Paleo Solution - 339

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Robb: Hey, folks, six listeners can't be wrong, another edition of The Paleo Solution Podcast. Today's guest is Ali Bouzari. He is the author of the amazing and just stunningly beautiful book, Ingredient: Unveiling the Essential Elements of Food. He is also a nutritional biochemist and a trained chef.

Ali, how are you doing, man?

Ali: Doing really well, thanks for having me on.

Robb: So you have a really eclectic and interesting background. Could you flesh some of this stuff out for folks? Like we were talking about just before we started recording, I get a ton of questions about career path type stuff. People really are interested in health, wellness, sustainability, regenerative agriculture, and just feeling like what they're doing is helping the world and leaving a mark and all that stuff. It sounds like you've just had an enormous amount of influence on people already, so it would be really interesting to know your background.

Ali: Oh, well that's awesome. The way I try to pitch myself is I have one foot as firmly planted as possible in both the kitchen and the lab. I was cooking in restaurants in high school and through college as just a fun side job, and both my parents worked in restaurants when they were in college. It was kind of a family thing. My family was always very much into food. At the same time when I was in high school and then later doing Biochemistry as an undergrad in college, I really fell in love with this idea that the universe had a rhythm and a series of patterns. I've learned that over the years of being in Academia for too long that the way I like to learn stuff is with patterns, whether it was scales and rhythms in music or it was the character types that you would see in English Literature class and things like that, and I really love that Chemistry was this guidebook to how an adobe hut is built and to how your skin tans in the sun. I love that all of that stuff was connected.

I don't know really exactly when specifically it happened, but at some point I was looking at food, I was cooking in a restaurant, and I realized that I had this old school movie reel of images and drawings and just this imaginary vision, like X-ray vision, into the Hollandaise or whatever that I was making at the time. All of a sudden all of that fear of the unknown got a lot more tolerable. It felt as though cooking for me, in the early stages of my career, was walking down a hallway in the dark, fumbling for the doorknob. Now all of a sudden, this was a way to get a flashlight or turn on a light switch.

I loved that combining this science of how stuff works with cooking, it wasn't a thing where it robbed the soul of it. To keep with the hallway analogy, you still are the person who chooses which door you're going to get into, now you just have an easier time getting to the doorknob so that you can spend more of your energy on all the fun stuff that happens afterwards.

Robb: Right. I was thinking about our question. You largely answered it, but it was related to many artistic endeavors. People just want to go with that artistic expression. They don't want too much analysis. It sounds like you've struck a pretty good balance between incorporating this nutritional biochemistry understanding but then still being able to stay in that flow state to express your cooking.

Ali: Which I tell you what, it is easier now that the industry and the media has calmed the hell down about the whole molecular gastronomy thing. When I first started doing this, this blend and working with chefs, it was like 2008, 2009, when in the US, at any fine dining restaurant you would go to, everybody was about this very scientific, flashy aesthetic that in truth really had nothing to do with what I actually do, but aesthetically it felt like, oh, we're serving this thing in an eyedropper, in a petri dish, or there's a foam or whatever. I started teaching at a culinary school and on my first orientation day, I went around and introduced myself to all the other chef instructors, and I kid you not, there was a couple of chef instructors who, when I went to introduce myself, they said, "Oh, you're teaching the science stuff. Yeah, I don't do that. I'm all about flavor and meat."

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It was just the craziest thing because there is the exact same set of fundamental rules make a peanut butter and jelly sandwich really, really good, as the same fundamental rules that make the most esoteric, avant garde, highbrow thing you could imagine. Now people are believing that more and believing that science can just be a Swiss Army knife to help you do whatever job you need to do, rather than the people who equate science with a cold aesthetic that loses sight of the grandma style of cooking that at least gets most people excited about food.

In those beginning stages, I also come from a very musical background, and the analogy that I would just rant about with my friends is, there were times when people thought that electric guitars were selling out, selling out the soul of music. There's always going to be these adjustment periods where people will realize, like there are now, that even electronic music, doing almost everything through a keyboard, that is starting to feel more connected to the soul of a

creative artist now that we're starting to wrap our brains around how it works and how we interface with it. So it should happen in food, and I'm really happy that it is.

Robb: It's really interesting stuff. Having a biochemistry background, I've always tackled my cooking with a little bit of kitchen chemistry informing what I'm up to. I have a really good friend who is a mixed media artist, does paintings, does sculptures, and he has a little bit of an engineering background. He went and took some advanced materials science stuff because he's like, "I'm using all these paints, and I don't actually know why cadmium plus this produces this color." So he actually got in and started getting a little bit of materials science background and really feels like it has helped him because when he wants some sort of a nuance or a texture to what he's doing, he much better understands how he can produce either a color or, say, a type of ceramic finish versus a metallic type of finish.

So you can arrive at that stuff through trial and error or through an empirical background, I guess, which is where most of culinary science maybe has progressed and most of art. But if you've got those fundamentals, the Math, the Physics, the Chemistry, then it really doesn't have to neuter the thing or make it really Frankensteinian, super rote process.

Ali: Yeah. That painting example is amazing where that is yet another way to achieve total dominion over your creative field. Forever, painters were limited by what the commonplace pigments could and couldn't do, so what an awesome idea to think about, well, I'm just going to learn how to craft that part of it as well. That's brilliant. I think it's a natural extension of any art, is to figure out every aspect of what goes into it.

Robb: Right, right, yeah. It doesn't seem that far afield to me, from a woodworker going out in the woods and picking this particular tree because it has got a certain look to it or a branch or something. I have another good friend, Billy Berger, who is a primitive skills expert. He makes handmade bows with primitive tools and goes out and hunts with them. This is a complete soup to nuts process where he uses the tendons from the animals to actually make his bowstrings which then he goes out and hunts and he has to fashion with the stone tools. So it's really an interesting soup to nuts process. Even for him, he has gotten and done a little bit of engineering and some materials science stuff so that he can understand crystal structures within the chert versus slate and stuff like that. It totally has improved his ability to work these tools, so I think that that's just fascinating.

Ali: Yeah, I've wondered for a number of years, how it is that we've had those advances even in what you just described as the most primordial possible thing.

Like flint knapping to make a hand ax, we have that down to literally a molecular level of how that works and how things are going to fracture and break, and that is potentially the birth of all technology. Yet the average, really accomplished chef still doesn't really know what's going on inside of a potato that would make it crispy or not. Why have we left that out? Because the thing is, this knowledge that I talk about in the book and in my work, that stuff has been around since World War II and before when we started really diving into how food works. It has just been in the hands of people who maybe don't like talking to humans as much maybe. I don't know.

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Robb: Right, right, yeah. I always found it interesting. I was a pretty Chatty Cathy in the lab compared to all my lab mates. So you jump into your book starting off with water. Talk to me about that and tell folks abut that. Why is water important? I love it because you start off solid with gas and move your way forward until you're dealing with these physical states of water and then how that influences cooking.

Ali: Yeah. So the basic framework of the book is that each chapter goes through one of these eight building blocks. Water was the natural entry point, for a lot of reasons, water and its link to basically all living things that give us food. A lot of the chemistry that makes an animal or a plant able to work is based on water. I tried as much as possible to shed a lot of the conventions that were hammered into me over 12, 16 years of learning the periodic table over and over again, but one that I don't think I can shake is that every Chemistry class you ever take starts with water.

Water is a really weird thing. It's a really unique thing. It's going to be in basically everything you're ever going to cook, eat or serve. Water seems like this thing that is very static and very straightforward to an outside observer, but it is absolutely this all-important stage on which everything happens. I think that's how the book opens is presenting water as the arena in which the other building block Ingredients, in which they do battle. There are so many things that happen in your food and these recurring themes that are just what you're doing to water. When you're doing any kind of pickling or any kind of preservation, a big element of that is how you're controlling what can have access to water and what can't.

One of my favorite concepts in that whole book is there are four or five different ways you can treat water to ward off scary stuff like E. coli in preserving food, and that can be removing it obviously by drying stuff. It can be binding water up in salt and sugar when you're curing and candying things. It can be changing water, either making it more acidic or more alkaline, changing the pH. There are

all these things that come in. What's cool is you can then dive even a layer deeper if you look at, okay, I'm going to pickle something by making it acidic or making it alkaline.

I personally don't think food safety is the most riveting topic in the world that you could talk about forever. So when you're talking about making an acid-preserved pickle, whether it's fermented or whether you're adding vinegar or whatever, that's great but then that acid also changes the texture of that food, it changes the color of it, it changes the way that aroma works, and these concepts are universal. So the way that, I don't know, a naturally leavened, wild foraged sourdough grain loaf of bread will work, is a lot of the same processes that will happen in Scallop Ceviche, which is a lot of the same processes that will happen in a kosher dill pickle, and that's awesome.

From my point of view, I want to know how to cook anything that I will ever come into contact with in my day-to-day life, and that's really hard to do if you have to go through every cuisine and every culture in the world and memorize all the 30,000 different things we can do with food. But memorizing a few fundamental patterns and figuring it out from there, especially when you start from water and you see water as this almost Puppet Master behind the scenes controlling a lot of stuff that happens, it's liberating to not have to memorize every single detail.

Robb: Absolutely, transferable job skills, yeah.

Ali: Yeah, yeah, exactly.

Robb: I love it. I don't want to steal the thunder here or ask to -- leading of a question but what are those pillars? The way that you tackle it, the way that it's broken down in the book, the water, the sugars, carbohydrate, lipids, protein, heat, gases; are those the fundamental pillars that then you use those as the mile markers and drive from there?

Ali: Yeah. I like to think of them as, if you're trying to figure out how your watch works, you open up the face of the watch, and you'll more than likely see a bunch of gears turning. The cool thing about food is that those eight things are the types of gears. There are only eight gears. There are only eight notes in this scale. There are only eight letters in this alphabet. It's just these eight basic things that -- one of the coolest things to me was every time I look at food, I see food in terms of the personalities of those eight building blocks. Now more than ever, we live our lives almost reading the back of a label with more interest than the daily newspaper.

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Robb: Eating the food, right, right.

Ali: Yeah, and a lot of people now are getting better about recognizing -- and by the way, I am very agnostic when it comes to food trends and dietary restrictions and so on and so forth. There are a lot of chefs out there who are very agro when it comes to accommodating people who are vegetarian or vegan or trying to avoid or emphasize certain things in their diet. I am totally into different strokes for different folks, and I try to relegate myself to figuring out, what do you feel is best for you? Great, let me help you make that taste good with the sandbox that you've constructed for yourself to plan.

With all of these things where you're looking at the back of the label and you're looking at total fat or you're looking at sugars or you're looking at carbs or protein or whatever, what's fascinating to me is those aren't just static things that make you feel better or worse about the thing that you're about to eat. Those are the players that are making this thing worth eating in the first place. So it makes eating and thinking about what's going into your food a lot more of a robust experience where protein isn't just a good guy that will help do this and that for your body.

Protein is a tool. Protein gives us scaffolding. It helps things bind together. It helps things gel. Protein, when broken down, is what makes stuff savory. Protein comes alive and acts like enzymes in a bunch of different foods. Even outside of the nutritional ramifications of if it's good to have enzymes in your diet or not, enzymes make sweet potato sweeter. Enzymes make herbs more fragrant. They make miso more savory. Enzymes do a bunch of really amazing things for us and on and on and on. Proteins help us make food turn golden brown in the oven. Proteins help us bind up water so that a protein bar is something that you can take with you and it won't spoil.

These things are all -- it's a series of eight different shapes of Swiss Army knife and if you can get a hold of the personalities of those things, all of a sudden, cooking and eating and accommodating for whatever you want to put in your body becomes less of an accountant kind of job and more of creative director, putting a bunch of these different characters together to make an interesting and delicious story.

Robb: That's awesome. That's awesome. Somewhat related to both proteins and then talking a little bit about heat, this is still something that I'm playing with, slow cooking versus fast cooking of, let's say, meat in general, like the old age super slow cook barbecue that's like 199.1 degrees versus a quick sear on a grill. Both of those can be absolutely amazing, but they're totally different. What's going on both chemically and physically there and then what are the -- if people are

thinking about why they might want to slow cook a particular cut of meat versus a quick sear or something -- what are the flavor ramifications and then why are we choosing one path versus another?

Ali: I love this question. To continue with analogies, for a change, sometimes I speak like only in metaphors, if water is the stage on which all of this is going down, heat has the baton. Heat is the conductor that sets the tempo for all of this stuff. One of the great myths of the food world is that stuff happens at specific temperatures. A bunch of people who are proponents of raw food diets will say, "At this temperature, nutrients are destroyed or enzymes are deactivated," or whatever. Then culinary school pastry chefs will say, "If your making caramel, this is the temperature at which caramelization starts," or this is the temperature blah-blah-blah.

The answer to all of those questions, with a few examples but, again, we're talking about in general approach to food and eating and cooking, the answer of at what temperature does something happen, is usually, yes. Heat is really just the gas pedal. When you're searing a steak or you're searing an onion or you're grilling asparagus, that brown, beautiful, charred kind of Maillard browning aesthetic and then flavor profile that you're going for, happens in a matter of minutes or seconds at the, literally, blisteringly hot temperatures of a cast-iron skillet or grill.

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What our conventional wisdom has told us for a long time is, oh, don't crowd the pan when you're trying to saute mushrooms because they won't turn brown. Well, yeah, they'll definitely turn brown. It will just take a while. While you've got this one process of browning taking a while for the mushrooms to brown, you've got other processes happening that will outstrip it. Those mushrooms may be dried out by the time that they finally turn golden brown, and maybe that's not what you're going for, but the takeaway there is that it will happen.

Wine will brown slowly in a wine cellar. Brisket will brown very slowly over a course of hours rather than seconds if it's being slow smoked in a smoker. One of the things that really trips me out is the reason books turn yellow over time is the exact same process. I had the opportunity to go down to Franklin Barbecue in Austin, which being a native Austinite and a fan of smoky meats, this was a near-religious experience for me, but we got to nerd out about how the smell of delicious wood smoke and the smell of old books are the same thing.

What I mean by that is, with the application of heat, again, you're just pushing the gas, you're making things happen faster or slower, so in a literal fire when things are ripping hot, you are going to have the carbs that are making up that

wood, breaking down and forming all of these awesome, little volatile pieces that float up in your nose, and good wood smoke often smells like warm spices like vanilla and cloves and cinnamon. You get those notes.

What's crazy is if you go and smell an old book, like my granddad has this first edition Catcher in the Rye, it's like 60, 70 years old, if you smell a book that has been well-preserved and hasn't gotten moldy, old books will also start to smell like warm spices like vanilla and cloves and that kind of stuff. The mind-blowing thing is that what's making that book, the pages turn yellow and start to smell like smoked brisket over time is because it's actually kind of smoking itself in slow motion in the library.

So that same process that happens in a couple of seconds in a fire, takes decades to happen at a lower temperature. In that way, yeah, we use temperature to marshal the troops and make it so that different things will happen at different times and in different orders but eventually, virtually, everything that you want to happen in food will happen if you give it enough time.

When you were talking about slow cooking something versus cooking it fast and high, I would say, cooking something fast and high is maybe the middle of the spectrum and the far right, the opposite end of slow cooking would be pressure cooking where you're cooking things at an even higher temperature than you would be able to in a grill. What's crazy is you can pressure cook a lamb shank and you can slow braise a lamb shank for 45 minutes on the pressure cooking side and for several hours on the braising side, and you'll get to very, very, shockingly, similar destinations given how different the approach was. Yeah, it's fascinating.

Heat is, in a lot of ways, the most simple and the most complex of the Ingredients because it only does two things. It makes stuff move around quicker and it makes stuff vibrate more which his how reactions happen, but even though it only has two tricks, those two tricks are profound and meta.

Robb: Right, right. Again, hand ax and fire and then reasonably sophisticated monkey and you end up with humanity, so, yeah --

Ali: Yeah, exactly.

Robb: -- pretty good stuff. All these chapters are amazing, and the artwork you have in this book is just really jaw-dropping. I seriously want to blow a bunch of these things up or be able to get posters out of some of this stuff and throw them up in the house. The minerals section, talk to folks about the minerals. I think, generally, if you mention minerals to people with regards to cooking, it's like, okay, salt, done. Clearly that's not the full story. Talk to folks about that.

Ali: Yeah. First of all, the illustrations and the photos in this book are absolutely what I would love to have in my -- well, what I do have in my brain when I think about food and what I would love to be able to create to show people, but I'm horrendous at all visual arts. I had a hard time, a harder time than I should have on my PhD defense because the PhD committee couldn't always tell what I was drawing on the dry erase board. So I discovered through a couple of my best friends, the wonders of comic books, and they introduced me to a comic book illustrator, an amazing guy whose name is Jeff Delierre who did all the illustrations for this book. All the photos were one of my childhood best friends, a guy named Jason Jaacks who, we all grew up and had our adult jobs, he grew up to be a Nat Geo doc filmmaker.

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Robb: Oh, wow.

Ali: It's great to be able to call in that favor. So the minerals chapter, to get back to that, which, by the way, was illustrated in graphite to make the whole minerals thing work better, just like the water chapter was illustrated in watercolor --

Robb: Nice.

Ali: -- because I guess we were drunk with power. The minerals thing, yeah, minerals, we're eating rocks. Most people are comfortable with we're eating sodium and chlorine in table salt, and that's great. But there are minerals in just everything, and they do a bunch of different jobs. The taste thing seems clear, but all of the other minerals that we eat actually have different tastes.

I like to poke fun at what I call just food science as food science where it's brilliant small-scale stuff that loses sight of the big picture sometimes. When people were clamoring at the turn of the millennium for low sodium options, louder than ever before, the food science world came up with, oh, we'll make deli meats and hot dogs, but we use potassium chloride instead of sodium chloride so we can still cure it and keep it safe but it won't have as much sodium. The problem is, if you ever tasted potassium chloride or low sodium salt, it has the nuances of licking a rusted car bumper.

Robb: Right. I was going to go with ass, but, yeah, rusted car bumper is pretty good, yeah.

Ali: It tastes weird. It's like metallic and yet also sour and bitter. It's really hard to put your finger on horrendous experience. Then you've also got things where people talk about the complex, oceanic, briny taste of gray sea salt, unrefined sea salt or

pink Himalayan salt. That's just coming from calcium and magnesium and iron which, first of all, have their own tastes but without getting too far down the rabbit hole, they can also affect smell because even though we will never smell minerals and that whole salty smell of the sea thing is actually a psychology manifestation of you smell the smell of decaying kelp and fish guts but your brain remembers the saltiness when you got hit in the mouth with a wave. Because you can only smell stuff that floats up in your nose and minerals are never going to be volatile, so you can't smell them.

Things that are like gamey, like when people taste something that's really iron-y like quail or lamb or are really gamey meat, a lot of that, people say, is smell. When you've got it in your mouth, you're like, oh, man, it has got all these different things going on that has nothing to do with sweet, sour, salty, bitter taste types of stuff. What happens is the iron actually messes with lipids in your saliva. It chops them up into little pieces, and they fly up in your nose, and you smell them. So minerals, the flavor world of minerals is crazy.

Minerals are behind the scenes in a whole lot of the colors that we have in food. Colored food can come from a variety of sources but the color of red meat and the color of green vegetables are intimately linked to iron in red meat and magnesium in green vegetables, magnesium and chlorophyll. Basically, pigments in those two things, whether it's a piece of steak or a duck breast or it's kale or some parsley or the rind of a cucumber, the way those pigments work is that if you zoomed in and looked at what those molecules actually were, they're shaped like solar panels.

They're these big structures that are built to interact with light in a specific way. Anchoring those structures and holding them in the right shape, keeping the solar panel at a right angle, is magnesium on the green side and iron on the red side. Anything that you do that messes with those minerals is going to change the color of that food. When you overcook, I don't know, broccoli or Brussels sprouts, and they turn army green, like dark brownish tan, what's happening is that magnesium has actually fallen off of that solar panel, dissolved in some water and now the solar panel is a little bit bent and contorted so now it interacts with light in a way that we see it as brown.

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So minerals do a ton of stuff for color. Minerals also do a ton of stuff for structure. One thing that minerals, some specific minerals like calcium and magnesium especially, they're really good at binding stuff together. So when we're making any type of scaffolding or gel or we're trying to get anything to stick together in food, that is going to have something to do with either carbs or proteins. Those are all chains and ropes in the Ingredient world. So for things to

link together to form nets that hold tofu together or that hold a croquette or even bread dough together, you need to have those carbs and proteins interact with each other, and minerals are great at tying things together.

When you make tofu, the old school Japanese way of making tofu is you knit soy proteins together using, basically, rivets made of magnesium. You add magnesium salt to soy milk, and it brings together soy proteins and makes them clump, and that's what gives you tofu curds. When, let's see, when you're making asparagus, when you're cooking asparagus and that asparagus goes from really firm and crisp and fresh to wilted and tender and al dente, the transformation that's happening is actually the opposite of what happens with tofu. Rather than minerals bringing things together, minerals are dissolving, off of pectin, which is a carb that acts like cement in all plant foods. It's what keeps everything joined together since plants don't have the luxury of bones. As you cook a piece of asparagus, the calcium that's naturally binding that pectin cement together starts to dissolve and wither away. That pectin now goes from cement to jelly, and that's what makes vegetables tender.

This five-minute rant about minerals that I just went on, these are like two or three concepts that explain things as diverse as why meat is red to why bok choy wilts when you cook it.

Robb: Oh, that's awesome. That's awesome. I love it. I love it. Let's talk a little bit about lipids and fats and in particular, emulsifiers. This is something that freaks people out because there are some emulsifiers in different types of prepared foods that we purchase, but there's just a stunning number of really cool foods, I'm thinking about like creme brulee and homemade ice cream and different things like that, that you need to get this emulsion right otherwise you totally botch the whole thing. Here, again, tying back into heat, if you get the heat component wrong then you denature the protein, and the thing doesn't work. So talk a little bit about lipids in general. Go as wild as you want but I definitely want to talk about emulsifiers a little bit.

Ali: Sure. I really like talking about -- it's interesting, some of these ingredients in this book, specifically lipids and sugars, are completely typecast. They are just Al Pacino'ed to hell. Al Pacino is never going to play the warm and fuzzy role ever in his career. Nobody in their mind, when they think of sugar, is thinking of anything but sweet and probably guilt. If we rewound about 20 years and this was back in the '90s, everybody, when they think of lipids, would think of fatty, creamy, decadent and guilt, but sugars do four or five other things and lipids do four or five other things than be creamy.

One of the things that lipids do is they form these amazing emulsions, and there are all sorts of ramifications of that. I started this whole journey of teaching this

stuff in a culinary school at the Culinary Institute of America up in Napa Valley. There is nothing that strikes terror into the heart of somebody learning how to cook like an emulsion because it's this thing that will seemingly break and fail and turn on you for no reason, but it's a very simple premise. The idea is we all know that oil and water don't mix. Emulsions are physically beating oil and water into each other's presence to make a bunch of little, tiny oil droplets scattered in a sea of water or vice versa. But no matter how much our culinary savvy progresses with the ages, we're always going to be living on borrowed time with an emulsion. It is an unholy violation of the basic principles of physics. Just these guys are never going to want to be in contact with each other so they're going to try to separate out and minimize the surface area that's exposed to that unhappy border.

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So our answer to that is a bunch of different things. We can throw stuff in the way to keep oil droplets from being able to cling together and separate out as one big oil slick, and those are separated into two categories. There are stabilizers and there are emulsifiers. Again, if you're a member of the ingredient-conscious populace, if you're a label reader, neither stabilizers nor emulsifiers are words that you want anywhere near your food.

To dig into that a little bit and add some shade and some nuance to that conversation, what stabilizers do, all a stabilizer is, is something that thickens water. It's something that is basically a roadblock that you can put in the way of two oil droplets that are trying to find each other and separate out. To give you an example, if you just took oil and vinegar and you whisked them together to make a vinaigrette, yeah, you can beat them together and those little tiny oil droplets will go and be nicely and evenly dispersed for a second and then the oil droplets will start to band together and escape and rise to the surface.

If you then took, I don't know, the Hidden Valley Ranch approach which is to take Xanthan gum or starch or gelatin or just any long, noodley kind of Ingredient, if you put that stuff in the water and you dissolve it to make that water thicker, now all of a sudden these lipid droplets, when they want to band together, it's like they're trudging through mud to try to find each other and it takes longer. So that's what a stabilizer is. A stabilizer is anything that's going to thicken the water to make it harder for lipid droplets to find each other and band together.

Emulsifiers are like one step closer towards a fail-safe where emulsifiers say, okay, let's say those lipid droplets will eventually find each other anyway. What if we coded them with like pinball bumpers so that even if they tried to merge together into one droplet and they were able to successfully hit each other,

instead of merging, they will just bounce off of each other. That's what emulsifiers are. They are little, tiny -- they're anything that has one-half of it -- well, any molecule that has one-half that loves water and one-half that hates it.

What happens is if you put in an emulsifier like lecithin, the one that everybody has seen on the label, all lecithin does is if you've got a bunch of fat droplets that are trying to glob together and turn your creme brulee or your vinaigrette into an oil slick, it coats each one of those droplets and the part of lecithin that loves oil, digs into the droplet, and the part that loves water, hangs out into the water so that you can imagine them like a pin cushion covered with all these little, tiny bits of lecithin that when two oil droplets that are pin-cushioned meet each other, they can't merge together.

So that's basically what stabilizers and emulsifiers do. Now there's nothing special about getting stabilizers and emulsifiers from a bag of white powder. That makes them work. That's why we have egg yolks in mayonnaise. The types of Ingredients that can act as emulsifiers are usually proteins and lipids because they have parts that love water, parts that love oil. If you have gelatin, gelatin can work to some extent as an emulsifier. If you have any type of protein or lipid that can bridge that gap, you can make it work.

When you're trying to make an emulsion stable, it's not like, oh, I have to use either these impure or these overly pure chemicals or stick to real food that may not have the texture that I want. There's all sorts of middle ground where you can use, I don't know, everything from an avocado or roasted garlic puree to an egg or, I don't know, ground up coconut. There are emulsifiers and stabilizers everywhere around us in the natural world and so where one person might want to use Xanthan gum to thicken their Hidden Valley Ranch, you could just easily use pureed okra to make a more stable green goddess dressing.

Robb: Interesting. I love it.

Ali: I've been talking about this a lot. I'm a little bit jaded about the merry-go-round of which specific additives we're going to hoist up as our superfoods and as our demons of the week. It's going to always be cyclical, and we're going to always learn new stuff. I still am not sure if milk is good for us or not. It changes every -- I think it's months that end with R, milk is bad for us. But one thing that will never change is that people will always be skeptical of something that is purified and feels overly processed even if it's something like baking soda. People are always going to have weird thoughts about baking soda, but it's really hard for people to be super anti-parsnip.

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Whole foods are always going to be a little bit more palatable regardless of the nutritional climate we live in. Right now we're in a very carb-averse moment in our world, but potatoes are never going to freak people out quite the way that Yellow No. 5 will. So if we learn to get back to the roots of understanding which tools are in all of these whole foods, that's like the whole aquafaba thing. Yeah, we could go into a bag of magic tricks of different "chemicals" to replace the eggs in a meringue, or we could just use garbanzo beans. People are always going to feel a little more warm and fuzzy about the thing that they identify as a whole food so why not figure out how to open up the hood of those whole foods and see what parts they've got going in them.

Robb: I couldn't agree more. Even on the sustainability side, there's a -- gosh, what was it -- the Just Mayo, there was recently some big drama with that. There were some claims around their sustainability and then their sales. It looks like they have a fleet of people going out, purchasing the stuff to make it look like they were selling a lot more and just this whole interesting deal. They spent I think like $200 million trying to find an egg substitute and still can't really come up with it. Nature and evolutionary biology have really done some good, pretty good engineering on a lot of that stuff. So to your point, probably looking a little bit less towards the lab and a little bit more towards what do we already have kicking around in nature that is an analog as best as we can get to that type of stuff. We might have a little bit more success but, man, I wouldn't mind getting some of that Silicon Valley money for some sort of a harebrained idea. That would be pretty amazing.

Ali: Well let me give you my quick hot take on the Silicon Valley approach versus not. I agree that if you want to replicate to within 95%, exactly the experience you get from eggs without actually eggs, I think that does take hundreds of millions of dollars and staffs of dozens of people working on it for years to make that happen because that's a very specific experience that, just like you said, eggs are such a specific nexus of evolution and composition and memory for all of us, to recreate the experience of an egg, it's going to take some serious homework.

To recreate the individual jobs that an egg is doing in mayonnaise, we can do that right now on the cheap, this afternoon in ten different ways but that requires from us, as consumers, to be a little bit open to interpretation of what we're looking for. If we want to make an eggless mayo that is one for one perfect just like the mayo you had out of the jar as a kid, that takes some serious doing. If we're open to, like, I don't want exactly eggless mayo but I want something that's creamy that has a lot of the different cues in mayo but maybe I can push it in different ways to match up with what I'm eating anyway, then obviously you can make eggless mayo with avocados, with hazelnut, butter, with garlic, you can make eggless mayo with, I don't know, pureed scallops if you're not trying to be vegan.

There's a ton of ways to replicate those things that just requires a little bit more maturity and openness from us as consumers to realize, hey. If you're using an avocado to make an eggless mayo, it's not going to taste as neutral as mayo, but avocados also don't taste bad. If you don't want something that necessarily tastes like avocado then there are other ways to do it. It just takes a little bit more thinking on our end to pair how you're going to substitute the functionality in that mayo for what else is going into your sandwich or what else is going into your dish.

Robb: Right. I'm intrigued by a pureed scallop mayo. That sounds amazing.

Ali: That's at all of these amazing Nordic restaurants that have popped up all over the country. Scandinavia is the land of amazing creamy meats that there is a cultural standard and heritage there for taking everything from fish and other seafood, to just any source of animal protein that you can imagine and whipping it together with all of the delicious dairy that they have up there to make amazing stuff. If you're going to have like a lox spread, a lox spread that is just basically smoked trout that you put in a food processor and mix with whatever you want to make a creamy spread, that's only one step removed from using scallops or shrimp or smoked ham that you grind up and make into a really beautiful ham mousse. It's all just protein. It's like an equal opportunity experience. It just depends on if that's the overall experience that you want to create.

[0:45:25]

Robb: Right, right, sounds amazing. I'm starving right now. I had breakfast early today so I'm pretty hungry. I could go on with your for hours, but I don't want to chew up your whole day here. Where can folks track you down on the interwebs?

Ali: I have really started to enjoy the Twitter and Instagram more as I've taken the time to actually interact with people and use those as ways to talk rather than just a way to read the daily newspaper. So, yeah, Twitter, I have a super weird name, so my Twitter handle is actually my name. It's Ali Bouzari. Then on Instagram, the only other Iranian dude with my same name beat me to it, so it's Bouzari Ali rather than Ali Bouzari.

Robb: Nice.

Ali: But, yeah, find me on there. It's great to talk about things. Also, if you want to check out the book, it's on Amazon, and it is amazingly cheap online. It's often less than $20 which when I went to a couple of 3-Michelin-star restaurants in Manhattan to do a little workshop on the book, I was like, "And guys, you can get

this for less than the price of a cocktail on this island." So there's a really great ROI on that investment.

Robb: That's awesome. Well we will have links to all of your social media handles and to the book. Ali, it was great having you on the show, really super cool. I get over to your neck of the woods occasionally, so the next time I get over that direction, I definitely want to figure out where you are cooking and go get some grub.

Ali: Let's hang out. Do you like the water?

Robb: Is that a restaurant in Sonoma?

Ali: No, it's me asking if you want to go spearfishing.

Robb: Oh, hell, yes.

Ali: Okay, great.

Robb: I don't know if you know that but, literally, that's what I do.

Ali: Oh, really?!

Robb: Yes.

Ali: Oh, my God.

Robb: Even when we go somewhere like to the Bahamas, I will stay in the water until I'm hypothermic. My wife, last time, sent people out to get me because I was purple and probably not thinking quite straight because I was out there for like six hours straight.

Ali: Well one of my business partners, Kyle, is opening this amazing restaurant in Sonoma County called Single Fred ***[Phonetic]***, and his first mate is a guy named Aaron, was previously living in Carmel down in the Central Coast. He's an insane person who goes diving for 30-inch lingcod off the Northern California coast, and he's got me hooked on it over the past year, so let's do that.

Robb: Sign me up, yeah. I'm not really into surfing. I like hunting stuff underwater. Yeah, that is definitely my gig.

Ali: Let's do that.

Robb: Awesome, man. Well, again, thank you so much for being on the show. This was just amazing. Your book, literally, in our house, I had a little easel-type gig that I

used to have an award set up on that, but now your book is the centerpiece on the island in our kitchen. Everybody that has come over so far, they're like, dude, that thing looks amazing. I agreed with them. It absolutely does. So fantastic job on that.

Ali: That's great. Well, hey, let me know which one of the illustrations is your favorite. We'll see if we can maybe get you the image and all from Jeff.

Robb: Oh, that would be awesome. Even just a big, high res PDF deal so I could print it up here would be amazing.

Ali: Of course.

Robb: That would be super awesome. Okay, awesome, man. Well I look forward to meeting you in real life, and thank you again for being on the show.

Ali: Thanks for having me on. This has been awesome.

Robb: Okay, we'll talk to you soon.

Ali: All right, take care.

Robb: Bye-bye.

[0:49:03] End of Audio