

Bryan Schaaf:

Back here on the Meat Speak podcast, powered by the Certified Angus Beef brand. Brian Schaaf, joining me via Zoom, meat scientist, Diana Clark. How are you?

Diana Clark:

Doing pretty good.

Bryan Schaaf:

Excellent, excellent. Really excited about what we're going to talk about today. And so, I would like to state that our guest today is a Regents professor of meat science at Texas A&M University in College Station, Texas. Gig them, right? I had to learn what the Gig 'em sign was, by the way, in preparation. He completed his undergrad at Cal State, Bakersfield, and his PhD at UC Davis, which is also the same institution as another former podcast guest of ours, Dr. Frank Mitloehner.

Bryan Schaaf:

At Texas A&M he teaches meat science, nutrition, and physiological nutrition courses, and conducts research on the growth and development of adipose tissue or more commonly known as fat, particularly in cattle. In addition, he has investigated the limitation of cattle to marble, and has used as background in molecular biology to investigate lipid metabolism in the bovine muscle. Please welcome to the podcast, the man who I'm counting on to definitively tell me whether or not I'm actually big boned, Dr. Steve Smith. Sir, how are you?

Steve Smith:

Oh, I'm great. Thank you. I should say I can't even grade a carcass. My degrees are in biology and metabolic physiology. And I came down to A&M in 1983, just to use the tools that I have to study marbling in beef cattle. So, that is my life.

Diana Clark:

I was actually going to ask that. What got you into meat science because, given your background and everything, your bachelor's degree and PhD, I was shocked to see that. That's pretty neat, to see where your path has taken you.

Steve Smith:

Well, by way of background, in 1979, I came to Dallas, Texas for a national meeting. And I was looking around for jobs and I'd spent four years in rat research and I was tired of rats, tired of rat liver cells. Most of people that I interviewed with just wanted me to do the same old thing that I'd always been doing. And a guy from the Meat Animal Research Center in Clay Center, Nebraska, Ron Pryor came up and said, "How would you like to work in beef cattle fat?", and I said, "Well, it's not rat, it's not a liver cell. I'm all in."

Steve Smith:

I lived in Hastings for four years and, small town, I thought, Davis is a small town, Hastings is a small town. How different could it be? Davis is so liberal they won't eat the right wing of a chicken. So anyway, I got into beef cattle nutrition, and then metabolism of adipose tissue fat. And then a position opened

This transcript was exported on Feb 23, 2021 - view latest version [here](#).

up here in 1983 with the meat science section, so I said, "Oh, I'd really like to get back to a university life". College Station is a smallish town but not as small as Hastings, Nebraska.

Diana Clark:

Yeah, that's for sure.

Steve Smith:

So I've been there ever since. I've been here.

Bryan Schaaf:

But can you speak on the amount of marbling found in a rat rib-eye? I would like to know.

Steve Smith:

Okay, sure. [crosstalk 00:03:52] are great, and there's not much market for them.

Bryan Schaaf:

They're bite-sized. Fat is one of those things that we knew when we were getting in and getting ready to launch season two of this podcast, fat is one of those things that we knew we wanted to touch on because, if you trace back Certified Angus Beef, which obviously is where this podcast comes from, we like to think we're unbiased, but obviously we're a little biased towards that. But fat is a big reason why we exist as a company, because at the time in the '70s the beef carcass had less fat in it, less marbling in it through breeding decisions and different... Long story on that.

Bryan Schaaf:

But fat is really important to who we are as a company and really over the years it has kind of been maligned, especially back in the '70s and '80s, to where it is today. So, can you talk to us about the importance of fat, specifically in just the normal human diet? It's not necessarily something that you should be shying away from, correct?

Steve Smith:

Oh, that's absolutely right. And I should say when I was doing my undergrad in Bakersfield, I saw the first restaurant that advertise CAB. I didn't know what that was.

Diana Clark:

That's pretty cool.

Steve Smith:

Yeah. Well, I left Bakersfield in '75, so I'm pretty sure somewhere around that time, I had seen that.

Diana Clark:

That's real neat.

Steve Smith:

So, back to your question. Well, fat and beef, I totally understand why CAB has been pushing marbling, for a very long time, years, for decades. And the meat scientists, who are into centric qualities in this group, they have very strong evidence of going over many, many years, that the marbling is an insurance factor, insurance for overcooking. It's a lubrication factor, it makes the beef juicier. And it imparts a pleasant flavor.

Steve Smith:

Now, I am terribly biased, I'll say right off hand that when I say pleasant flavor, it's the flavor that most Americans are used to from a grain-fed beef, corn-fed beef. So, with different grains, different pastures, the flavor can be different. So, there are so many experts for the flavor components of beef, for the positive attributes of fat in beef. I'm not trained in that area. I just hitch my wagon onto that. And I have been looking for, is the fat in beef healthy? Is it unhealthy? And what can we do to improve the marbling in beef and the healthfulness of the fat?

Steve Smith:

Now, that said, I'm not going to say that any beef is unhealthy because people just tag onto that. "Smith said some kind of beef is unhealthy". And I'm never going to say that. I just say that beef isn't bad for you, but maybe some kinds of beef are better for you.

Diana Clark:

So basically, I think, because a lot of people now, even though I feel like we've done a lot of education of showing them what marbling is and that marbling is good and it does add flavor and it is your insurance policy when cooking, but still it amazes me, I've been recently diving into a lot of consumer panels where we simply ask them, "What are your two major attributes that you look for quality of meat?", and color is always by far number one, by far, which makes sense. I get that.

Diana Clark:

But then you throw in the term marbling and your generation, 55 and older, they'll check marbling. They want it. But then, anyone younger than that, they don't really know what marbling is. They look for flavor and they check flavor, but they don't fully understand it. And I feel like if they actually saw a steak in front of them that had a lot of marbling, they fear it because they think that fat in there is unhealthy for them. So, in your expert opinion, what would you say to that? If someone said, "Oh, that extra marbling in there is just unhealthy?".

Steve Smith:

Two things. The simple approach is you see the marbling, but that doesn't contribute a great deal to the total calories or total fat in the steak. You go from a select to a choice, okay, there may be four or five more grams of fat in that four ounce serving. So, it's not that much fat, if you trim off the outside fat and there's not that much to start with, you're not getting that many calories from the fat. And the fat in beef, the fatty acid composition, is not unhealthy. Most of the fat in the beef, regardless of production system, is oleic acid, which imparts the juiciness. It's a healthy fatty acid. You guys like olive oil and canola oil, so beef, it does have saturated fats, but they're lesser in abundance than oleic acid. Now that's a complicated answer. And when the [crosstalk 00:09:44] over, I'm going, "Okay, I've said enough".

Bryan Schaaf:

Oh no, we welcome the most complicated, down the rabbit hole answers as you can give us. A lot of the people who listen to this are doing so because they want assignments afterwards to have to go and google things. So, don't worry about holding back.

Steve Smith:

Okay, good. Thank you.

Diana Clark:

So if animals, the more they marble, do they have more oleic acid than in that fatty acid profile?

Steve Smith:

Oh, rabbit hole. Yes. Short answer. Well, in the early 1990s, Japan opened a beef trade with the US, and a couple of professors from A&M, Dave Lunt and Dr. Gary Smith, and Dr. Dave Lunt, they went to Japan to learn the grading system. While they were there at Osaka and Itoham, a company in Osaka, they watch the Japanese graders. And at that time, there were Japanese A5 carcasses, the very best. And there were American carcasses and then Australian. And it was really weird, the Japanese graders would push on the outside fat or maybe pinch... Now, I didn't see this, this the second hand. But they would push on it to see if it's soft, or they pinch off a piece and rub it in their hand and see if it melts. The A5 carcasses have very soft fat.

Steve Smith:

And the American, it was softer. It was soft, but not nearly as soft as from the Japanese carcasses. And the Australian carcasses, it was very hard fat. Now, fat softness is not part of the Japanese grading system, but there's a little subjectivity going on there. So, the harder the fat, the lower the grade and the less desirable. So, in that time, when I started going to Japan, well, they brought some fat samples back and long behold the oleic acid was just so much more than I'd ever seen in an American beef carcass. So I said, "Okay, oleic acid has a melting point just below room temperature, so that accounts for the softness of the fat", and when I started going to Japan, 1990, 91, we visited supermarkets and there'd be an entire section of beef and it would be labeled Wagyu on the top shelf, the shelf that's most visible, and then American beef and then Australian beef.

Steve Smith:

So, it was in tiers. And so, of course the Japanese beef was the most expensive and then American and then Australia. So, that started my journey into saying, "Okay, what is it about Japanese beef? There's so much marbling, the falling snow, so much marbling and so much oleic acid". So, what we found out in the last 30 years or so, that production practices, that increase marbling will also increase oleic acid. So, it doesn't always work. It's not tightly genetically linked, but in general, if you feed a corn-based diet for extended periods of time, you'll get more marbling and you'll get more oleic acid. The composition of a corn-based diet, we think it's the starch turns out on the gene that catalyzes the synthesis of oleic acid.

Diana Clark:

That's really awesome.

Steve Smith:

That's a deep rabbit hole.

Diana Clark:

I like that a lot though. That's really neat to hear. And it's neat. After we talked with you last year, Daniel and I did a little experiment at the Culinary Center, where we took some ground beef, just commodity trim, disordered it in, and then we actually took some Certified Angus Beef Prime ground beef and we brown both of them and collected that fat. And then, we actually used the Suvi machine. So, we raised the temperature, I think we started at around 70 degrees, and slowly just went up a few degrees all the time, and you can see at the lower temperature, you're Certified Angus Beef Prime, that fat actually melted while the commodity was still pretty solid. So, it was just a really neat visual to see those differences, and pretty simple to do. We actually did that right before a COVID hit.

Diana Clark:

That was going to be a goal, to show some people when they walked in, just so they could see those differences within cattle production. Because a lot of people do ask that, especially coming into the centers, about just cattle production in general. Most chefs know that the conventionally raised, the grain-finished cattle, that they're going to eat better and they swear by it. But they say that they have a lot of customers that go for that grass-finished beef. And a lot of times they just think it's healthier. So, in your opinion, is one healthier than the other, or no?

Steve Smith:

Well, so here on sensitive ground, I believe I told you guys, we do a lot of work with ground beef so that we can set the fat level constant. You get a grain finished, a grass finished, it's going to have different fat content in the lines, or intact pieces. So, we used to do a lot of ground beef research so we can set the fat levels the same. And then, we measure. We've actually done a lot of human studies and [crosstalk 00:15:51] ...

Diana Clark:

Really?

Steve Smith:

We've published six or seven papers. So, I guess that's a lot.

Diana Clark:

Yeah, it's pretty neat, though.

Steve Smith:

Bottom line is green-finished, grass-finished, they're not bad for you, but what we consistently see with high oleic acid ground beef, that there's an increase in HDL cholesterol, the good cholesterol that is involved in reverse cholesterol transport, scrubbing out your blood vessels, taking away the cholesterol.

Steve Smith:

So, it's only for ground beef that's from grain-fed cattle for a pretty long period of time, and the carcasses do get fat. And we did do an experiment with the first one, with some fat trim from Wagyu cattle and it was high oleic acid, and that was the first time we saw that result. We have done two studies that compare grass-fed to grain-fed, and, again, they don't increase the bad cholesterol, the LDL

cholesterol, but the grain-fed would increase the HDL cholesterol. So, there's nothing that's going to harm you from eating... We've gone as high as 35% fat, which was technically not legally ground beef, but it was [crosstalk 00:17:26]. So, as low as about 15% in our studies. And we get the best results with the higher fat ground beef. So, there was enough fat in it to have a nutritional dietary impact, but [crosstalk 00:17:45].

Diana Clark:

I think you might have just made a Bryan state with that fact. He is definitely a ground beef burger kind of sewer, for sure.

Steve Smith:

My wife only buys Angus ground beef. Now, the store we shop at have CAB, but she's a registered dietetic nutritionist, with a PhD in nutrition. But she insists that I don't ever give nutrition advice. So ,I'm never going to give nutrition advice.

Bryan Schaaf:

I think it's interesting. I think it's probably one of the most misunderstood things in the food world, is the idea, if you see 80, 20 ground beef, "Oh yeah. It's a lean to fat ratio. Got that, makes perfect sense". But there are no parameters on what that fat needs to be made of. It could be back fat, which scientifically is different than the marbling fat, correct?

Steve Smith:

Yeah. Now back fat, I'm glad you brought that up. The subcutaneous fat over the line actually has more oleic acid than the marbling. It's an indication of the stage of development. Back fat developed first, by far the first, and then as the fat cells differentiate, as they fill with lipid, they get larger, they accumulate more oleic acid. My favorite gene is turned on to produce oleic acid. The more of my fat is later developing, fat cells are smaller and they just haven't caught up yet. So, if they take the fat tran, the outside fat, and incorporate that into a product, the ground beef will be more enriched with oleic acid.

Diana Clark:

That's pretty cool. So are there specific subprimals that have more oleic acid in them, just naturally?

Steve Smith:

Yes. Such good questions. A few years ago, well, it was published in 2009. Funny how time flies.

Diana Clark:

It really does.

Steve Smith:

Stacey Turk, a master's student, we had noticed that when we're getting fat trans to do our human studies, to make the ground beef, we would measure the outside fat, but then we'd take the flank and plate to make the ground beef, and the fat has some composition, wasn't the same as outside. We would measure outside fat to select the carcasses. It was lower in oleic acid and I thought, "That's odd". So, Stacy asked, she was doing her master's research, and said, "Can I take the next 50 carcasses that go from our Rosenthal Meat Science and Technology [inaudible 00:20:53], and so, she did that and she

sampled outside fat from eight different sites. So, the round, the line, the Chuck, the brisket, the flank, the plate, and lo and behold, there were differences across it.

Steve Smith:

And, what was startling, and this is good news in Texas, the brisket had by far the most oleic acid, and it's still reproducible. And these were cattle. We didn't know the background. I think we had some show cattle from Houston, we had researched cattle. So, with those 50 carcasses, it was just really strong evidence, and it's again, highly reproducible. So, for whatever reason, the brisket has the most oleic acid of any site that we've sampled.

Diana Clark:

I was going to ask if you have any inkling of why that would be, do they add fat there first? Because I think of young cattle, I don't really see them having heavy brisket fat, usually that's a sign of them being close to finish.

Steve Smith:

Well, and that's something we would really like to answer. We would need to get funding. My hypothesis is that the brisket fat cells develop initially as brown fat, we've done a lot of that.

Diana Clark:

Oh, that makes sense. Yeah, because if you think about in humans, by your chest, you get a lot of fat. Okay.

Steve Smith:

And the fatty acid composition of brown fat has more oleic acid than white fat early on. So, as you accumulate fat, unless you change drastically, you don't turn over the fat, you add to that. So, if something in production causes you to have low oleic acid, like back grounding on grass, that fat will have low oleic acid. And then, when you start on corn grain, it has to catch up, it has to dilute the saturated fats with oleic acid. So, if you start cattle really early weaning, the [inaudible 00:23:07], what we call it, [inaudible 00:23:11], they will start accumulating fat and oleic acid very early, and they just keep adding to that. So, maybe the brisket starts with more oleic acid as brown adipose tissue, and it just adds to that as it has transitioned to a finishing diet. But we haven't the funds to... We have to kill calves early on, at the very least, four month intervals, just to track that and do measurements of specific gene expression that indicates differentiation of the adipocytes.

Diana Clark:

That's fascinating to me. That is so cool.

Bryan Schaaf:

Cool. So, I have to throw this out there, doctor, this is my theory and... So brisket fat, it's a better fat, it has more oleic acid, which is a healthier fat. Therefore, brisket should qualify as a health food, correct?

Steve Smith:

Okay.

Diana Clark:

We reside in the state of Texas. [crosstalk 00:24:18].

Steve Smith:

I'm going to dodge that question. But I will say, and I don't know the regulations, but studies were done years ago by Dr. Joanne Lupton, she was in a nutrition department at Texas A&M. And she showed that Quaker oats, I think, reduce cholesterol a little bit. The fiber band, cholesterol in the GI tract. But Quaker oats was able to label their product. If you like, look at Quaker oats.

Diana Clark:

They do.

Steve Smith:

'Heart-healthy' or something like that.

Diana Clark:

Yes, they do have that on there.

Steve Smith:

They do. Well, brisket...

Diana Clark:

They should put a 'heart-healthy' sticker on a brisket.

Steve Smith:

Yes. But that would be valid because we have studies. And again, I don't know regulations, I'm blissfully ignorant of that. So, to answer your question, that could be a possibility, but someone would have to chase the paperwork and see what was involved.

Bryan Schaaf:

I believe I have a mission.

Diana Clark:

I was going to say, I think if you could ignite one person to do that, Bryan might be that person.

Steve Smith:

Again, Dr. Lupton, she's a great person and a great scientist, but these were based on a limited number of human studies. So, it's not like you have to get a drug approved by FDA.

Diana Clark:

Yeah. Go through all that requirements, yeah.

Steve Smith:

And maybe it was easier 30 years ago, but still.

Diana Clark:

But still, yeah. It's still on their package today. So, once they validate it once, it seems to be holding true throughout. So...

Steve Smith:

Yep.

Bryan Schaaf:

Well, you just made my day, Doctor, thank you.

Steve Smith:

I'm here to please.

Diana Clark:

I do have to ask, what do you think is the most interesting thing or, to you, the most exciting thing that you've discovered within your time of research?

Steve Smith:

Oh, wow.

Diana Clark:

No, that's a pretty loaded question.

Steve Smith:

Because... I don't know. Maybe I get so distracted easily because I have fun with all the things that I do. I've really been invested in our human research and they're difficult. People do not like [inaudible 00:27:05]. Their carcasses are really hard to grade, but that's been exciting. Okay, it's not quite the thing that I've discovered or anything, but my marbling research and my early publications and, I think my first was 1992 with a fat from a Japanese cattle, that opened up so many doors to travel, working with the fatty acid composition. I was able to do a faculty development leave, like a sabbatical leave in Brisbane. And I packed up my wife and my, at that time, two kids and we moved there for five or six months. And they lived in downtown Brisbane or next to the botanical garden.

Diana Clark:

Oh, wow.

Steve Smith:

Because of that research. And then, I started doing collaborative research with folks from Kyoto University in Japan. That lasted a long time. I've done a lot of research with Korea and more recently China. And I've been back to Australia several times. So, that just makes my life complete. That's the most fun. And so, the travel restrictions, the pandemic put a real damper on my self there.

Diana Clark:

I can imagine that. It's probably really neat to see, too, just how they research, I mean, their protocols and everything have to be... There's similarities, of course, across the board that you can see, but there's got to be differences just within their research sites and their universities too. And that just had to be such a neat experience, to be able to get all these different countries' views on things. That had to be awesome.

Steve Smith:

Oh, it is. And so many similarities. They're fully invested in corn feeding. And so, Australia does not grow corn, it's very limited. So, we've got a complete advantage, but China, Korea, Japan, at least for the last finishing period, they have a total mixed ration to pass very much corn. Japan, Korea, China, their cattle have different names, but they're all from the same genetic stock.

Steve Smith:

So, travel across China, Yan Ren came to Korea, the Honu came to Japan, the Walgett mixed with their indigenous breeds and some other cross breeding. So there's some similarities, but there's some real differences. They feed cattle for a very long time. So, their cattle really don't show their marbling capacity until they pass our production needed. So, 20 months of age, that is when they really show up. So, our cattle will get fatter, twice as that much more marbling. They do get a little fatter, they just keep accumulating marble. And the differences, the cultural differences, that's what's fun. I was visiting Japan, I went to Korea, "Well, Koreans are just like Japanese, but they speak a different language", no. They're really different, and that's what's fun, to learn the differences in culture, production. I'm in heaven.

Diana Clark:

I completely agree with you. Actually, it was two years ago now, coming up on two years, we had an international group come in and there was actually 13 different countries that were represented there. So, all these different backgrounds and, not many of them, probably only five or six actually spoke English, but we had two different translators to help. So we had a dry-aged rib that we let hang in our cooler for close to 400 days, it was just a fun side experiment. Yes. We did not really care about yields at that time.

Steve Smith:

[inaudible 00:31:30].

Diana Clark:

Yes. But on the 365th day, its birthday, is when we had all these different countries in there. And so, I've told them the day before, I'm like, "Okay, when you guys get here, we're going to sing happy birthday to this rib". And it was neat because, so first I sang it in English, and then we had some Latin Americans in there, so Spanish, they jumped in right away and sang. And then, it was just a little bit of a silent pause. And then, the Japanese went, "Well, can we sing too?", so then, they went and sang and then every single country, I remember we had South Korea, everywhere, just started singing. It was one of the neatest experiences because you all come together, knowing beef and loving beef, but you bring your culture with you, and so you get to grow and learn from them at the same time. So, I completely agree

with you, it's such a great thing to gather around and talk about. And then you're able to share your experiences too, and everyone can grow together. So, completely agree.

Steve Smith:

I was invited aloud to co-chair a session at a meeting in Kagoshima, Japan, and the topic was production of beef around the world or something like that. I wrote a little review paper summarizing it, but that was a real eye-opener. I only dealt with countries that were producing high-quality beef, but in Malaysia or Thailand, they're feeding whatever is left over. They would never feed corn to cattle because, for one thing, if they can grow grains, of course it's for human consumption. So anything left over, and any waste food products, they'll feed the cattle. And the breed types, "Oh, that won't marble", well, they don't care, they're just trying to get high quality protein. Eating quality is not the primary issue for them. But again, as you said, getting together with so many different cultures, that was a real eye-opener. I cater to the rich, but that's a small proportion of the world.

Diana Clark:

Oh yeah, the whole beef production. You're totally [crosstalk 00:33:57] on that. That's awesome.

Steve Smith:

But the good news is everybody is trying to increase beef consumption, so that speaks well for maybe some export of beef for the US so...

Diana Clark:

Yeah, that is very true.

Bryan Schaaf:

Hey, man, well, I'm doing my part to help drive demand, so. I consumption alone, so...

Diana Clark:

Well, I eat everything, anything that doesn't start chewing on me first.

Bryan Schaaf:

It's fair game. Diana, anything else you want to touch on?

Diana Clark:

No, I just want to thank you. This has been awesome. At the beginning of this, I was even nervous. You're such an expert in your field, just being able to communicate, but you make things very simple to understand and... Just fascinating. You can see your excitement in your research just simply by talking to, I love to see that. It's so much fun.

Steve Smith:

Well, some of the excitement comes from... Leaving rat research to animal production research, it's a whole different group of people. They're fun. [crosstalk 00:35:08]

Steve Smith:

When I was a grad student, "What are you working on?", "Well I isolate rat liver cells". And now I say, "What are you working on?", the elevator talk; "Well, I want to increase the amount of marbling and the health list of the fat in the marbling". And they go, "Oh, you do grass feeding".

Diana Clark:

Let's ride the elevator a few more times. Let's talk.

Steve Smith:

Yeah. Yeah. That's three stories of it. I take the stairs.

Bryan Schaaf:

That question can't come up in Texas, can it?

Steve Smith:

Oh, College Station is a mixed group of people. When I first got to Texas, it was mostly Texans and a few Californians. But, boy, we have such a mix here now. So, lots of different opinions. I teach this semester a lipids class and graduate lipids and metabolism. And these are people from the nutrition department, from health and kinesiology, from animal science, science. But some of these people don't eat meat at all. I haven't had a vegan yet, but lots of vegetarians or some shade of that. So, I intentionally don't promote the consumption of beef because people have different attitudes, opinions, philosophies. And I said, "Okay, that's good".

Diana Clark:

Yeah, it's your choice".

Bryan Schaaf:

More for the rest of us, right?

Steve Smith:

Yeah.

Bryan Schaaf:

I'll tell you, this is just where my brain lives. When I think of College Station, Texas, I don't think about college football, which I know is what a lot of Northerners... I think about our buddy, Justin Manning, over at C&J Barbecue and delightful brisket, he's cooking them every day.

Steve Smith:

Yeah, I have my favorite brisket place and I take my visitors. Well, I'm a cheap date. I take them there because it is cheap and there's, of course, beef and there's chicken. But it's Texas. You're going to experience...

Diana Clark:

You got to have it.

This transcript was exported on Feb 23, 2021 - view latest version [here](#).

Steve Smith:

Yeah. Why go to an olive garden? Oh, you got to cut that one out.

Diana Clark:

Yeah, I agree. I'm not a olive garden sewer.

Bryan Schaaf:

But endless breadsticks though is... Credit works too.

Steve Smith:

And the salad is to die for.

Bryan Schaaf:

That is not Texas.

Bryan Schaaf:

On that note, I'd like to thank Dr. Steve Smith, a Regents professor of meat science at Texas A&M University. Gig 'em, down in College Station for joining us here on the Meat Speak podcast, and the man who has personally given me enough thought to really run with the notion that brisket is the new kale. So, thank you for joining us on the Meat Speak podcast. If this is your first tuning in, you can catch us across all of your major podcasting platforms, Apple, Google Play, Spotify, or simply by visiting certifiedangusbeef.com/podcast. So, Dr. Steve Smith, meat scientist, Diana Clark, guys, thank you so much for taking time. This was fascinating. I am starving.