

How does the coffee extraction method affect the quality in the cup?

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Motivation

The preparation of a cup of coffee may vary among countries, cultures and individuals [1]. Here, we compare nine extraction methods - four espressi and five lungi - using instrumental and sensory tools.



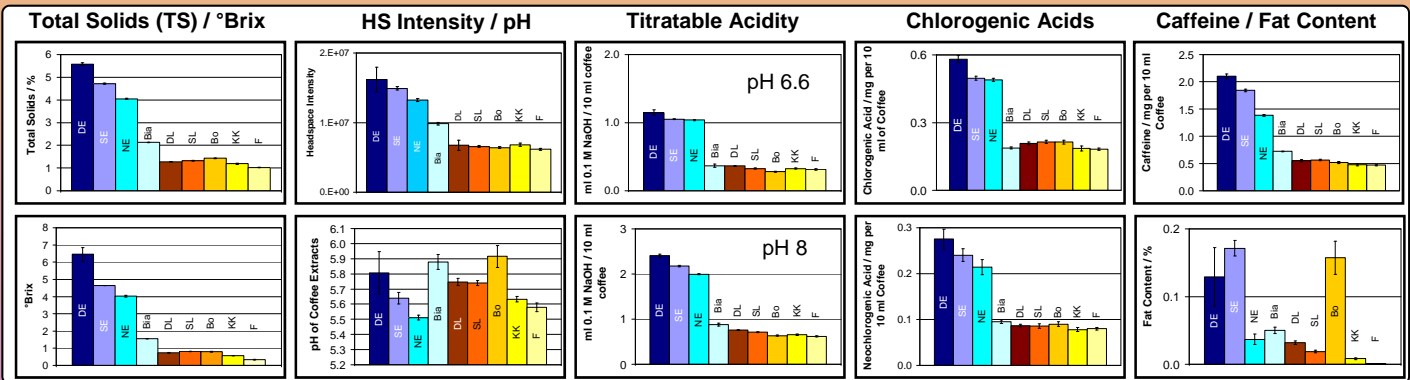
Espresso Dalla Corte (DE)
Schaerer (SE)
Nespresso Arpeggio (NE)
mocha percolator (Bialetti, Bia)

Lungo Dalla Corte (DL)
Schaerer (SL)
French Press (Bo)
Bayreuth coffee machine (KK)
Filter Coffee (F)

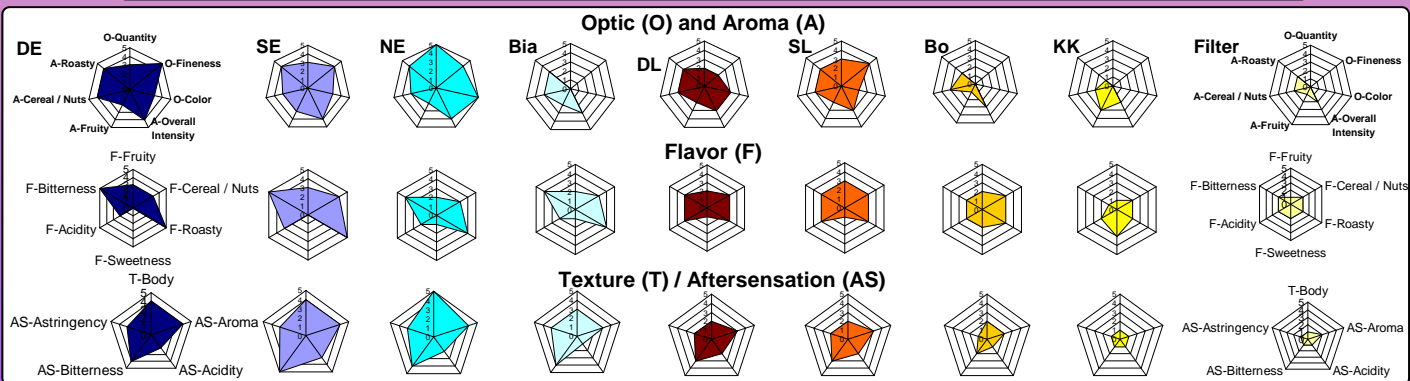


Freshly roasted Guatemala Antigua (Pt 86 for espressi, Pt 80 for lungi) was used, and each extraction method was optimized individually to reflect a typical consumer's situation. Analytical measurements on the respective extracts included: headspace analysis, acidity (pH), titratable acidity, fat content, total solids, °Brix (via refractive index), caffeine and chlorogenic acids content. Sensory analysis included attributes from optic of the Crema, aroma, flavor, texture and aftersensation. This allowed identifying correlations between various parameters, as well as elucidating advantages, short comings and characteristics of the respective brewing methods.

Analytical Results



Sensory Aspects



Conclusions & Main Learnings

Correlation

High TS ↔ High °Brix / refractive index ↔ High body / texture, roasty ↔ TS / °Brix: Quickly measurable quality criterium

High TS ↔ High headspace intensity ↔ High aromaticity ↔

High TS ↔ High titratable acidity ↔ -- (differences too small?) ↔

High TS ↔ High concentration of caffeine and chlorogenic acids ↔ bitter, adstringent ↔

High TS ↔ High concentration of caffeine and chlorogenic acids ↔ Influence of Crema? ↔

No matches / Counterpart: Fat content (< 0.2 %), pH Value, Sweetness, Fruity, Cereal/Nuts, Optic of Crema

Per sip
(ca. 10 ml)

Espressi
> Bialetti
> Lungi

Content of

- TS
- titratable acidity
- caffeine
- chlorogenic acids

Per cup
(30 ml resp. 120 ml)

Lungi
> Espressi
> Bialetti

Specifics

DE: highest °Brix **NE:** small pH, almost no fat
Bia: between Espresso and Lungo
Bo: high fat content, high pH
KK: small pH **Filter:** almost no fat, small pH

Reference

[1] Petracco, M. In *Coffee: Recent Developments*, Clarke, R. J., Vitzthum, O. G., Eds.; Blackwell Science: London, 2001; 140-164.