

**Brains On (APM) | Brains On! Salty snack science: Popcorn, nachos and the origins of salt
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CAITLIN: You're listening to *BrainsOn* where we're serious about being curious.

SPEAKER 1: *Brains On* is supported in part by a grant from the National Science Foundation.

CAITLIN: OK. Ready to do this, Molly?

MOLLY BLOOM: Sure. Where's my script?

CAITLIN: It's right in front of you.

MOLLY BLOOM: Oh yeah. OK. Ugh. Why is this font so tiny? Who printed this?

CAITLIN: Um, you did.

MOLLY BLOOM: Ugh. Does my microphone sound weird to you?

CAITLIN: No. I think--

MOLLY BLOOM: Hello? Hello? Bouncing baby, buggy bumpers, bouncy baby, buggy--

CAITLIN: Molly, it sounds fine.

MOLLY BLOOM: Ugh. My headphones are so tight. They're crushing my skull.

CAITLIN: What's going on with you, Molly?

MOLLY BLOOM: Why does any of this-- It's like a medieval torture device. All I can hear is the sound of my head being smushed and my stomach growling. Ugh, so terrible.

CAITLIN: Oh, I see what's going on here. Molly, you're hangry.

MOLLY BLOOM: Hangry?

CAITLIN: You know, so hungry it makes you angry, hangry. That's why your stomach is growling. Here, have some of this popcorn I keep in my backpack for pop-mergencies.

MOLLY BLOOM: What's a pop-mergency?

CAITLIN: This is a pop-mergency. You're about to go full Incredible Hulk right here in the studio.

MOLLY BLOOM: Fine. I'll eat some of your popcorn. [CRUNCH] Mm! You know, I do feel better. Thank you. Well, now we can get the show going.

CAITLIN: Another day saved by popcorn!

[HORNS]

Hey, Molly. Stop hogging my stash. I want some too.

[CRUNCH]

MOLLY BLOOM: Sorry.

[THEME MUSIC]

OK. We got to put this popcorn aside. [CLEARS THROAT] You are listening to-- oh, man. Hold on. There's a kernel stuck in my teeth. All right. Whatever. You are listening to *Brains On*. I'm Molly Bloom. And my popcorn-packing partner is Caitlin from Yakima, Washington. Hey, girl.

CAITLIN: Hey!

MOLLY BLOOM: Today, snack attack. We're talking salty, savory, sometimes sweet mini meals.

CAITLIN: Like pretzels.

MOLLY BLOOM: Or trail mix.

CAITLIN: Or pizza bagels.

MOLLY BLOOM: But not soup.

CAITLIN: Yeah, not soup. That's more of a meal or an appetizer.

MOLLY BLOOM: Definitely not a snack. So Caitlin, you inspired today's episode when you asked us--

CAITLIN: What actually happens when I pop popcorn?

MOLLY BLOOM: This is something a few of you are curious about.

SIMON 1: I want to know why corn pops and turns into popcorn.

SIMON 2: How does a little kernel turn into those puffy white things that we refer to as popcorn?

[MUSIC PLAYING]

MOLLY BLOOM: That's Simon from Boston and also Simon from Bothell, Washington. These are very good questions. And like popcorn, we didn't want to hog them all for ourselves. So we asked a friend to help out.

FLORA Hey, it's me. I'm the friend.

LICHTMAN:

MOLLY BLOOM: Hi, Flora.

CAITLIN: Hi!

FLORA Hey, Molly. Hey, Caitlin.

LICHTMAN:

MOLLY BLOOM: Flora Lichtman hosts a charming little podcast called *Every Little Thing*. Flora, how do you describe the show?

FLORA Our podcast is a show where listeners call in with excellent questions like, how old is Winnie the Pooh? Did

LICHTMAN: pirates really have hooks and peg legs? What happens to your body in space? And then we tracked down experts to find an answer.

MOLLY BLOOM: I want to know all those answers. You must find them right now.

FLORA [CHUCKLES] You can, wherever you get your podcasts.

LICHTMAN:

MOLLY BLOOM: [LAUGHS] Perfect. So, Flora, let's chat snacks real quick. If you could have an infinite supply of one snack, what would it be?

FLORA I'm going to go with an underdog. I think it would be corn nuts.

LICHTMAN:

MOLLY BLOOM: Why corn nuts?

FLORA Well, they're salty, they're crispy. I feel like they have a lot going for them.

LICHTMAN:

MOLLY BLOOM: What about you, Caitlin? Is there a snack you would like an endless supply of?

CAITLIN: Well, maybe apples with caramel. Apples are delicious and healthy. And caramel adds extra tastiness.

MOLLY BLOOM: Very good choice. You guys both listed things that I feel like gets stuck in my teeth. I think I need an endless supply of-- I really like string cheese. I just really love string cheese. Is there a snack that you guys think is overrated?

CAITLIN: Um, for me, probably Doritos and other chips like that because some people are just crazy about them, but I don't see what the big deal is.

MOLLY BLOOM: Yeah, it's really annoying how the powder gets all over your hands, and you feel like you need to wash your hands when you're done eating them.

CAITLIN: Usually, I lick them.

[BOTH LAUGH]

MOLLY BLOOM: That's a very good solution too. So what is better, constant snacking or eating a full satisfying meal?

CAITLIN: Well, probably a meal because it's more satisfying and you have a chance to be hungry beforehand. And it includes hamburgers.

MOLLY BLOOM: [LAUGHS] You're not going to eat a hamburger as a snack, probably.

FLORA I'm in the other camp. I would go constant snacking. I like to be eating 24/7. I would eat in my sleep if I could.

LICHTMAN:

MOLLY BLOOM: [LAUGHS] Well, these are very good answers. So, Flora, you have offered to help us answer Caitlin's popcorn question on your show.

FLORA Yes! Caitlin, I love your question so much because it was about this everyday thing in my life that I had never

LICHTMAN: thought to wonder about. So thank you for the excellent question.

CAITLIN: You're welcome.

FLORA To find an answer, we took Caitlin's question and then shared it with some scientists.

LICHTMAN:

CAITLIN: Um, popcorn, why is it so big and white and fluffy inside a tiny little kernel?

ALEX: It's a great question.

EMMANUEL: Yeah, wonderful question.

CAITLIN: Thank you. [GIGGLES]

FLORA That's Alex and Emmanuel. They're going to help answer this question.

LICHTMAN:

ALEX: We are physicists interested in everyday life objects.

FLORA So, Caitlin, what interests you about this?

LICHTMAN:

CAITLIN: I don't know, stuff being like a normal explosion that creates fire and smoke, it creates popcorn.

EMMANUEL: I agree. It's very mysterious. And this explosion is a bit magical.

FLORA Caitlin, you're on to a real mystery.

LICHTMAN:

CAITLIN: Cool.

FLORA Unbelievably, humans didn't understand some of the fundamental mechanics of popcorn-popping until

LICHTMAN: Emmanuel and Alex looked into this a few years ago.

EMMANUEL: I think part of it is because we often assume that familiar objects are well known. And we usually are afraid to ask simple questions like, why do popcorn pop?

FLORA OK, so why does it pop? First thing you need to know is that popcorn is a seed.

LICHTMAN:

ALEX: The seed contains a fair amount of starch and some water.

FLORA And that starch and water is like a snack pack for the baby plant. And it's also very important to why popcorn

LICHTMAN: pops. So, Caitlin, I want you to imagine that you are a microscopic Caitlin, and you're inside the kernel before it pops.

CAITLIN: Um, OK?

FLORA What do you think it would look like all around you?

LICHTMAN:

CAITLIN: Just like marshmallows everywhere and this water.

FLORA Yeah. So what do you think happens to that water when you heat the kernel?

LICHTMAN:

CAITLIN: It starts to boil, and it turns into steam.

FLORA Precisely. And that steam is trapped inside the kernel, but the steam takes up a lot more space than liquid water.

LICHTMAN: So you can imagine what's happening.

CAITLIN: The steam wants to escape.

ALEX: This is what makes the explosion of popcorn is that as you warm it up, you start to build pressure inside. So what happens when you raise the pressure?

CAITLIN: It pops.

EMMANUEL: Exactly.

ALEX: Yes.

EMMANUEL: And it breaks.

CAITLIN: And the starch is like, I'm free!

FLORA That's completely scientifically accurate.

LICHTMAN:

EMMANUEL: When the shell of the popcorn is broken, all those cells can expand.

FLORA The steam that had been trapped pops out the starch as it blows out of the shell.

LICHTMAN:

EMMANUEL: And the starch, it starts to look like a sponge that you may have in the kitchen.

CAITLIN: And it turns out white and fluffy.

FLORA Yes. And that fluffiness explains why popcorn jumps into the air when it pops. That's one of the discoveries that

LICHTMAN: Alex and Emmanuel made in their study a few years ago. They filmed popcorn popping in super slow motion. Do you want to take a look at this video?

CAITLIN: Yeah. Sure.

FLORA Also, if you're following along at home, you can go to elt.show/snackmiracle.

LICHTMAN:

CAITLIN: Wh-- whoa.

FLORA And you can see that just as the kernel splits, that starch, that free starch comes spilling out.

LICHTMAN:

EMMANUEL: Yeah. The starch will create legs. It's propelling the popcorn.

FLORA So the popcorn launches itself with its starchy leg.

LICHTMAN:

CAITLIN: When it pops, it pushes off the ground?

EMMANUEL: Exactly.

FLORA It's like a gymnast.

LICHTMAN:

EMMANUEL: Yeah, yeah, exactly.

FLORA Except you eat it.

LICHTMAN:

EMMANUEL: Yes.

CAITLIN: I can do a flip. Maybe I'll call it the popcorn move instead of a flip.

FLORA I like that. Did we answer your question, Caitlin?

LICHTMAN:

CAITLIN: Yeah. It's a whole new world of popcorn.

FLORA But we're not at the bottom of the popcorn bucket yet.

LICHTMAN:

MOLLY BLOOM: Oh, I cannot wait to hear the rest. But you guys, I think we should take a quick break. Are you up for a mystery sound?

CAITLIN: Yes.

FLORA Yes.

LICHTMAN:

CAITLIN: (WHISPERS) Mystery sound.

MOLLY BLOOM: All right, ears ready. Here it is.

[MYSTERY SOUND]

All right.

CAITLIN: Um, it might-- kind of sounds like a dog eating. Or maybe I kind of heard like a-- at the end, there was kind of a shh, shh, shh. Like, maybe it's like a baby or something. It kind of sounds like a dog eating really fast, someone eating really fast.

MOLLY BLOOM: A dog eating very fast. Maybe there's a baby in the mix. Flora, do you have any guesses?

FLORA I think the dog eating was a good guess. That came to mind. I also wondered if it was a horse running, clumping
LICHTMAN: down cobblestones.

MOLLY BLOOM: Both excellent guesses. Yeah, it's like a very constant, persistent sound. Well, we are going to answer it in just a bit. But for now, let's get back to popcorn. Where were we, Flora?

FLORA So we had just answered Caitlin's question about how popcorn pops. But we had another listener with a different
LICHTMAN: corn question. So we tackled that one too. Take a listen.

[RINGS]

RYAN: Hello?

FLORA This is listener Ryan. He needed to know popcorn's origin story.

LICHTMAN:

RYAN: I mean, I don't even know how you get popcorn.

FLORA Is popcorn a big part of your life, Ryan?

LICHTMAN:

RYAN: It's been a big part of my marriage. We've been married for 15 years now. And when we first moved in together, we started making popcorn pretty much every single night.

FLORA You've been eating popcorn every night for 15 years?

LICHTMAN:

RYAN: Most nights for 15 years.

FLORA OK, so your question is--

LICHTMAN:

RYAN: Where did it come from? How did we discover it? I'm also curious about the history of it.

FLORA Yeah. Who gave us the gift of popcorn?

LICHTMAN:

[LOADING SOUNDS]

To get to the bottom of that, we had to go to the premier repository of popcorn knowledge, a silo of popcorn history.

GALE MARTIN: Well, the popcorn museum was founded around 1982. It's housed in a circus tent.

FLORA That's Gale Martin, director of the Wyandot Popcorn Museum in Marion, Ohio. And there are challenges when you

LICHTMAN: work at an institution dedicated to the preservation of popcorn knowledge.

GALE MARTIN: We have to be really careful. You can't hardly eat popcorn and then handle a historic document.

FLORA And Ryan, where there are historic popcorn documents, there is popcorn history.

LICHTMAN:

[LOADING SOUNDS]

So how long do you think people have been eating popcorn?

RYAN: I'm going to go back at most, like, a hundred years, maybe 80 to 90.

FLORA Do you want to just think about that any longer?

LICHTMAN:

RYAN: I'm going to go with 400 years.

FLORA 400 years?

LICHTMAN:

RYAN: Why not? Is that better?

FLORA OK. Yeah.

LICHTMAN:

GALE MARTIN: Popcorn might be as old as 5,600 years.

RYAN: What?

FLORA Popcorn appears to be a 5,000-year-old snack.

LICHTMAN:

RYAN: Ho-- how did they do-- it was-- ho-- [LAUGHS] How did they figure that out?

FLORA I'm going to tell you. But first, you need to some other corn facts. And I'm just going to go full on nerd with you,

LICHTMAN: OK?

RYAN: You can give it to me. Yeah, let's nerd out on popcorn.

FLORA OK. There are different types of corn. There's animal feed corn, corn for flour, sweet corn, and then there's

LICHTMAN: popcorn corn.

RYAN: Oh, so it's only one type of corn.

FLORA Correct. And then within popcorn, there are varieties with different kernel shapes. So there's mushroom, which is

LICHTMAN: rounded and perfect for caramel corn.

RYAN: I just figured it was rounded off by the caramel.

FLORA No, it was bred for caramel corn. There is also butterfly shape, which has a lot of surface area to soak up butter.

LICHTMAN: And that is the kind you get at the movie theater.

RYAN: Yeah, that's my favorite.

FLORA OK. back to our 5,000-year-old popcorn, the earliest evidence of the popcorn type corn was found in an archaeological site in New Mexico called Bat Cave. And to verify that it was indeed popcorn, the scientists really went the extra mile on this one.

LICHTMAN:

GALE MARTIN: They took a few of the unpopped kernels and dropped them into hot oil to prove they could still pop.

RYAN: Then it popped?

GALE MARTIN: Yes.

RYAN: It popped! [LAUGHS] That just lets me know that I never need to worry about, are these popcorn seeds old?

FLORA OK. Questions?

LICHTMAN:

RYAN: Well, yes. So the first question I had, you said you said Bat Cave. You didn't say Human Cave. How do we know the bats weren't jamming on the popcorn?

GALE MARTIN: Well, they discovered layers of trash, garbage, and all kinds of things.

FLORA So they can tell that the cave was inhabited by humans.

LICHTMAN:

RYAN: But they didn't find that they had popped it.

GALE MARTIN: Well, we don't know how they were popping them.

RYAN: Oh, Gale.

FLORA But listen to this.

LICHTMAN:

GALE MARTIN: In fourth century AD, they found a Zapotec funeral urn in Mexico, and it depicted a maize god with symbols that represented primitive popcorn in his headdress.

FLORA Evidence that they had a popping mechanism.

LICHTMAN:

RYAN: Oh, that's awesome.

FLORA It's clear that this human-popcorn love story goes way back in history. And if you want to hear more about popcorn, like how pilgrims ate it-- hint, think cereal-- or how it got banned from movie theaters, just head to [elt.show](#) or wherever you get your podcasts and look for *Every Little Thing* and the episode called The Corn Identity.

LICHTMAN:

MOLLY BLOOM: And we should warn parents not all episodes of *Every Little Thing* are family-friendly, so check them out before you give it a listen. OK. Before we say goodbye to our pal Flora, let's give that mystery sound one more try. Here it is.

[MYSTERY SOUND]

OK. Any new thoughts after hearing it again?

CAITLIN: Kind of sounds like a dog chewing on a bone. Or at the end, it kind of changes, like the chewing kind of changes a little bit. And there's kind of a few voices.

MOLLY BLOOM: Very good listening.

CAITLIN: But I think I'll stick with dog eating or dog chewing on a bone.

MOLLY BLOOM: Excellent. Excellent guess. Flora, do you have any new thoughts this time?

FLORA Can I change my answer to Caitlin's answer?

LICHTMAN:

MOLLY BLOOM: Sure. Absolutely. She-- that's a good answer. I don't blame you. Well, here is the answer.

AVERIE: I'm Averie, and I'm here with my brother Mac. I'm nine years old, and I'm from Hollywood, California. And the sound you just heard was our pet Scottie dog Ralphie chewing on his favorite bird chew toy.

MAC: It's not even a chew toy. It's my favorite stuffed animal, and you stole it.

MOLLY BLOOM: So excellent listening, you two. You were right. Correct! Amazing! Good work!

CAITLIN: Ooh-hoo!

FLORA Thanks, Caitlin, for letting me crib off of you.

LICHTMAN:

CAITLIN: I don't mind.

MOLLY BLOOM: Don't mind sharing your excellent listening skills with the world. Well, thank you so much for helping us out today, Flora. We really appreciate it.

FLORA Thank you. It's been a pleasure.

LICHTMAN:

MOLLY BLOOM: Bye, flora.

CAITLIN: Bye.

FLORA Bye.

LICHTMAN:

MOLLY BLOOM: Do you have a mystery sound for us?

CAITLIN: Or question? Or snack recipe?

MOLLY BLOOM: Send it on over. Head to brainson.org/contact.

CAITLIN: Hey, Molly, do you like fun?

MOLLY BLOOM: Uh, obviously.

CAITLIN: Great. But what is fun, if you had to describe it?

MOLLY BLOOM: Ooh, that's a good question. Uh, fun is kind of thing that you do that makes you feel happy and entertained. It's like the opposite of boring. It's a good time. Is that a good answer? I'm not sure. Well, we'd love to hear your thoughts, listeners. How would you explain what fun is to a robot? Record an answer and send it to us for an upcoming episode we're working on. We'd also love to know how you'd explain what makes something gross. Caitlin, how would you describe what gross is?

CAITLIN: I don't know, anything that makes me say, ew!

MOLLY BLOOM: Oof, that was a very succinct answer, much better than my answer about fun. Well, tell us how you would describe fun or gross. Just record your answer and submit it to brainson.org/contact.

CAITLIN: Thanks!

MOLLY BLOOM: You're tuned to *Brains On* from American Public Media. I'm Molly.

CAITLIN: And I'm Caitlin.

MOLLY BLOOM: Today were chomping away on the topic of snacks. Caitlin, when you snack, do you go for the salty or the sweet?

CAITLIN: Well, probably sweet. I love candy and baking desserts. And I had an-- I had an idea. I think this is a good idea for a debate-- sweet versus savory.

MOLLY BLOOM: That is a very good idea for a debate. And I feel like I would never be able to choose because I'm one of those people who likes to mix them together, so I feel like I need both taste sensations happening at the same time. Well, we recently got a question about salt and its BFF . pepper.

PIPER: Hi, I'm Piper. I'm nine years old. I live in Thailand. And my question is, where does salt and pepper come from?

MOLLY BLOOM: We're going to answer that pepper question in our *Moment of Um*. But let's tackle the salt question now. Here to help us is producer Emily Bright.

EMILY BRIGHT: You can find salt all over the world. But that doesn't mean it looks the same. I learned that from Laurie Crowell.

LAURIE CROWELL: I mean, it's very interesting all the different flavors each of the salts actually have.

EMILY BRIGHT: Laurie Crowell owns a specialty grocery store in Saint Paul that sells all kinds of salt.

LAURIE CROWELL: You see different sizes of grains and different saltiness, if that makes sense. Some are much more salty than others. Some are a lot more subtle in flavor.

EMILY BRIGHT: The answer to where salt comes from accounts for these differences. There are two ways to get salt. One is from salt water. You heat it until the water evaporates, and salt is left behind. The other is you can mine it from underground. Canada and Pakistan have the world's largest salt mines. But you can find salt mines on every continent except the Antarctica. Depending on where you get it, salt can even be different colors.

LAURIE Like Himalayan salt is huge caves of salt that over millions of years has formed that they just then kind of chunk
CROWELL: it off into big pieces to harvest it. So that is a beautiful bright pink color. And then you have, like, a Hawaiian red salt that has some of the clay from the Hawaiian islands that makes it pretty, almost a brownish color.

EMILY BRIGHT: Yeah, it's a pretty reddish brown. But it doesn't taste like clay. It tastes salty, right?

LAURIE It does taste salty, and it does have a little clay though. That mineral content, that's another thing that's
CROWELL: interesting with salts. Depending where it's harvested from or the water it's made from, you get different trace minerals.

EMILY BRIGHT: Minerals are naturally occurring compounds. The stuff you find all over our planet, like clay and copper and iron ore, stuff that makes up rocks. Salt itself is a mineral. And this fascinating substance is used to make so much more than snack food. Salt is put on roads in winter to help melt ice. It's used to help make paper and soap.

But before all that, salt solved a major problem facing humanity. The problem of-- dum, dum, dum-- rotten food. You see, long ago, before there were refrigerators and freezers, it was really hard to keep food from going bad, especially in hot weather.

SPEAKER 2: What a hot day. Can't wait to eat all that meat I've been saving for.

[FLIES BUZZING]

Oh, man! Shoo, flies! This looks and smells disgusting! No way I'm eating this now. I mean, I could, but no. Bad idea.

SPEAKER 3: Have you tried salt?

SPEAKER 2: Salt?

SPEAKER 3: Yeah, salt. It's all-natural, fat-free, and you can use it to preserve meat and vegetables so they don't spoil.

SPEAKER 2: Really? This sounds awesome!

SPEAKER 3: Don't take my word for it. Here, rub this salt into that fresh fish.

[RUBBING]

Presto salt-o. Bacteria and fungi can't grow. Your food stays fresh thanks to salt.

[CRUNCH]

SPEAKER 2: And it's tastier too! Wow! Thanks, salt!

EMILY BRIGHT: Salt revolutionized life. Food lasted longer. You could pack it to go. Because of salt's food-preserving abilities, countries with access to salt mines or salt water often had a lot of power. Ancient civilizations like Chinese, Romans, and Ethiopians used trade routes called Salt Roads specifically for transporting salts to different places. The empire of Ghana and the empire of Mali in the Middle Ages had salt mines. And they shipped that salt across the desert using camel trains.

SPEAKER 3: Watch out. Camel spit. [SPITS]

EMILY BRIGHT: This made them very rich.

SPEAKER 3: The camels? Nah. We don't pay them.

EMILY BRIGHT: No! I mean the empires. Battles were fought over this stuff, even here in America. Union troops won a battle near Saltville, Virginia in 1864. They destroyed the salt works. This cut off some of the salt supplied to the Confederacy, which they use to keep their food from going rotten. Not only did this mess with their food supply, but it hurt morale.

Salt didn't just change how we eat. It changed how we talked too. Salt is sprinkled all over our vocabulary, especially when you start with the Latin word for salt, "salis." Let's say "sal" for short. That gave us words like "salad," which means salty vegetables, and "salami," which means salted meats, and "salsa," salty sauce. Even the word "salary," which is your pay for the work that you did, points at how valuable salt was.

[MUSIC PLAYING]

MOLLY BLOOM: One of my all-time favorite salty snacks has to be nachos. When I make them, I like to add beans, sometimes some, like, ground beef potentially. Also, like little peppers, black olives, some scallions, tomatoes. Caitlin, what do you like to put on your nachos?

CAITLIN: Cheese.

MOLLY BLOOM: Oh, cheese. I forgot cheese, the most important part. Well, nachos seem like an obvious snack. But nobody had ever thought to make them until--

[MUSIC PLAYING]

--75 years ago in Piedras Negras, Mexico.

CAITLIN: In 1943, you could easily find your way to this small Texas border town.

MOLLY BLOOM: That's where a group of women found themselves for a fun day of shopping, so fun it seems that they forgot to eat.

WOMAN 1: I'm starving, you guys.

WOMAN 2: Oh, I just hope they have something, just a little something to get me by. I'm just--

WOMAN 3: I'm getting hangry.

CAITLIN: And by the time they went looking for food, all the restaurants were closed.

MOLLY BLOOM: All but the Victory Club where Ignacio Anaya was just about to head home.

IGNACIO Bienvenidos! Welcome to the Victory Club. I must apologize, but we are about to close up for the evening.

ANAYA:

WOMAN 1: Oh, but we're so hungry.

WOMAN 2: Yes, please. I'm not picky. Is there anything left in the kitchen?

MOLLY BLOOM: Ignacio, or Nacho as everybody called him, took pity on these weary travelers. And being a nice guy--

IGNACIO OK. Have a seat and hang tight. Let me see what I can find in the kitchen. Let's see. I've got some corn tortillas
ANAYA: and-- oh! Queso, everybody loves cheese. And for flavor, hmm. Oh! A jalapeno, of course. Not too spicy, though.

MOLLY BLOOM: Nacho cut up the corn tortillas and fried them in some oil to make corn chips.

CAITLIN: He topped that with queso and added the jalapenos and heated it all up.

IGNACIO Well, it looks good to me.

ANAYA:

MOLLY BLOOM: When he brought the dish out to the hungry shoppers, they loved it.

WOMAN 1: Oh, thank you so much!

WOMAN 2: Mm-hmm.

WOMAN 3: (MUMBLING) It's delicious.

WOMAN 1: I'm definitely going to order this again.

WOMAN 2: Hmm, what do you call it?

CAITLIN: Nacho thought for a second, and then--

IGNACIO Nachos especiales.

ANAYA:

WOMAN 1: Oh, divine!

[MUSIC PLAYING]

MOLLY BLOOM: To commemorate this momentous event in snacking history, we have a song from our friends Andrew & Polly and
Lucky Diaz.

CAITLIN: Check it out.

[LUCKY DIAZ AND THE FAMILY JAM BAND, "NACHO SONG']

LUCKY DIAZ AND THE FAMILY JAM BAND: (SINGING) Do you want to know the secret history about the first time man covered chips with cheese? I will tell
you, my friends, if you say please.

**FAMILY JAM
BAND:**

Por favor!

Well, as the legend goes, there was a man named Ignacio. But to his friends, he was known as--

Nacho.

And he had--

Nacho cheese. Na na, na na, na na, na na. Nacho cheese. Na, na na, na na, na na, na. Nacho cheese. Na na, na na, na na, na na. It's mine. It's Nachos.

There were some ladies down in Mexico, went to the restaurant, but they found it closed. And they said--

Oh, please! Help us, Nacho.

He said, I cannot make you no casserole. Won't give you hotdogs. No, no, no. But what I can do is create something especial.

And he made--

Nacho cheese. Na na, na na, na na, na na. Nacho cheese. Na na, na na, na na, na na. Nacho cheese. Na na, na na, na na, na na. It's mine. It's nachos. Nacho cheese. Na na, na na, na na, na na. Nacho cheese. Na na, na na, na na, na na. Nacho cheese. Na na, na na, na na, na na. It's mine.

Ignacio said--

I will make you something very nice, see. It will be hot, hmm, but not too spicy. Fry tortillas, queso, and one pickled jalapeno-- slicey.

He served it up, and their eyes grew wide. They started drooling, and they realized they were the first people of all humankind to experience nachos!

Nacho cheese. Na na, na na, na na, na na. Nacho cheese. Na na, na na, na na, na na. Nacho cheese. Na na, na na, na na, na na. It's mine. It's the nacho. Say it, nacho. Nacho cheese. Na na, na na, na na, na na. Nacho cheese. Na na, na na, na na, na na. Nacho cheese. Na na, na na, na na, na na.

Siempre de nacho. Nacho cheese!

The story lives because now you know the legend of a man named Ignacio. Onto the world, he is known as Nacho.

CAITLIN: That was lucky Diaz along with Andrew & Polly singing their song about the origin of nachos.

MOLLY BLOOM: Andrew and Polly also host the podcast *Ear Snacks*.

CAITLIN: Seems appropriate.

MOLLY BLOOM: You could find episodes and more music on andrewandpolly.com.

[MUSIC PLAYING]

Popcorn pops when the water in a kernel heats up, turns to steam, and bursts the corn shell.

CAITLIN: The steam puffs out starch in the kernel, making it pop out all white and fluffy.

MOLLY BLOOM: Humans have been popping popcorn for thousands of years.

CAITLIN: And they've been using salt to preserve their food for a long time too.

MOLLY BLOOM: And nachos started as a quick way to feed hungry shoppers.

CAITLIN: That's our show. *Brains On* is produced by Sanden Totten, Molly Bloom, and Marc Sanchez.

MOLLY BLOOM: We had production help from Lauren Dee, Emily Ellen, and Emily Bright, engineering help from Jonny Vince Evans, Aaron Bruton, and Veronica Rodriguez. And many thanks to Chelsea Leslie, Meg Martin, Nancy Yang, Regina McCombs, Stephanie Curtis, and Laurie Hammermeister.

CAITLIN: We're supported by the National Science Foundation and by you.

MOLLY BLOOM: If you want to be part of our elite crew, sign up for our newsletter at brainson.org. It's got recipes, DIY experiments, book suggestions, and more.

CAITLIN: It's a boredom-busting powerhouse. And it's free!

MOLLY BLOOM: Again, find it at brainson.org. Now, time to answer that question about where pepper comes from.

CAITLIN: It's our *Moment of Um*.

[CHORUS OF UMS]

JENNA SCHULTZ: Hi. My name is Dr. Jenna Schultz. I am a historian, and I teach at the University of Saint Thomas in Saint Paul, Minnesota. Pepper is only found in tropical areas. It's actually grown on a plant. The pepper is the fruit that's grown on a vine. And those fruits are then harvested, boiled in water, and then dried to become the black pepper corn.

Scientists today are starting to explore if there are any medicinal benefits, including for digestive problems. The biggest use of pepper, of course, is to flavor our food, and it's used in many recipes around the world. It already appeared to be in use by the ancient Chinese, Greeks, and Romans. This means that there were early trade routes already connecting these far flung civilizations to ancient India. We even have cookbooks from the ancient Romans that have recipes that include pepper.

Since it was so hard to get pepper, merchants had to haul it long distances. And it was very expensive for people living in these ancient civilizations to purchase it. It was a luxury item for the wealthy, so much so that even in the Middle Ages in Europe, a pound of pepper was equal to several day's pay for an average worker. People traded in pepper like they did gold and silver.

As European shipping technologies improved, kingdoms set sail to find new routes to gain easier access to pepper and other spices starting in the late 1400s. The Portuguese, Dutch, and English all at one time or another fought for control of these spice routes. With more and more pepper available thanks to this trade, the costs slowly went down, making it more accessible to everyone.

[MUSIC PLAYING]

MOLLY BLOOM: And just like pepper, the Brains Honor Roll is accessible to all. It's how we thank all the listeners who send in their questions, mystery sounds, and drawings by going to brainson.org/contact. Here's the latest group of brainiacs to be added to the honor roll.

[LISTING HONOR ROLL]

[MUSIC PLAYING]

We'll be back soon with more sciencey goodness.

CAITLIN: Keep listening. And pass that popcorn, Molly.

MOLLY BLOOM: Sorry. I keep shoving it in my mouth. I can't stop. It's so good.

CAITLIN: I know. Popcorn's the best.