



All the espresso in this article was produced using Paul's signature machine developed with Sunbeam; see 'I want' p24.

espresso is not only a brewing method; it's a way of life that has developed around this amazing beverage. Espresso meaning express, made on request or to order (as in: 'expressly for you'). Because it is volatile by nature it is imperative that espresso is made from scratch, grinding and brewing to order, ensuring the freshest possible cup. In return, it should be consumed immediately after brewing. Otherwise its quality will diminish, with the crema starting to dissipate and the brew temperature starting to cool. And it is through this potential quality of espresso, that the lifestyle/culture of espresso that is best epitomized by the Italians, has evolved. Stopping, as they do, at an espresso bar with a friend or alone, throughout the day, to absorb and enjoy the sensory, physiological and psychological benefits espresso has to offer.

Glasses by Bodum

Photography by Hamish Ta-mé



Perfecting the espresso

What gives espresso its unique form is that hot water (approximately 92-93 degrees) passes through a bed of ground, roasted coffee under pressure - a pressure of 9 bars (or atmospheres) to be precise. This creates espresso's trademark foam - the *crema*.

Made up of a mist of aromatic gases trapped in emulsified, caramel-rich coffee oils. This makes for a sensory experience that is like no other.

A true espresso should be approx 25 mls (including crema), extracted in approximately 25-30 seconds. Espresso should be sweet, its structure should be balanced, its texture smooth and viscous, almost like dessert wine, with a rich, concentrated flavor and perfumed, intense aroma... leaving you with its sensory imprint to consider for minutes after.

And then, there's a philosophical element to this - I've come to believe that, just as a vigneron sees his wine as expressing something of the true nature of the land or *terrior* that his grapes are grown on, I believe a perfect espresso is the pristine expression, in concentrated form, of the coffee that gave it up.

Several issues ago, we looked at the 'menu' of espresso drinks (see *Crema Winter '04*). In this article we look in detail into what goes into making an espresso coffee, examining all the elements in detail, for the true coffee aficionado. By following this process, you should be able to make coffee as good, or better, than that served in most cafés.

Purchasing Coffee best suited for Espresso

There are three main considerations when purchasing coffee for brewing espresso: freshness, bean quality and roast degree. Firstly, if coffee isn't fresh you have no chance of producing a great espresso.

Remember coffee is an organic product that is living and breathing, and just like your fruit and vegetables, it will naturally deteriorate over a short period of time. So purchase whole bean coffee in small amounts that you will consume weekly. Preferably coffee that was packed immediately after roasting and sealed in a bag with a one-way valve and either vacuum or nitrogen-flushed.

Funnily enough, coffee can actually be too fresh and volatile for brewing, so it is advantageous to know when the coffee was roasted and then let it rest/stabilize for four or five days after the actual roast date. This optimal period for aging the coffee will be dependent on the type of packaging used and the season and storage conditions - cooler winter conditions obviously retarding the aroma release, making for a longer aging period. Typically ten days-plus (in winter) whereas in summer, five days or more will probably be enough. As the coffee stabilizes the extraction pour will seem less volatile in motion and the espresso characteristics will be less of fizz and caramel and more of accentuated sweetness and flavor.

Keep an eye out for specialty coffee roasters, either in your area, or if unavailable locally, online. There are an increasing number of online roasters, who will deliver beans to you shortly after roasting, and if they are any good, they will be prepared to guarantee quality and freshness. Be wary of most use-by dates (especially in supermarkets) as they have long turnover periods, and the use-by dates tend to be dictated by health and safety requirements, not optimal dates for usage and freshness.

Fresh coffee will have a sweet, toasted aroma, whereas stale coffee beans will exhibit rancid, oxidized, aroma characteristics reminiscent of the smell of a rancid orange.

If, at this point, you're still unsure of the freshness of your coffee, you may have to take a punt, but be aware - the characteristics mentioned here will be magnified 10-fold in the cup.

The quality of the coffee beans used for espresso is of major importance; keep an eye out for arabica blends/origins using estate or high-grade coffees; naturally processed or semi-washed beans will contribute greater body and sweetness to espresso coffee. And a very small amount of quality robusta in a blend will add great body and crema longevity to an espresso.

Try a few different blends and origins - coffee is very similar to wine, and eventually you'll settle on a blend that really suits your taste.

Coffee that is being used for espresso must be roasted to between a medium and dark roast; ideally to a point where there is a balance between the coffee origin's characteristics and the development of caramelized natural sugars... attaining maximum sweetness and body while expressing the true nature of the bean. Remember burnt toast is burnt toast; coffees roasted too dark will display the character of carbon. And lighter-roasted coffee will typically lack body, sweetness and will have a sharp, acidic edge.

Storage

Once you have broken the seal of your coffee bag, it should be stored if possible in a *vacuvin* coffee saver - a container that allows you to remove the oxygen from it (a little like the system used to pump air out of an opened bottle of wine).

With respect to storage, remember that the elements of heat, light, moisture and oxygen will cause coffee to deteriorate faster than it would naturally do otherwise. Place your coffee saver in a cool dry place, not the fridge or freezer. Cellar conditions are ideal.

Setting up the extraction:

Dosing - this refers to the amount of coffee you use. In creating this perfect extraction, the objective is to create resistance to the pressurized water in the form of two factors, one being constant - *Dose* (the amount of coffee) and the other factor being variable - the *particle size*. Because all machines are different, the dosing level will vary - depending on the height of the shower screen in the group head. The lower the shower screen sits, the lower the ideal dosing height in the basket and vice versa. Indicators that tell you have dosed correctly are when your extraction is pouring vertically from the spouts, it is even from start to finish and your spent coffee cake (puck) is firm, moist and even in color. If you're under-dosing the filter basket, your espresso pour will be bent or mouse tailing at the spouts and the spent puck will be soft. When over-dosing the extraction will tend to choke up at the spouts and the spent cake will be puffy and discolored.

Coarseness of grind - this is the main determinant of the espresso flow rate. Assuming you have dosed correctly, if your extraction is pouring too fast and under-extracting it will be because your grind is too coarse and the water is passing through too fast; conversely, if the pour is only just dripping (i.e. not strong enough to constitute an actual stream and over-extracting) a courser setting will be required.

Factors that can affect optimal grind - bean density, age of the coffee, wearing of the burrs and humidity all have an impact on the grind setting; getting the right setting is often a matter of trial and error. Only make an adjustment on your grind once you've checked that your dose is correct, and note that you may need to adjust the grinder setting throughout the day. Most of the time it will only be a fractional adjustment that is required.

Tamping - the purpose of tamping is to pack the ground coffee firmly and evenly into the filter basket to allow for a controlled expansion of the coffee particles. Apply firm pressure (for the technically minded, try to achieve approximately 30 kilograms of pressure); a professional barista will ensure that the tamper sits at the same point in the basket each time after tamping, confirming the correct dose level is achieved each time. Finally twist the tamper back and forth (approx. 180 degrees) to seal the surface of the cake.

Other considerations

- Use fresh filtered water
- Follow your machine's recommended cleaning process
- Service equipment when necessary, changing seals, showers, burrs and filters
- De-scale internal pipes as required
- Don't bother with the single basket and handle.



As you watch the perfect extraction, time and everything around it stops...this fleeting wonder transfixes your attention and captures your imagination.

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Your coffee machine.

There are a huge variety of domestic espresso machines now on the market. What should you expect your machine to offer, in terms of performance?

The two essentials that your espresso machine must deliver are consistency of temperature and pump pressure. With pump pressure on domestic machines being a great concern for a lot of machine buyers, be reassured that a 15 bar (vibrating) pump is more than adequate when it comes to producing amazing espresso.

Why is consistency of temperature important? Because brewing water temperature above 95 degrees causes the coffee to burn, whereas anything less than 90 degrees will under-extract the coffee, causing your espresso to lack body and sweetness, leaving it sharp and undeveloped.

In terms of the technology, a lot of domestic machines brew water that is heated through a 'thermo bloc' heating system; if properly calibrated, this system has the potential to produce as good or greater consistency and stability than the traditional boiler heat exchange system.

Getting the grinder right

The good news is that you should be able to get a good, basic espresso machine for between \$400 and \$600. However, that's not quite the end of it. It's also important to purchase the right grinder... in fact, what many people don't realize is that a grinder is just as important a tool in achieving a great espresso, as the coffee machine itself.

A good grinder should allow you to make fractional adjustments to your grind setting, be of high enough quality that it doesn't overheat the coffee grounds during short periods of use, and most importantly, it should be able to grind *fine enough to make a true espresso*. Be aware that many cheaper grinders (e.g. the spice 'chopper' variety) simply cannot deliver on the above criteria.

Once you get to the quality end of the market (usually \$250 upwards) you'll be confronted with a choice. There are two main types of grinding burrs - conical and flat, of which I believe conical is superior, due to its homogenous particle size distribution and minimal heat transfer. There are a few grinders that I would recommend for domestic use ranging from \$250 - \$650, for instance, the Isomac Inox, Isomac Gran Macino, the Nemox and the Mini Mazzer, which has a dispensing unit and sits at the upper end of the market. Note: on the Isomac models the collar grub screw should be removed

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- 1 / Allow for your espresso machine, group handle and basket to heat up sufficiently
- 2 / Prepare one espresso seasoning shot (to be 'wasted') to line the basket with coffee oils and to calibrate dose and grind.
- 3 / Remove spent coffee cake and wipe clean. Dry the basket, don't rinse it!
- 4 / Load basket and collapse fresh ground coffee (knocking filter basket on bench).
- 5 / Remove surplus coffee grounds with a sweeping action over the rim.
- 6 / Pack (tamp) the coffee.
- 7 / Clean rim of the basket.
- 8 / Release water from the group head for 2-3 seconds (i.e. turn on switch), purging spent coffee grounds from previous extraction.
- 9 / Insert group handle into group head and brew immediately into a heated cup.
- 10 / Leave the group handle with the spent cake in it on the group head during periods of frequent machine use.
- 11 / Back flush your machine (with clean water) and clean the inside of the group handle and filter basket after heavy coffee making periods.

The actual extraction process

The extraction method that I follow is known as the 'expansion' method, where ground coffee is packed to a specific level (depth) in the basket, allowing for it to expand firmly and evenly onto the shower screen during brewing. This process does not rely on coffee by weight (e.g. 7 or 9 grams) or the 'level to the rim of the basket and tamp' approach.

This method generates an optimal release of the organic soluble solids, aromatics and emulsifiable coffee oils and if executed correctly, creates an espresso with amazing flavor, sweetness and body.

Once the brew switch is activated there should be an initial period of approximately 3-5 seconds of infusion (where nothing is coming out). When the liquid itself starts to pour it should be dark brown with reddish reflections. The form of the pour should be similar to thick, dripping honey and should be falling vertically from the spout into the cup; the pour should be even from start to finish - i.e. not dripping at the start and gushing out towards the end.

Use colour as the ultimate guide to knowing when to cut the shot off; at around the 20 - 25ml point the extraction will usually change colour, becoming lighter. Extracting beyond



this point will cause harsh, bitter flavors to be released and will thin out the espresso. Less is more.

A sure sign that the espresso has been prepared correctly is that the dark brown crema should have excellent surface tension, being able to hold one white sugar for 3 - 4 seconds on the surface before falling through into the brew. Keep in mind this is only a test... amazing espresso shouldn't need any sugar in it at all, it should be sweet enough!

Espresso is an endless journey that offers artistic expression through a matrix of physics, chemistry and nature; with a volatile, sometimes unpredictable character, that only ever reveals its true potential through the smallest window of opportunity. Become in tune with your espresso environment, taste and learn from your mistakes and share the unforgettable moments of sensory bliss. •