

Supplementary Table 1. Vascular endothelial function of postmenopausal women with above-normal blood pressure who completed a 12-week intervention evaluating 22 g freeze-dried highbush blueberry powder vs placebo powder on endothelial function, blood pressure, and other measures of cardiometabolic health.

	Blueberry (n=17)	Placebo (n=15)
Baseline Diameter (mm)		
Baseline	2.81±0.10	2.78±0.10
12 Weeks	2.87±0.10 [#]	2.78±0.08
Δ 0 to 12 Weeks	0.06±0.03	0.00±0.02
Peak Diameter (mm)		
Baseline	2.91±0.10	2.91±0.10
12 Weeks	3.01±0.10 [*]	2.90±0.09
Δ 0 to 12 Weeks	0.10±0.04 ^{**}	-0.01±0.03
FMD (%)		
Baseline	3.84±1.02	4.69±0.55
12 Weeks	5.18±0.98	4.29±0.55
Δ 0 to 12 Weeks	1.34±0.89	-0.41±0.46
SR_{AUC}		
Baseline	35992±3140	37573±4569
12 Weeks	26241±3271 [#]	32177±3422
Δ 0 to 12 Weeks	-9741±2157	-5395±4692
FMD/SR_{AUC}		
Baseline	1.13e-04±3.03e-05	1.41e-04±1.24e-05
12 Weeks	2.22e-04±3.30e-05 [*]	1.37e-04±1.32e-05
Δ 0 to 12 Weeks	1.09e-04±4.12e-05 ^a	3.82e-06±1.59e05 ^b

Data are mean±SEM. ^{*}Different ($p<0.05$) than baseline. [#]Trend for different ($p<0.1$) than baseline. Different letters indicate a difference ($p<0.05$) between groups. Abbreviations: FMD, flow-mediated dilation; SR_{AUC}, shear rate area under the curve.

Supplementary Table 2. Endothelium-independent dilation to sublingual nitroglycerin (NTG) in postmenopausal women with above-normal blood pressure who completed a 12-week intervention evaluating 22 g freeze-dried highbush blueberry powder vs placebo powder on endothelial function, blood pressure, and other measures of cardiometabolic health.

	Blueberry (n=11)	Placebo (n=9)
Baseline Diameter (mm)		
Baseline	2.71±0.12	2.74±0.15
12 Weeks	2.77±0.12	2.71±0.13
Δ 0 to 12 Weeks	0.06±0.04	-0.03±0.05
Peak Diameter (mm)		
Baseline	3.60±0.15	3.57±0.15
12 Weeks	3.63±0.15	3.55±0.14
Δ 0 to 12 Weeks	0.04±0.06	-0.02±0.05
Dilation to NTG (%)		
Baseline	33.16±3.07	31.05±4.86
12 Weeks	31.54±4.86	31.43±3.11
Δ 0 to 12 Weeks	-1.62±1.13	0.38±2.97

Data are mean±SEM. No significant differences. Abbreviations: FMD, flow-mediated dilation; NTG, nitroglycerin.

Supplementary Table 3. Vascular endothelial function responses to a supraphysiologic dose of ascorbic acid in postmenopausal women with above-normal blood pressure who completed a 12-week intervention evaluating 22 g freeze-dried highbush blueberry powder vs placebo powder on endothelial function, blood pressure, and other measures of cardiometabolic health.

Blueberry	Saline (n=17)	Ascorbic Acid (n=17)	Saline vs. Ascorbic Acid Difference
Baseline Diameter (mm)			
Baseline	2.81±0.10	2.72±0.09#	-0.08±0.03
12 Weeks	2.87±0.10	2.69±0.09*	-0.15±0.03
Peak Diameter (mm)			
Baseline	2.91±0.10	2.90±0.09	-0.08±0.03
12 Weeks	3.01±0.10	2.84±0.08*	-0.15±0.03^
FMD (%)			
Baseline	3.84±1.02	6.88±1.41*	3.04±1.11
12 Weeks	5.18±0.98	6.07±0.89	0.69±0.62
SR_{AUC}/Peak			
Baseline	35992±3140	27538±3402#	-8454±2980
12 Weeks	26241±3271	31358±3716	6107±2020**
FMD/SR_{AUC}			
Baseline	1.13e-04±3.03e-05	3.42e-04±1.16e-04*	2.29e-04±3.61e-07
12 Weeks	2.22e-04±3.30e-05	2.20e-04±2.45e-05	-1.86e-05±4.59e-05**
Placebo	Saline (n=15)	Ascorbic Acid (n=15)	Saline vs. Ascorbic Acid Difference
Baseline Diameter (mm)			
Baseline	2.78±0.10	2.66±0.09*	-0.12±0.03
12 Weeks	2.78±0.08	2.69±0.07*	-0.10±0.02
Peak Diameter (mm)			
Baseline	2.91±0.10	2.84±0.08	-0.07±0.03
12 Weeks	2.90±0.09	2.83±0.08	-0.08±0.04
FMD (%)			
Baseline	4.69±0.55	6.81±1.41#	2.39±0.82
12 Weeks	4.29±0.55	5.29±0.85	1.19±0.97
SR_{AUC}/Peak			
Baseline	37573±4569	32238±3859	-2357±2518
12 Weeks	32177±3422	30139±3149	-1453±1535
FMD/SR_{AUC}			
Baseline	1.41e-04±1.24e-05	2.32e-04±2.16e-05*	9.04e-05±2.00e-05
12 Weeks	1.37e-04±1.32e-05	2.20e-04±4.60e-05#	8.58e-05±4.59e-05

Data are mean±SEM. *Difference ($p<0.05$) between saline and ascorbic acid infusion on the same day. #Trend for difference ($p<0.1$) between saline and ascorbic acid infusion on the same day. **Difference ($p<0.05$) between baseline and 12 weeks for the difference between saline and ascorbic acid. ^Trend for difference ($p<0.1$) between baseline and 12 weeks for the difference between saline and ascorbic acid. Abbreviations: FMD, flow-mediated dilation; SR_{AUC}, shear rate area under the curve.

Supplementary Table 4. Hemodynamics and arterial stiffness values for postmenopausal women with above-normal blood pressure who completed a 12-week intervention evaluating 22 g freeze-dried highbush blueberry powder vs placebo powder on endothelial function, blood pressure, and other measures of cardiometabolic health.

	Blueberry (n=22)	Placebo (n=21)
Brachial SBP (mmHg)		
Baseline	134±3	131±2
4 Weeks	129±2	128±3
8 Weeks	133±2	132±2
12 Weeks	134±2	131±2
Δ 0 to 4 Weeks	-5±2	-3±2
Δ 0 to 8 Weeks	1±4	-1±3
Δ 0 to 12 Weeks	-1±2	-1±1
Brachial DBP (mmHg)		
Baseline	80±2	78±1
4 Weeks	77±1	76±1
8 Weeks	79±1	78±1
12 Weeks	79±1	79±2
Δ 0 to 4 Weeks	-2±1	-1±1
Δ 0 to 8 Weeks	-1±2	0±2
Δ 0 to 12 Weeks	-1±1	1±2
Aix (%)		
Baseline	36±1	37±1
4 Weeks	33±2	38±2
8 Weeks	36±2	36±2
12 Weeks	35±1	38±2
Δ 0 to 4 Weeks	-2±1	1±2
Δ 0 to 8 Weeks	0±2	-1±2
Δ 0 to 12 Weeks	-1±1	1±1
Aix@75 (%)		
Baseline	29±2	31±1
4 Weeks	28±2	32±2
8 Weeks	29±2	30±2
12 Weeks	28±1	32±2
Δ 0 to 4 Weeks	-1±2	1±2
Δ 0 to 8 Weeks	0±2	-1±2
Δ 0 to 12 Weeks	-1±2	0±2
Aortic PWV (m/s)		
Baseline	7.9±0.2	7.4±0.2
12 Weeks	7.8±0.2	7.3±0.1
Δ 0 to 12 Weeks	-0.2±0.2	-0.3±0.2
Aortic SBP (mmHg)		
Baseline	124±2	122±1
4 Weeks	120±2	120±2
8 Weeks	124±2	123±2

12 Weeks	124±2	121±2
Δ 0 to 4 Weeks	-4±2	-2±2
Δ 0 to 8 Weeks	-1±2	2±1
Δ 0 to 12 Weeks	-1±2	0±1
Aortic DBP (mmHg)		
Baseline	80±2	79±1
4 Weeks	79±1	78±1
8 Weeks	80±1	79±1
12 Weeks	80±1	79±1
Δ 0 to 4 Weeks	-1±1	-2±1
Δ 0 to 8 Weeks	0±1	0±1
Δ 0 to 12 Weeks	-1±1	1±2
Aortic MAP (mmHg)		
Baseline	93±3	95±1
4 Weeks	94±1	93±1
8 Weeks	96±1	95±1
12 Weeks	95±2	94±1
Δ 0 to 4 Weeks	1±3	-1±1
Δ 0 to 8 Weeks	3±2	0±1
Δ 0 to 12 Weeks	1±2	0±2
Aortic Pulse Pressure		
Baseline	47±3	43±1
4 Weeks	41±1*	42±2
8 Weeks	44±1	44±1
12 Weeks	43±1	43±2
Δ 0 to 4 Weeks	-6±3	-1±1
Δ 0 to 8 Weeks	-4±3	1±1
Δ 0 to 12 Weeks	-2±2	0±1
HR (bpm)		
Baseline	61±2	61±2
4 Weeks	63±2	62±2
8 Weeks	61±2	61±2
12 Weeks	61±1	61±1
Δ 0 to 4 Weeks	2±1	2±2
Δ 0 to 8 Weeks	1±1	0±1
Δ 0 to 12 Weeks	0±1	0±2
AP (mmHg)		
Baseline	16±1	16±1
4 Weeks	14±1	16±1
8 Weeks	16±1	16±1
12 Weeks	16±1	16±1
Δ 0 to 4 Weeks	-2±1	0±1
Δ 0 to 8 Weeks	-1±1	0±1
Δ 0 to 12 Weeks	0±1	1±1

Data are mean±SEM. *Different ($p<0.05$) than baseline. Abbreviations: Alx, augmentation index; Alx@75, augmentation index normalized to 75 beats per minute; AP, aortic pressure; DBP, diastolic blood pressure; HR, heart rate; MAP, mean arterial pressure; PWV, pulse wave velocity; SBP, systolic blood pressure.

Supplementary Table 5. Mean plasma (poly)phenol metabolite concentrations for postmenopausal women with above-normal blood pressure who completed a 12-week intervention evaluating 22 g freeze-dried highbush blueberry powder vs placebo powder on endothelial function, blood pressure, and other measures of cardiometabolic health.

Compound (nmol/L)	Blueberry (n=22)				Placebo (n=21)			
	Baseline	Week 4	Week 8	Week 12	Baseline	Week 4	Week 8	Week 12
Flavan-3-ols								
(-)-Epicatechin	36.88±6.64	49.67±8.65	47.53±7.8	47.98±10.36	31.09±4.95	38.43±7.58	45.33±7.92	34.2±3.64
(-)-Epicatechin-3'-sulfate	42.69±3.08	55.27±6.71	53.26±8.4	49.88±5.79	40.64±3.99	36.77±3.25	46.73±4.86	48.89±4.94
3'-Methoxy(-)-epicatechin	721.17±22.46	748.1±23.08	775.6±31.07	750.54±27.81	729.67± 23.79	726.65±23.2	725.66±32.31	726.1±21.33
4'-Methoxy(-)-Epicatechin	852.15±13.1	859.79±9.09	861.29±10.2	847.84±11.27	841.85±12.76	858.29±11.99	846.64±12.33	861.72±10.46
Procyanidin A2	67.13±3.77	69.65±4.27	70.82±2.78	68.5±2.87	64.44±2.06	62.3±1.73	63.65±2.06	67.49±2.81
Flavonols								
Quercetin	13.34±4.43	22.83±7.57	8.41±2.35	9.56±2.42	10.05±1.81	13.11±2.24	32.28±22.64	11.68±2.09
Kaempferol-3-glucuronide	3.41±0.25	3.7±0.27	3.55±0.31	3.53±0.23	3.34±0.25	3.36±0.23	3.21±0.23	3.11±0.23
Myricetin	139.4±22.31	165.49±31.22*	161.62±27.55	151.61±23.05	118.03± 5.75	97.27±5.21	111.19±8.21	120.31±6.54
Morin	0.4±0.28	10.02±9.26	0±0	2.41±2.41	0±0	0±0	27.29±27.29	0±0
Benzene diols & triols								
1,2-Dihydroxy-4-methylbenzene	1503.03± 209.29	2141.64± 311.45	2669.97± 748.44	2080.14± 341.6	1623.59± 191.31	1743.38± 192.92	2079.48± 400.6	1414.62± 191.43
2-Hydroxy-4-methylbenzene-1-sulfate	9486.53± 998.76	12470.44± 1645.82	18864± 7782.74	12468.05± 2286.31	10085.21± 1024.48	10674.15± 898.46	14468.87± 3955.65	9026.89± 1156.78
2-Hydroxybenzene-1-glucuronide	38.71±15.44	165.79±62.82	239.86± 131.97**	68.58±19.57	43.92± 19.37	37.36±13.01	82.28±28.43	48.78±15
2,3-Dihydroxybenzene-1-sulfate	113.37±20.24	196.64±33.02**	246.19±55.01**	109.48±10.32	105.71± 17.73	125.43± 18.05	149.08±21.16	119.49±18.93
2,6-Dihydroxybenzene-1-sulfate	799.51± 327.99	710.99±210.3	726.28±172.32	614.55± 234.39	408.08± 147.5	834.89± 366.64	404.23± 224.21	810.88± 339.62
2-Hydroxy-6-methoxybenzene-1-sulfate	1641.94± 564.57	2197.32± 538.16	1859.06± 376.75	1922.74± 499.91	1084.92± 312.23	2192.85± 842.35	1174.1± 541.28	2493.69±1 204.12
3-Hydroxy-2-methoxybenzene-1-sulfate	214.56±72.41	260.67±71.62	266.09±59.66	199.15±73.6	235.7±101	406.62± 179.72	296.71±71.75	486.13± 194.66
Benzaldehydes								
3,4-Dihydroxybenzaldehyd	5.54±1.03	5.63±0.88	4.76±1.41	5.29±0.98	4.47±0.67	6.25±0.69	5.19±0.71	4.9±0.88

e								
4-Hydroxybenzaldehyde	419.3±32.75	520.2±45.64 [#]	459.44±47.69	427.5±37.37	423.22± 31.29	499.83± 33.59	475.3±30.21	415.6±37.09
4-Hydroxy-3-methoxybenzaldehyde	1680.06± 508.74	2199.81± 641.53	2148.71± 599.72	1989.04± 510.64	2179.23± 489.26	1821.43± 454.71	1840.43± 456.91	2244.62± 506.42
Benzoic acids								
Benzoic acid	5178.54± 1547.39	5126.52±1 503.38	5023.22± 1784.53	5584.88± 1610.32	6689.47± 1499.65	7825.33± 1673.13	7902.12± 1799.75	6565.77± 1463.56
2-Hydroxybenzoic acid	3391.51± 1167.92	3177.14± 554.36	3373.62± 512.47	2582.32± 517.92	3236.18± 662.33	3170.26± 492.84	4008.44± 856.15	3620.21± 631.85
3-Hydroxybenzoic acid	505.58± 299.29	389.87± 240.57	428.15± 366.39	563.87± 396.23	478.3± 278.55	240.47± 127.98	220.43± 119.57	519.4±278.55
4-Hydroxybenzoic acid	312.48± 187.13	228.39± 142.53	219.51± 194.55	395.17± 320.47	235.96± 160.77	100.31± 75.26	127.97±70.75	269.83± 152.22
2,3-Dihydroxybenzoic acid	58.73±51.44	206.69±163.52	210.54±168.02	25.38±16.29	42.79±42.79	37.19±37.19	57.41±57.04	35.63±35.63
2,4-Dihydroxybenzoic acid	2517.29±393.7 9	3066.48±416.2 6	2329.6±331.28	2150.46±274.9 5	2147.94±348.9 3	2431.54±441.6 2	2286.32±326.4 4	2359.76±492.0 5
2,5-Dihydroxybenzoic acid	821.33±136.35	1029.41±154.3 3	1411.62±348.9 8**	994.76±124.74*	657.71±72.03	810.89±88.17	733.83±88.04	575.6±92.99
2,6-Dihydroxybenzoic acid	1536.94±235.9 1	1903.09±256.2 2	1457.2±205.35	1388.35±180.1 6	1290.81±202.8 9	1556.93±277.9 3	1434.8±217.39	1486.96±309.6 9
3,4-Dihydroxybenzoic acid	23±1.74	28.93±3.29	32.31±3.35±	26.27±2.09	21.71±1.34	21.09±1.03	22.05±1.89	20.45±1.25
3,5-Dihydroxybenzoic acid	306.65±79.72	426.56±125.21	221.36±49.76	302.26±80.02	348.79±181.16	210.1±73.47	279.49±84.27	329±115.11
2,3,4-Trihydroxybenzoic acid	15.94±1.78	20.3±2.99	17.69±3.3	15.36±2.18	14.81±2.19	12.63±1.89	12.8±2.51	12.94±2.08
2-Hydroxy-4-methoxybenzoic acid	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0
3-Hydroxybenzoic acid-4-sulfate	1.27±0.76	14.65±6.73	14.56±4.41	6.36±2.01	1.45±0.72	4.4±1.76	12.79±8.69	3.53±1.82
4-Hydroxybenzoic acid-3-sulfate	5±1.99	30.53±12.77	36.14±11.57	13.52±3	7.66±4.68	8.43±4.23	12.8±6.76	6.94±4.37
4-Hydroxybenzoic acid-3-glucuronide	1.75±0.58	3.79±1.22	3.49±1.33	2.79±0.66	1.78±0.56	1.75±0.45	3.93±0.8	1.18±0.38
4-Hydroxy-3,5-dimethoxybenzoic acid	133.53±26.07	166.71±32.15	197.43±50.67	182.98±62.67	152.88±30.05	183.75±39.97	206.01±53.22	146.1±40.91
3,4,5-trihydroxybenzene ethyl ester	1.84±0.23	2.05±0.41	2.07±0.35	2.2±0.48	1.49±0.14	1.54±0.16	1.51±0.17	1.56±0.12
3,4,5-	1.27±0.33	4.19±1.45	7.4±3.01	3.45±0.92	0.42±0.18	1.9±0.79	0.72±0.31	0.49±0.25

Trihydroxybenzoic acid								
3-Hydroxy-4-methoxybenzoic acid-5-sulfate	270.04±91.16	426.29±189.2*	600.83±341.67*	247.03±76.84	76.54±17.01	329.23±219.97	83.04±31.31	97.26±25.05
4-Hydroxy-3-methoxybenzoic acid	128.48±51.83	205.69±53.62	84.13±23.84	101.94±23.66	69.86±22.56	124.43±42.92	189.21±102.55	256.62±102.73
3-Methoxybenzoic acid-4-sulfate	75.71±11.22	230.85±66.42**	166.41±28.06 [±]	118.51±12.83**	95.42±23.64	99.03±14.47	100.89±12.06	127.98±24.14
4-Methoxybenzoic acid-3-sulfate	1763.96±352.2	2358.16±403.4	2578.72±419.5	1881.87±324.7	964.58±153.29	1083.72±240.2	1294.56±244.2	1167.08±191.1
	8	6	6	1		9	9	4
Hippuric acids								
Hippuric acid	49902±8610.51	159259.47±289	205196.88±637	144940.06±260	35799.93±5663	65710.24±1682	49620.56±7689	43238.38±8244
		09.72 [±]	62.99 [±]	03.74 [±]	.65	2.04	.91	.16
2'-Hydroxyhippuric acid	701.57±269.32	570.41±98.89	622.04±93.71	485.59±87.41	543.16±96.02	581.07±80.92	813.35±221.01	617.11±90.64
3'-Hydroxyhippuric acid	2971.78±593.5	4889.13±693.0	6444.11±2049.	4850.0±813.99 [#]	2309.01±683.5	2877.84±588.3	3772.13±783.7	2946.18±602.4
	8	6**	88**		9	3	3	1
4'-Hydroxyhippuric acid	1304.52±237.8	1629.05±241.9	1546.77±255.1	1238.36±175.7	1037.65±175.7	1279.23±270.5	1560.06±347.1	1389.36±262.0
	3		2	8	1	7		8
alpha-hydroxyhippuric acid	0±0	0.45±0.36	0.91±0.52	0.91±0.77	0.55±0.55	0.48±0.29	0±0	0.51±0.51
Cinnamic acids								
Cinnamic acid	10091.3±1482.	10145.56±1216	10411.21±1721	9740.43±1156.	9602.43±596.2	10418.72±691.	9076.48±655.4	9747.2±590.51
	13	.63	.25	6	9	51	7	
3',4'-Dihydroxycinnamic acid	792.65±87.41	977.56±148.8	902.58±115.48	846.6±118.01	898.03±80.29	895.79±90.28	859.5±68.1	855.8±92.6
3'-Hydroxycinnamic acid-4'-sulfate	0±0	0±0	0±0	0±0	0±0	0±0	0±0	0±0
4'-Hydroxycinnamic acid-3'-sulfate	13.49±5.66	65.83±40.94	77.46±32.11	18.65±6.32	13.49±5	30.46±14.16	30.57±10.75	22.26±12.56
3'-Hydroxycinnamic acid-4'-glucuronide	112.95±25.39	136.86±28.43	129.67±28.68	124.17±27.3	124.54±14.56	127.54±17.16	129.42±15.72	109.25±15.99
4'-Hydroxycinnamic acid-3'-glucuronide	2.37±2.35	3.36±2.1	4.02±2.62	0.86±0.86	0.04±0.04	2.69±1.57	0.4±0.36	1.89±1.42
4'-Hydroxy-3'-methoxycinnamic acid	97.39±28.6	210.94±85.77	149.22±59.47	164.37±73.03	70.05±14.46	93.66±21.84	110.42±22.89	120.92±42.74
3'-Methoxycinnamic acid-4'-sulfate	29.07±29.07	170.75±120.59	111.45±60.8	122.2±95.07	0±0	21.84±11.44	23.52±14.85	38.14±32.43
3'-Methoxycinnamic acid-4'-glucuronide	31.43±9.42	114.46±52.11	132.42±39.03	60.97±14.45	54.39±14.6	88.36±35.57	76.67±14.94	122.46±64.98
3'-Hydroxy-4'-	194.07±17.1	282.53±55.74	264.15±46.58	232.21±41.82	174.21±14.93	213.03±22.43	221.46±20.03	198.69±28.31

methoxycinnamic acid								
4'-Methoxycinnamic acid-3'-sulfate	10.82±1.12	23.59±5.48	20.71±4.51	27.48±8.54	18.23±3.09	18.99±3.35	22.86±6.77	20.72±5.37
4'-Methoxycinnamic acid-3'-glucuronide	15.13±9.68	33.18±26.48	35.8±17.02	66.37±51.89	5.45±3.59	17.9±12.19	29.4±14.07	12.86±7.06
4-O-Caffeoylquinic acid	2.54±0.35	6.09±3.9	2.39±0.2	2.75±0.34	2.4±0.14	2.48±0.21	2.86±0.32	2.77±0.39
5-O-Caffeoylquinic acid	2.95±0.12	5.45±2.5	5.27±1.42	3.23±0.25	3.77±0.3	3.89±0.72	4.02±0.56	4.16±0.64
3-O-Feruloylquinic acid	2.79±0.21	12.35±8.93	8.87±4.43	3.52±0.3	3.64±0.8	4.12±0.74	3.56±0.43	4.74±1.13
4-O-Feruloylquinic acid	2.82±0.08	23.32±20.43	15.82±12.18	3.08±0.24	2.88±0.15	4.44±1.6	4.02±1.18	3.61±0.66
4'-Hydroxy-3',5'-dimethoxycinnamic acid	18.61±4.61	42.95±17.61	61.72±26.09	18.44±3.48	56.01±14.54	38.55±8.73	41.08±6.7	36.92±7.48
3'-Hydroxycinnamic acid	10.59±2.88	7.98±2.45	10.67±3.53	6.94±3.43	6.47±1.36	9.27±2.13	3.97±1.29	7.23±1.95
4'-Hydroxycinnamic acid	1.53±1.4	3.19±2.62	8.29±6.26	5.38±3.64	0.15±0.1	2.59±1.31	0.59±0.29	2.1±1.3
2'-Hydroxycinnamic acid	742.21±83.53	812±96.73	758.96±104.47	760.47±83.81	735.46±75.77	800.04±71.79	765.59±64.68	767.94±71.26
Cinnamic acid-4'-sulfate	83.03±19.58	115.69±29.3	113.88±34.33	77.92±18.39	56.75±12.38	70.04±13.3	49.3±12.55	51.27±12.71
Cinnamic acid-4'-glucuronide	9.71±5.38	13.66±6.5	26.84±7.48	21.59±8.91	11.13±3.43	14.27±5.4	6.72±2.38	9.82±4.03
Phenylacetic acids								
Phenylacetic acid	3993.51±1048.49	3012.74±946.1	2576.45±633.18	2848.06±744.07	2803.31±794.84	2425.36±668.01	2720.96±458.6	1697.6±393.36
3'-Hydroxyphenylacetic acid	7444.66±622.79	8936.8±1333.29	9575.42±1509.91	8819.77±1006.28	7169.73±506.45	6838.21±558.73	6672.18±561.72	5842.4±542.66
3',4'-Dihydroxyphenylacetic acid	163.15±23.66	220.18±40.62	219.87±36.41	167.95±21.14	130.57±14.04	155.83±13.15	186.4±28.57	154.36±19.85
3'-Methoxyphenylacetic acid-4'-sulfate	151.42±34.32	214.03±67.38	228.29±49.1	185.61±30.26	144.4±20.32	166.51±19.82	137.74±28.27	181.82±39.11
Phenylpropanoic acids								
2-(4'-Hydroxyphenoxy)propanoic acid	12.12±6.6	33.61±12.52	35.44±18.87	33.46±14.4	3.09±3.09	37.66±18.99	4.09±2.78	35.91±34
3-(2'-Hydroxyphenyl)propanoic acid	1354.88±358.48	1782.49±354.11	2146.88±501.84	1787.64±396.06	832.62±325.52	1253.06±350.83	1954.5±412.57 [#]	1708.86±397.74

3-(3'-Hydroxyphenyl)propanoic acid	491.02±288.96	1092.42±638.75	804.99±593.89	876.86±456.82	131.97±83.81	1342.84±970.7	648.15±556.16	1571.58±1063.97
3-(2',3'-Dihydroxyphenyl)propanoic acid	14.86±3.53	24.23±8.59	27.21±9.35	15.96±2.68	13.22±1.75	12.93±1.62	14.11±1.54	13.3±1.51
3-(2',4'-Dihydroxyphenyl)propanoic acid	112.05±34.46	188.61±41.73	225.47±85.61	163.84±54.38	104.76±41.2	91.43±34.33	80.41±17.76	109.41±35.63
3-(3',4'-Dihydroxyphenyl)propanoic acid	49.93±4.89	52.16±6.23	60.21±12.66	48.06±3.87	47.75±2.53	47.98±2.47	48.75±2.11	48.48±1.99
3-(3',5'-Dihydroxyphenyl)propanoic acid	149.45±48.54	213.17±53.21	281.03±92.75	186.79±58.85	122.89±43.21	92.58±27.48	102.18±23.16	123.59±37.24
2-Hydroxy-3-(4'-hydroxyphenyl)propanoic acid	8781.25±639.28	10779.37±1011.26**	9922.6±965.4	9190.64±742.1	9008.31±584.62	9690.44±588.98	9240.98±685.18	8880.14±674.67
3-(4'-Hydroxy-3'-methoxyphenyl)propanoic acid	54.19±19.3	143.21±55.34	130.2±56.13	62.92±13.39	80.89±22.39	65.21±19.79	78.69±23.41	55.18±18.47
3-(4'-Hydroxyphenyl)propanoic acid-3'-glucuronide	37.7±10.84	289.4±140.18	74.04±20.1	43.89±13.29	71.79±16.13	144.67±53.93	145.51±44.45	119.36±37.12
3-(4'-Hydroxyphenyl)propanoic acid-3'-sulfate	495.62±63.84	720.37±102.9	826.54±159.08	627.08±95.03	392.07±34.17	480.66±36.9	582.25±85.88	768.31±349.38
3-(3'-Methoxyphenyl)propanoic acid-4'-sulfate	62.17±26.42	131.09±52.54	121.05±46.44**	75.4±21.73	25.77±6.42	46.49±10.6	74.71±25.25**	166.08±110.46*
3-(3'-Methoxyphenyl)propanoic acid-4'-glucuronide	102.29±23.33	201.39±47.96	268.28±105.7	154.27±34.35	64.94±10.57	98.18±18.54	157.33±36.52	200.96±85.72
3-(4'-Methoxyphenyl)propanoic acid-3'-sulfate	244.58±73.4	417.8±114.57	380.29±130.51	299.55±79.13	376.47±104.65	386.55±103.49	349.27±93.39	440.9±108.68
3-(4'-Methoxyphenyl)propanoic acid-3'-glucuronide	26.67±8.15	46.49±9.72	86.18±35.16**	42.69±8.78	58.97±27.89	71.32±24.81	60.06±13.43	116.25±55.22

Valerolactones

(4R)-5-(3'-hydroxyphenyl)- γ -valerolactone-4'-sulfate	79.12 \pm 35.31	97.22 \pm 32.22	117.33 \pm 40.13	110.96 \pm 51.08	41.55 \pm 21.55	84.26 \pm 38.82	105.25 \pm 37.27	47.6 \pm 14.68
Sum of Polyphenol Metabolites	125798.37 \pm 127	250052.95 \pm 343	303052.73 \pm 801	227970.5 \pm 3308	107725.03 \pm 684	145293.43 \pm 182	132461.22 \pm 103	119158.19 \pm 104
	27.95	74.48 ^{*a#}	46.47 ^{*a}	4.02 ^{*a#}	8.71	76.91 ^b	52.79	00.79 ^b

Data presented as mean \pm SEM.

For individual metabolites: *Difference between groups (blueberry vs placebo) at that time point ($p < 0.05$); **Difference ($p < 0.05$) within group compared to baseline; #Trend for difference ($p < 0.10$) within group compared to baseline. \pm Difference ($p < 0.05$) between groups at that time point and within group compared to baseline.

For Sum of Polyphenol Metabolites: *Differences ($p < 0.05$) within group compared to baseline. Different letters indicate differences ($p < 0.05$) between groups at that time point.

#Difference ($p < 0.05$) in the change from baseline to 12 weeks between groups at that time point.

Supplementary Table 6. Protein expression measured by immunofluorescence microscopy in venous endothelial cells collected from postmenopausal women with above-normal blood pressure who completed a 12-week intervention evaluating 22 g freeze-dried highbush blueberry powder vs placebo powder on endothelial function, blood pressure, and other measures of cardiometabolic health.

	Blueberry (n=13)	Placebo (n=11)
<i>p47phox (AU)</i>		
Baseline	0.94±0.14	0.99±0.18
12 Weeks	0.93±0.12	0.99±0.21
Δ 0 to 12 Weeks	-0.01±0.06	0.00±0.09
<i>Phos-eNOS (AU)</i>		
Baseline	0.80±0.10	0.93±0.16
12 Weeks	0.81±0.06	0.75±0.05
Δ 0 to 12 Weeks	0.01±0.1	-0.18±0.12
<i>MnSOD (AU)</i>		
Baseline	0.46±0.08	0.58±0.10
12 Weeks	0.48±0.10	0.64±0.18
Δ 0 to 12 Weeks	0.02±0.07	0.07±0.10
<i>Phos-NFκB p65 (Ser536) (AU)</i>		
Baseline	0.81±0.07	0.81±0.08
12 Weeks	0.78±0.05	0.72±0.10
Δ 0 to 12 Weeks	-0.02±0.07	-0.07±0.06

Data are mean±SEM. No significant differences. Phos-eNOS, phosphorylated endothelial cell nitric oxide synthase; MnSOD, manganese superoxide dismutase; Phos-NFκB, phosphorylated nuclear factor kappa B.

Supplementary Table 7. Anthropometrics, body composition, and energy intake and expenditure of postmenopausal women with above-normal blood pressure who completed a 12-week intervention evaluating 22 g freeze-dried highbush blueberry powder vs placebo powder on endothelial function, blood pressure, and other measures of cardiometabolic health.

	Blueberry (n=22)	Placebo (n=21)
Weight (kg)		
Baseline	73.0±3.2	73.6±3.3
4 Weeks	73.3±3.2	74.3±3.5
8 Weeks	73.5±3.3	74.5±3.5
12 Weeks	73.1±3.2	74.7±3.5
Δ 0 to 4 Weeks	0.3±0.2	-0.2±0.2
Δ 0 to 8 Weeks	0.4±0.3	-0.1±0.3
Δ 0 to 12 Weeks	0.0±0.2	0.1±0.3
BMI (kg/m²)		
Baseline	27.6±1.0	27.7±1.1
4 Weeks	27.7±1.0	27.7±1.1
8 Weeks	27.7±1.0	27.7±1.1
12 Weeks	27.6±1.0	27.8±1.1
Δ 0 to 4 Weeks	0.1±0.1	-0.1±0.1
Δ 0 to 8 Weeks	0.2±0.1	0.0±0.1
Δ 0 to 12 Weeks	0.0±0.1	0.0±0.1
WC (cm)		
Baseline	91±3	88±2
4 Weeks	90±3	88±3
8 Weeks	91±3	92±3
12 Weeks	90±3	91±3
Δ 0 to 4 Weeks	-0.4±1.1	-1.7±1.0
Δ 0 to 8 Weeks	-0.8±1.4	2.0±1.5
Δ 0 to 12 Weeks	0.0±0.9	0.8±1.4
HC (cm)		
Baseline	109±2	107±2
4 Weeks	107±2	108±3
8 Weeks	103±5	108±3
12 Weeks	107±2	107±3
Δ 0 to 4 Weeks	-0.45±0.91	-0.57±0.97
Δ 0 to 8 Weeks	0.50±0.83	-1.26±-3.64
Δ 0 to 12 Weeks	-0.15±0.61	-1.55±0.92
Android Fat Mass (%)[^]		
Baseline	41.59±1.65	37.54±2.26
12 Weeks	39.08±1.76	35.2±2.22*
Δ 0 to 12 Weeks	-2.51±1.05	-2.34±0.68
Gynoid Fat Mass (%)[^]		
Baseline	43.71±0.87	41.21±1.93
12 Weeks	43.44±0.74	40.74±1.92

Δ 0 to 12 Weeks	-0.27 \pm 0.71	-0.48 \pm 0.27
Total Fat Mass (%)[^]		
Baseline	40.72 \pm 1.24	38.01 \pm 1.78
12 Weeks	39.96 \pm 1.11	37.49 \pm 1.66
Δ 0 to 12 Weeks	-0.76 \pm .67	-0.51 \pm 0.42
Average Daily Energy Intake (kcal)		
Baseline	1717 \pm 81	1653 \pm 112
4 Weeks	1857 \pm 109	1624 \pm 133
8 Weeks	1790 \pm 100	1607 \pm 146
12 Weeks	1685 \pm 95	1631 \pm 127
Average Daily Energy Expenditure (kcal)		
Baseline	2621 \pm 148	2653 \pm 140
4 Weeks	2615 \pm 146	2651 \pm 128
8 Weeks	2699 \pm 153	2617 \pm 143
12 Weeks	2677 \pm 162	2640 \pm 138

Data are mean \pm SEM. *Different (p <0.05) than baseline. Abbreviations: BMI, body mass index, HC, hip circumference, WC, waist circumference. [^]n=32 for these analyses.