



# DROP OF INSPIRATION EP40: ESSENTIAL OILS AND SCIENCE

**Celeste Rosenlof:** You're listening to Drop of Inspiration, a Young Living podcast. Join me for leadership lessons, conversations with Young Living influencers, and an inside perspective on our company. I'm your host, Celeste Rosenlof.

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**Jared Turner:** While we've talked about Seed to Seal as our five-step production process, it represents something much more expansive: our effort from the seed of an innovative idea, to our final promise to deliver the best quality oils in every aspect, and the most quality member experience. While that production process is key in our Seed to Seal program, it is upheld by three essential pillars: Sourcing, Science, and Standards.

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**Celeste Rosenlof:** That audio you just heard was from our International Grand Convention in Salt Lake City, Utah, earlier this year. At it, Chief Operating Officer Jared Turner announced the three pillars of Seed to Seal: Sourcing, Science, and Standards. In August we talked to Chief Supply Chain Officer Lauren Walker about her role as the owner of the Sourcing pillar and what that looks like. So today we're continuing our three-part series with the pillar owners by talking to Mike Buch, Chief Science Officer. Here is that conversation.

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**Celeste Rosenlof:** Hi, Mike, welcome to Drop of Inspiration.

**Dr. Mike Buch:** Well, thank you.

**Celeste Rosenlof:** Thank you for joining us today. So first of all, I wanted to get a little introduction from you. Can you tell me a little bit about yourself for the people who are new here?

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**Dr. Mike Buch:** Yeah, it depends how many hundred years you want to go back, I guess. (Chuckles) I was born and raised in central Pennsylvania, in the heart of Amish country. And that really has kind of stuck with me all my life. The rule there is to respect nature and respect people, and I have a great respect for both. And that calling towards nature has always sort of driven me as I've gone through my educational process. I went to a private college in Pennsylvania called Franklin and Marshall. It was a great little school. It's kind of a powerhouse for scientists actually,



and I really got into chemistry at that point and then furthered my chemical education at the University of Delaware, where I got my Master's degree and then my PhD.

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And then did a short stint at the University of Hawaii of all places. And that was actually some really fascinating research because I was able to set up something called the Hawaii Biosensor Institute out there, where we were actually using naturally occurring chemoreceptors in different types of plants and animals to make biosensors that would detect chemicals in people.

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So that was really interesting research, and we started a program there that was based on neuronal-based biosensors. So we were actually taking chemoreceptors that were in the neurons of crustaceans, things like crabs and lobsters. And we were using them to build instruments that would detect very, very minute quantities of compounds in water and in blood. So that got me really interested in kind of relating the natural processes to chemistry.

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And then I decided I'd better get a real job that pays some money, so I went back to New Jersey and worked in some big pharma companies for a while, actually progressing the biosensor work. But what really got me into essential oils was my early work at a company called Warner-Lambert, which has now become part of Pfizer. And they worked on Listerine. And it turns out that the active ingredients in Listerine are actually essential oils. And it was my job to actually study how those ingredients work and develop new Listerine-type products. And that really got me into essential oils. And from there I drifted into a few other jobs and, eventually, here I am, finally planted firmly in essential oils.

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**Celeste Rosenlof:** Yeah, that's so interesting, I think. So you are the owner of the Science pillar for Young Living. What all does this pillar encompass?

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**Dr. Mike Buch:** Well, it sounds kind of silly, but it encompasses all of our science, quite frankly. But that involves what I would consider to be our industry-leading research pillar, where we actually study plants to understand what oils we can get from plants, what those oils can do. We study lots of other things besides oils now as we move into other types of products like nutritional supplements.

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It also involves making sure their quality testing is second to none. And we've done a lot to actually improve our quality testing over the past few years. And frankly, Young Living is really



good at improving anyway. We have continuous improvement here. It's one of the reasons I'm here. It's really fun to continually upgrade and update as science itself improves.

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And then finally, we also have within the pillar, our innovative development processes. And we really have some fantastic product development scientists who are really devoted to finding new ingredients and new ways of combining ingredients to deliver new products. So it's a lot of fun.

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**Celeste Rosenlof:** Yeah, that sounds really interesting and like you just get to go and figure things out and test how things work together.

**Dr. Mike Buch:** You know, science is actually a very creative process. So it allows us to use scientific methods to be creative, and that's where the fun comes in.

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**Celeste Rosenlof:** Yeah. I know it's always fun to talk to your scientists downstairs and see what's on their radar. They're a really interesting group. So you touched on this, that we want to be industry leading and that our testing is second to none. What specific things are we doing that set us apart from what other essential oil companies are doing with testing or science?

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**Dr. Mike Buch:** Well, I'm all about focus, quite honestly. And one of the things I did last year to help us focus a little bit better in the science area was to actually split R&D right in half. So now we have an R, and we have a D. And that means that I have scientists who are fully, 100 percent devoted to research. And I also have a group of scientists who are completely, 100 percent devoted to product development. And that allows them to really focus on not only their own skill sets but to bring the best products to market.

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Together in that team, there's some fantastic people, as you've mentioned. We've currently got six analytical chemists, two with PhD's, two with Master's degrees, two with Bachelor's degrees. I've got three certified food scientists. Two of those have Master's degrees and one has a Bachelor's degree. I have a Master's degree person in ecology. I have two information technology scientists. I have two molecular biologists. I have a biochemist, a neuroscientist, a chemical engineer, and an environmental scientist. And then there are two food scientists all working together down there. And it's just really a fun place to be because all those different diverse backgrounds allow us to kind of tackle scientific problems from different directions.

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**Celeste Rosenlof:** Yeah, I was just thinking like, wow, that would be so cool to be in a group of people who are that highly specialized. If you have a problem with something you're working on, I mean, I'm sure there's ample opportunity to turn to your neighbor and say, "This seems like something you might have insight into."

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**Dr. Mike Buch:** Yeah, it's really good, and the other thing that I've done now is really try to integrate the quality control scientists with the R&D scientists. So the quality control scientists are a whole different group of people, and there are quite a few people. I think there's over 30 quality control scientists now who are doing nothing but spending every day testing Young Living products to make sure that we meet our Seed to Seal standards.

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But those people now work very closely with the researchers and the product formulators as well to help understand the products. As we test products in quality control, we learn things about them, and then we can go back and adjust formulations to make them even more effective. And similarly, as the R&D scientists talk to the quality people, it helps them to understand what's needed in a product to have it pass our rigorous quality standards. So it's really a well-functioning it team right now. And Young Living's got, let's see, that's over 50 highly trained, highly skilled scientists plugging away to make sure that our products are the best they can be.

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**Celeste Rosenlof:** So Mike, you mentioned a lot of sophisticated testing that takes place here. How do we confirm our results?

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**Dr. Mike Buch:** Yeah, that's a great question. We actually have two laboratories within Young Living, one at Spanish Fork, and one here at Lehi, where it gives us the ability to play the results from one lab off the other. So that helps quite a bit. But in addition to that, we have over a dozen external expert partner testing labs that we use. These range in specialties from things like analytical chemistry to microbiology to physical chemistry. We even have a few forensics labs who are real specialized in detecting minute quantities of contaminants. And we use those folks routinely. They're located all around the world to sort of help confirm all of the results that we generate.

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**Celeste Rosenlof:** Now, you have talked about how you're improving the processes down in the lab and also the products. But it's interesting, too, I think the innovation that's coming out of Young Living in terms of all of our quality testing, but also, like, all of our formulation and all of that. Could you tell us about the formulation process and what goes into that?



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**Dr. Mike Buch:** That's actually a really difficult question, believe it or not, because every product is just a little bit different. Oils are one thing, supplements are another thing, makeup is something different, topicals are different again. But in general, what happens is that the Product Development team works very closely with Gary and myself to identify new ingredients. They check them through R&D. We see what those ingredients can actually do. It goes into early stage formulation, where that's basically a lab batch, a very small amount of product made literally in the laboratory, usually no more than about a kilogram or so of product.

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It's a very iterative process. So they will mix it and test it, and then change the mix and test it, and then change the mix and test it again. And many times that can be 20 or 30 different formulations until they hit upon something that they think is really worth taking forward.

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And at that point, we work with process engineers to begin scaling it up. And what that means is that you now move from batches that may be 1,000 milliliters or so, about a kilogram, something like that, up to batches that are roughly 100 times that size. So larger-scale batches, as we move towards the final size that would be done in a manufacturing facility.

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But the scale-up involves, again, making sure that everything can be blended the same way as the batch becomes larger to make sure that we're able to mix ingredients thoroughly, to make sure that they interact properly. Part of that interaction process is stability testing, where we'll actually put these things into what we call stability chambers, which are basically small rooms that have a controlled warm temperature and a high humidity. And the reason we do that is to sort of stress the product, to see how long it takes before it begins to degrade either chemically or microbiologically. And that's how we establish expiry dates on our products.

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So that's part of it. Concurrent to that work, we're constantly testing the product for claims support. So for example, if we want to say a product improves your complexion, we will start testing it either internally or go to external experts, who may be skin experts in this case, to actually do careful photographic monitoring of the skin to see that it does improve your complexion, or there are special IT techniques we can do with redness measurement, things like that.

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So the whole time we're actually developing the product, we're actually developing the claim set. And the objective there is—and I've said this many times on stage actually—not to let a product



out the door that doesn't have a strong supporting system for its claims. Because we want strong claims, and we want strong scientific support for those claims.

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So, you know, the development process can be very, very time consuming. Typically, where I came from before, in big pharma, it could take 10 to 15 years to develop a product. If you go to consumer health care groups, places like Procter & Gamble and Johnson & Johnson, for example, their average turnaround time from inception to the final product formulation is about two years; 18 months if they're really hitting everything well. We do it in about a year. So I'm really, really proud of our team. We're able to develop products in about a year's worth of time. So that's pretty much from convention to convention; the teams are working really hard to get those products out the door.

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**Celeste Rosenlof:** Yeah. I liked the idea that there is all these teams kind of working together on this product, which I'm sure helps make things move a little quicker so that your timeline is realistic, or achievable. (Chuckles)

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**Dr. Mike Buch:** Well, there's so many other teams that have to move in parallel with that. You know, I'm only talking now about the scientists in the lab. But along with all of that work, there are people in Regulatory, for example, who have to make sure that we're able to use the ingredients we want to use and to make sure that we can use them in each country that we want to launch into. And then there are people who do nothing but work on labels to make sure that the label accurately reflects what's in the product.

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And there are the legal teams who make sure that we are allowed it to name the product what we want to name it, or to make sure that our claims on the product are permitted legally in all the markets we operate in. So there's just so much. I could go on and on. But every product's different, and it is a tribute to the people here that we're able to do it so quickly.

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And I can tell you that my previous job was at a company called GSK, big, bad pharma, again, but I was on the consumer health care side of that company. And that company is 60, 6-0, times larger than Young Living. It's an enormous company. And we thought we were very successful if we would launch about a dozen products a year. And I should tell you that my R&D resources at GSK were phenomenal, just huge. I had an \$8 billion R&D budget. Needless to say, that's not quite the budget we have here. But, as I said, if we launched a dozen products a year, we were doing really well. Last year at Young Living, we launched over 50 products. So it's a real



testament to this team of how quickly they move, how hard they work, and frankly, how smart they are.

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**Celeste Rosenlof:** Well, and too, I think, for members, that means more options than ever, more higher quality options than ever. And really, at the end of the day, I feel like all of the scientists downstairs are advocates for our members.

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**Dr. Mike Buch:** Everything we do is member-first. They're always thinking about the members; they're always thinking about how the member would use the product, what they would use it for, what it should do for the members. So, you're absolutely right, it's always members first, right down to the people who are doing some of the most tedious tasks in the company.

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**Celeste Rosenlof:** Now, I wanted to shift back to what we're doing to improve the testing and research behind the Science pillar. How are we making those processes more rigorous than ever before?

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**Dr. Mike Buch:** Well, scientists in general sort of like to continuously improve. That's the nature of science. Frankly, science is based on learning something and then building upon that learning and learning something else. So we actually have a team of people in R&D who do nothing but scan the scientific literature that's generated around the world to learn kind of the latest in our field. And I've kind of had the team sort of fundamentally change in the way they operate, and that is I asked them to think about claims first and then the product.

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So what we're doing now is thinking about what our members want or need and then developing products to deliver on those needs. And those needs come also from perusing all of the literature around the world. So we're looking at technical literature as well as consumer literature as to what people want, what they don't have, products that don't work well that can be improved. So there's this spirit of continuous improvement.

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On the technical side of that, the continuous improvement is really in training as well as new instrumentation. And Gary has been incredibly generous in budgeting with us to allow us to purchase new instrumentation on an annual basis. And I am very confident in saying that we have some of the best instruments in the world, not only in our industry, but in the world. Some of them,



in fact, are so complicated that our scientists need to go to special training just to learn how to operate them.

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And one of the instruments that I've talked about in the past is the isotope-ratio mass spectrometer. We actually have two of those instruments. And those instruments are so complex that I've got two scientists who have been to two years of training before they could even turn those instruments on. And those are the only scientists in the lab who are able to operate those instruments at the moment. And we have a few more who are taking training now.

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But you know, we're constantly updating our capabilities. One of the things that we talk about a lot in this industry is GC, or GCMS, gas chromatography. I just want to let our members know that we take it way beyond simple gas chromatography. We do gas chromatography flame ionization detection. We do gas chromatography mass selective detection, which is a quadrupole mass spectrometer, which I'll people look up if they're interested.

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We use gas chromatography combustion pyrolysis analysis. We use ultra-high-performance liquid chromatography both with UV detectors and mass quadrupole detectors. We're really, really getting very sophisticated. And, you know, people think chromatography is kind of a simple little thing, and it's basically a system that's used to separate all of the compounds that are in an oil into their individual compounds so they can be analyzed. But it's very, very complex, and we are, I think, leading the field in chromatography right now.

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**Celeste Rosenlof:** That's great. Sounds like there's a real marriage of great people, great, smart people, and the best scientific practices as well as these instruments. No one thing would be enough.

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**Dr. Mike Buch:** Well said. Well said. You could have the best instruments in the world, but if you don't really know how to use them to their fullest potential, they're wasted, you know? And we've got people who really know how to use these instruments, so it's really great.

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**Celeste Rosenlof:** Is there anything else that you want to say about the Science pillar or the work you're doing here?

**Dr. Mike Buch:** I mean I could go on and on about, you know, the science that we have here. At



the risk of boring everyone, I just really want to say to our members that they can rest assured that we have some of the best science on the planet. And I think really we have the best science in the essential oil industry by far. And we have the best scientists in the essential oil industry by far.

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And you know, one of the things that people tend to do these days is Google something. So they'll see a word that they don't understand or an ingredient that they don't understand and they Google it. And I'll ask our members to just think to themselves when they do that—and I welcome that, they should be Googling things. But you have to be careful. And I'd ask them to think to themselves: Do you trust scientists with years and years of scientific experience, or do you trust Google where something could've been posted by someone with no credentials whatsoever? Because we really don't know where things on Google come from all the time.

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So you've got this great team here at Young Living, and it should be a resource to our members. And I encourage our members, if they have questions, to ask us. Don't go out to Google and try to find things that are more and more confusing. If you get confused, come to us, we'll help you. We've got a lot of great people here who love helping members.

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**Celeste Rosenlof:** That is very true. Before I have you go, I wanted to ask a just for fun question. I want to know what your favorite Young Living products are, or if you can even narrow it down to one or two. (Chuckles)

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**Dr. Mike Buch:** Well, it sort of depends on what you mean by "favorite." In terms of diffusing, in my office, one of the favorite things that I like to do is mix a few drops of Grapefruit oil with just a drop or two of Peppermint and diffuse that. I love that. In terms of actual products, unfortunately, as I get older, the one that I appreciate the most is our pain cream. It really works. And it's really nice to hear all of the positive feedback we get on that product. So that's really one of my favorites.

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**Celeste Rosenlof:** Yeah, same. I love the pain cream. Well, thank you, Mike, it's been a delight to talk to you today.

**Dr. Mike Buch:** You're welcome, thank you.

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**Celeste Rosenlof:** A big thank you to Mike for talking with us, and thank you for listening. If



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