

Sawbones 413: Infant Formula

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Clint: *Sawbones* is a show about medical history, and nothing the hosts say should be taken as medical advice or opinion. It's for fun. Can't you just have fun for an hour and not try to diagnose your mystery boil? We think you've earned it. Just sit back, relax, and enjoy a moment of distraction from that weird growth. You're worth it.

[theme music plays]

Justin: Hello everybody, and welcome to *Sawbones*: a marital tour of misguided medicine. I'm your cohost, Justin McElroy.

Sydnee: And I'm Sydnee McElroy.

Justin: Syd, I'm getting over this little cold bug. It never even got very serious. I didn't take a day off or anything.

Sydnee: It wasn't COVID.

Justin: It wasn't COVID. You have to specify that, I feel like, or it gets awkward. We tested. It wasn't COVID. It was just a little bug. But—

Sydnee: Especially when you have kids with allergies who are just, like, during the spring, just constantly kind of sniffly. I feel like that I am frequently announcing loudly to other adults, "They don't have COVID!"

Justin: And kids have no mechanism for getting rid of snot in, like, a discreet manner. So it's just like, "Let me just blow this in my hand and rub it on my forehead. There we go, perfect!"

Sydnee: Just letting you all know. I did check.

Justin: It's not COVID.

Sydnee: I— I am being responsible! [laughs]

Justin: But it's— it's given my voice this little bit of— you hear it, right? You're loving it, I can tell, over there. From when we recorded before, the other podcast, and you were like, "Hubba hubba."

Sydnee: I'm becoming very excited.

Justin: Yeah, I don't blame you.

Sydnee: [laughs]

Justin: I'll tell you what I'm not excited about though, Syd, and I think I'm like a lot of parents in this way. In fact, I think it's weird that you're so fixated on how sexy my voice is when we're in the middle of a national crisis.

Sorry. When we're in the middle of—[wheezes loudly]

Sydnee: I was gonna say.

Justin: [laughs] One of perhaps a dozen national crises.

Sydnee: This has been true for a while. But, uh— so you probably are aware that we're in the middle of a baby formula shortage, an infant formula shortage. Infant formula is more... I don't know. I guess either way. You know what I mean when I say baby formula. [laughs quietly]

Justin: Baby formula does, I will grant you— and perhaps this is what you're getting at— it does sound like a very polite way of referring to, uh, ejaculate. So I—

Sydnee: [laughs quietly]

Justin: —if that's what you meant...

Sydnee: [holding back laughter] That's not what I meant!

Justin: ... I think infant formula is perhaps more proper. I do agree, baby formula could be misconstrued.

Sydnee: Um... yes. This has been going on, and it has gotten quite dire recently. And, uh, it occurred to me that while we have sort of tangentially discussed a little bit of the history of formula on a breastfeeding episode, actually, very long time ago, one of our very early episodes.

Justin: I mean, it would've been when Charlie was in utero, right?

Sydnee: Mm-hmm. I think it was before I had given birth, so it was about the— I think it was because I was doing—

Justin: Back when we knew nothing about anything!

Sydnee: Well, I was doing a lot of research at the time on breastfeeding, 'cause I intended to breastfeed, and so I was in the midst of it. Um, and we talked a little bit about some of the things that people came up with throughout the years other than breast milk. Um, we didn't get into the nitty gritty of how formula as we know it today was developed, and I then I wanted to talk a little bit about why we're in the midst of a shortage, and why some of the solutions people are proposing are not good ideas.

Justin: Many of us on the podcast aren't even exactly sure what's in formula.

Sydnee: Well, I can... you know, unlock that mystery for you.

Justin: For— thank you.

Sydnee: Um, a lot of people, by the way, have written in and suggested this topic while I was already sort of in the midst of— I've been working on it, putting it together. So it's not that I'm not giving you credit. We just— it was one of those— what is it when you simultaneously come up with an idea? Like, two people at the exact same time.

Justin: There's a word for it. I don't know.

Sydnee: We've talked about it on the show before. Um, anyway, I'm just gonna say at the top of the show, there are people out there suggesting ways to make your own infant formula. Don't do that. I just want— I'm going to get into it more, but I just want to— in case people, like, halfway through, abandon the show, or—

Justin: [simultaneously] In case your internet cuts out, yeah.

Sydnee: Don't make your own formula. That's not a good idea.

Justin: Yeah, don't bury the lede.

Sydnee: We're gonna go through all the reasons, but, um— uh, so again, we covered a little bit about this in the past. People have been feeding babies things other than breast milk for a very long time, for a variety of reasons. Sometimes because they thought it was better, or because they thought it was also needed, like, supplemental, or for the heck of it, or...

Justin: I don't know. Yeah, we didn't know anything. Or baby just got into something and it seemed okay, so...

Sydnee: Or they didn't have breast milk, so they were just making do with what they had.

Justin: Sure, yeah, of course.

Sydnee: Um, and so, like, as we look back through history— and again, we've talked about some of these before— but, like, the Greeks gave babies honey and wine, sometimes. Why not? [laughs] It was early on identified that milk from a human seems fairly similar to milk from other animals, other mammals, so why not allow a baby to nurse on an animal? If you don't have a human to nurse on. So...

Justin: I— in my favorite film— in my favorite film, one of the actors in the film— the name of this film escapes me— but one of the actors in the film is performing a—he's a father of some sort. He says, um... one of the younger guys says, "You can milk anything with nipples."

Sydnee: Right.

Justin: And then the older gentleman says, "Greg, I have nipples. Could you milk me?" And so that's a...

Sydnee: It's like a classic comedic... bit.

Justin: Yeah. I didn't do it justice, but...

Sydnee: No. But no, I know what you mean. Um, sometimes melted butter was thrown in there with the recognition that fat was important.

Justin: Nice.

Sydnee: Um, bread soaked in water. We talked about that a lot. Pap is what it was called, and, like, that was a— that was sort of a mainstay if you didn't have some other sort of milk product.

Um, and for most people, these were usually either used as supplements, like I'm gonna give the baby this too, um, to nursing, or if you— if you, for whatever reason, if they didn't have a caregiver who would nurse, you would try to find a wet nurse, right? This was sort of the idea.

It wasn't like... it was all just trying to make do, right? And so if you could, you would pay somebody to nurse the child for you. If for whatever reason you didn't want to, or you couldn't, or whatever.

And if you did use an animal, by the way, that's called dry nursing.

Justin: Oh, really?

Sydnee: I don't think we ever talked about that, yeah. If it's just animal milk, that's dry nursing. Um, we don't recommend that anymore. We never recommended it, it was just what people did, but... no. You know what? Someone recommended it. [laughs]

Justin: Someone recommended it. Yeah. Yeah.

Sydnee: I'm certain someone recommended. Um, as we talked about previously, it also took a while for bottles to develop. So if you're going to—

Justin: Right, right.

Sydnee: —intentionally feed an infant something other than breast milk, you need a way to give it to the baby.

Justin: Yeah.

Sydnee: And initially it was just like, I don't know, get, like, a clay pot.

Justin: Try that.

Sydnee: Or get, like, an animal horn, like, with a hole, you know? You can kind of see where at least you're getting, like, a shape— like, a... sort of shape of it. Like a tapered—[laughs]

Justin: You could also do— a lot of people would go with, um, goat stands, which is basically like a keg stand but with a goat. So you kind of lay the goat down and then just hold the baby up by its ankles—

Sydnee: [simultaneously] Hold the baby upside down.

Justin: —and be like, "Slam it, baby! Yes! You're finally in... Phi Kappa... Delta."

Sydnee: We— we t—[laughs] we talked about this in that old episode, but with the pap that they would make— which again was, like, bread that you would soak to the point in water that it was just this sort of, like, gruel, mushy thing.

Justin: Yeah.

Sydnee: And then you would put it in this—

Justin: We've all accidentally gotten water on bread. We don't need to get into this.

Sydnee: You would put it in a spoon that had, like, a hollow tube attached to it to, like, blow it into the baby's mouth?

Justin: Hachi machi.

Sydnee: Which, like, I was thinking about, like, what would this look like? It's like a McFlurry spoon. [laughs quietly]

Justin: Okay, perfect.

Sydnee: So you put the— it's like you put the McFlurry spoon...

Justin: It's amazing, the invention of the McFlurry was predicated by the McFlurry spoon. We knew. We knew that this was important, and we just didn't know why.

Sydnee: Uh, it was really not until the mid-1800s that you see the introduction of, like, a bottle and, like, rubber nipples. Like the kind of things that were the predecessors of what we would use today, right? Like, the early forms of those things. They were actually pretty effective, mimicked more what a, you know, a human breast would be like, and so was a better tool for feeding a baby.

Um, and this was a lucky time to be a baby compared to previous times. [laughs quietly] In history. Because not only did we have devices that were easier to use to feed the baby, like bottles and nipples, but they were cleaner than drinking— like, a lot of the things that they would use previously to feed babies, like, because we didn't really understand germ theory or anything, you would just have, like, milk or water and, like, some food substance and different— like I said, melted butter, whatever. Like, food substances sitting in something. And it wouldn't be cleaned properly in between.

Justin: Eww, yeah.

Sydnee: And so you could imagine how contaminated...

Justin: So it's actually a little more sanitary, weirdly.

Sydnee: Mm-hmm. It was more sani— because we're also moving into the era where we come up with pasteurization. So all of a sudden we can—

Justin: We're moo-ving.

Sydnee: Moo-ving into the era—

Justin: [crosstalk]

Sydnee: —where we can, uh, properly treat milk so that it won't give you bacteria that will kill you.

Justin: That's— that's easy, put it in the fridge. I don't know why they didn't.

Sydnee: But—[laughs] well, no. They didn't— well, they didn't—

Justin: Just put it in the fridge.

Sydnee: No, that's not enough.

Justin: What?

Sydnee: You've got to pasteurize it first. You've got to kill all the bacteria first. You have to heat it up.

Justin: Ehh, yeah, but after that you leave it in the fridge.

Sydnee: Well, yeah, after that you leave it in the fridge, if you had a fridge, but they didn't have a fridge yet.

Justin: Yeah, that's kind of what I was— it wasn't a good... I mean—

Sydnee: Well, but you can't just put it straight in the fridge, or drink it straight from the cow.

Justin: We've— we've—

Sydnee: Don't do those things.

Justin: —we've gotten off the track.

Sydnee: But when did we figure out, uh, that animal milk and human milk were not the same? Because that seems like— I mean, that was probably a big hang-

up, right? Like, I don't know, it feeds cows, and they're, like, bigger than us, so it could probably swing a baby. It's, like, much smaller.

Justin: You could probably tell it tasted different.

Sydnee: Yeah. But why would you have any— especially at that point with our very sort of, uh...

Justin: Rudimentary?

Sydnee: Yes, that's a good word— understanding of nutrition. How would you ever know why that was better or worse, right?

Justin: I don't know.

Sydnee: Um, well, they had some suspicions by the 1800's, because they had started to note that infants that were fed only animal milk and no breast milk actually had, like, more GI problems, they were more likely to be dehydrated, and in general their mortality was higher.

Justin: Okay.

Sydnee: Than breastfed infants. And so they knew there was something different in the nutrition they were getting. They just didn't really understand what.

Justin: Stands to reason to us modern folk, for lots of reasons, but probably was pretty big revelation back then.

Sydnee: Yeah, and this is— and this is outside of the idea of, like, antibodies and stuff that can be given, you know, across in breast milk. I just mean, you know—

Justin: The nutrient composition—

Sydnee: Yes, that was obviously— there's a reason we do not advise giving a newborn straight up cow's milk, right? There are reasons for that. This is what they were seeing.

Um, so in 1838, Johann Franz Simon published what was, like, the first chemical makeup comparison of human milk and cow's milk, right? Where we first finally look at the two substances and say, "Ohh. Okay. These are the differences between them."

Because once we found the differences, then you could start trying to fix the cow's milk, so it's more like the human's milk.

Justin: Mm-hmm.

Sydnee: Right? Um, so they— the biggest difference that they found is that cow's milk generally is higher in protein and lower in carbohydrates.

Justin: Oh, okay. So it wouldn't be as, uh, sweet.

Sydnee: Yes, but also, like, there's stuff you need there— like, you need the carbohydrates.

Justin: Yeah.

Sydnee: Yeah. And the— our— especially little newborn baby bodies weren't always necessarily as good at breaking down all that protein.

Justin: Hmm, hmm.

Sydnee: And they needed more carbohydrate. There's also, like, some differences with fats that we would later discover, and—

Justin: We evolved specifically for this to be a good food for babies.

Sydnee: Yes.

Justin: Right.

Sydnee: Yes. Well, that's— I mean, I think that's the thing to remember. And that's true for—

Justin: [simultaneously] It's a one-to-one— it's a one-to-one.

Sydnee: [laughs] For every, like, mammal pairing. Like, cow's milk is specifically what baby cows need. You know, human milk has evolved to be what baby humans need.

Justin: Although you can probably find some great TikToks of baby cows trying to, uh, feed off of, like, mama bears? I— I bet that that is not a common occurrence in nature.

Sydnee: Uh... I don't know. I think that there are, like— animals, like, cross-nursing each other. I feel like I've seen videos of that.

Justin: I did just say. [through laughter] I'm sure there's TikToks of that.

Sydnee: Oh. Oh. Well, yeah. Yeah, I think that does happen.

Justin: Yeah. Like, cute animal friends that shouldn't be friends. Like when a— you see, like, a cheetah, and he's got a little monkey friend and they're, like, best friends? I love that.

Sydnee: And that might work, like, for a little nip. Like a little...

Justin: [smacks lips]

Sydnee: Yeah, just a little... a little snack.

Justin: We can have a little nip of— we can have a little nip of cow's milk from time to time.

Sydnee: Just a little— yeah, as, like, a snack. But like, just not all the time. Um, so this led to the conclusion that, okay. We can fix cow's milk if we add cream, sugar, and water.

Justin: I'm getting hungry over here, now. This sounds good.

Sydnee: We're gonna dilute it, and then we're gonna throw in some cream and some sugar, some sweet and some fat, and we're gonna fix the cow's milk, right? It's gonna be more like human's milk.

Um, but it was very unscientific. It was just like, "Add it in there."

Justin: To taste, probably. I mean... yeah.

Sydnee: Probably, yeah. And so—

Justin: —analyze the chemical composition, they could probably reverse engineer something approximating a recipe, right?

Sydnee: Well... somebody did that. [laughs]

Justin: Oh, okay, good!

Sydnee: So— so that fell to Justus von Liebig, who was a German chemist who had devoted his whole career to understanding nutrition, and specifically fighting hunger. I think it's kind of interesting, uh, just as a little bit of a backstory, why von Liebig was so— like, why he was devoted to this. Why was he drive to this, specifically? Um, in 1815, okay? So we're going back a little bit.

Mount Tambora on the island called, uh, Sumbawa in what is now Indonesia— it wasn't Indonesia at the time, it is now Indonesia— erupted. So there was this big volcano that erupted, okay?

Justin: Mm-hmm.

Sydnee: It was the most powerful volcanic eruption in human history. [pause] Have you heard of this?

Justin: No. Never have.

Sydnee: Okay.

Justin: Hm.

Sydnee: So because of this gigantic volcanic eruption in 1815, like, the big column of ash that this produced... like, blocked the sun. And lowered the global

temperatures to the point that 1816, the following year, became known as the year without a summer.

Justin: Oh my gosh.

Sydnee: Yes.

Justin: On Earth?

Sydnee: Yes.

Justin: Wow.

Sydnee: This was mainly a European concept, but yes, it would've affected global— affected temperatures all over the Earth.

Justin: That's wild.

Sydnee: But— so anyway, because it was the year without a summer— I mean, and not literally. Like, it was probably warmer, but not normal temperatures. Because of this, crops failed.

Justin: Aw, man.

Sydnee: So there was no food.

Justin: Ugh.

Sydnee: So, mass starvation, right? So, in this summer, when there was no summer, and people were starving, and a 13-year-old Justus was seeing this happen around him. He lived in Germany, and he's seeing all these people have to eat rats, because there was no food. They couldn't grow anything. Um, this is what— I mean, we can assume, we think—

Justin: Something like that'll get to you.

Sydnee: Yeah. And it inspired his journey in life to study nutrition, to understand fighting hunger, to understand feeding people. Um, and create what was the first baby formula.

Justin: Hm.

Sydnee: Which is pretty cool.

Justin: I think it's cool.

Sydnee: Because again, there was no perfect alternative to breast milk at the time. And so babies that were being fed anything other than breast milk were being fed something nutritionally inferior, perhaps dangerous for them. So he invented Liebig's Soluble Infant Food.

Justin: Not...

Sydnee: [laughs]

Justin: ... I... probably a super science genius. Again, you gotta get marketers in here.

Sydnee: Well...

Justin: Baby juice!

Sydnee: And see, here's the problem. So he comes up with the first baby formula. It's a powdered formula, okay? It's got some cow— a mixture of some cow's milk, some wheat flour, some malt flour, potassium bicarbonate—

Justin: It would something sel— shelf stable, I would imagine. That would be important in this time period.

Sydnee: Yes. And so he makes this. He makes these cans of this Liebig's Soluble Infant Food. Sold it for— well, bottles. Sold it for a dollar a bottle in 1869 is when it went on the market for a dollar a bottle.

Justin: A dollar a bottle?

Sydnee: Yeah.

Justin: In 1869.

Sydnee: Yep!

Justin: Hold on a second. I'm gonna do a conversion. You keep talking.

Sydnee: Okay. Well, Justin...

Justin: Yes?

Sydnee: While you... [laughs] do some math...

Justin: Okay.

Sydnee: I'm gonna head to the billing department.

Justin: Oh, that's perfect timing! This has never worked out before. Okay, let's go!

Sydnee: [laughs]

[ad break]

[music plays]

Graham: Hi! My name is Graham Clark, and I'm one half of the podcast *Stop Podcasting Yourself*, a show that we've recorded for many, many years and, uh, at the moment, instead of being in person, we're recording remotely. And, uh, you wouldn't even notice. You don't even notice the lag.

[extended pause]

Dave: That's right, Graham! And, uh, the great thing about this—

Graham: The—

[pause]

Dave: Go ahead?

Graham: No, you go ahead.

Dave: Okay, and—

Graham: [simultaneously] Okay, go ahead?

[pause]

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Justin: Alright, Syd. So that bottle of... Liebsig's Super... Baby... uh, Instant Soluble Baby Food...

Sydnee: Mm-hmm.

Justin: What-have-you, for one dollar in 1869 would be \$21.26 today.

Sydnee: So, expensive.

Justin: Expensive. Pricey.

Sydnee: Expensive stuff.

Justin: Pricey.

Sydnee: Yeah. I mean, it was hard to formulate, and it was expensive. Um, so he starts selling it. He's the first, but what happens? The big companies?

Justin: Swoop in.

Sydnee: They swoop in. First of all, Nestle's. Nestle's comes in first and they make something similar, a powdered infant formula. And all of these have sort of, like, similar ingredients, slightly different amounts maybe of different things but, like, generally these are the same ideas.

Um, but this one has two key advantages. Nestle's has two key advantages that out compete Liebig's. First, the Liebig formula was made to be reconstituted in warm cow's milk, so you still had to have milk, right?

Justin: Okay, right.

Sydnee: Which, I mean, I guess if you had a cow that's all great. But if you don't have a cow, you still gotta buy milk. Um, and you're already paying, whatever, 21 bucks a bottle.

Uh, secondly— and Nestle's you just had to add water, so that's easier. Um, and secondly, Nestle's was half the price, 50 cents a bottle.

Justin: That is a steal. I mean, compared to...

Sydnee: So, Nestle's comes on the market. And that was not the only— the only one who would sort of knock off this idea. By 1900, you could get, like, eight different infant formulas from the Sears catalog.

Justin: Hm.

Sydnee: And all similar kind of approaches. Um, and with varying costs, all between 50 cents and a dollar for a bottle, somewhere in there, with different advantages and things touted by each of the different manufacturers. But the problem, as you're probably already guessing, is that this is still expensive! This is still very expensive.

And if you are trying to raise a family, and for whatever reason you're in a position where breast milk isn't an option, this is prohibitively expensive for most people. So they're still just gonna turn to cow's milk, because it's what they— it would be the same thing our parents would say today, right? Good enough for me!

Justin: Yeah, right.

Sydnee: Good enough for you, as a kid! And they couldn't afford the alternative!

Justin: Yeah.

Sydnee: So they would've just done that. Um, now at this point, doctors also wanted to get in on the act, 'cause they're looking at all this and they're like, "Well, we're experts in what humans need. We're doctors. Like, why aren't we the ones coming up with these ideas?"

So they kind of came up with, through some research, like, a compounded formula. Like, their own sort of recipe for you to use. Like, okay, you can't buy these formulas because they're expensive, right?

Justin: Right.

Sydnee: And you're not breastfeeding. So the big idea for them is you gotta dilute the protein. There's too much protein. We need to dilute it. So you take the cow's milk, you add some water, um, and then you put in— and they had exact amounts of cream and sugar, and then you could either take this order to a pharmacy and they would compound it for you, just like they would, like, a medication, they would compound infant formula for you.

Justin: Okay.

Sydnee: Or you could take the recipe home and try to do it yourself at home. Either way. And it could also account for, with this sort of method of, like, the doctor giving you a recipe for your formula, you could also account for changes.

Like, once pasteurization became widely accepted, they began to analyze pasteurized milk, and they found that it was lower in levels of Vitamin D and C after it was pasteurized. Now, you still need to pasteurize it so you don't die of bacteria that could be in the raw milk, which is why you should not drink raw milk. [laughs quietly]

Justin: Again.

Sydnee: Again. I think we've already done that episode, but just... saying it again.

Justin: Some of you are still drinking raw milk, so...

Sydnee: Pasteurization was necessary, but you did need to supplement with Vitamin D and C, so you could throw some of that in there by way of orange juice and cod liver oil. So some of the— some of the doctors' formulas got even more, you know, fancy. Like, you need some milk, you need some water, you need some cream, you need some sugar, you need some cod liver oil, you need some orange juice.

Justin: Now with a great orange flavor kids go crazy for. This is how Sunny D was invented.

Sydnee: Um, and this would be altered even further within, like, this same time period. First condensed milk was invented, which had a ton of sugar in it, right? It's delicious. It's yummy. They figured out pretty quickly, like, there is no way this is good for babies. That had to have been a moment of like, "Oh, it's more concentrated! Is this— no, this can't be right. [laughs quietly] There's no way this is what we're supposed to feed babies. It's too delicious." [laughs]

Justin: [laughs] The babies are like, "Ohh, yeah, okay!"

Sydnee: "Heck yeah!"

Justin: "Hey!"

Sydnee: "Some Eagle brand? Yes!"

Justin: "You know, I was all stressed out about our mortality rate right now, but I'm feelin' pretty good! I'm ready to go!"

Sydnee: Uh, you want carbs; not *that* many carbs. So, um, evaporated milk seemed to be a better option because you didn't add in all that sugar, right? But you're still, like, concentrating the milk, and it was more easily digestible, what you end up with when you go through the process of evaporating milk.

Um, so you could use this to make a compounded infant formula that would become, like, the mainstay of infant nutrition for decades.

Justin: Hm.

Sydnee: There was this formula that your doctor would tell you, like you take 13 ounces of evaporated milk, you put in 19 ounces of water, and then 2 tablespoons of either corn syrup or table sugar. Oh, and you would throw in, like, a vitamin and an iron supplement, too.

Justin: Is this how— is this how we got to the nomenclature of "formula"? This, like... like, why it's called that? Because—

Sydnee: Yes.

Justin: —there was so much of this, like, ingredient blending that got to, like, something that you would wanna give your kid.

Sydnee: Yes. 'Cause that's exactly what they're trying— so, I mean, they are starting with the natural product, human breast milk, and attempting to devise a chemical formula that will recreate it in a lab. I mean, that is basically what they're trying to do. And they're usually using cow's milk as a base because it's a good jumping off point, right?

Justin: Right.

Sydnee: Okay. So, throughout the early 1900's, while this is happening, while people are making their evaporated milk formulas— which were, again, like, the mainstay. For a very long time, the majority of infants were getting this evaporated milk formula, especially as breastfeeding went out of fashion eventually.

Um, but scientists and physicians were still working on, like, something that would be— that would come in a can or a bottle or whatever and be perfect. Like, not something you'd have to make at home. You could just sell it.

Justin: Yeah.

Sydnee: So they were still working on something like that. Um, and you see this introduced throughout this whole time period. Like, it wasn't like as soon as it came to market everybody switched to it. So, like, in 1926, the first Similac was developed.

Justin: Hm.

Sydnee: Um, which is the word Similac, similar to lactation.

Justin: Lactation.

Sydnee: Yeah. So, Similac was first introduced in 1926, and there were other formulas that were introduced throughout, like, the 30's and 40's. There was— Enfamil would come up, and then Nutramigen. These are things that are still—

Justin: [wheeze-laughs] The brand was Nutramigen?!

Sydnee: Yeah, this is still a brand!

Justin: "Baby loves his Nutramige—" [wheeze-laughs]

Sydnee: There's another one called Alimentum. Like, these are still formulas today. And they sound very scientific, because this was the poi— this was the selling point.

Justin: Right.

Sydnee: They are scientific.

Justin: Right.

Sydnee: But the thing is, like, even as these were introduced at the time, nobody was buying them, 'cause it was still super expensive, and why would I bother? I could make— I've got evaporated milk. I've got cream and sugar. Like, I got this stuff at home. Why would I mess with this?

Justin: Yeah.

Sydnee: Um, and it really wasn't until the 50's when people started slowly, you know, switching from these ratio-based homemade formulas that they were told to use by their doctors to something that was seen as scientifically superior, medically superior, physician-recommended. And it took doctors a while to switch to recommending them too, but eventually they did, because the science was on the side of these formulas. These are better.

Justin: Yeah.

Sydnee: Um, so if they sound really scientific, that was part of the marketing. It is. This is to build a better baby. Um—

Justin: [laughs]

Sydnee: Well, and it worked so well that, like, there was this peak in the 60's and 70's when breastfeeding rates were, like, 25% of the public or something, but it was because this is scientifically proven to feed your baby. I can't say that about your breast milk. That's just comin' out of your boob! This is science!

Justin: It's like Brawndo for babies. It's got what babies crave.

Sydnee: It was— it was seen as like, this is the better thing. 'Cause, like, doctors and scientists spent years— I mean, decades trying to make this. They went through hundreds of different formulations to come up with exactly the nutrition that your baby needs. Um, and so it really rea— like I said, reached a peak in the 60's and the 70's.

The American Academy of Pediatrics set standards for, like, the vitamins and mineral levels in the formula so that, you know, things would— you could make sure that things were coming out right. Um, and the formula industry at this point also started distributing those little prefilled bottles. You know, like you can get in the hospital?

Justin: Yeah.

Sydnee: And that was a huge selling point. Because here you've just had a baby. You're— you know, you're stressed out. You're trying to get the baby to eat, and they can just hand you this prefilled, like, "Here it is. Just take it. It's ready. It's ready to go. Here's one thing you don't have to think about, you don't have to stress about. Here's the food."

Um, and so that really made uptick of those formulas go through the roof, you know? Because that's so much easier than having to mix something up in your kitchen at home. Um, there were a couple of cases of, like, inappropriately mixed formula in terms of, like, diluting, and the electrolyte levels and stuff in the late 70's, which led to some babies having low sodium levels and being hospitalized.

And because of that, in 1980 they passed the Infant Formula Act, which sort of codified the standards for formula, and the standards for, like, testing and, like, the process of making the formula and making sure that, like, these companies that are going to do this are going to go through pretty rigorous processes to make sure that what they're sending into your home or your hospital room...

Justin: Kind of wild that we weren't doing that already, in a sense, I guess? Maybe?

Sydnee: Well, I mean, that's the whole history of medicine though, right? Like, we start doing things and then somebody goes, "That... seems like something we should regulate, right? Like, why are we just letting people do that?" Um, so now we have formulas with cow's milk, with soy milk. We got, you know, higher calorie ones for neonates. We've got, like I said, elemental things that are easier to digest, you know, for— for a variety of reasons. We have all kinds of different formulas.

Justin: Decaf.

Sydnee: [laughs]

Justin: Finally.

Sydnee: Hopefully they're all decaf.

Justin: I don't know what took so long.

Sydnee: Um, and a lot of 'em, too, like, the idea now is that you shouldn't have to supplement with, like, a Vitamin D or with an iron or anything. Like, it's all in there.

Justin: It's in there.

Sydnee: Right. Um, so why— what is happening now with formula? So that's where we are.

Justin: I don't know.

Sydnee: We have— we have formula, which is an excellent alternative to breast milk, um, which gives your baby the nutrition it needs to be great at basketball or whatever. [laughs]

Justin: [laughs] I'm just—

Sydnee: Whatever you want your baby to do.

Justin: Yeah, run for office, uh...

Sydnee: Whatever—[laughs] whatever you want your baby to do.

Justin: Climb Mount Everest. Just all your baby dreams can be realized through this great formula.

Sydnee: Yeah, exactly. We've come a long way with that, and that's great, um, except from November of last year to February of this year they found four cases of newborns becoming quite sick with something called Cronobacter, uh, sakazaki— sakazakii. Sakazakii.

And in most adults and older kids, this specific bacteria is not particularly harmful, but in newborns, the elderly, the immunocompromised, you know, people who are more vulnerable to these types of bacteria, um, it can lead to life threatening infections, things like meningitis, brain abscesses, and in fact two of this children did succumb—

Justin: Ugh.

Sydnee: —to this infection. Um, so the concern became, after it was isolated, that this was the bacteria responsible. Where did this come from? And this can grow in formula. Like, this is known to be something that can contaminate infant formula if the appropriate processes aren't being done and the checks aren't happening, and all that kind of thing.

Um, and so because there were these four cases, it led to this huge recall out of concern that what if it is in the formula? Um, all of the affected products. And then one of the plants— it was an Abbott Laboratories plant— was actually closed down as a result of this.

And I will say, um, for what it's worth, they never did— they weren't able to isolate it in the factory and prove definitively where it came from. But there was enough in common— I mean, it's a better safe than sorry, right? Like, if— I mean, it's life threatening so, you know.

Justin: Yeah. Had to.

Sydnee: So they shut down the plant, and this dramatically reduced our stores of formula in the United States.

Justin: Of course, yeah.

Sydnee: Um, because there are only four manufacturers in the US. The vast majority— like, 95% of formula— is domestically produced. We do not import very much formula at all, um, because we have really high import tariffs.

So in order to encourage people to buy American and to allow our American factories to succeed, we don't import formula. This is sort of a big sticking point politically for a lot of people, because in Canada there is a— there's a booming formula industry.

Um, maybe related to all the dairy there, I don't know. But there's a lot of formula. Um, and we could, if we were going to take imports— well, we could take imports from Canada, they're just really expensive. But we do have the ability to have the FDA inspect their factories and, like, it's not necessarily unsafe.

Justin: Yeah.

Sydnee: It's just expensive.

Justin: Yeah.

Sydnee: So we don't.

Justin: Yes.

Sydnee: Um, so it's not really to main— I mean, that would be the line, right? "We don't import formula to maintain safety standards." Well, that's not entirely true. It's really about making sure American manufacturers can sell their product.

Justin: Right. It seems weird they can't do, like, an emergency action to, like, [quietly] lift those tariffs to get some... baby formula out there.

Sydnee: Mm-hmm, yeah. It almost seems like you could.

Justin: Hmm, weird.

Sydnee: Uh, and the other thing is that things get even more complicated with the WIC program, the Women Infants and Children program, which ensures that everybody can feed their children; which is wonderful, obviously. We should have the ability that if you can't afford formula, it should be provided free to you, and to your child, because... I don't know. Human decency.

Um, but it gets complicated because each state awards the WIC contract exclusively to one formula manufacturer, which gives them a lot more shelf space in all the grocery stores in that state. I mean, other formulas can be in the state, but WIC mu— like, your WIC certificate only buys that brand, right? And so if that brand then gets a recall, everybody who uses WIC in that state is in a— is in bad shape, right?

Justin: Sure, of course, yeah.

Sydnee: And so, like, this is— this can be disastrous. So now we have a formula shortage. Um, and there are things they can do, like— this is really important if you do have WIC. A lot of people, if they've found that they— and you can still check. I mean, I think the investigation is over at this point, but you can still go to the CDC website, um, and they have an entire section on this outbreak, and they tell you, like, you can go to the Abbott Nutrition website to find out if your product was one of the ones that was recalled. At this point, it is unlikely you have this.

Um, but you can still go check that if it's something that you're concerned, 'cause they were specific types of Similac, and Alimentum, and EleCare, were the recalls. And they have all the numbers and everything that you can check. Um, but if you did have— if you get your formula through WIC program, they were really— they wanted you to know, don't throw it away, because you can take it back and get something else. Like, you can exchange it, basically.

Um, and if you— if you throw it away it would be harder to prove, like, "I already used my WIC to get— you know, I need something else." And so that was part of

it too, and a lot of states have already done that. I know West Virginia did allow you to get whatever with your WIC, you know, uh, funding, so that that way you're not, like, tied into, "The only thing I can get is this, and they're out of it." You can get anything.

Um, but even with those sorts of things, it's a huge problem. [sighs]

Justin: Of course, yeah.

Sydnee: Um, the factory I think will reopen shortly, or already has, or, like, production should be restarting, because the investigation has ended and they feel like there's no longer a threat of new cases. Um, and they haven't found any since those four. Uh, but... we're still where we are. Obviously don't hoard formula. I can't imagine any of our listeners would be the people doing that.

Justin: Probably not. That would be wild.

Sydnee: There are people doing that, reselling formula for money, for an upcharge.

Justin: Come on.

Sydnee: I can't fathom anybody who listens to our show would do that.

Justin: Yeah.

Sydnee: But, um... uh, and then the other thing that has come from this are people saying, like, here are ways to make your own formula, and I know you had asked me about one with, like, fruit and milk or something.

Justin: For older— it was for older kid— like—

Sydnee: So, the idea of making your own baby food and things like that for over six months old... I mean, there are lots of options for that, right?

Justin: This is what I'm— yes, this is what they were talking about in the news, making a blend of, like... I don't know. I don't— I don't even do— I— I'm not

[wheezes] giving medical advice here, so I'm not gonna sit around and tell you, but... for— for six months plus.

Sydnee: I mean, this is the tough— this is the tough situation. There is— as we've just charted the history of the development of formula, the point of it is, there just isn't anything that's like formula. Formula's formula. Again, there's a reason we don't just use cow's milk. It's not the same.

Justin: Couldn't you do the evaporated milk thing? Like, is that a recipe that people...

Sydnee: Well, I wouldn't, because again it was never proven... equal to formula. I mean, so... I wouldn't recommend any of these— and certainly what— like, something that you're getting from, like, a YouTube video or a TikTok or something like that. I would not recommend trying any of these homemade formulas, 'cause again, like, the... how can you use sterile technique at home to make these sorts of formulas?

How can you— not— eh, which I will say, formula isn't technically sterile to begin with, but still. Like, there's a lot of room for dangerous things, for wrong proportions, for something to go wrong, and you would inadvertently harm an infant, and obviously nobody wants to do that.

Um, if— they did have a big section on the CDC website with the advice of how to deal with this that if you have a child who's supposed to be on specific formulas for perhaps, like, medical conditions, underlying issues, things like that, please talk to your doctor immediately if you think you're not gonna be able to get those products, um, because there was this discussion of, like, risk-benefit ratios and... maybe there are certain things you shouldn't throw away.

So, like, please, if you have questions like that, you should be reaching out to your child's doctor or to your... if you're the guardian, you know, to the child's doctor, um, to discuss with them what the best move is.

Um, but I do not advise making...

Justin: There could be—

Sydnee: ... your own formula.

Justin: —anything— there could be an allergic reaction.

Sydnee: Yes.

Justin: Like, that is a possibility. Contaminants. I mean, who knows?

Sydnee: And again, there— like, a lot of the babies that we talked about that were dehydrated, because they were getting the wrong proportions of sugars and fats and— and proteins, and all those different things, and liquid content, and all of that. Again, it's scientific, it's formula, it's made to be the perfect food for your baby, just like breast milk is. And—

Justin: I've been seeing a recipe card from, like, the 50's circulating, um, from this, like... of— of evaporated milk formula recipes that people have been sharing around, so.

Sydnee: But it's hard, because— I understand, again, it's sort of like what we were talking about. I understand this sort of argument. Like, "Well, it was good enough for me," or "It was good enough for my kid," or whatever. But, like... being from the generation where, on long car trips I was just sort of allowed to roll around in the backseat of the car unrestrained—

Justin: [laughs]

Sydnee: —because it would be hard for a kid to be in a seat belt that long... like, yes, I'm fine. Thank goodness. I'm still here. I would never recommend that to any, you know, parent or guardian today. I would always encourage you to use appropriate car seats, safety seats, booster seats, seat belts, depending on the age and weight of your child. I would never, ever encourage that, even though yes, it was— I did survive that. [laughs quietly]

Justin: Yes.

Sydnee: Um, we grow and we learn, and we had made mistakes in the past, and we learn from those mistakes, and we don't repeat them. And we should not— this is not the best thing. Um, and I know that that doesn't give you, like, a

definitive answer as to what to do, but I do think that it's important not to do something harmful.

Justin: Mm-hmm.

Sydnee: Um, and then of course just as, like, a final word, there are donors of breast milk that you can find sometimes. Sometimes it's free. Sometimes you gotta pay, and it's expensive to pay for breast milk. It really i— I mean, as expensive as it was back in the day to buy formula.

Justin: Take it from me, I've been trying to kick the habit for years.

Sydnee: [laughs quietly]

Justin: Um, I'm going broke on this stuff, but I just love it.

Sydnee: But, um— and, I mean, if you can find, like, a safe donor source, that's fantastic. Not everybody can, and certainly not everybody can, or wants to, or chooses to for whatever reason, breastfeed. And so to just simply suggest—

Justin: [sighs] This— this— can I talk—

Sydnee: —to parents and guardians that the solution is breastfeeding, just breastfeeding—

Justin: Can I vent about that? It makes me so mad. But, like... [quietly] who was it? Some celebri— I think Bette Midler maybe stepped up to the speaker and was like, [normal volume] "Try breastfeeding!" And it's like... it— it's so infuriating that we have this society that has... worked against breastfeeding, like actively, in a culture, I would say, in a society that has discouraged breastfeeding for so long. And then it's like, "Wait! Why isn't everybody just breastfeeding?"

'Cause it's like— it's not just flipping a swi— like, it would be akin to if there was a... a food shortage and everyone was like, "Just eat the stuff in your garden!"

Sydnee: Yeah.

Justin: It's like, well, not everybody has a garden! Like, we— we've moved away from that!

Sydnee: Yeah. Just go kill one of your chickens.

Justin: Yes, just go—

Sydnee: That you have.

Justin: —why don't you kill a chicken that you have? Like, we don't— we haven't encouraged a culture of breastfeeding for decades. Like, why would you— what— people don't understand. It's not like you can just... pop out a boob and go to town. Like...

Sydnee: No. It is— it is a—

Justin: It's not like these stupid people— stupid people are like, "Well, I've gotta feed my baby somehow. I've got delicious milk coming out of my chest. Why did that never occur to me?"

Like, there— there— if a baby stops nursing it can be hard to get them. Some babies never get into it!

Sydnee: Mm-hmm.

Justin: Some babies just don't!

Sydnee: Some parents choose not to breastfeed. Some parents, uh, try and just are unable to for a variety of reasons.

Justin: We also don't have the resources to help people, like, to— to— to support people who are attempting to breastfeed.

Sydnee: Well, we don't give paid family leave. We don't make it easy to leave work, to have a flexible schedule, to feed your child or to pump or to do any of those things. We have no support for people who choose to breastfeed already. And so then to just suggest that, like, if you're not already doing it and you don't— and you're not lactating, to just *induce* lactation... it also assumes that

there is a person who can lactate taking care of every infant, which is not true. It's ridiculous.

Justin: It's infuriating.

Sydnee: Um, that is obviously not going to be a solution for the vast, vast, vast majority of people. And I say this as somebody who— I loved my breastfeeding experience. I was very grateful for it, and I encourage people who ask me, "I would like help with breastfeeding," I encourage them to do so, because I got a lot of joy from the experience.

That doesn't mean that everybody needs to, has to, should, wants to... it's not— I mean, the thing about formula that has been wonderful is that formula, one, provides nutrition for babies who need it, period. Which is the most important function of formula. Um, but beyond that, it also is key to allowing people who lactate to make that choice. Like, to make the choice to breastfeed or not. Or if you can't, that's— you know, either way, whatever your reasons are.

And also, to leave the house? To...

Justin: Go other places.

Sydnee: ... to go other places? To work, to have a job? To— there's all kinds of things that formula allows— to sleep at night so that, you know, perhaps your partner can take a feeding? Um, or again, just to supplement feeding or replace breast milk if that's not— that's not the best option for you and your baby.

Justin: What we're saying is that this is an incredibly complex issue, and if you don't understand it, you should probably shut up! [wheezes] Like, you should probably not start talking about it.

Sydnee: It's the kind of thing that you certainly can't fix or explain... with a tweet. Hopefully we know that.

Justin: *Bette!* [wheezes]

Sydnee: Um... my hope is that production is gonna ramp back up and, I mean, maybe we need to reevaluate— well, first of all we could— we... we can turn

factories into whatever we want them to, right? Don't we have a defense production act? Can't we just say, like, "Make breast mi—" er, "Make formula now"? "Everybody make formula. This is a— this is an emergency! We need to feed infants! I don't know what's a bigger emergency. Feed infants! So... do that." And— in formula. Whatever we need to do to get safe formula to infants, let's do it.

Justin: Let's do it. Hang in there, folks. That's a stressful... if you're experiencing this and you're hit by this, I... [sighs] hang in there.

Sydnee: I know. I wish I had a great alternative to tell you, but... [sighs] I don't know what it is, and I think right now trying to make your own DIY formula at home could be very dangerous.

Justin: Yeah. Um, thank you so much for listening to our podcast, *Sawbones*. Thanks to The Taxpayers for the use of their song, "Medicines," as the intro and outro of our program. Thanks to everybody who supported us in the Maximum Fun Drive.

Sydnee: Yes, thank you.

Justin: We're so sorry that we did not have a new episode for you last Tuesday, but it was exciting nonetheless, because Dr. Sydnee Smirl McElroy did win her battle for the, uh, Democratic nominee for the West Virginia House of Delegates, 26th District, so we're very proud of her, here at *Sawbones* HQ.

Sydnee: Thank you. Thank you to everybody who supported me, and...

Justin: Now the real work begi—

Sydnee: [simultaneously] ... who voted for me.

Justin: Go ahead, Syd. Now the real work—

Sydnee: [simultaneously] And volunteered.

Justin: —begins.

Sydnee: [laughs]

Justin: We're accepting donations now, at—

Sydnee: No, no, don't say that.

[clattering]

Justin: I just threw a dice across the room. I didn't mean to. [through laughter]
Thanks for listening to *Sawbones*. Uh, until next time, my name is Justin McElroy.

Sydnee: I'm Sydnee McElroy.

Justin: And, as always, don't drill a hole in your head.

[theme music plays]

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