

18 Espresso Coffee

Pressure is important for the definition of espresso, making it different from other brews. During espresso percolation (see Chapter 7), a small amount of hot water under pressure is applied to a layer of ground roasted coffee, the *coffee cake*, and this very efficiently produces a concentrated brew, containing not only soluble solids, but also lipophilic substances, lacking in filter and instant coffees. The foam on the top and the opaque brew are unique to espresso, owing to the presence of a disperse phase formed by very small oil droplets in emulsion (Petracco, 1989) (see 8.1.1), which are perceived in the mouth as a special creamy sensation, the *body*. Furthermore, the oil droplets preserve many volatile aromatic components, which would otherwise either escape into the atmosphere or be destroyed by contact with water as in other brewing techniques, so that the rich coffee taste lingers in the mouth for several minutes. If coffee were percolated under high static pressure only, the pressure would be lost downstream and no work could be performed on the cake; while, if kinetic energy from stirring propellers, choke nozzles, sprayers, etc., were applied downstream from the cake, a smooth layer of foam could be produced, but it would lack body.

The Latin etymology of the word espresso, literally meaning *pressed out* (Campanini and Carboni, 1993), clearly points out the importance of pressure in espresso brewing, making the technique an integral part of the definition:

- Espresso is a brew obtained by percolation of hot water under pressure through tamped/compacted roasted ground coffee, where the energy of the water pressure is spent within the cake.

1.7.3 Italian espresso: it must be rapidly brewed

Another important feature of espresso, especially as traditionally drunk in Italy, is the length of percolation (see 7.5.8). The diversified energy input in espresso pressure brewing efficiently brings into the cup both hydrophilic and lipophilic substances. A best mix is reached within 30 seconds; if the extraction is shorter than 15 seconds a weak and exceedingly acid unbalanced and under-extracted cup is obtained. Conversely, if extraction lasts longer than 30 seconds, over-extraction of substances with poor flavour will produce an ordinary harsh-tasting cup, as can be easily seen by separately tasting the liquid fraction percolated after the prescribed 30 seconds.

A quantitative definition can now be given: