Masterclass: finding the right recipe for your beans
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An hour long conversation between Decent co-founder, John Buckman, coffee educator and judge Celia Wong, and trainer from Fuel Espresso, Paul Chan

https://www.youtube.com/watch?v=1qyFDbkRrOA

[0:00]
So today we're going to do a master class on the decent espresso machine. Specifically on how to extract different flavors from your beans depending on the recipe. So we're going to start with the lever profile. Also, a version of that is the traditional 9 bar profile and that is really dialed-in in the hardware in traditional machines to get you chocolaty flavors from medium to dark roast beans.

Now these beans we're going to be working with here are from Scotty Callahan who is a two-time Australian national champion winner. From the color I would say this is a medium roast bean, in fact there is some oil coming out of it…so some of them are a little bit more roasted. However, it's a very well-executed bean and besides chocolaty medium flavors it's possible to get some more subtlety out of it and that's what we're going to try and do in some of the recipes. So we'll use this bean initially to do the panorama of different recipes and then later in the class we're going to bring some lovely light roast beans and we're going to show how to extract those properly, because if you do those in a traditional machine it's not so pleasant.

[1:09]
Okay, now for everything we're doing we're going to be using 15 gram doses, okay, and the reason we're doing 15 gram doses is because: (a) we're going to be drinking a lot of coffee! (b) it's emerging as a quite popular choice; it's more eco to try and get more coffee out of less beans. I also feel that it's kind of cheating to do 22-24 gram coffees and then just pull them like say, 1-to-1, 22 grams in and 22-24 grams out; those are ultra-ristrettos and you're not really getting everything out of the bean if you do that.

Now, one of the things Scott Rao says, that I didn't really understand for a while, is the longer you can pull a bean out the better it's going to taste. But that doesn't mean that if you take a bean - let's say 15 in and 30 out - and now do 45, that will taste better. If it channels, then it's going to taste worse. So the key word is, can I pull it out that long? And with the charts, we have a hint as to when the bean is falling apart. So, one of the key things about all espressos is that all espressos end in tragedy!

[2:21]
Okay, what I mean is that every single espresso falls apart. At some point, the puck goes to hell. Matt Perger maybe will invent something that solves this problem, but until he saves us all that is the reality. And so, what we're trying to do when we're making espresso is delay that time when the puck goes to hell, so we can pull that shot longer. So when Rao is saying the longer

you can pull the shot the better it tastes, what he's really saying is the longer you can delay the puck falling apart the better your shot will taste… and if you put it that way, it doesn't sound that radical! Right?

Now, the other thing (this is more of a flavor thing) is if you pull shots shorter you tend to have less subtlety. They tend to be easier-drinking espressos; you pull them longer you have more in the mouth, more complexity, more acidity as well. So generally - and I say just generally - you're going to pull shorter shots if you're going to put milk in them you want less complexity, less acidity. If you're going to drink them neat, either as straight espresso or Americano, you want to pull them longer. You want more complexity, a little bit more acidity. And the recipes here are going to reflect some of that. Okay. The way we're going to do that today is I'm going to pull a shot that hopefully won't be bad, and then I'm going to explain it and then I'll want you guys to make it. And we're going to talk about what's going right or wrong with those shots and what we see on these.

[3:55]
So, looking at the tablet, if you are here and you tap the word for the profile then you actually get a list of all the presets - which is this list here, okay? And the profiles we're going to make today…we're going to start with the Default profile, which is essentially a lever profile. It goes up to, let's see, up to 8.6 bars and then comes down to 6 bars if it ran the whole time. There's also a pre-infusion phase here and I'll talk later about why that's important and why it's a good innovation.

We're also going to make, and it's not on the screen right now, but we're going to make a traditional 9 bar shot and you can show it by tapping the eyeball here, okay? And then you can say, for example, e61. That is a traditional 9 bar shot and if I look at it you can see it just goes straight to 9 bar straight across. What we can do with this shot that's interesting is that we can turn it into a lever shot by having the shot go down in pressure… and down in pressure in different speeds and ways. Okay, and we'll make some espressos that do that and when we start going from a straight 9 bar shot to something that decreases, we're going to taste the difference and you're going to see that this decrease here is going to affect, really, the acidity and the length of the shot. So, an espresso that's really falling apart, you might want to decrease the pressure here, but it's going to come at a sacrifice of extraction. There's always this relationship.

[5:41]
I've got this unified theory of how to make espresso, and it largely simplifies espresso to two variables: one is the solubility of the bean, which is how quickly does the bean give up materials to water; and the second is puck integrity, which is how well does it resist pressure. Those are the main two variables. If you start going really deep on espresso, you end up with 50 variables and you can't make any progress. It's just it's just too complicated. The reason I focus on those two is that roast level - which is to say how dark your bean is, how much it's roasted - affects both those things immensely.

A bean that's very lightly roasted is very poorly soluble. It doesn't give up the material to water very easily. It's going to need either more water contact time or more water speed, in order to give up its material. If you treat a dark-roasted bean and a light-roasted bean with the same recipe they won't both work. And as you go darker and darker what's happening is that the soluble material is becoming more and more accessible to water. The darker the roast the faster the espresso is going to give up its material and for reasons we don't really understand, the darker you roast the bean the more puck integrity it has and we don't understand why that is. No, that's not a well-understood thing. But it is absolutely a fact that if you take Italian super-dark roasted beans, they can make a tiny puck that's 7 grams and it will actually hold up. Now do that with light roast and in five seconds you have vinegar, okay! So, that presents a challenge because it means in order to extract those light-roasted beans we need to give them a lot of water or long water contact time …but that's also going to promote them falling apart. And that's what makes light-roasted beans so hard.

[7:41]
It's also what makes dark roasted beans so easy. They give up the material easily and they don't fall apart. Okay, it's also why I think that this machine is kind of the first attempt really, after Slayer and Synesso, to try and do something with light-roasted beans. Because we have to recognize the problem with puck integrity.

Okay, so I am going to go in and I'm just going to use the Default profile here. We're going to be using a Niche grinder the whole time and the grind is set to about 3 right now. What I'm going to do first is I'm going to pull this shot, as it is now, a bit too slow, and we can taste it and what should happen is it should just be chocolaty.

One thing I'll mention is that the concentration of the coffee, what's called TDS (total dissolved solids), affects your ability to taste subtlety, and so the thicker the coffee is the harder it is to taste things. So if we make a really slow mayonnaise-y shot, you're going to taste it and it's going to just whack and it might actually ruin your tongue. You might lose the ability to taste for a while, so it's totally okay, in fact, (I do it, so does Rao) to water down your espressos to taste it.

[9:11]
There's another reason, too, which is, as an espresso, or any drink, comes down in temperature - down to 30 celsius - you can taste more and more and more. At 30 celsius and below we don't taste any more. But espressos coming out of here are somewhere around 60 celsius. If we do it in a paper cup, then they're really hot, like 80 celsius and you don't taste much. At trade shows I try to get people to add cool water and they're like no, no I want my espresso super strong like a man drinks espresso! Like, okay, you're just…it's like eating baking chocolate. Right, it's just, it's too much. So don't be afraid to be wimpy and add water to your coffee.

We're gonna use the scale for the whole time and the routine's always going to be the same. We're just going to stick with 15 grams no matter what, and this cup is just about 15 grams, which makes it pretty fast to do. I'm always aiming for within 0.3 so I'm

going to be a little lazy. I'm not going to go single bean dosing, and the reason I'm not worrying about it is I am also playing with the grind. So, it's not like I've super dialed this in at this point.

[10:25]
In terms of puck prep, for consistency, I'm just always going to use this portafilter stand. There is a better method, but the advantage of doing it this way is that every shot's going to be identical. Now, one thing about the Niche is you can see stuff is still coming out but I'm going to stop it, because the end takes quite a long time and if I stop it always at about the same point, then the weight's always going to be the same. There's still some retained grinds in here, but they're going to come out in the next shot… otherwise I'm adding 10-15 seconds. I'm not going to talk about puck prep yet, except to say that I'm grooming the puck and that'll be something we talk about later. First I want to talk about recipes.

Every single time I make a shot I'm going to tap once, and I'm going to observe, and I'm going to criticize, okay? So here you can see it's a bit high and here you can see it's a bit low, okay? It's not terrible, it's not worth redoing, but this whole area here is lower…this area here is higher. When we make this shot, if we look in the shot mirror, I'm pretty sure we're going to see the shot start toward the front and move to the back. So once you dial in your recipe, this puck preparation step is pretty much the main variable that's going to determine good and bad shots and, unfortunately, it's a huge variable.

[Hey, John. What's happening here? What's with all the lights?]

This is our disco version right now. This is a really, actually old machine; it's a four-year old machine and we've pimped it up with lights because some of our customers have done so, I think.

[Does it have a microphone?]

It has a microphone in the back and so it's blinking when it hears us. It's also blinking as the espresso comes out.

[12:15]
You're good, okay. So that was a fairly slow shot. It started off at 1 ml per second and went up to about 2-1/2 mls per second, but that was kind of the recipe I was looking for. This lever profile is the default profile. Most of our customers are in the medium-light to medium range, and this is also making an espresso that they're going to recognize as traditional. Okay, and this flow rate, here-to-here, is kind of the crucial one for the flavor. So, if this goes down to about half ml per second, then we're going to get like sludge. We're going to get that super thick espresso, the kind of thing that people using lever espressos sometimes really want… like melted chocolate. It will be without subtlety, but it will have really intense mouth feel.

This is kind of an in-between. What's happening here, is as the puck integrity gives up as water goes through the puck, the puck loses material. It loses about 20 percent of its material and

because water pressure is pushing through here, the puck is losing material. The water flow rate increases. Okay, now we have a very very subtle, not very big pressure decrease that's going on here. So we're rising at 8.6 bar and then we're slowly going down and we only got to about 7.3 bar. So just barely more than one bar difference …but I want to show you what that did. What it did is, as the puck first started to extract here, okay, we had a kind of constant flow rate and then the flow rate started to speed up kind of quickly right? Went from 1 to 2 mls per second in 10 seconds, but we started to lower the pressure and lowering the pressure slowed the acceleration of that, okay? And if I had kept going then they would have reached maybe 3 mls per second at the end. The faster that flow rate goes, the less time the water is in contact with the beans, the more likely you are to get acidic unpleasant tasting coffee.

[14:17]
There's no golden rule as to what flow rates are good and bad, but definitely the start and end points are super important in your flavor and if you have one that does that, right - your flow rate really accelerates - there's probably something really wrong with your puck and it's not going to taste good.

Okay, so what I'm going to do is, you can see it's quite thick, let's just give this one a little taste. Then for each of these, you're welcome to just press it on the pitcher rinser. Yeah, dark chocolate. Right. Oh sorry. Anything else? [Orange peel.] [How uneven is it? How is it reflected here?] That's a good point. I cannot see anything wrong with the prep in the chart. So what we should have done is look in the mirror to see…[right, right]. So I'm going to throw the espresso scale in here because it can give us insight.

So I've turned the scale on. Use this one, or Acaia, or a number of other scales. One thing changes, which is on the recipe. It now says, "stop at weight"as opposed to "stop at volume" and it will use the scale and it will show us what's going on. So, I'm going to…um, that one I think, stopped at 38.

[15:35]
So, the shots will stop volumetrically if you don't have a scale and usually what I do is, I use a scale initially, and then I set the volumetric to what the weight gave me. In other words, it might say 36 here but 38 there, so I set to 38 - to get 36 here - it's not perfect.

Now, I should have already weighed my dose but what I'm going to do here is I'm just going to go I think a full notch coarser, okay, one full setting coarser. Same exact profile just so we can taste it and we should get significantly more fruit and hopefully the acidity will still be pretty tamed and we'll see it on the charts. So when people say my espresso is not being subtle, right, or it's, it's kind of muted, I say I first look to see what their flow rate start-to-end is and especially, if it's doing that very slow start at half ml per second, then they're way too fine. But what I just did there, 1- to -2 is what I would consider kind of optimal for a milked drink. Right? Because you just got nice chocolate and a little bit of something else…and the something else, orange peel, tastes good in milk.

We also have to be honest that we don't always have the world's best beans. How does that look? Not bad, but a little higher here - a little lower there…. Okay, so I could be doing a better job!

[17:11]
If you don't have the world's best beans, which is frequently the case, then you often want to work on your recipe to hide defects. We're going to talk about that, but largely it means higher doses and shorter shots. Largely because the more the shot opens up, more good and bad comes out. The more the shot is shorter, the more you have simpler flavors.

So if we look here, we look in the mirror and we'll see the start of the shot. Okay. [How much information does the mirror shot give you?] The mirror shot…the mirror shows you the start of the shot and it also shows you how even the extraction is. So you learn a huge amount, by looking at the mirror. It should, in theory, end at 38. Okay, good.

[How many grams per second?]

So that was the shot here. It started at 2 and it went up to about 3 - 3.2 mls per second. So, this was a significantly faster shot. The other one was 35 seconds, this is 28 seconds to get to the same in-cup volume. So, 7 seconds about 20 percent faster. What I don't know is, I think what happened when the shot stopped…because we jolted the scale.

Too much acidity? Yep, so I'm going to remake this one, because what it looked like to me is the shot started for five seconds, and what happened is that ended up having a huge pre-infusion time because the shot stopped and I restarted it…so I'm making a coarser version of the default profile now.

[19:12]
Okay, so now that the flow rate is a more reasonable 1-1/2 mls per second. Last time it was 2. I think that long pre-infusion, the longer the pre-infusion usually the faster the initial flow rate. Okay. And now there's the flow rate speeding up to about 3 and then it should not go above 3, hopefully. The other thing we're seeing is this shot is significantly longer. The other variable that's kind of confounding here is that even though I went coarser, this shot is pulling 2 seconds longer than the finer shot. Okay, so that's probably because my puck prep was better. So I think Celia would be a lot happier with that one! So, way way more fruity I think than the first one, than the 1 ml per second one. I think we can go coarser still. So this is still a pretty long espresso at 35. This is 15 in and 38 out. We could pull it maybe a little shorter? I'm getting a little bit of, kind of unpleasantness on the end. I want to try and get a fruitier version of this that's not unpleasant. Okay, so I'm just going to trim a few grams off of that from 38 to 34. So we're closer to 2 – to – 1.[The first shot was *{unintelligible}*….] Yeah, and that is, that is also the shot that I make. So, with 1 ml per second starts, about 2 mls per second end.

And that is my standard espresso shot that I use here for milking. [Yeah, so the temperature is what?] So, the temperature is usually 88 throughout the shot, but I have a little bit, I have a 90

degree start…just because the beans are room temperature. So if I touch here, then everything is the same temperature. It's at 90. If i touch that, now I can change it and I can, for example set it to 88 throughout. Tap here and then just make the start a little bit hotter. Okay, so there's the start and the start is the temperature of the group head and just the first two seconds. So it's really just to kick-start the bean temperature, which is room temperature, mixing with hot water. Just bring it up a little bit faster at the start of the extraction. So, that's an experimental feature I'm trying and that's why this little curve right here is why it has this little dip there. It starts at 90 and then quickly drops to 88.

[21:42]
[Does that make a big difference?]

No, and we're really in the realm of subtlety. This is something I added maybe three months ago. We're still trying to figure out when it's useful. With faster flowing shots it's more dangerous because the faster flowing shots will bring the puck temperature up much faster because so much more water is passing through. But with really slow shots that are slow-flowing, probably helps because you're not adding much water and since the puck is, you know, 25 celsius and the water is 90. Your actual extraction is somewhere around 80 at the start and as the shot progresses more and more 90 degree water comes in. The actual puck temperature is coming up. It's something you don't see in traditional machines and it's part of why people don't like espresso, like real coffee pros, because the extraction temperature is starting somewhere around 80 to 90 and then ending somewhere between 90 and 95. So, it's a very unequal extraction. [That's why people, in the last 10 seconds, will lower the temperature …because, let it cool down a bit.] Yeah, I mean the lower the temperature, the less you extract from the bean.

And so, lowering pressure and lowering temperature have similar effects. Right. You have decreased solubility as the puck is being extracted. The remaining materials are harder to extract and so the thinking is, extract less toward the end. That's the thinking. But I could also give you the opposite theory, which is, the beans are hard to extract so we should increase the temperature. Right. I don't know, uh, but I can go both ways on it. Temperature profiling is really an area that is not well understood and I think the reason has been that people haven't been able to do it, and they haven't seen what's happening.

[23:42]
So, so this is going to be again the same shot, but now we are even coarser. We've now gone 2 coarser, so from 3 to 5, okay? I'm hoping that this shot will end well under 30 seconds.
So it's going to still look now more like a traditional Italian espresso. Okay? Looking at the drops in the mirror. [Yeah, you can see it right here.] [It looks nice.] So this is a quite long pull.

[How long did it go for?]

Well it's 29 seconds, but more importantly it was um, 42 grams. Okay, I wouldn't say it's over-extracted… 3 - to - 1 is about as far as people go with espresso in terms of ratio, so 15 to 45. It

smells pretty good but I think it's going to have a, I think you called it “dryness.” It's kind of like a kind of a drip coffee; kind of chalkiness that's not super present. Over-pulled, yeah? Yeah. But interesting on the nose! [It smells, it has more complexity.] Yeah, because we're pulling it long and fast, we're getting more acidity. That's right. I want to pull the default correctly…and we put 8 grams more than we wanted in that cup. So, I wanted to pull it at 34 and it came out at 41.5 or so. Okay, let's actually pull it at 34 and taste it, because we can then compare it.

[25:44. Celia. *{off-microphone}*]

[26:00]
I agree with you that I think at least if you're running a café what the public mostly wants is what I'd call chocolate plus. So they want chocolate plus something else. Just chocolate is already enough to make a lot of people happy…and if you're Starbucks you know you just add chocolate. So solve that problem, I think the flow rate's going to be in the 2 mls per second range. As this comes up, okay, that's where it is. That's where the last shot was. So this shot is looking similar and I think it ended at 3-1/2 mls per second. Um, I stopped it two grams short but that's how it is. Okay. 32 is where we came in but that's still 15 in 32 out. Would be very traditional.

I think you're going to prefer that. Hopefully, the over-extractedness of that has gone that sort of chalky dryness. [The dryness is gone.] [Acidity is shot up.] Acidity is shot up, yup. [But, oh, much more fruitier.] So, for me the acidity is controlled. It depends on what you're looking for. I agree it is a much more acidic shot. But as a drinking espresso I find this, I find it personally really interesting [For me, too. I enjoy the acidity.] …and for me it's almost a fruit bomb like it's surprising that this is the same bean that we tasted at the start.

[I'd agree, yeah.]

Celia, what do you, how would you describe this one?

[It's quite floral and I think it's more balanced now. Of course it is sweetness. Um, but for me I would thinking how about the aftertaste. I can cut down a little bit astringency for this coffee, okay.]

So I think that the astringency, for me personally, in terms of my theory, is because this is an uneven pre-infusion. Because we're doing a quite fast flow rate but our pre-infusion is only nine seconds which is quite fast. So, the the fastest that a bean can absorb water is typically 4 mls per second okay and um, and it needs to absorb twice as much water. [So if like that, then I need to longer the pre-infusion time?] Well, or use a different recipe. But you can't lengthen it because what's actually happened here is, we put water in fast enough that the pressure rose. Once the pressure rises you can't actually pre-infuse anymore because the puck is now compressed. [Oh yes.] Okay. You can only pre-infuse before the puck compresses. Yeah, as soon as it crosses 4 bar it's compressed. It's now on, okay, so if you want to do a longer pre-infusion - which if we want to get more of those floral flavors but less unpleasant flavors - I

would in this case say we want a longer pre-infusion. And the way to do that would be either to slow this pre-infusion down from 4 mls to 3 mls per second, okay, or use a different recipe. The reason that the puck is compressing so quickly is that this bean, if it's well prepared, is accepting water at the top and then is saturating and the top of the puck is now refusing to accept water at the speed that we're giving it. [Higher temperature?] Temperature is not going to affect the pre-infusion, but it will give you more extraction. But I think what you're finding as astringency here, is because this shot is simultaneously correctly extracted and under-extracted… that the top of the puck in that first nine seconds is getting wet, but as the shot is continuing, the bottom of the puck is now finally getting wet and is underextracted.

[30:02]
So, I mentioned when we were talking before how the Slayer shot technique I thought was the worst of all, actually. And and the reason is it's this problem, even worse. So the Slayer shot is very slow pre-infusion, for like 40 seconds, and then as soon as you see a drip here you start the shot. But the way the Slayer shot is working is, it's dripping water here. The top then has a full 40 seconds of pre-infusion. But as soon as you see the drip on the bottom it's only had a few seconds. [Yeah. It's even very sour.] That's right, so the top is over-extracted and the bottom is under-extracted; only the center is actually correct. So, it's not a great technique.

The reason that's important is that the two recipes that we're going to try now - Londinium and Blooming - both address that issue, okay, and what they're doing is here, the puck started to resist water at nine seconds and the shot is programmed to go to full pressure. So what the Londinium profile is going to do is go to this point, and then cut the water for 10 seconds and then continue on a shot that looks like this. So, the idea is the water hits the top, the puck starts to resist and then it keeps the pressure and pushes the water through. And then, after 10 seconds, the shot rises. The other thing about Londinium is that its pre-infusion flow rate is twice as fast as this. So, it's trying to avoid over-extracting the top. So, put water on it as fast as possible and then stop. Yeah. And it soaks in through capillary action and pressure. It is, it is, it is a gentle Aeropress is what it is. And you'll see, in fact, it uses 3 bars.

[31:44]
So, if I go here to presets, Londinium. So we're going to go through a process of essentially the default recipe, is the original lever recipe and then people started seeing problems with it and solving them. Yeah, okay. So we're going to try and solve it with this. So, don't worry about that much about the chart, except that it does also use temperature profiling… it starts hotter, it goes cooler, okay. But when we see the shot pulled, you're going to see that 10 second pause. Because it has a longer pre-infusion, it needs a much finer grind. So, in general, there's this ratio which is: the longer the pre-infusion, the faster the flow rate will be after pre-infusion. So you need a finer grind to compensate for that.

[Does the profile tell you that?]

It does it, so if you go to settings here, it'll say this profile simulates a Londinium R machine. Advanced profile. Add steps. It doesn't say anything, so. Great body, flavor range. So it actually

doesn't say anything…. This was done by a customer, Damien Brakel, who also does the DSX skin. But, I have made a video about how to dial this specific shot in.

And what you're going to see when the shot is pre-infusing, this one pre-infuses at 3 bar. So it fills the cavity of the group head up and then it maintains a little bit of pressure - and the reason it does that is that it's using both capillary action and pressure to try and quickly move water through the puck. So in that way it's also a more even pre-infusion than if you just rely on capillary action. And I'm just going to check the settings here, advanced limits. Okay, this is set for 36 grams in cup, as well.

[33:39]
Okay I'm gonna turn water volume off. It tares with the start of the espresso. So if we look at this in the mirror, okay, so now we're pre-infusing and and this thick stuff is coming out - and we're at a 3 bar pause and I'll explain the shot afterwards - but you can see just how thick this stuff is that's coming out. And now we're getting a pressure rise, okay, and I would say this grind is still too coarse for Londinium. So if I look here, you can see our pre-infusion was about 1 ml per second, of what I call "dripping," which is quite a lot. Okay. this is because here's the water coming in at 7.5 mls per second and then the cavity fills up, pressure rises and it just stops for 10 seconds. Then it rises to, in this case it actually wanted to rise to 9 bar but the grind was too coarse, so it actually only managed to rise to 7-1/2 bar, all right.

So I would suggest, unless you have palate to spare, smell it don't taste it because it's too coarse. Whenever you have this dotted line, which means the goal, and you didn't reach the goal, then you're essentially gushing. I would separate gushing from channeling. Channeling is a hole in your puck; gushing is the whole puck is unable to resist water effectively. Our flow rate was 4 mls per second, which is so fast that it's going to take out a lot of acidity and not a lot of great coffee material. But what's nice is that this looks like a pretty espresso. Yes, right. And you might be fooled, either to serve it to a customer or drink it yourself…but I don't think you're going to like it. And yes, it's going to be very fruity because the flow rate. It's the thing is, it's going to be correctly- and over-extracted at the same time, because the pre-infusion was pretty successful. Right, you still had this… you had about 18 seconds where everything was kind of okay. We had a pre-infusion and a 3 bar here. So this is almost like a very fast filter coffee in terms of extraction approach, because we aren't getting much material out and then at the end we squeeze it all out. Right, so imagine if you did a filtered coffee. You let it sit there for 15 seconds and then you poured all the water, you squeeze it all out in eight seconds.

[36:11]
So I've got another, 1 setting coarser, because the previous one was not that far off. I'm hoping will be 35 seconds or so. So now, we're getting a bit more dripping here, okay, and that looks about right in terms of what I'm expecting. And I'll show you on the chart you can actually see the weight of those drips. So if you end up being unable to understand how much dripping you want during the pre-infusion phase you say, "Oh, I want 6 grams worth," then you know you've dialed in correctly. You can see that afterwards on the chart. [Yeah, wow, I think this one's good.] Yep, so 32 seconds. That's where I want it to be. More traditional espresso. By the way,

in terms of temperature, you can see this this is very effective at getting the temperature up quickly because there's a lot of water very quickly and then pressure to push it throughout the puck. So, it's not a gentle pre-infusion at all. It's trying to be very even. And then here, this line right here, this guideline is actually the total weight. And if you tap here, or here, you can zoom, okay. And during the pre-infusion phase, which ends right here, I can go there and I can see what we had. So, we only had this zero to one, we only had maybe 3 grams. That's where that line is in the cup at that point, okay, but that's useful to know if it turns out that's our grind.

So here, we were, uh, our pre-infusion and typically I'm expecting pre-infusion Londinium to be about half ml per second when it's dialed in. All right, so this is, this is nice. It didn't have any problem. No, it actually did not manage to hit 9 bar, okay, but it did hit 8-1/2 bar. Flow rate's a bit fast. Let's see how it tastes.

[38:02]
Okay, this might be might be fine, I don't know. What I'd like to see, Celia, is whether we got any of that floral nature back or if we're just not going to get it with this profile. We're losing the orange peel and I think, because we weren't able to hit our target pressure and the flow was too fast, we got a lot more acidity. This is much less pleasant than the previous one, right, but I think that that's too much to expect from Londinium. Londinium is about big mouthfeel. Orange-plus. [I'm guessing. I'm still thinking that the first one, that we were talking about was 4 per sec, right? Then if you lower to 3 per second, I think it's rich.] I mean Default is my favorite recipe - it's the one I made. This is the one I use the most and it is a lever profile, I think, and these beans are kind of specialty medium, medium-light beans, which are exactly targeted at a lever machine.

Right. So there's that profile is the right profile for this. I think that actually these beans are not entirely appropriate for Londinium. Londinium is more medium to medium-dark…getting huge mouth feel. [It's about the roasting level.] Really really thick espresso that's what they're trying to do with that.

All right. So next we're going to try a totally different approach. We're going to try the "Blooming Espresso." Now, Blooming and Londinium are not that different. What Blooming is has the same idea with pre-infusion, which is water quickly on the puck and then stop. Slight difference, the Blooming doesn't add any water, it just holds the pressure and pushes the water in. Okay, you'll get more dripping with Blooming than you do Londinium. It demands an even finer grind and the pre-infusion is 30 seconds of pause instead of 10. So, Blooming is really more for light roast. It will work with this. It's also going to give us more in the cup and it's not really for making an espresso that you milk. It's really for opening it up. However, it is a difficult espresso to master because you need a very fine grind. The long pre-infusion will tend to cause the puck to flow quickly and fall apart. But, for certain beans, it's genius! All right, it might work with this.

Now I'm gonna go, however, quite a bit finer. I was at 3 on my Niche for Default; I'm at 1 right now for Blooming. I could be wrong. It'll take a few to dial in. The other thing that's really hard

about Blooming is that that long pre-infusion…you don't really know if you're going to hit your pressure at the end and generally if espresso is made under 6 bar, or over 10 bar, it's no good. Over 10 bar, it's double compressed and it's very muted. Under 6 bar - peak pressure I'm talking about - a peak pressure of under 6 bar generally you're getting more acidity. Under 4 bar, the puck isn't even compressed, so a 3 bar espresso is actually just a gusher… it's a fast filter coffee. You can make espressos at 4 or 5 bar and certainly, coming down to that works; the Sweet and Gentle profile is a 6 bar shot and it's meant to be either light roast or bad grinder, because the lower pressure makes it easier to make or the person is just not good at preparing pucks. That's why I recommended it as the first espresso you make.

[42:14]
[How many bars on this?]

Uh, this is not that kind of espresso. So the end of Blooming is flow-controlled. But partially what makes it difficult is that, um, go ahead…and the reason the end is flow-controlled, Celia, is because it spent already 40 seconds in pre-infusion and so most of the coffee material is already, yeah, so that is a pretty good puck. What's interesting is the finer I'm grinding it, the higher it's going up the basket. Right, the more space it takes. And this is still, remember, a 15 gram dose. Typically, so Blooming is a really long shot, typically 72 seconds to make an espresso. So it is also the approach that gets the absolute highest refractometer ratings on the planet, so typically 23 to 25 percent extraction rates, as opposed to a normal café/bar would be 19 to 21… so very, very high.

Generally, like Rao, will do Kenyans, light roast Ethiopians with this. Things that are more expensive, that are filter coffees, is what he would do with this recipe. Generally, it's also going to favor larger burrs…like a really nicely aligned EK or something like that…a Monolith. Though the tamping pressure just is not a relevant variable. I was really surprised about that, but years ago I was visiting La Marzocco and they said their research was 5 pounds or more, were all equivalent. And then Socratic Coffee, Joe from Socratic Coffee, was here at one point and he challenged me said just put a tamper, like that, and make a shot and see… and it had no, it was the same as normal! So, and the reason is at this point this shot is at 140 pounds per square inch of pressure. So that much is getting 140 pounds. So, 30 pounds on that is nothing.

Okay, so I'm looking at how much drippage I have and I've got a bit more dripping this time and hopefully I'm going to get like 6 to 8 mls as the pressure rises. That's just my number in my head that I've known - gets me the kind of blooming that I like. Okay, because if it's too coarse the water's not flowing everywhere.

[44:41]
So there we are. We're at 5 so I maybe could go a little coarser, maybe not, we'll see. Pressure-wise, I've only peaked at 5 mls per sec, uh, 5 bar, but the pressure is not crashing. So this is constant flow…and if the pressure crashes it means I'm channeling. So this is now a nice linear reduction and there we go, okay. And this is a 3-to-1 shot, so 15 in, 45 out and still looks nice. If you wanna, it actually smells a bit muted. I'm showing you this technique and it can work with

this bean, but it's really not meant for it. It's meant for a lighter roast, because a 40-second pre-infusion is trying to work with a poorly soluble bean. For me, that's really controlled the acidity. Right, it just doesn't have much complexity. [Yeah, it's like a little flat.] [Yeah, but no acidity.]

Celia's brought her own beans *{Da Vinci Coffee}*. Let's try it. Smell the beans. [Ooh.] [That's really good!] [It comes out like strawberry, raspberry….]

Puck okay. But the pressure is holding. So, one of the things I also look for in Blooming is after pre-infusion, and I stop the pressure valve. Does this pressure crash? If the pressure crashes, it's bad, bad puck prep. Okay, so the puck is really holding its integrity nicely here, so this shot might be okay. Okay, there's our pressure shooting up. I'm really happy with that pressure - that was 9.2 bar. And now what I want to see is whether this pressure decline, here, is nice and linear or if it crashes. And we're holding at 6-1/2 bar even though we're constant flow and you can see it even looks nice, right? At no point did it start to channel.

Now, what I could do is lengthen this, if i want some more, to get more in the cup. Okay, we're back to Blooming. Hopefully, a little bit coarser. Back to your Da Vinci's, okay?

[47:07]
And then, the last one we're going to do, is the Allongé style which is more like Americano and it's just going to bring out fruit. Okay, let's see what the dripping looks like here. Okay, I'm at 4 grams and again, remember, I was looking for like 6-8 grams of drip… tells me that my grind is dialed in. Okay, so there we are at 6 grams. So I'm hoping that when this pressure rises this should be a good expression of the Blooming style. Whether this bean is the right bean for this is a different issue.

This is a longer pull. There's more water. This is more typical Blooming - less crema. *[Questions from off-camera and off-microphone.]* No, no not at all, because it's not a thick espresso. It's like the exact opposite of lever. This is all about addressing solubility and getting more water through it in order to get, uh, this is the highest extractions currently recipe on the planet. [It has a bit, but it's so perfect. That's what it is, very good.] [This actually smells good!] [Just open the bag.] It's awesome, isn't it? [Oh yeah, like yeah, yeah.]

So it's a really hard recipe to dial in. I use those drips to try and figure out if I've got it right.So 6-8 grams before the pressure rises. I can also see it here, if I zoom. Here, this was my end of pre-infusion, here, and I can look…this is 1 gram, right, so 10 rather. So here I was around 6-7 grams. This line, here, is total shot weight. Okay, so at that point when the pre-infusion ended I look there, I go over here…somewhere around 6-7 grams that's where I was, and then I come down here. Here's what the shot looked like [because I'm really not very good, yeah, and this is from starting] so this is time zero. The dark brown line is what's going into the cup. You can see there are some drips right away, but drips is just part of Blooming. Blooming is a weird technique. [So how long is it total?] Total shot time was 66 seconds. [Oooh.] I know, and then, so let's walk, let's walk through this one, okay?

[49:31]
So, pre-infusion here. Pre-infusion was 4 mls per second and it lasted about um 10 seconds. Right here, okay, this is just filling the thing, filling the cup because pressure went up and then pressure hit almost 6 bar and then the machine just stopped water completely - that's what the blue line down here is. No more water. Pressure then just pushed the water throughout the puck and, as it did so, we got some dripping off the bottom and the puck is very evenly wet. What you'll notice is, if you look at the bottom of the puck, you would have seen water very early, on the bottom. So it's really a very even extraction. That's why the refractometer readings are so high. And then, at the end of 30 seconds on top of the 10 seconds - so at about 40 seconds total - flow comes up and then pressure is something, the pressure is whatever it is at that point…and, at this point pressure was 2 bar.

All right, let's do that same bean and let's try and do it with Allongé, which is the Rao Allongé. The Rao Allongé is not so hard to dial-in because it's very fast flow and it's quite coarse, so you don't need the world's best grinder. The trick with the Rao Allongé is you want to be between 6 and 10 bar. Right, if you aren't, then you're just actually gushing. So, it's quite hard to do this shot on a traditional machine because they don't usually have a pressure gauge that tells you real pressure…they just say 9 bar… but your beans might be 1 bar and you don't know, okay?

[51:11]
So, I've gone quite coarse on this. I'm not going to waste your beans, because you don't have a lot of them. I'm going to just check with mine first and see if it's okay. I think yours need to be a little finer grind than mine, because yours are lighter roast than mine. So, I first made, the first time I made this for someone else it was at Square Mile in the UK …and Hoffmann was not around, it was all his staff… and I was delivering the machine to them and they looked at and went, "Oh, God, that's a gusher. That's going to be terrible." And then everyone tasted and went, "Huh, this just violated everything we know about espresso. This really should not have been drinkable." But the reason it's drinkable is because you achieve pressure and the flow you want. But, if you don't achieve pressure, you are just making a very fast, channeled filter coffee. [Yes, yes, okay.] So what I don't know is…let's see what the pressure does here. And it looks to me like it's over pressure. Yeah, so the green is the pressure and I'm over pressure… so I am currently too finely ground. But it's not too bad. Uh, but it's coming out really evenly, right? I'm not channeling, I'm not spraying. Okay. And I'm going to stop it there.

So, I want to go still faster, so that in the end was just 37 seconds…41 out, not actually that different from the normal espresso, all right. And, it's going to be muted because at about 9, sorry, at 10-1/2 bar, the puck goes to another compression and the flavors really get muted at that point. Okay. And you kind of see something strange happen here, between 11 bar and 9.5 bar, like it's not clear, right? And this is really kind of the cutting edge of espresso right now. Is what's happening with secondary compressions. So I think this is going to be too concentrated. So, Allongé gets you perfume and fruit bomb, typically. But we can do better. Not sweet, but quite open, yeah. [A little flat I would say, not a whole lot of complexity.] Not a lot of complexity.

[53:52]
Yup all right, I'm going to do it again. So this is fast, as well, but I'm still seeing too high pressure. I want to go coarser still. Okay, so, and I'm actually aiming for 60. I'm actually aiming for 4-to-1 with Allongé, so it really is more like Americano. But it's getting better. So what you're tasting is the effect of increased flow rate while still maintaining pressure. And that increased flow rate is going to be diminishing your chocolate flavors, increasing your floral and your fruit. I'm only using 15 grams. I've not increased the contact time. I've increased the flow rate, oh yes, but it has more-or-less the same effect, right?

But the difference is that – um, think of water as a solvent. It's the universal solvent, right? And with something like Blooming I let a 30 second pause happen. But that coffee goes into the water almost immediately and then the water has used most of its solvent potential, right? And so the more and more concentrated that water gets, the less effective it is at extracting coffee. Right, there's the Chinese tea technique: 30 second extractions with clean water every time. With clean water each time it extracts a maximum, as opposed to, let's say, 2 minutes of the same water.

So something like Blooming is not using water at its maximum extractive potential because it's the same water for 40 seconds. When you're putting a lot of water through, it's constant fresh water going through. Now, what you lose is concentration. You end up with much more in the cup so you don't get a thick body…but you are extracting far more out of the bean. So this is something that Allongé is one of my favorite recipes because I have never been a fan of light roast beans, because they've always been too acidic and too hard to extract. [Longer time, yeah, I mean longer. Also the program.] The flow rate. Yeah, Yeah. So I love this recipe because give me a filter coffee bean that is always incredibly acidic with espresso. I make it this way and then the acidity goes way down and it's incredibly expressive. But it's not really espresso anymore. So what! [It's almost in-between right?] It is. [In-between, you can say a small Americano.] So, in terms of TDS we're around 6 percent. We're not, so we're still much much higher than a drip coffee would be …but we're not in the 9-12 percent right, of an espresso - of a thick espresso. And once I get this dialed-in, then we'll switch to the beans it was really meant for. But, I think we can make a delicious coffee with this dialed-in and these beans.

57:20
Okay, now sound-wise I'm a lot happier. I can hear the motor really moving, which is what I'm looking for. I'm looking to get a fast flow right here, okay, and then pressure-wise I'm a lot happier. This is around 8 bar now, 7-1/2 bar, so we're not going to mute the coffee like we were before when we were up 10-11-12 bar. And so I'm stopping at 65. It's a 4-to-1 ratio on this, okay, almost five to one. But what's cool is that because we had pressure we have crema…so it still looks like an espresso but you'll see body-wise it's going to be much much thinner. So for me, on the nose, it's really interesting - like maybe the most interesting of these beans. [Light tea?] [Yes, I like this.] [This is good, yeah.] I also think the TDS is now under control. This is like a strong coffee. It's not really espresso anymore, and that thickness of espresso is gone. It's hard to believe this is the same as the chocolaty one that you made your latte from….

All right, let's do it with the beans it was meant for. Now, I like this also because in a café you can make a good-sized drink in 30 seconds, because it's fast flow rate. You've got your little artisan roast. [This is more accessible for people like who are used to filter, maybe. The level of espresso, you know this is right up there, you know maybe a bit stronger.] [Is in-between.]

[59:08]
Okay, that's quite fast. I can hear the the pump. It's a fun thing about this, it's like a motorcycle. You can kind of judge the flow rate. Now, so we really are getting a 40 ml per second flow right now and I'm going to stop this at 30 seconds. So this 15 in, 80 out. This is really going to be a lot more dilute, but we still look at the insane amount of crema on what is actually a fairly light roast [And the color of it too.] Yeah. [It's beautifully pale actually.] [When you start smell it, then you will have the sesame seeds come out. But it's so pretty, all-together, you have fruits and candy and yes] [I smell the jackfruit now. Easy.] [It tastes very nice. It's very nice, yeah. So yellow fruit. More tropical, yeah and jackfruits, yeah yeah.]

And it's just a fruit bomb, right? [It's all good.] So that's what I like Allongé for, is expressing the bean in this very crazy way…that's still an espresso machine. I also warn you, always put it in ceramic, because it's so hot.

1:00:31

[Music]