Authentic human data for 3-phenylpropanoic acid (C_6–C_3) metabolites in urine, plasma, ileal fluid and feces

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Introduction

This document is a compilation of published quantitative data obtained with authentic calibrants for the concentrations of C_6–C_3 metabolites (i.e. 3-phenylpropanoic acids and the associated phase-2 conjugates) in human urine, plasma, ileal fluid and feces. The originating publications were identified by searching Web of Science, PubMed and Google Scholar up to May 2024.

Data originally reported on a mass/day or mass/volume basis have been converted to a molar basis to facilitate comparisons, but some published data were excluded from these tables:

(i) Data originally reported relative to creatinine, the standard clinical practice with spot plasma and urine samples, cannot be accurately converted to a molar basis because creatinine production varies with sex, age and protein intake.

(ii) Data produced by acid or enzymic hydrolysis of phase-2 conjugates have not been tabulated except for glycine or glutamine conjugates when β-glucuronidase and sulfatase hydrolysis has been used.

Similar compilations have been prepared for C_6–C_1 metabolites (benzoic acids), C_6–C_2 metabolites (phenylacetic acids), C_6=C_3 metabolites (cinnamic acids) and C_6–C_5 metabolites (5-phenylvaleric acids, 4-hydroxy-5-hydroxyphenylvaleric acids and phenylvalerolactones), and the metabolites have been identified using the nomenclature recommended by Kay *et al*. (Kay et al. 2020) and are numbered consecutively in a single series through the five documents.

Table 18. 3-(Phenyl)propanoic acid											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
0.55 ± 0.11 0.94 ± 0.43 1.06 ± 0.42 0.58 ± 0.12 0.54 ± 0.11									Healthy free-living adults (mean ± s.d., *N*=12). Data from HMDB supplementary data attached to the journal no longer available.	(Loke et al. 2009)	12
0.55 (0, 6.61)									Healthy free-living adults (median, min, max, *N*=72)	(Beloborodova et al. 2015)	72
		0.35 ± 0.04 [c]	2 days						Orange juice (368 µmol) (*N*=9, mean ± s.e.)	(Pereira-Caro et al. 2023)	9
		0.43 ± 0.06 [c]	2 days						Orange juice (368) plus oat bran (58 µmol) (*N*=9, mean ± s.e.)		
		0.9 ± 0.3	Two days		12 hours	0.5 ± 0.2 [b]			Orange juice (398 µmol) (mean ± s.e., *N*=10 trained)	(Pereira-Caro et al. 2017)	10
		0.7 ± 0.2	Two days		12 hours	0.5 ± 0.7 [b]			Orange juice (398 µmol) (mean ± s.e., *N*=10 detrained)		
	0.019 ± 0.012		Over-night	0.0006 ± 0.0003					Orange juice (398 µmol) (*N*=10, mean ± s.e.) Trained athletes	(Pereira-Caro et al. 2020)	10
							197 ± 73		(*N*=5) (mean ± s.e.)	(Karlsson et al. 2005)	5
							166 ± 174		Free-living volunteers (mean ± s.e., *N*=5). No increase on hydrolysis	(Jenner, Rafter, and Halliwell 2005)	5
							378 223 617 362		One free-living volunteer over four consecutive days. No increase on hydrolysis		
			Two weeks				30.1 ± 29.4 [a] 30.0 ± 21.2 [a]		Low (poly)phenol diet four weeks	(Munoz-Gonzalez et al. 2013)	40

									Zero time (mean ± s.d., *N*=7) Four weeks (mean ± s.d., *N*=6)		
			Two weeks				62.4 ± 63.6 [a] 81.6 ± 62.7 [a]		Red wine (*ca* 112 mg/250 ml) daily for four weeks Zero time (mean ± s.d., *N*=33) Four weeks (mean ± s.d., *N*=29)		
										8	163

Notes a) µmol/g rather than µmol/l but authors do not indicate whether this is wet weight or dry weight.

b) Phenolic content of baseline urine collected 12 h before orange juice intake used, on an excretion-per-hour basis, to subtract from excretion values in trained and detrained states obtained 0–24 h after supplementation to estimate increases in the phenolic content attributable to orange juice intake.

Table 19. 3-(2'-hydroxyphenyl)propanoic acid										
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l		
2.72 ± 4.51 (**0.70** and 2.01)									Free-living volunteers (*N*=90, mean ± s.d.) (**Median** and IQR)	(Le Sayec et al. 2023)
0.009 0.007–0.018 [b]		**<LOQ** [b]							*N*=10, median and IQR. Polyphenol-rich breakfast for 3 days [b]	(Domínguez-Fernández et al. 2021)
	0.011 (0, 0.023)	0.2, (0.1, 0.4)	24 hours	0.008 ± 0.002	2 hours	0.082 ± 0.024			Artichoke (5727 µmol) (*N*= 8, mean) (min, max)	(Dominguez-Fernandez et al. 2022)
			—				3 ± 2 [a] 3 ± 2 [a] 2 ± 2 [a] 0 [a]		(*N*=5, mean ± s.e.) Italy (*N*=5, mean ± s.e.) Germany (*N*=5, mean ± s.e.) Spain (*N*=5, mean ± s.e.) Denmark	(Knust et al. 2006)
										4

Notes: a) Fecal matrix rather than fecal water.

b) The participants consumed for breakfast for 3 days milled flaxseed (30 g/day), freeze-dried raspberry powder (40 g/day), and soy milk (250 mL/day), providing 300 mg/ day of lignans (300 mg of secoisolariciresinol diglucoside), 150 mg/ day of ellagitannins (118 mg of sanguiin H6, 14.3 mg of lambertianin C, and other minor ellagitannins), and 22 mg of isoflavones/day (20.10 mg of daidzin and 1.8 mg of daidzein).

Table 20. 3-(3'-Hydroxyphenyl)propanoic acid											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
0.056 ± 0.015 0.035 ± 0.008 0.086 ± 0.021 0.084 ± 0.022 0.034 ± 0.01									Healthy free-living adults (mean ± s.d., *N*=12). Data from HMDB supplementary data attached to the journal no longer available.	(Loke et al. 2009)	12
1.768 ± 0.1494 (**1.209** and 2.812)									Free-living volunteers (*N*=90, mean ± s.d.) (**Median** and IQR)	(Le Sayec et al. 2023)	90
0.092 **0.057–0.280** [c]		**2.05** **0.701–3.36** [c]							*N*=10, median and IQR. Polyphenol-rich breakfast for 3 days [c]	(Domínguez-Fernández et al. 2021)	10
		2.8 ± 0.6 day 1 3.3 ± 1.1 at 1 month	2-day including over-night fast	2.52 ± 0.49					Day 1 placebo (mean ± s.e., *N*=45) Placebo after 1 month (mean ± s.e., *N*=45)	(Heiss et al. 2022)	45
		2.5 ± 0.9 day 1 3.0 ± 0.6 at 1 month	2-day including over-night fast	1.98 ± 0.57					Day 1 cranberries (525 mg) (mean ± s.e., *N*=45) Cranberries (525 mg) after 1 month (mean ± s.e.), *N*=45)		
	n.d.	0.98 ± 0.28	Three days	n.d.	2 hours	0.019 ± 0.007			Maté (1118 µmol) (mean ± s.d., *N*=12)	(Gomez-Juaristi et al. 2018a)	12
	6.0 (1.0, 16.0)	110 (2.5, 419)	24 hours	0.401 ± 0.211		1.27 ± 1.08			Artichoke (5727 µmol) (*N*= 8, mean) (min, max)	(Dominguez-Fernandez et al. 2022)	8
	0.006 ± 0.0004		Over-night	0.0006 ± 0.0002					Orange juice (398 µmol) (*N*=10, mean ± s.e.) Trained athletes	(Pereira-Caro et al. 2020)	10
			—						Placebo daily for 12 weeks		

0.077 ± 0.011 0.041 ± 0.010									Zero time (mean ± s.e., *N*= 31) Twelve weeks (mean ± s.e., *N*= 31)	(Tosi et al. 2023)	60
0.051 ± 0.009	0.039 ± 0.008		—						Cranberries (588 mg) daily for 12 weeks Zero time (mean ± s.e., *N*= 29) Twelve weeks (mean ± s.e., *N*= 29)		
	0.03 ± 0.02		3 days including over-night fast						Rosemary tea (1055 µmol rosmarinic acid equivalent) (mean ± s.d., *N*=12) Quantified with free acid	(Achour et al. 2021)	12
			—				691 ± 410 [a] 491 ± 231 [a] 1076 ± 666 [a] 15 ± 3 [a]		(*N*=5, mean ± s.e.) Italy (*N*=5, mean ± s.e.) Germany (*N*=5, mean ± s.e.) Spain (*N*=5, mean ± s.e.) Denmark	(Knust et al. 2006)	20
			Two weeks				17.6 ± 30.4 [b] 12.3 ± 23.1 [b]		Low (poly)phenol diet four weeks Zero time (mean ± s.d., *N*=8) Four weeks (mean ± s.d., *N*=8)	(Munoz-Gonzalez et al. 2013)	41
			Two weeks				48.3 ± 138.6 [b] 48.0 ± 119.2 [b]		Red wine (*ca* 112 mg/250 ml) daily for four weeks Zero time (mean ± s.d., *N*=33) Four weeks (mean ± s.d., *N*=33)		
										11	320

Notes: a) described as fecal matrix and unclear precisely how it compares with fecal water as used by Jenner *et al*. and Karlsson *et al*.

b) µmol/g rather than µmol/l but authors do not indicate whether this is wet weight or dry weight

c) The participants consumed for breakfast for 3 days milled flaxseed (30 g/day), freeze-dried raspberry powder (40 g/day), and soy milk (250 mL/day), providing 300 mg/ day of lignans (300 mg of secoisolariciresinol diglucoside), 150 mg/ day of ellagitannins (118 mg of sanguiin H6, 14.3 mg of lambertianin C, and other minor ellagitannins), and 22 mg of isoflavones/day (20.10 mg of daidzin and 1.8 mg of daidzein).

Table 21. 3-(4′-hydroxyphenyl)propanoic acid											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l		µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
0.664 ± 0.089 0.628 ± 0.075 0.712 ± 0.088 0.701 ± 0.071 0.574 ± 0.078									Healthy free-living adults (mean ± s.d., *N*=12). Data from HMDB supplementary data attached to the journal no longer available.	(Loke et al. 2009)	12
		14.4 ± 3.0 day 1 10.3 ± 2.5 at 1 month	2-day including over-night fast	26.6 ± 1.3					Day 1 placebo (mean ± s.e., *N*=45) Placebo after 1 month (mean ± s.e., *N*=45)	(Heiss et al. 2022)	45
		18.7 ± 5.5 day 1 18.0 ± 3.9 at 1 month	2-day including over-night fast	24.7 ± 2.0					Day 1 cranberries (525 mg) (mean ± s.e., *N*=45) Cranberries (525 mg) after 1 month (mean ± s.e.), *N*=45)		
		2.4 ± 0.4 zero time		n.d.	?	0.5 ± 0.2 zero time			Green coffee extract (600 mg) and oat β-glucan day 1 (*N*=9, mean ± s.e.) Free-living overweight / obese volunteers	(Seguido et al. 2022)	9
		4 ± 1 at 8 weeks		n.d.	?	1.7 ± 0.6 at 8 weeks			Green coffee extract (600 mg) and oat β-glucan 8 weeks (*N*=9, mean ± s.e.) Free-living overweight / obese volunteers		
		4 ± 1 zero time		n.d.					Green coffee extract (600 mg) (*N*=9, mean ± s.e.) zero time	(Angel Seguido et al. 2022)	9
		6 ± 2 at 8 weeks		n.d.					Green coffee extract (600 mg) (*N*=9, mean ± s.e.) 8 weeks		
	0.025 ± 0.001		Over-night	0.008 ± 0.002					Orange juice (398 µmol) (N=10, mean ± s.e.) Trained athletes	(Pereira-Caro et al. 2020)	10
			—				61 ± 34		(*N*=5) (mean ± s.e.)	(Karlsson et al. 2005)	5

			—				68 ± 93		Free-living volunteers (mean ± s.e., *N*=5). No increase on hydrolysis	(Jenner, Rafter, and Halliwell 2005)	5
			—				2.50 1.30 3.74 2.32		One free-living volunteer over four consecutive days. No increase on hydrolysis		
			—				78 ± 63 [a] 7 ± 1 [a] 74 ± 64 [a] 3 ± 0.5 [a]		(*N*=5, mean ± s.e.) Italy (*N*=5, mean ± s.e.) Germany (*N*=5, mean ± s.e.) Spain (*N*=5, mean ± s.e.) Denmark	(Knust et al. 2006)	20
			Two weeks				30.7 ± 28.2 [b] 12.7 [b]		Low (poly)phenol diet four weeks Zero time (mean ± s.d., *N*=3) Four weeks (mean ± s.d., *N*=1)	(Munoz-Gonzalez et al. 2013)	10
			Two weeks				21.9 ± 15.6 [b] 23.9 ± 17.7 [b]		Red wine (*ca* 112 mg/250 ml) daily for four weeks Zero time (mean ± s.d., *N*=5) Four weeks (mean ± s.d., *N*=7)		
										9	125

Notes: a) described as fecal matrix and unclear precisely how it compares with fecal water as used by Jenner *et al*. and Karlsson *et al*.

b) µmol/g rather than µmol/l but authors do not indicate whether this is wet weight or dry weight

Table 22. 3-(Phenyl)propanoic acid-4'-glucuronide											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
		0.07 ± 0.01	2 days						Orange juice (368 µmol) (N=9, mean ± s.e.)	(Pereira-Caro et al. 2023)	9
		0.14 ± 0.01	2 days						Orange juice (368 µmol) plus oat bran (58 µmol) (N=9, mean ± s.e.)		
										1	9

Table 23. 3-(2',3'-dihydroxyphenyl)propanoic acid											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
0.943 ± 0.382 (**0.945** and 0.438)									Free-living volunteers (*N*=90, mean ± s.d.) (**Median** and IQR)	(Le Sayec et al. 2023)	90
<LOQ [a]		**0.046 0.031–0.113** [a]							*N*=10, median and IQR. Polyphenol-rich breakfast for 3 days [a]	(Domínguez-Fernández et al. 2021)	10
		0.7, (0.03, 1.9)	24 hours	<LOQ		0.048 ± 0.014			Artichoke (5727 µmol) (*N*= 8, mean) (min, max)	(Dominguez-Fernandez et al. 2022)	8
										3	108

Notes: a) The participants consumed for breakfast for 3 days milled flaxseed (30 g/day), freeze-dried raspberry powder (40 g/day), and soy milk (250 mL/day), providing 300 mg/ day of lignans (300 mg of secoisolariciresinol diglucoside), 150 mg/ day of ellagitannins (118 mg of sanguiin H6, 14.3 mg of lambertianin C, and other minor ellagitannins), and 22 mg of isoflavones/day (20.10 mg of daidzin and 1.8 mg of daidzein).

Table 24. 3-(2',4'-dihydroxyphenyl)propanoic acid											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
1.521 ± 0.825 (**1.275** and 0.922)									Free-living volunteers (*N*=90, mean ± s.d.) (**Median** and IQR)	(Le Sayec et al. 2023)	90
<LOQ [a]		**0.148 0.084–0.199** [a]							*N*=10, median and IQR. Polyphenol-rich breakfast for 3 days [a]	(Domínguez-Fernández et al. 2021)	10
										2	100

Notes: a) The participants consumed for breakfast for 3 days milled flaxseed (30 g/day), freeze-dried raspberry powder (40 g/day), and soy milk (250 mL/day), providing 300 mg/ day of lignans (300 mg of secoisolariciresinol diglucoside), 150 mg/ day of ellagitannins (118 mg of sanguiin H6, 14.3 mg of lambertianin C, and other minor ellagitannins), and 22 mg of isoflavones/day (20.10 mg of daidzin and 1.8 mg of daidzein).

Table 25. 3-(3',4'-dihydroxyphenyl)propanoic acid (Dihydrocaffeic acid)											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l				
0.194 (0.133, 0.375) **									Healthy controls (*N*=809, **median**, 5% and 95% C.I.) Hydrolysed	(Murphy et al. 2018)	809
0.195 (0.133, 0.426) **									Cancer patients (*N*=809, **median**, 5% and 95% C.I.) Hydrolysed		809
0.029 ± 0.010 0.017 ± 0.004 0.038 ± 0.009 0.016 ± 0.005 0.018 ± 0.006									Healthy free-living adults (mean ± s.d., *N*=12). Data from HMDB supplementary data attached to the journal no longer available.	(Loke et al. 2009)	12
0.266 ± 0.209 (**0.232** and 0.269)									Free-living volunteers (*N*=90, mean ± s.d.) (M**edian** and IQR)	(Le Sayec et al. 2023)	90
0.019 **0.016–0.024** [d]		**0.335** **0.158–0.544** [d]							*N*=10, median and IQR. Polyphenol-rich breakfast for 3 days [d]	(Domínguez-Fernández et al. 2021)	10
	0.22 ± 0.06 zero time	16 ± 2 zero time							Green coffee extract (600 mg) (*N*=9, mean ± s.e.) zero time	(Angel Seguido et al. 2022)	9
	0.22 ± 0.05 at 8 weeks	31 ± 5 at 8 weeks							Green coffee extract (600 mg) (*N*=9, mean ± s.e.) 8 weeks		
	0.17 ± 0.04	13.0 ± 1.0			?	1.9 ± 0.5			Green coffee extract (600 mg) and oat β-glucan day 1 (*N*=9, mean ± s.e.) Free-living overweight / obese volunteers	(Seguido et al. 2022)	9
	0.22 ± 0.05	28.0 ± 5.0			?	14.0 ± 3.0			Green coffee extract (600 mg) and oat β-glucan 8 weeks (*N*=9, mean ± s.e.) Free-living overweight / obese volunteers		
		n.d. 97 ± 16 n.d. 5 ± 1	—						Placebo 7 days (mean ± s.e., *N*=20) 5-CQA 5.5 mmol/day, 7 days (mean ± s.e., *N*=20)	(Olthof et al. 2003)	20

									660 µmol rutin/day, 7 days (mean ± s.e., *N*=20) 4.3 mmol/d black tea solids, 7 days (mean ± s.e., *N*=20).		
	0.093 ± 0.032	0.184 ± 0.04	Three days						Daily Cranberry juice (787 mg) for 1 month (mean ± s.e., *N*=10).	(Feliciano, Boeres, et al. 2016)	10
	0.091 ± 0.031		Three days						Daily Cranberry juice (476 mg) (mean ± s.e., *N*=10).	(Feliciano et al. 2017)	10
	0.091 ± 0.031		Three days						Daily Cranberry juice (1238 mg) for (mean ± s.e., *N*=10).		10
	0.097 ± 0.032		Three days						Daily Cranberry juice (1534 mg (mean ± s.e., *N*=10).		10
	0.188 ± 0.104		Three days						Daily Cranberry juice (1910 mg) (mean ± s.e., *N*=10).		10
		0.252 ± 0.05 day 1 0.407 ± 0.08 at 1 month	1-day including over-night fast	0.024 ± 0.006 0.017 ± 0.004 0.027 ± 0.006 0.023 ± 0.005					Daily Wild blueberries (726 mg) for 1 month (mean ± s.e., *N*=18).	(Feliciano, Istas, et al. 2016)	18
	n.d.		Over-night	n.d.					Orange juice (398 µmol) (*N*=10, mean ± s.e.) Trained athletes	(Pereira-Caro et al. 2020)	10
		1.3 ± 0.4 day 1 2.40 ± 0.7 at 1 month	2-day including over-night fast	0.009 ± 0.004					Day 1 placebo (mean ± s.e., *N*=45) Placebo after 1 month (mean ± s.e., *N*=45)	(Heiss et al. 2022)	45
		1.6 ± 0.4 day 1 2.3 ± 0.4 at 1 month	2-day including over-night fast	0.023 ± 0.009					Day 1 cranberries (525 mg) (mean ± s.e., *N*=45) Cranberries (525 mg) after 1 month (mean ± s.e.), *N*=45)		
			—				0.097 ± 0.014 [a] start 0.28 ± 0.1 [a] 6-weeks		White-fleshed apple (mean ± s.e., *N*=8) (197 mg)	(Macià et al. 2022)	29

		1.52 ± 1.52	—						Red-fleshed apple (mean ± s.e., *N*=12) (193 mg)		
			—						Aronia infusion (mean ± s.e., *N*=9) (99 mg)		
	trace	0.3 ± 0.1	3 days including over-night fast		2 hours	0.015 ± 0.008			Rosemary tea (1055 µmol rosmarinic acid equivalent) (mean ± s.d., *N*=12) Quantified with free acid	(Achour et al. 2021)	12
	0.027 ± 0.014	2.42 ± 0.67	Three days		2 hours	0.054 ± 0.014			Maté (1118 µmol) (mean ± s.d., *N*=12)	(Gomez-Juaristi et al. 2018a)	12
	0.03 ± 0.01	2.5 ± 0.5	3 days		2 hours	0.06 ± 0.01			Coffee (761 µmol) (mean ± s.d., *N*=12)	(Gomez-Juaristi et al. 2018b)	12
		0.87 ± 0.15	Three days		2 hours	0.117 ± 0.024			Cocoa (68 µmol) (mean ± s.d., *N*=13), UNHYDROLYSED	(Gomez-Juaristi et al. 2019)	13
		1.12 ± 0.13	Three days		2 hours	0.213 ± 0.031			Cocoa (235 µmol) (mean ± s.d., *N*=13), UNHYDROLYSED		
	0.024 (0.008, 0.033)	4.3 (4.1, 12)	24 hours	0.004 ± 0.001		0.243 ± 0.052			Artichoke (5727 µmol) (*N*= 8, mean) (min, max)	(Dominguez-Fernandez et al. 2022)	8
	0.066 ± 0.040								Artichoke (498 mg) (*N*=5, mean ± s.d.)	(Azzini et al. 2007)	5
	0**.049** (0.034, 0.054)		2 days						Coffee low dose (412 µmol) (**median** and quartiles, *N*=11)	(Stalmach, Williamson, and Crozier 2014)	11
	0.056 (0.039, 0.101)		2 days						Coffee medium dose (635 µmol) (**median** and quartiles, *N*=11)		
	0.072 (0.056, 0.102)		2 days						Coffee high dose (795 µmol) (**median** and quartiles, *N*=11)		
		1.1 ± 0.2	2 days					**2 ± 1**	Coffee low dose (1053 µmol) (mean ± s.d., *N*=5 ileostomists) PLASMA HYDROLYSED	(Erk et al. 2012)	5
		1.4 ± 0.1	2 days					**4 ± 1**	Coffee medium dose (2219 µmol) (mean ± s.d., *N*=5 ileostomists) PLASMA HYDROLYSED		

		5.1 ± 6.2	2 days					**8 ± 3**	Coffee high dose (4525 µmol) (mean ± s.d., *N*=5 ileostomists) PLASMA HYDROLYSED		
			—				5.2 ± 4.1		Free-living volunteers (mean ± s.e., *N*=5). No increase on hydrolysis	(Jenner, Rafter, and Halliwell 2005)	5
			—				12.1 4.6 14.3 9.8		One free-living volunteer over four consecutive days. No increase on hydrolysis		
			—				27 ± 15 [b] 123 ± 75 [b] 13 ± 6 [b] 1 ± 0.4 [b]		(*N*=5, mean ± s.e.) Italy (*N*=5, mean ± s.e.) Germany (*N*=5, mean ± s.e.) Spain (*N*=5, mean ± s.e.) Denmark	(Knust et al. 2006)	20
			Two weeks				3.53 ± 2.46 [c] 2.28 ± 0.61 [c]		Low (poly)phenol diet four weeks Zero time (mean ± s.d., *N*=5) Four weeks (mean ± s.d., *N*=4)	(Munoz-Gonzalez et al. 2013)	18
			Two weeks				5.06 ± 7.62 [c] 4.30 ± 5.09 [c]		Red wine (*ca* 112 mg/250 ml) daily for four weeks Zero time (mean ± s.d., *N*=13) Four weeks (mean ± s.d., *N*=10)		
										23	423

Notes a) µmol/g rather than µmol/l

b) described as fecal matrix and unclear precisely how it compares with fecal water as used by Jenner *et al*. and Karlsson *et al*.

c) µmol/g rather than µmol/l but authors do not indicate whether this is wet weight or dry weight

d) The participants consumed for breakfast for 3 days milled flaxseed (30 g/day), freeze-dried raspberry powder (40 g/day), and soy milk (250 mL/day), providing 300 mg/ day of lignans (300 mg of secoisolariciresinol diglucoside), 150 mg/ day of ellagitannins (118 mg of sanguiin H6, 14.3 mg of lambertianin C, and other minor ellagitannins), and 22 mg of isoflavones/day (20.10 mg of daidzin and 1.8 mg of daidzein).

Table 26. 3-(3′-hydroxyphenyl)propanoic acid-4′-glucuronide											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot $conc^n$ µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
		0.20 ± 0.01	2 days						Orange juice (368 µmol) (N=9, mean ± s.e.)	(Pereira-Caro et al. 2023)	9
		0.35 ± 0.03	2 days						Orange juice (368 µmol) plus oat bran (58 µmol) (N=9, mean ± s.e.)		
										1	9

Table 27. 3-(3′-hydroxyphenyl)propanoic acid-4′-sulfate											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot $conc^n$ µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
		0.07 ± 0.01	2 days						Orange juice (368 µmol) (N=9, mean ± s.e.)	(Pereira-Caro et al. 2023)	9
		0.11 ± 0.01	2 days						Orange juice (368 µmol) plus oat bran (58 µmol) (N=9, mean ± s.e.)		
	trace		Over-night	n.d.					Orange juice (398 µmol) (N=10, mean ± s.e.) Trained athletes	(Pereira-Caro et al. 2020)	10
										2	19

Table 28. 3-(4′-hydroxyphenyl)propanoic acid-3′-glucuronide											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
0.616 ± 0.659 (**0.226** and 1.238)									Free-living volunteers (*N*=90, mean ± s.d.) (**Median** and IQR)	(Le Sayec et al. 2023)	90
<LOQ [a]		**0.258 0.098–0.450** [a]							*N*=10, median and IQR. Polyphenol-rich breakfast for 3 days [a]	(Domínguez-Fernández et al. 2021)	10
		0.33 ± 0.05	2 days						Orange juice (368 µmol) (N=9, mean ± s.e.)	(Pereira-Caro et al. 2023)	9
		0.48 ± 0.07	2 days						Orange juice (368 µmol) plus oat bran (58 µmol) (N=9, mean ± s.e.)		
	0.084 ± 0.011	0.129 ± 0.20	Three days						Daily Cranberry juice (787 mg) for 1 month (mean ± s.e., N=10).	(Feliciano, Boeres, et al. 2016)	10
	0.090 ± 0.013		Three days						Daily Cranberry juice (476 mg) (mean ± s.e., *N*=10).	(Feliciano et al. 2017)	10
	0.099 ± 0.015		Three days						Daily Cranberry juice (1238 mg) for (mean ± s.e., *N*=10).		10
	0.091 ± 0.011		Three days						Daily Cranberry juice (1534 mg (mean ± s.e., *N*=10).		10
	0.110 ± 0.013		Three days						Daily Cranberry juice (1910 mg) (mean ± s.e., *N*=10).		10
		0.293 ± 0.06 day 1 0.318 ± 0.06 at 1 month	1-day including over-night fast	0.009 ± 0.001 0.008 ± 0.001 0.011 ± 0.002 0.010 ± 0.002					Daily Wild blueberries (726 mg) for 1 month (mean ± s.e., N=18).	(Feliciano, Istas, et al. 2016)	18
		2.6 ± 0.5 day 1 1.3 ± 0.2 at 1 month	2-day including over-night fast	0.093 ± 0.016					Day 1 placebo (mean ± s.e., N=45) Placebo after 1 month (mean ± s.e., N=45)	(Heiss et al. 2022)	45
		1.4 ± 0.2 day 1 2.5 ± 0.4 at 1 month	2-day including over-night fast	0.079 ± 0.014					Day 1 cranberries (525 mg) (mean ± s.e., N=45)		

									Cranberries (525 mg) after 1 month (mean ± s.e.), N=45)		
		0.7 ± 0.2							Coffee (412 µmol) (mean ± s.e. *N*=11)	(Stalmach et al. 2009)	11
	0.024 (0.006, 0.041)	25 (2.1, ?)	24 hours	0.004 ± 0.000		0.171 ± 0.067			Artichoke (5727 µmol) (N= 8, mean) (min, max)	(Dominguez-Fernandez et al. 2022)	8
										9	241

Notes: a) The participants consumed for breakfast for 3 days milled flaxseed (30 g/day), freeze-dried raspberry powder (40 g/day), and soy milk (250 mL/day), providing 300 mg/ day of lignans (300 mg of secoisolariciresinol diglucoside), 150 mg/ day of ellagitannins (118 mg of sanguiin H6, 14.3 mg of lambertianin C, and other minor ellagitannins), and 22 mg of isoflavones/day (20.10 mg of daidzin and 1.8 mg of daidzein).

Table 29. 3-(4′-hydroxyphenyl)propanoic acid-3′-sulfate										
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
1.704 ± 1.044 (**1.376** and 1.133)									Free-living volunteers (*N*=90, mean ± s.d.) (**Median** and IQR)	(Le Sayec et al. 2023)	90
0.031 0.019–0.061 [c]		**11.5 0.99–11.6** [c]							*N*=10, median and IQR. Polyphenol-rich breakfast for 3 days [c]	(Domínguez-Fernández et al. 2021)	10
		0.90 ± 0.20	2 days						Orange juice (368 µmol) (N=9, mean ± s.e.)	(Pereira-Caro et al. 2023)	9
		1.40 ± 0.03	2 days						Orange juice (368 µmol) plus oat bran (58 µmol) (N=9, mean ± s.e.)		
	1.66 ± 1.12	0.417 ± 0.082	Three days						Daily Cranberry juice (787 mg) for 1 month (mean ± s.e., N=10).	(Feliciano, Boeres, et al. 2016).	10
	1.66 ± 0.85		Three days						Daily Cranberry juice (476 mg) (mean ± s.e., *N*=10).	(Feliciano et al. 2017)	10
	1.23 ± 0.62		Three days						Daily Cranberry juice (1238 mg) for (mean ± s.e., *N*=10).		10
	1.67 ± 0.59		Three days						Daily Cranberry juice (1534 mg (mean ± s.e., *N*=10).		10
	2.18 ± 0.88		Three days						Daily Cranberry juice (1910 mg) (mean ± s.e., *N*=10).		10
		3.15 ± 0.74 day 1 3.94 ± 0.93 at 1 month	1-day including over-night fast	0.053 ± 0.012 0.041 ± 0.011 0.104 ± 0.028 0.073 ± 0.015					Daily Wild blueberries (726 mg) for 1 month (mean ± s.e., N=18).	(Feliciano, Istas, et al. 2016)	18
		20.4 ± 3.3 day 1 14.3 ± 2.2 at 1 month	2-day including over-night fast	0.115 ± 0.010					Day 1 placebo (mean ± s.e., N=45) Placebo after 1 month (mean ± s.e., N=45)	(Heiss et al. 2022)	45
		12.8 ± 1.9 day 1 16.4 ± 2.9 at 1 month	2-day including over-night fast	0.125 ± 0.013					Day 1 cranberries (525 mg) (mean ± s.e., N=45) Cranberries (525 mg) after 1 month (mean ± s.e.), N=45)		

		1.1 ± 0.3 [a]	Two days		2 hours	trace			Raspberries (553 µmol) (N=9, mean ± s.e.)	(Ludwig et al. 2015)	9
	1.33 (0.002, 4.0)	8.4 (18, 37)	24 hours	<LOQ		0.395 ± 0.095			Artichoke (5727 µmol) (N= 8, mean) (min, max)	(Dominguez-Fernandez et al. 2022)	8
	0.325 ± 0.099	37.1 ± 8.2							Coffee (412 µmol) (mean ± s.e. *N*=11)	(Stalmach et al. 2009)	11
	0.220 (0.107, 0.429)	**35.7** (16.3, 43.0)	2 days						Coffee low dose (412 µmol) (**median** and quartiles, *N*=11)	(Stalmach, Williamson, and Crozier 2014)	11
	0.465 (0.174, 0.772)	**47.4** (27.8, 71.2)	2 days						Coffee medium dose (635 µmol) (**median** and quartiles, *N*=11)		
	0.409 (0.318, 0.678)	**47.9** (36.6, 89.9)	2 days						Coffee high dose (795 µmol) (**median** and quartiles, *N*=11)		
	0.032 ± 0.008		2 days						Coffee (1 cup/day) (mean ± s.e., N=21) T_{max} = 7.5 ± 1.3 hours	(Mena et al. 2021)	21
	0.026 ± 0.007		2 days						Coffee (3 cups/day) (mean ± s.e., N=21) T_{max} = 5.9 ± 0.7 hours		
	0.044 ± 0.014		2 days						Coffee-cocoa mixture (3 cups/day) (mean ± s.e., N=21)) T_{max} = 6.5 ± 1.0 hours		
		3.0 ± 0.2	2 days					0.5 ± 0.2	Coffee low dose (1053 µmol) (mean ± s.d., N=5 ileostomists) PLASMA HYDROLYSED	(Erk et al. 2012)	5
		5.4 ± 0.2	2 days					0.9 ± 0.4	Coffee medium dose (2219 µmol) (mean ± s.d., N=5 ileostomists) PLASMA HYDROLYSED		
		3.4 ± 1.3	2 days					1 ± 1	Coffee high dose (4525 µmol) (mean ± s.d., N=5 ileostomists) PLASMA HYDROLYSED		
		3.2 ± 0.9	36 hours						Coffee (385 µmol) (mean ± s.e., N=5 ileostomists)	(Stalmach et al. 2010)	5
		9 ± 3 at 8 weeks							Green coffee extract (600 mg) (*N*=9, mean ± s.e.) 8 weeks		
		0.5 ± 0.2	Two days			1.0 ± 1.0 [b]			Orange juice (398 µmol) (mean ± s.e., N=10 trained)		10

		0.9 ± 0.4	Two days			1.0 ± 1.0 [b]			Orange juice (398 µmol) (mean ± s.e., N=10 detrained)	(Pereira-Caro et al. 2017)	
	0.008 ± 0.002		3 days including over-night fast		?	0.06 ± 0.03			Grape pomace (N=10, mean ± s.e.)	(Castello et al. 2018)	10
		1.76 ± 0.65	2-day including over-night fast	n.d.					Mean ± s.e., *N*=7, beans	(Mecha et al. 2020)	7
										17	319

Notes a) Urine collected over 48-hours rather than 24-hours

b) 12-hour urine

c) The participants consumed for breakfast for 3 days milled flaxseed (30 g/day), freeze-dried raspberry powder (40 g/day), and soy milk (250 mL/day), providing 300 mg/ day of lignans (300 mg of secoisolariciresinol diglucoside), 150 mg/ day of ellagitannins (118 mg of sanguiin H6, 14.3 mg of lambertianin C, and other minor ellagitannins), and 22 mg of isoflavones/day (20.10 mg of daidzin and 1.8 mg of daidzein).

Table 30. 3-(4′-hydroxy-3′-methoxyphenyl)propanoic acid (Dihydroferulic acid)											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
<LOQ [b]		**2.11 1.16–5.41** [b]							*N*=10, median and IQR. Polyphenol-rich breakfast for 3 days [b]	(Domínguez-Fernández et al. 2021)	10
		0.6 ± 0.2	Two days			0.3 ± 0.3 [b]			Orange juice (398 µmol) (mean ± s.e., *N*=10 trained)	(Pereira-Caro et al. 2017)	10
		1.0 ± 0.3	Two days			0.1 ± 0.06 [b]			Orange juice (398 µmol) (mean ± s.e., *N*=10 detrained)		
		1.90 ± 0.03	2 days						Orange juice (368 µmol) (*N*=9, mean ± s.e.)	(Pereira-Caro et al. 2023)	9
		21 ± 5	2 days						Orange juice (368 µmol) plus oat bran (58 µmol) (*N*=9, mean ± s.e.)		
	n.d.		Over-night	n.d.					Orange juice (398 µmol) (*N*=10, mean ± s.e.) Trained athletes	(Pereira-Caro et al. 2020)	10
	0.304 ± 0.122	0.524 ± 0.368	Three days						Daily Cranberry juice (787 mg) for 1 month (mean ± s.e., *N*=10).	(Feliciano, Boeres, et al. 2016).	10
		0.75± 0.22 day 1 0.77 ± 0.18 Day 30	1-day including over-night fast	0.100 ± 0.023 0.072 ± 0.024 0.111 ± 0.022 0.074 ± 0.015					Daily Wild blueberries (726 mg) for 1 month (mean ± s.e., *N*=18).	(Feliciano, Istas, et al. 2016)	18
		3.4 ± 1.0 day 1 1.1 ± 0.3 at 1 month	2-day including over-night fast	0.122 ± 0.052					Day 1 placebo (mean ± s.e., *N*=45) Placebo after 1 month (mean ± s.e., *N*=45)	(Heiss et al. 2022)	45
		1.3 ± 0.3 day 1 5.2 ± 1.1 at 1 month	2-day including over-night fast	0.127 ± 0.042					Day 1 cranberries (525 mg) (mean ± s.e., *N*=45) Cranberries (525 mg) after 1 month (mean ± s.e.), *N*=45)		

	0.31 ± 0.16	6.72 ± 1.47	Three days		2 hours	0.056 ± 0.014			Maté (1118 µmol) (mean ± s.d., *N*=12)	(Gomez-Juaristi et al. 2018a)	12
		0.25 ± 0.07	Three days		2 hours	0.104 ± 0.027			Cocoa (68 µmol) (mean ± s.d., *N*=13), UNHYDROLYSED	(Gomez-Juaristi et al. 2019)	13
		0.46 ± 0.14	Three days		2 hours	0.077 ± 0.032			Cocoa (235 µmol) (mean ± s.d., *N*=13), UNHYDROLYSED		
	0.3 ± 0.1 zero time	0.5 ± 0.2							Green coffee extract (600 mg) (*N*=9, mean ± s.e.) zero time	(Angel Seguido et al. 2022)	9
	0.25 ± 0.06 at 8 weeks	1.1 ± 0.4							Green coffee extract (600 mg) (*N*=9, mean ± s.e.) 8 weeks		
	0.25 ± 0.05	1.3 ± 0.6			?	0.8 ± 0.4			Green coffee extract (600 mg) and oat β-glucan day 1 (*N*=9, mean ± s.e.) Free-living overweight / obese volunteers	(Seguido et al. 2022)	9
	0.30 ± 0.10	0.8 ± 0.2			?	0.5 ± 0.2			Green coffee extract (600 mg) and oat β-glucan 8 weeks (*N*=9, mean ± s.e.) Free-living overweight / obese volunteers		
	0.385 ± 0.086	9.7 ± 2.0							Coffee (412 µmol) (mean ± s.e. *N*=11)	(Stalmach et al. 2009)	11
	0.86 (0.073, 1.96)	38 (9, 108)	24 hours	<LOQ		0.511 ± 0.058			Artichoke (5727 µmol) (*N*= 8, mean) (min, max)	(Dominguez-Fernandez et al. 2022)	8
	0.108 ± 0.047								Artichoke (498 mg) (*N*=5, mean ± s.d.)	(Azzini et al. 2007)	5
			—				76 ± 68 [a] 4 ± 1 [a] 4 ± 1 [a] 2 ± 1 [a]		(*N*=5, mean ± s.e.) Italy (*N*=5, mean ± s.e.) Germany (*N*=5, mean ± s.e.) Spain (*N*=5, mean ± s.e.) Denmark	(Knust et al. 2006)	20
										15	199

Notes: a) described as fecal matrix and unclear precisely how it compares with fecal water as used by Jenner *et al*. and Karlsson *et al*.

b) The participants consumed for breakfast for 3 days milled flaxseed (30 g/day), freeze-dried raspberry powder (40 g/day), and soy milk (250 mL/day), providing 300 mg/ day of lignans (300 mg of secoisolariciresinol diglucoside), 150 mg/ day of ellagitannins (118 mg of sanguiin H6, 14.3 mg of lambertianin C, and other minor ellagitannins), and 22 mg of isoflavones/day (20.10 mg of daidzin and 1.8 mg of daidzein).

Table 31. 3-(3′-methoxyphenyl)propanoic acid-4′-glucuronide											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
0.619 ± 0.814 (**0.297** and 0.459)									Free-living volunteers (*N*=90, mean ± s.d.) (**Median** and IQR)	(Le Sayec et al. 2023)	90
0.017 0.012–0.025 [c]		**0.584 0.242–1.41**[c]							*N*=10, median and IQR. Polyphenol-rich breakfast for 3 days [c]	(Domínguez-Fernández et al. 2021)	10
		0.24 ± 0.04	2 days						Orange juice (368 µmol) (N=9, mean ± s.e.)	(Pereira-Caro et al. 2023)	9
		0.22 ± 0.04	2 days						Orange juice (368 µmol) plus oat bran (58 µmol) (N=9, mean ± s.e.)		
	0.201 ± 0.059	0.353 ± 0.117	Three days						Daily Cranberry juice (787 mg) for 1 month (mean ± s.e., N=10).	(Feliciano, Boeres, et al. 2016)	10
	0.123 ± 0.025		Three days						Daily Cranberry juice (476 mg) (mean ± s.e., *N*=10).	(Feliciano et al. 2017)	10
	0.230 ± 0.064		Three days						Daily Cranberry juice (1238 mg) for (mean ± s.e., *N*=10).		10
	0.150 ± 0.023		Three days						Daily Cranberry juice (1534 mg (mean ± s.e., *N*=10).		10
	0.581 ± 0.469		Three days						Daily Cranberry juice (1910 mg) (mean ± s.e., *N*=10).		10
		1.15 ± 0.35 day 1 1.09 ± 0.21 Day 30	1-day including over-night fast	0.116 ± 0.023 0.076 ± 0.016 0.124 ± 0.031 0.100 ± 0.025					Daily Wild blueberries (726 mg) for 1 month (mean ± s.e., N=18).	(Feliciano, Istas, et al. 2016)	18
		37.4 ± 9.5 day 1 21.5 ± 3.5 at 1 month	2-day including over-night fast	0.066 ± 0.012					Day 1 placebo (mean ± s.e., N=45) Placebo after 1 month (mean ± s.e., N=45)	(Heiss et al. 2022)	45
		16.2 ± 3.1 day 1 33.0 ± 6.8 at 1 month	2-day including over-night fast	0.144 ± 0.026					Day 1 cranberries (525 mg) (mean ± s.e., N=45) Cranberries (525 mg) after 1 month (mean ± s.e.), N=45)		

		1.3 ± 0.4	Two days			0.6 ± 0.4 [b]			Orange juice (398 µmol) (mean ± s.e., N=10 trained)	(Pereira-Caro et al. 2017)	10
		1.0 ± 0.4	Two days			0.5 ± 0.2 [b]			Orange juice (398 µmol) (mean ± s.e., N=10 detrained)		
	0.26 (0.023, 0.77)	3.8 (?, ?)	24 hours	0.014 ± 0.004		1.16 ± 0.47			Artichoke (5727 µmol) (N= 8, mean) (min, max)	(Dominguez-Fernandez et al. 2022)	8
	0.005 ± 0.0003	1.3 ± 0.4	Over-night	0.003 ± 0.001					Orange juice (398 µmol) (N=10, mean ± s.e.) Trained athletes	(Pereira-Caro et al. 2020)	10
		8.4 ± 1.9							Coffee (412 µmol) (mean ± s.e. *N*=11)	(Stalmach et al. 2009)	11
		1.3 ± 0.6 [b]							Mean ± s.e., *N*=10 Week 1 low consumption flavanone-rich ingredient	(Muralidharan et al. 2023)	10
		1.0 ± 0.3 [b]							Mean ± s.e., *N*=10 Week 16 low consumption flavanone-rich ingredient		
		0.6 ± 0.1 [b]							Mean ± s.e., *N*=9 Week 1 high consumption flavanone-rich ingredient		9
		0.6 ± .0.2 [b]							Mean ± s.e., *N*=9 Week 16 high consumption flavanone-rich ingredient		
		0.724 ± 0.192	2-day including over-night fast	0.045 ± 0.005					Mean ± s.e., *N*=7, beans	(Mecha et al. 2020)	7
										13	287

Notes: b) 48-hour urines

c) The participants consumed for breakfast for 3 days milled flaxseed (30 g/day), freeze-dried raspberry powder (40 g/day), and soy milk (250 mL/day), providing 300 mg/ day of lignans (300 mg of secoisolariciresinol diglucoside), 150 mg/ day of ellagitannins (118 mg of sanguiin H6, 14.3 mg of lambertianin C, and other minor ellagitannins), and 22 mg of isoflavones/day (20.10 mg of daidzin and 1.8 mg of daidzein).

Table 32. 3-(3′-methoxyphenyl)propanoic acid-4′-sulfate											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
0.409 ± 0.481 (**0.257** and 0.318)									Free-living volunteers (*N*=90, mean ± s.d.) (**Median** and IQR)	(Le Sayec et al. 2023)	90
0.023 0.020–0.027 [c]		**1.241 0.354–1.703**[c]							*N*=10, median and IQR. Polyphenol-rich breakfast for 3 days [c]	(Domínguez-Fernández et al. 2021)	10
		5.50 ± 0.4	2 days						Orange juice (368 µmol) (N=9, mean ± s.e.)	(Pereira-Caro et al. 2023)	9
		20 ± 3	2 days						Orange juice (368 µmol) plus oat bran (58 µmol) (N=9, mean ± s.e.)		
	0.197 ± 0.096	1.00 ± 0.18	Three days						Daily Cranberry juice (787 mg) for 1 month (mean ± s.e., N=10).	(Feliciano, Boeres, et al. 2016).	10
	0.166 ± 0.084		Three days						Daily Cranberry juice (476 mg) (mean ± s.e., *N*=10).	(Feliciano et al. 2017)	10
	0.151 ± 0.049		Three days						Daily Cranberry juice (1238 mg) for (mean ± s.e., *N*=10).		10
	0.124 ± 0.041		Three days						Daily Cranberry juice (1534 mg (mean ± s.e., *N*=10).		10
	0.179 ± 0.065		Three days						Daily Cranberry juice (1910 mg) (mean ± s.e., *N*=10).		10
		3.46 ± 0.57 day 1 3.38 ± 0.49 Day 30	1-day including over-night fast	0.154 ± 0.026 0.096 ± 0.019 0.138 ± 0.029 0.090 ± 0.017					Daily Wild blueberries (726 mg) for 1 month (mean ± s.e., N=18).	(Feliciano, Istas, et al. 2016)	18
		0.6 ± 0.2 day 1 0.5 ± 0.1 at 1 month	2-day including over-night fast	0.022 ± 0.005					Day 1 placebo (mean ± s.e., N=45) Placebo after 1 month (mean ± s.e., N=45)	(Heiss et al. 2022)	45

		0.3 ± 0.1 day 1 0.5 ± 0.1 at 1 month	2-day including over-night fast	0.019 ± 0.005					Day 1 cranberries (525 mg) (mean ± s.e., N=45) Cranberries (525 mg) after 1 month (mean ± s.e.), N=45)		
	0.114 (0.028, 0.281)	49 (?, ?)	24 hours	0.020 ± 0.003		0.094 ± 0.020			Artichoke (5727 µmol) (N= 8, mean) (min, max)	(Dominguez-Fernandez et al. 2022)	8
	0.002 ± 0.001	2.6 ± 0.8	Over-night	0.004 ± 0.0002					Orange juice (398 µmol) (N=10, mean ± s.e.) Trained athletes	(Pereira-Caro et al. 2020)	10
	0.145 ± 0.053	12.4 ± 3.4							Coffee (412 µmol) (mean ± s.e. *N*=11)	(Stalmach et al. 2009)	11
	0.088 (0.044, 0.166)	**11.4** (5.4, 13.9)	2 days						Coffee low dose (412 µmol) (**median** and quartiles, *N*=11)	(Stalmach, Williamson, and Crozier 2014)	11
	0.098 (0.046, 0.172)	**12.4** (3.4, 22.5)	2 days						Coffee medium dose (635 µmol) (**median** and quartiles, *N*=11)		
	0.117 (0.080, 0.327)	**17.5** (6.5, 25.8)	2 days						Coffee high dose (795 µmol) (**median** and quartiles, *N*=11)		
	0.008 ± 0.001		3 days including over-night fast		?	0.12 ± 0.04			Grape pomace (N=10, mean ± s.e.)	(Castello et al. 2018)	10
	0.009 ± 0.001 0.010 ± 0.004 0.012 ± 0.002								Wholegrain bread and aleurone – enriched wholegrain bread (N=5, mean ± s.e.)	(Bresciani et al. 2016)	5
		2.6 ± 0.8	Two days			1.2 ± 0.7 [b]			Orange juice (398 µmol) (mean ± s.e., N=10 trained)	(Pereira-Caro et al. 2017)	10
		2.5 ± 0.8	Two days			0.4 ± 0.2 [b]			Orange juice (398 µmol) (mean ± s.e., *N*=10 detrained)		
	0.0030 ± 0.0011	1.3 ± 0.4 [b]							Mean ± s.e., *N*=10 Week 1 low consumption flavanone-rich ingredient	(Muralidharan et al. 2023)	10

	0.0023 ± 0.0006	1.0 ± 0.3 [b]							Mean ± s.e., *N*=10 Week 16 low consumption flavanone-rich ingredient		
	0.0025 ± 0.0004	1.0 ± 0.2 [b]							Mean ± s.e., *N*=9 Week 1 high consumption flavanone-rich ingredient		9
	0.0018 ± 0.0005	0.9 ± 0.2 [b]							Mean ± s.e., *N*=9 Week 16 high consumption flavanone-rich ingredient		
		0.490 ± 0.096	2-day including over-night fast	n.d.					Mean ± s.e., *N*=7, beans	(Mecha et al. 2020)	7
										16	313

Notes: b) 48 hour urines

c) The participants consumed for breakfast for 3 days milled flaxseed (30 g/day), freeze-dried raspberry powder (40 g/day), and soy milk (250 mL/day), providing 300 mg/ day of lignans (300 mg of secoisolariciresinol diglucoside), 150 mg/ day of ellagitannins (118 mg of sanguiin H6, 14.3 mg of lambertianin C, and other minor ellagitannins), and 22 mg of isoflavones/day (20.10 mg of daidzin and 1.8 mg of daidzein).

Table 33. 3-(3'-hydroxy-4'-methoxyphenyl)propanoic acid (Dihydroisoferulic acid)											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
		3.60 ± 0.08	2 days						Orange juice (368 µmol) (N=9, mean ± s.e.)	(Pereira-Caro et al. 2023)	9
		56 ± 14	2 days						Orange juice (368 µmol) plus oat bran (58 µmol) (N=9, mean ± s.e.)		
			2-day including over-night fast	0.053 ± 0.014					Day 1 placebo (mean ± s.e., N=45) Placebo after 1 month (mean ± s.e., N=45)	(Heiss et al. 2022)	45
			2-day including over-night fast	0.099 ± 0.028					Day 1 cranberries (525 mg) (mean ± s.e., N=45) Cranberries (525 mg) after 1 month (mean ± s.e.), N=45)		
	0.052 ± 0.039		Three days		2 hours				Maté (1118 µmol) (mean ± s.d., N=12)	(Gomez-Juaristi et al. 2018a)	12
	0.0002 ± 0.0001		Over-night	0.019 ± 0.001					Orange juice (398 µmol) (N=10, mean ± s.e.) Trained athletes	(Pereira-Caro et al. 2020)	10
	0.07 ± 0.02 zero time	3.7 ± 0.04 zero time							Green coffee extract (600 mg) (N=9, mean ± s.e.) zero time	(Angel Seguido et al. 2022)	9
	0.07 ± 0.02 at 8 weeks	3.2 ± 0.02 at 8 weeks							Green coffee extract (600 mg) (N=9, mean ± s.e.) 8 weeks		
	0.08 ± 0.02	4.20 ± 0.8			?	n.d.			Green coffee extract (600 mg) and oat β-glucan day 1 (N=9, mean ± s.e.) Free-living overweight / obese volunteers	(Seguido et al. 2022)	9
	0.05 ± 0.01	5.0 ± 1.0			?	n.d.			Green coffee extract (600 mg) and oat β-glucan 8 weeks (N=9, mean ± s.e.) Free-living overweight / obese volunteers		
										6	94

Table 34. 3-(4′-methoxyphenyl)propanoic acid-3′-glucuronide											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
0.576 ± 0.745 (**0.304** and 0.533)									Free-living volunteers (*N*=90, mean ± s.d.) (**Median** and IQR)	(Le Sayec et al. 2023)	90
<LOQ [c]		**0.298 0.111–0.640** [c]							*N*=10, median and IQR. Polyphenol-rich breakfast for 3 days [c]	(Domínguez-Fernández et al. 2021)	10
	0.023 ± 0.010	0.76 ± 0.32	Three days						Daily Cranberry juice (787 mg) for 1 month (mean ± s.e., N=10).	(Feliciano, Boeres, et al. 2016).	10
	0.044 ± 0.021		Three days						Daily Cranberry juice (476 mg) (mean ± s.e., *N*=10).	(Feliciano et al. 2017)	10
	0.020 ± 0.004		Three days						Daily Cranberry juice (1238 mg) for (mean ± s.e., *N*=10).		10
	0.024 ± 0.004		Three days						Daily Cranberry juice (1534 mg (mean ± s.e., *N*=10).		10
	0.069 ± 0.042		Three days						Daily Cranberry juice (1910 mg) (mean ± s.e., *N*=10).		10
		0.41 ± 0.10 day 1 0.45 ± 0.20 Day 30	1-day including over-night fast	0.008 ± 0.002 0.006 ± 0.002 0.009 ± 0.002 0.008 ± 0.002					Daily Wild blueberries (726 mg) for 1 month (mean ± s.e., N=18).	(Feliciano, Istas, et al. 2016)	18
		45.9 ± 12.2 day 1 38.1 ± 9.4 at 1 month	2-day including over-night fast	0.051 ± 0.010					Day 1 placebo (mean ± s.e., N=45) Placebo after 1 month (mean ± s.e., N=45)	(Heiss et al. 2022)	45
		22.8 ± 4.4 day 1 25.1 ± 4.5 at 1 month	2-day including over-night fast	0.107 ± 0.021					Day 1 cranberries (525 mg) (mean ± s.e., N=45) Cranberries (525 mg) after 1 month (mean ± s.e.), N=45)		
	0.042 ± 0.007		2 days						Coffee (1 cup/day) (mean ± s.e., N=21)	(Mena et al. 2021)	21
	0.039 ± 0.005		2 days						Coffee (3 cups/day) (mean ± s.e., N=21)		

	0.034 ± 0.006		2 days						Coffee-cocoa mixture (3 cups/day) (mean ± s.e., N=21)		
	0.063 (0.010, 0.098)	27 (7.6, 96)	24 hours	0.006 ± 0.003		0.787 ± 0.474			Artichoke (5727 µmol) (N= 8, mean) (min, max)	(Dominguez-Fernandez et al. 2022)	8
	0.007 ± 0.0006	6.3 ± 2.0	Over-night	n.d.					Orange juice (398 µmol) (N=10, mean ± s.e.) Trained athletes	(Pereira-Caro et al. 2020)	10
	0.145 ± 0.053	2.5 ± 0.4							Coffee (412 µmol) (mean ± s.e. *N*=11)	(Stalmach et al. 2009)	11
		6.3 ± 2.0	Two days			0.06 ± 0.05 [b]			Orange juice (398 µmol) (mean ± s.e., N=10 trained)	(Pereira-Caro et al. 2017)	10
		5.7 ± 1.8	Two days			0.06 ± 0.04 [b]			Orange juice (398 µmol) (mean ± s.e., N=10 detrained)		
	0.0172 ± 0.0010	4.1 ± 1.4 [b]							Mean ± s.e., *N*=10 Week 1 low consumption flavanone-rich ingredient	(Muralidharan et al. 2023)	10
	0.0147 ± 0.0032	5.2 ± 2.2 [b]							Mean ± s.e., *N*=10 Week 16 low consumption flavanone-rich ingredient		
	0.0233 ± 0.0064	8.1 ± 1.4 [b]							Mean ± s.e., *N*=9 Week 1 high consumption flavanone-rich ingredient		9
	0.0393 ± 0.0124	6.6 ± 2.3 [b]							Mean ± s.e., *N*=9 Week 16 high consumption flavanone-rich ingredient		
		0.174 ± 0.066	2-day including over-night fast	0.0040 ± 0.0002					Mean ± s.e., *N*=7, beans	(Mecha et al. 2020)	7
										13	299

Notes: b) 48-hour urines

c) The participants consumed for breakfast for 3 days milled flaxseed (30 g/day), freeze-dried raspberry powder (40 g/day), and soy milk (250 mL/day), providing 300 mg/ day of lignans (300 mg of secoisolariciresinol diglucoside), 150 mg/ day of ellagitannins (118 mg of sanguiin H6, 14.3 mg of lambertianin C, and other minor ellagitannins), and 22 mg of isoflavones/day (20.10 mg of daidzin and 1.8 mg of daidzein).

Table 35. 3-(4′-methoxyphenyl)propanoic acid-3′-sulfate											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
0.381 ± 0.321 (**0.273** and 0.574)									Free-living volunteers (*N*=90, mean ± s.d.) (**Median** and IQR)	(Le Sayec et al. 2023)	90
0.0054 0.0043–0.0061 [c]		**0.831 0.293–1.368** [c]							*N*=10, median and IQR. Polyphenol-rich breakfast for 3 days [c]	(Domínguez-Fernández et al. 2021)	10
	0.097 ± 0.042	0.23 ± 0.035	Three days						Daily Cranberry juice (787 mg) for 1 month (mean ± s.e., N=10).	(Feliciano, Boeres, et al. 2016)	10
	0.090 ± 0.041		Three days						Daily Cranberry juice (476 mg) (mean ± s.e., *N*=10).	(Feliciano et al. 2017)	10
	0.091 ± 0.031		Three days						Daily Cranberry juice (1238 mg) for (mean ± s.e., *N*=10).		10
	0.083 ± 0.020		Three days						Daily Cranberry juice (1534 mg (mean ± s.e., *N*=10).		10
	0.149 ± 0.035		Three days						Daily Cranberry juice (1910 mg) (mean ± s.e., *N*=10).		10
		0.44 ± 0.10 day 1 0.68 ± 0.23 Day 30	1-day including over-night fast	0.102 ± 0.064 0.073 ± 0.039 0.044 ± 0.011 0.040 ± 0.008					Daily Wild blueberries (726 mg) for 1 month (mean ± s.e., N=18).	(Feliciano, Istas, et al. 2016)	18
		23.3 ± 3.0 day 1 16.4 ± 2.5 at 1 month	2-day including over-night fast	0.010 ± 0.001					Day 1 placebo (mean ± s.e., N=45) Placebo after 1 month (mean ± s.e., N=45)	(Heiss et al. 2022)	45
		12.4 ± 2.2 day 1 17.3 ± 2.7 at 1 month	2-day including over-night fast	0.010 ± 0.002					Day 1 cranberries (525 mg) (mean ± s.e., N=45) Cranberries (525 mg) after 1 month (mean ± s.e.), N=45)		

	0.046 (0.020, 0.108)	8.9 (2.9, 29)	24 hours	0.028 ± 0.011		3.87 ± 1.32			Artichoke (5727 µmol) (N= 8, mean) (min, max)	(Dominguez-Fernandez et al. 2022)	8
	0.009 ± 0.001	3.2 ± 1.0	Over-night	n.d.					Orange juice (398 µmol) (*N*=10, mean ± s.e.) Trained athletes	(Pereira-Caro et al. 2020)	10
		3.2 ± 1.0	Two days			0.06 ± 0.05 [b]			Orange juice (398 µmol) (mean ± s.e., *N*=10 trained)	(Pereira-Caro et al. 2017)	10
		3.3 ± 1.0	Two days			0.05 ± 0.04 [b]			Orange juice (398 µmol) (mean ± s.e., *N*=10 detrained)		
	0.0018 ± 0.0003	1.3 ± 0.3 [b]							Mean ± s.e., *N*=10 Week 1 low consumption flavanone-rich ingredient	(Muralidharan et al. 2023)	10
	0.0030 ± 0.0008	0.8 ± 0.3 [b]							Mean ± s.e., *N*=10 Week 16 low consumption flavanone-rich ingredient		
	0.0024 ± 0.0006	1.7 ± 0.5 [b]							Mean ± s.e., *N*=9 Week 1 high consumption flavanone-rich ingredient		9
	0.0031 ± 0.0005	2.1 ± 0.9 [b]							Mean ± s.e., *N*=9 Week 16 high consumption flavanone-rich ingredient		
										10	260

Notes: b) 48 -hour urines

c) The participants consumed for breakfast for 3 days milled flaxseed (30 g/day), freeze-dried raspberry powder (40 g/day), and soy milk (250 mL/day), providing 300 mg/ day of lignans (300 mg of secoisolariciresinol diglucoside), 150 mg/ day of ellagitannins (118 mg of sanguiin H6, 14.3 mg of lambertianin C, and other minor ellagitannins), and 22 mg of isoflavones/day (20.10 mg of daidzin and 1.8 mg of daidzein).

Table 36. 3-(3′,5′-dihydroxyphenyl)propanoic acid											
Free-living Plasma spot value	Plasma	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l	µmol/l	µmol/24 hours	Wash out durati on	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
0.041 (0.011, 0.161) **									Healthy controls (*N*=809, **median**, 5% and 95% C.I.) Hydrolysed	(Murphy et al. 2018)	809
0.040 (0.011, 0.163) **									Cancer patients (*N*=809, **median**, 5% and 95% C.I.) Hydrolysed		809
1.097 ± 0.786 (**0.90** and 0.68)									Free-living volunteers (*N*=90, mean ± s.d.) (**Median** and IQR)	(Le Sayec et al. 2023)	90
0.049 0.028–0.061 [a]		**1.25 0.64–3.89** [a]							*N*=10, median and IQR. Polyphenol-rich breakfast for 3 days [a]	(Domínguez-Fernández et al. 2021)	10
	0.019 (0.011, 0.059)	4.3, (1.2, 15)	24 hours	0.018 ± 0.005	2 hours	4.3 ± 2.1			Artichoke (5727 µmol) (*N*= 8, mean) (min, max)	(Dominguez-Fernandez et al. 2022)	8
		27.4 ± 12.1, 5.1, 57.2	7 days						Normal diet (mean ± s.d., min, max, *N*=17)	(Landberg et al. 2009)	17
		25.9 ± 6.8, 12.0, 40.7	7 days						Rye bran low dose (170 µmol) (mean ± s.d., min, max, *N*=17)		
		43.5 ± 9.2, 28.3–60.5	7 days						Rye bran medium dose (340 µmol) (mean ± s.d., min, max, *N*=17)		
		65.5–16.4, 36.5, 90.5	7 days						Rye bran high dose (680 µmol) (mean ± s.d., min, max, *N*=17)		
	0.067 (0.058, 0.077)		—						Rye bran low dose (85 µmol) (mean and 95% C.I., *N*=15)	(Marklund et al. 2014)	15
	0.122 (0.098, 0.152)		—						Rye bran medium dose (170 µmol) (mean and 95% C.I., *N*=15)		
	0.214 (0.182,0.253)		—						Rye bran high dose (342 µmol) (mean and 95% C.I., *N*=15)		
		8.1 (5.1, 13.0)	—						Normal diet (mean and 95% C.I., *N*=18)	(McKeown et al. 2016)	18
		24 (19, 30)	—						Whole grain wheat 3 times daily (mean and 95% C.I., *N*=18)		

		1.6, (1.1, 2.3)	—						Two week wash out (mean and 95% C.I., *N*=15)		
		41 (31, 53)	—						Whole grain wheat 6 times daily (mean and 95% C.I., *N*=15)		
										6	158

Notes: a) The participants consumed for breakfast for 3 days milled flaxseed (30 g/day), freeze-dried raspberry powder (40 g/day), and soy milk (250 mL/day), providing 300 mg/ day of lignans (300 mg of secoisolariciresinol diglucoside), 150 mg/ day of ellagitannins (118 mg of sanguiin H6, 14.3 mg of lambertianin C, and other minor ellagitannins), and 22 mg of isoflavones/day (20.10 mg of daidzin and 1.8 mg of daidzein).

Table 37. 3*R/S*-hydroxy-3-(3′-hydroxyphenyl)propanoic acid											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
		18 ± 2	2 days						Orange juice (368 µmol) (*N*=9, mean ± s.e.)	(Pereira-Caro et al. 2023)	9
		23 ± 1.7	2 days						Orange juice (368 µmol) plus oat bran (58 µmol) (*N*=9, mean ± s.e.)		
		14.0 ± 4	60 hours including 12 hour fast		24 hours	16.0 ± 6.0			Raspberries (344 µmol) (mean ± s.e., *N*=8). No increase on hydrolysis.	(Gonzalez-Barrio, Edwards, and Crozier 2011)	8
	0.628 ± 0.018	0.2 ± 0.3	Over-night	0.270 ± 0.044					Orange juice (398 µmol) (*N*=10, mean ± s.e.) Trained athletes	(Pereira-Caro et al. 2020)	10
		0.2 ± 0.3	Two days			1.3 ± 0.8 [b]			Orange juice (398 µmol) (mean ± s.e., *N*=10 trained)	(Pereira-Caro et al. 2017)	10
		0.6 ± 0.2	Two days			1.3 ± 1.0 [b]			Orange juice (398 µmol) (mean ± s.e., *N*=10 detrained)		
										4	37

Table 38. 3*R/S*-hydroxy-3-(3′-hydroxy-4′-methoxyphenyl)propanoic acid											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
		64 ± 7	2 days						Orange juice (368 µmol) (*N*=9, mean ± s.e.)	(Pereira-Caro et al. 2023)	9
		58 ± 5	2 days						Orange juice (368 µmol) plus oat bran (58 µmol) (*N*=9, mean ± s.e.)		
	0.020 ± 0.002	18 ± 5.8	Over-night	0.003 ± 0.001					Orange juice (398 µmol) (*N*=10, mean ± s.e.) Trained athletes	(Pereira-Caro et al. 2020)	10
		18.5 ± 5.8	Two days			0.3 ± 0.2 [b]			Orange juice (398 µmol) (mean ± s.e., *N*=10 trained)	(Pereira-Caro et al. 2017)	10
		21.0 ± 6.0	Two days			0.2 ± 0.2 [b]			Orange juice (398 µmol) (mean ± s.e., *N*=10 detrained)		
										3	29

Table 39. 2*R/S*-hydroxy-3-(4′-hydroxyphenyl)propanoic acid											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
1.47 (0.7, 3.47)									Healthy free-living adults (**median**, min, max, *N*=72)	(Beloborodova et al. 2015)	72
0.335–1.148			—						Healthy individuals (*N*=9, range)	(Deutsch 1997)	9
0.71 ± 0.01			—						Healthy individuals (mean ± s.d., *N*=10)	(Feng et al. 2014)	10
10.25 ± 3.07 (**9.27** and 4.08)									Free-living volunteers (*N*=90, mean ± s.d.) (**Median** and IQR)	(Le Sayec et al. 2023)	90
1.15 0.94–1.32 [b]		**2.17 0.90–4.41** [b]							***N*=10, median and IQR. Polyphenol-rich breakfast for 3 days** [b]	(Domínguez-Fernández et al. 2021)	10
		6.5 ± 0.8	60 hours including 12-hour fast		24 hours	3.8 ± 0.7			Raspberries (344 µmol) (mean ± s.e., *N*=8). No increase on hydrolysis.	(Gonzalez-Barrio, Edwards, and Crozier 2011)	8
	23.0 (20.5, 28.5)	5.8 (1.8, 12)	24 hours	2.41 ± 0.39		20.7 ± 1.17			Artichoke (5727 µmol) (*N*= 8, mean) (min, max)	(Dominguez-Fernandez et al. 2022)	8
			—				104 ± 33 [a] 15 ± 3 [a] 8 ± 3 [a] 11 ± 2 [a]		(*N*=5, mean ± s.e.) Italy (*N*=5, mean ± s.e.) Germany (*N*=5, mean ± s.e.) Spain (*N*=5, mean ± s.e.) Denmark	(Knust et al. 2006)	20
										8	227

Notes: a) described as fecal matrix and unclear precisely how it compares with fecal water as used by Jenner *et al*. and Karlsson *et al*.

b) The participants consumed for breakfast for 3 days milled flaxseed (30 g/day), freeze-dried raspberry powder (40 g/day), and soy milk (250 mL/day), providing 300 mg/ day of lignans (300 mg of secoisolariciresinol diglucoside), 150 mg/ day of ellagitannins (118 mg of sanguiin H6, 14.3 mg of lambertianin C, and other minor ellagitannins), and 22 mg of isoflavones/day (20.10 mg of daidzin and 1.8 mg of daidzein).

Table 40. 2*R/S*-hydroxy-3-(3′,4′-dihydroxyphenyl)propanoic acid (3′,4′-dihydroxyphenyl-lactic acid)											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol/l	µmol/l	µmol/l			
	0.677 ± 0.244		—						Healthy volunteers Compound Danshen Dripping Pills (*N*=8, mean ± s.d.)	(Li et al. 2017)	8
										1	8

Table 41. 2*R/S*-hydroxy-3-(4′-hydroxy-3′-methoxyphenyl)propanoic acid (Vanilloyl-lactic acid, VLA)											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
	0.235 ± 0.081		—						Healthy volunteers Compound Danshen Dripping Pills (*N*=8, mean ± s.d.)	(Li et al. 2017)	8
n.d.									Free-living volunteers (*N*=5, mean ± s.d.)	(Mitchell and Coscia 1978)	5
										2	13

Notes : a) value read from graph

b) both regio-isomers recorded at essentially identical concentrations

n.d. not detected

Table 42. 2-keto-3-(phenyl)propanoic acid											
Free-living Plasma spot value	Plasma C_{max}	Urine	Washout				Fecal water	Ileal fluid	Notes	Reference	N
µmol/l	µmol/l	µmol/24 hours	Washout duration	Plasma spot conc^{n} µmol/l	Urine collection duration	Urine content µmol	µmol/l	µmol/l			
0.15–0.822			—						Healthy individuals (*N*=9) (min, max)	(Deutsch 1997)	9
0.5 (0.1–1.9)									Healthy Individuals (*N*=18, mean, min, max)	(Turchany et al. 1993)	18
										2	27

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