopped producing milk just a few days after her birth. In the wild, Fiona would not have made it.

[MUSIC]

Barbara Henry: And we were asking, "Are there any are there any successful hand-rearings that have happened with a hippo in the past?" And that's where we came into roadblocks.

[MUSIC]

Tony Cohn: The clock was ticking and team Fiona needed to come up with a way to feed her and fast! And it wasn't like they could just run down to the grocery store and pick up some 2 percent or hippo milk formula.

[MUSIC]

Tony Cohn: So, what could they do to save Baby Fiona?

[MUSIC]

Tony Cohn: Some 500 miles away from Cincinnati, on the edge of the Smithsonian's National Zoo in Washington, D.C., is the Department of Nutrition Science.

[MUSIC]

Tony Cohn: It's a nondescript, single-story office building, where scientists research all areas of animal nutrition. The Department also happens to house the most extensive collection of exotic animal milks in the world. The milk bank itself is like a very strange, supermarket aisle. In a

walk-in-freezer kept at exactly minus 17 degrees Fahrenheit, there are cardboard boxes filled with small, frozen milk vials. It's like a biological time capsule, preserving the frozen milk samples until a need arises and some scientist says, "Alright. Crack open that batch of manatee milk to see what we can learn!" Altogether, there are over 15,000 samples of milk from over 185 species of mammals.

Michael Power: Uh, we have three types of mammals in the world right now. We've got our placental mammals, that we all know about. We got our marsupials, like the, the kangaroo and the possums. We also have the monotremes, uh, which are the duckbilled platypus. Um, those animals lay eggs. They lactate. They have no nipples.

Tony Cohn: We're mammals, kangaroos are mammals, and platypuses, apparently are also mammals. But, what exactly is a mammal? A mammal is a class of animal that has three important characteristics. Are you ready? One, they are warm-blooded. Two, they have hair or fur. And three, they have glands that produce milk for their young. Glands, not necessarily nipples. In the case of platypuses...

Michael Power: They have a patch, a mammary patch, on their front and the milk, and the milk just leaks out and wicks down the hair and the babies lick it up, off the hair.

Tony Cohn: Michael Power has been working with the Nutrition Department for over twenty years! His focus: milk.

Michael Power: So, nipples are an invention, at some point in, in, in the whole history of, of, of lactation.

Justin O'Neill: Nipples are a… so, a relatively new invention.

Michael Power: Relatively new. Yeah. They came about halfway through the entire life of lactation. So, the first half of lactation was essentially nipple-less.

[LAUGHTER]

Tony Cohn: Sidedoor Producer, Justin O'Neill, met with Power to ask him the hard questions.

Justin O'Neill: And, I think this is, um, it seems like a very obvious question and I think most people would think like, "Well, duh. But what is milk?"

Michael Power: Milk is…

[LAUGHTER]

Michael Power: That is not an obvious… there's no obvious answer to that. The simplest answer is that, uh, milk is a substance produced by a female mammal deliberately as a food to feed to her infant or other offspring or neonate; uh, however, it is far more than just a food.

Tony Cohn: And we're going to get to why milk is more than just a food. But let's start with this: milk is not just milk. It varies a lot depending on the species of animal, environmental factors, and their own unique evolution. But, as Mike Power explains, milk can be boiled down to a few key components: water, protein, sugar, fat, and minerals.

Michael Power: And here we get a little geeky, but fat, protein and sugar can cause great energy for the animal to live and also, protein is the building blocks of muscle and tissue. And then of course, the minerals for building bones and things like that.

[SFX]

Michael Power: Most mammals, I think, they run pretty much either on sugar or they run on fat.

[SFX]

Tony Cohn: For instance, whales run on milk that is very high in fat, and low in sugar.

[MUSIC]

Michael Power: Their babies are getting protein and fat. That's basically what they're getting. Almost no energy from sugar.

[MUSIC]

Tony Cohn: A higher fat milk tends to have less water in it; think of the cream that you put in your coffee. But for animals that need more sugar and less fat, their milk can be more watery; more like skim milk.

[MUSIC]

Tony Cohn: But what about apes? Orangutans? Chimpanzees? Gorillas? Bonobos? And humans?

[MUSIC]

Michael Power: Uh, an ape?

[MUSIC]

Michael Power: We're living on the sugar side of things. We're basically feeding our babies with sugar, which means we have a lot of water in our milk, which is actually probably useful in terms of, of thermal regulation because our apes and other primates came from hot environments originally.
[MUSIC]

Tony Cohn: Thermoregulation is our ability to control the temperature of our body. And how do we thermoregulate? Well, we sweat. Apes, including humans, do sweat, which is really good to know, because I thermoregulate a lot. And, as our sweat evaporates, it cools us down. But we end up losing a lot of water.

[MUSIC]

Michael Power: The water becomes an incredibly important nutrient. It's not that important nutrient for the marine mammal. Alright. They get enough water, they have to have water, obviously, but it’s not a big deal for them. For us, it’s a big deal.

[MUSIC]

Tony Cohn: Not only do infant mammals get water, protein, and energy from their mother’s milk, but most of them also get another super-cool and super-important thing: the power to fight off disease and infection.

[MUSIC]

Tony Cohn: For instance, when babies are first born, their immune systems are generally weak and inexperienced. But milk can give them the jump-start that they need to be healthy.

[MUSIC]

Michael Power: There's immune function molecules that carry the mother's disease history. So, the mother's disease history is essentially being transferred to the baby.

Tony Cohn: But think of the immune function information molecules as little microscopic teachers.

[MUSIC]

Tony Cohn: They tell the immune system…

Michael Power: These are the good ones. Leave them alone. These are not the good ones. We need to attack them. And milk seems to have a lot to do with that sort of priming.

[MUSIC]

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Tony Cohn: Milk also has a lot of extra sugar in it that babies don't digest. It's actually food for the good bacteria in a baby's gut, which helps them fight infections. But each type of animal has its own unique bacteria and its own unique milk cocktail.

Michael Power: I would never feed something that looked like a rhino milk to an elephant calf. You'd probably give it diarrhea, throwing all that water and sugar into it would probably just mess up its intestinal system really quickly.

Tony Cohn: You can't raise an elephant on rhino milk, or a human on whale milk. And, you should raise Baby Fiona, the hippopotamus, on hippo milk. So, when Fiona's mom, Bibi, wasn't producing enough milk to feed her very premature baby, the keepers did what everybody does when we're looking for answers in a time of crisis. They turned to the internet.

[SFX]

Tony Cohn: And no, they didn't just look on Amazon for "hippo milk" like I probably would've done. It turns out, there's a company called, "Pet AG" that can provide milk formulas to zookeepers in the know. With the right ingredients, Fiona's keepers could make a hippo milk substitute that would keep her growing and happy. Kind of like the formula that many babies consume. It's the same idea, just very different ingredients. So, Barbara Henry searched Pet AG's database to see if they could help with hippos and she got one hit, from the International Zoo Yearbook, published in January of 1960.

Barbara Henry: And it was a very short synopsis of one hippo milk that had been analyzed in a laboratory and that was the mom who was into lactation and her hippo died. And so, they were able to take a milk sample from that mom and have it analyzed.

[MUSIC]

Tony Cohn: The hippo milk analysis that Henry found was just four ingredients long: 3 ½ percent fat, 5.3 percent protein, 4.3 percent lactose, or milk sugar, and, 0.8 percent ash, which just means minerals.

[MUSIC]

Tony Cohn: Though it was something, the analysis seemed short on information. But through the zoo grapevine, Henry knew someone who might have some ideas on how to turn that 4-ingredient-long medical blurb into life-saving hippo milk.

[MUSIC]

Tony Cohn: Up next, we find out what to feed Fiona, after this quick break.

[MUSIC]
Tony Cohn: Alright, so let's boil this story down to the basics. Zoos often collect animal milk to study it and to better understand the animals that they care for. What they've learned is that all animal milk is different. Some animals have very sugary milk, like humans and apes. Others have high fat milk, like whales and elephants. And others, well, they just don't know. And unfortunately for the Cincinnati zoo, and the young hippo in their care, hippos fall into that last category.

[MUSIC]

Tony Cohn: Baby Fiona, the tiny hippo, faced long odds, unless Barbara Henry and the other at the Cincinnati Zoo could find some way to produce enough hippo formula to sustain her. But all they had to go off was the short analysis of hippo milk from 1960, and a small sample of Bibi's milk.

[MUSIC]

Tony Cohn: So, what could they do? Well, they sent Fiona's mom's milk sample and the 57-year-old milk analysis to, you guessed it, Michael Power, milk man extraordinaire, and his nutrition team at the Smithsonian's National Zoo. Here's Barbara Henry.

Barbara Henry: To have that valuable information, knowing that the National Zoo could analyze that, we felt like this was a great way to make sure we were within where we needed to be.

Tony Cohn: The clock was ticking. Baby Fiona's life was on the line. Michael Power's team worked quickly to figure out the right balance of ingredients to keep Baby Fiona going. But one big challenge? Estimating where Fiona was in her development. A one-week old hippo needs very different nutrients, among other things, then a 2-month-old hippo. And we didn't really know what a premature hippo needs.

Michael Power: Yeah, because I mean, obviously a baby grows and develops. A newborn baby is not the same as a 1-month old baby or a six-month-old baby. You're basically producing a food that's being fed to something that is continually changing and that's the whole point. The whole point is you're helping this thing grow and develop.

Tony Cohn: Power and his team took Bibi's milk sample and ran tests to better understand the composition of her milk. And the results?

Michael Power: We basically gave them as the baseline that says well look, in terms of sugar and protein and fat, these are the targets you probably want to hit. This is probably how much water you want to have in the milk.

Tony Cohn: For Baby Fiona, specifically, the hippo milk breakdown Power and his team did come up with ended up looking a bit like high fat, high protein cow's milk.

Michael Power: We dropped the sugar down and kept the fat up fairly high.

Tony Cohn: Equipped with the Nutrition Department's lab analysis, the team at the Cincinnati Zoo tried to prepare Fiona's formula as close to the lab-science as they could.

Michael Power: That's the something that Barbara Henry at Cincinnati is going to be perfectly capable of doing. She knows all the possible ingredients she has on hand. She knows all of things that they've used in the past and what's successful.

Tony Cohn: But how do you turn a series of numbers into baby food for a hungry, hungry hippo?

[MUSIC]

Tony Con: Henry explains that they started with a commercial formula based on cow milk.

[MUSIC]

Barbara Henry: The whole basis of knowing a formula works is A) is she consuming it, B) is she digesting it, and C) is she growing?

[MUSIC]

Tony Cohn: Okay. The moment of truth: would Fiona drink the milk that everyone, from her mom to her keepers, helped prepare?

Michael Power: Luckily, she was a happy little glutton and decide to drink almost anything and it was great.

Tony Cohn: Fiona not only drank the formula, she also gained weight and ended up being very healthy!

Michael Power: And it's just wonderful that, that, uh, apparently, uh, she's got a wonderful little personality, and, and is managing to be a hippo!

[MUSIC]

Tony Cohn: These days, little Fiona isn't so little. She weighs 550 pounds, and by the time you're hearing this, her weight will definitely have gone up.

[MUSIC]

Tony Cohn: Fiona is a constantly growing, happy hippo. And credit goes to the wonderful care she gets over in Cincinnati. But, she's also thriving because of the milk research done here, at the National Zoo.

[MUSIC]

Tony Cohn: Thanks to research programs like this one, and animals like Batang, the zoo's orangutan mom from the beginning of this episode, we know so much more about how animals grow and develop. Basically, without these animals' contributions, we wouldn't have the same understanding of the substance that keeps us all alive: milk.

[MUSIC]

Tony Cohn: And now, we also have a better understanding of hippo milk. Hopefully, this research will lead to more hippos being as fat, and happy as Fiona is today, even though it is kind of hard to imagine a future hippo with as much charisma.

[MUSIC]

Tony Cohn: You've been listening to Sidedoor, a podcast from the Smithsonian, with support from PRX. If you want to see Redd or Batang in person, they live at in the Smithsonian's National Zoo in Washington, D.C. And as for Fiona the Hippo? She's in Cincinnati, and all over the internet, and in my heart. And while you're on the internet, you may as well just mosey on down to our Twitter page, which is @sidedoorpod, all one word, where you can learn more about the work of the Smithsonian National Zoo and Conservation Biology Institute. You can also learn about it at our website, which is si.edu/sidedoor. Special thanks to Robert Cruthirds at the Memphis Public Library for checking out their archives for hippo stories, and especially to Devin Murphy for zipping us around the National Zoo in her golf cart.

[MUSIC]

Tony Cohn: We also want to dedicate this episode to Fiona's father, Poppa Henry the Hippo. He died while we were making this episode. We are sending hippo-sized hugs to Fiona and all of the Cincinnati Zoo family.

[MUSIC]

Tony Cohn: Our theme music is by Breakmaster Cylinder.

[MUSIC]

Tony Cohn: This episode was supported, in part, by the Alfred P. Sloan Foundation: enhancing public understanding of science, technology, and economic performance. More information at sloan.org.

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[MUSIC]

Tony Cohn: Our podcast team is Justin O'Neill, Rachel Aronoff, Jason Orfanon, Gabe Kosowitz, and Jess Sadeq. Extra support comes from John Barth, Barbara Rehm, and Andrea Mustain.

[MUSIC]

Tony Cohn: I'm your host, Tony Cohn. Thanks for listening!