

Table 4.1 The pharmacokinetic parameters of hydroxycinnamic acids detected in the blood or plasma of humans after drinking coffee

Reference	Amount	Source	Compound	Cmax	Tmax	AUC (time span)
Nardini et al. (2002)	200 ml	Brewed coffee	CA	91.3 ± 31.1 ng/ml	1 h	n/a
			FA	Not detected	n/a	n/a
Farah et al. (2008)	170 mg of hydroxycinnamic acids	Green coffee extract	CGA	14.8 ± 11.7 umol/l	3.1 ± 2.6 h	45.6 ± 37.1 μmol/h/l (0–8h)
			CQA	8.2 ± 6.3 umol/l	3.3 ± 2.4 h	25.2 ± 24.4 μmol/h/l (0–8h)
			5-CQA	5.9 ± 4.2 umol/l	3.3 ± 2.4 h	17.9 ± 15.3 μmol/h/l (0–8h)
			CA	1.1 ± 0.9 umol/l	3.6 ± 2.1 h	3.8 ± 3.2 μmol/h/l (0–8h)
			FA	0.8 ± 0.3 umol/l	2.9 ± 1.8 h	3.6 ± 1.5 μmol/h/l (0–8h)
			iFA	0.9 ± 0.2 umol/l	2.9 ± 1.8 h	3.5 ± 1.9 μmol/h/l (0–8h)
Monteiro et al. (2007)	190ml	Decaffeinated brewed coffee	CGA	7.66 ± 2.50 μmol/l	2.25 ± 1.25 h	17.11 ± 8.41 μmol/h/l (0–4h)
			CQA	4.89 ± 2.53 μmol/l	2.25 ± 1.25 h	11.48 ± 7.12 μmol/h/l (0–4h)
			5-CQA	3.14 ± 1.64 μmol/l	2.33 ± 1.17 h	8.10 ± 5.05 μmol/h/l (0–4h)
			CA	1.56 ± 1.62 μmol/l	1.42 ± 0.38	2.81 ± 1.75 μmol/h/l (0–4h)
Renouf et al. (2010a)	4 g	Instant coffee	CA	~50 nM	~1 h	n/a
			FA	~150 nM	~1 h	n/a
			iFA	~100 nM	~1 h	n/a
Renouf et al. (2010b)	4 g	Instant coffee	CA	81.1 ± 29.7 nM	100.0 min	n/a
			FA	139.4 ± 43.8 nM	143.9 min	n/a
			iFA	97.6 ± 32.4 nM	109.2 min	n/a
Renouf et al. (2014)	2 g	Instant coffee	5-CQA	~12 nM	40 min	~0.25 μM min (0–24h)
			CA	~50 nM	47 min	~7.1 μM min (0–24h)
			FA	~90 nM	47 min	~22.9 μM min (0–24h)
			iFA	~40 nM	58 min	~5.6 μM min (0–24h)

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Erk et al. (2012)	4 g	Instant coffee	5-CQA	~17 nM	61 min	~1.25 µM min (0–24 h)
			CA	~90 nM	58 min	~20 µM min (0–24 h)
			FA	~120 nM	41 min	~45.7 µM min (0–24 h)
			iFA	~60 nM	89 min	~8.6 µM min (0–24 h)
	8 g	Instant coffee	5-CQA	~30 nM	44 min	~4.25 µM min (0–24 h)
			CA	~160 nM	76 min	~45.7 µM min (0–24 h)
			FA	~300 nM	30 min	~80 µM min (0–24 h)
			iFA	~160 nM	62 min	~45.7 µM min (0–24 h)
	4525 µmol of CGA	Decaffeinated coffee	5-CQA	44 ± 7 nM	0.8 ± 0.3 h	125 ± 38nM/h (0–8 h)
			CA	214 ± 22 nM	0.6 ± 0.2 h	605 ± 176nM/h (0–8 h)
			FA	518 ± 76 nM	0.5 ± 0.0 h	937 ± 157nM/h (0–8 h)
			iFA	262 ± 91 nM	0.5 ± 0.0 h	559 ± 249nM/h (0–8 h)
2218 µmol of CGA		Decaffeinated coffee	5-CQA	30 ± 12 nM	0.9 ± 0.2 h	85 ± 32nM/h (0–8 h)
			CA	162 ± 52 nM	0.9 ± 0.2 h	445 ± 172nM/h (0–8 h)
			FA	214 ± 39 nM	0.5 ± 0.0 h	453 ± 93nM/h (0–8 h)
			iFA	110 ± 6 nM	0.5 ± 0.0 h	190 ± 43nM/h (0–8 h)
1053 µmol of CGA		Decaffeinated coffee	5-CQA	14 ± 5 nM	0.6 ± 0.2 h	43 ± 13nM/h (0–8 h)
			CA	77 ± 12 nM	0.5 ± 0.0 h	243 ± 71nM/h (0–8 h)
			FA	147 ± 27 nM	0.5 ± 0.0 h	377 ± 84nM/h (0–8 h)
			iFA	76 ± 27 nM	0.7 ± 0.2 h	344 ± 315nM/h (0–8 h)

CA, caffeic acid; CGA, chlorogenic acid; CQA, caffeoylquinic acid; FA, ferulic acid; iFA, isoferulic acid

References

- Erk T, Williamson G, Renouf M, Marmet C, Steiling H, Dionisi F, et al. (2012). Dose-dependent absorption of chlorogenic acids in the small intestine assessed by coffee consumption in ileostomists. *Mol Nutr Food Res.* 56(10):1488–500. <http://dx.doi.org/10.1002/mnfr.201200222> PMID:22945604
- Farah A, Monteiro M, Donangelo CM, Lafay S (2008). Chlorogenic acids from green coffee extract are highly bioavailable in humans. *J Nutr.* 138(12):2309–15. <http://dx.doi.org/10.3945/jn.108.095554> PMID:19022950
- Monteiro M, Farah A, Perrone D, Trugo LC, Donangelo C (2007). Chlorogenic acid compounds from coffee are differentially absorbed and metabolized in humans. *J Nutr.* 137(10):2196–201. PMID:17884997
- Nardini M, Cirillo E, Natella F, Scaccini C (2002). Absorption of phenolic acids in humans after coffee consumption. *J Agric Food Chem.* 50(20):5735–41. <http://dx.doi.org/10.1021/jf0257547> PMID:12236707
- Renouf M, Guy P, Marmet C, Longet K, Fraering AL, Moulin J, et al. (2010a). Plasma appearance and correlation between coffee and green tea metabolites in human subjects. *Br J Nutr.* 104(11):1635–40. <http://dx.doi.org/10.1017/S0007114510002709> PMID:20691128
- Renouf M, Guy PA, Marmet C, Fraering AL, Longet K, Moulin J, et al. (2010b). Measurement of caffeic and ferulic acid equivalents in plasma after coffee consumption: small intestine and colon are key sites for coffee metabolism. *Mol Nutr Food Res.* 54(6):760–6. <http://dx.doi.org/10.1002/mnfr.200900056> PMID:19937852
- Renouf M, Marmet C, Giuffrida F, Lepage M, Barron D, Beaumont M, et al. (2014). Dose-response plasma appearance of coffee chlorogenic and phenolic acids in adults. *Mol Nutr Food Res.* 58(2):301–9. <http://dx.doi.org/10.1002/mnfr.201300349> PMID:24039147