

1 **Supplementary Data**

2 **Effects of SAVEP on body weights of hyperlipidemic rats.**

3 No significant difference was observed in the body weight of the groups before the beginning of dietary intervention, and the beginning body
4 weight were 165.21 ± 3.15 g/BW. During the 8-12 weeks period, the weight of rats in Model group were increased by 22.5% compared with that
5 of the vehicle group. And HD group significantly declined the body weights relative to Model group, and body weights of each group rats were
6 shown in Table S1.

7 **Table S1** Effects of SAVEP on body weights of hyperlipidemic rats. (n=8)

Groups	Week 1	Week 8	Week 9	Week 10	Week 11	Week 12
Vehicle		379.14 ± 6.36^a	408.00 ± 8.08^a	423.60 ± 7.45^a	438.33 ± 9.62^a	455.80 ± 7.00^a
Model		417.20 ± 6.17^b	450.67 ± 6.70^b	477.67 ± 7.10^b	524.83 ± 8.84^c	558.20 ± 7.88^c
PC	165.21 ± 3.15^a	415.43 ± 6.48^b	447.50 ± 8.44^b	469.67 ± 5.89^b	482.86 ± 8.24^b	494.17 ± 9.93^b
NC		416.50 ± 6.38^b	439.67 ± 5.73^b	472.17 ± 4.01^b	495.33 ± 8.07^b	527.33 ± 6.85^{cd}
LD		418.36 ± 6.16^b	451.62 ± 7.59^b	475.69 ± 6.77^b	521.57 ± 7.57^c	547.21 ± 9.47^{de}

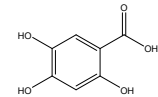
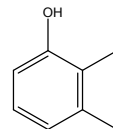
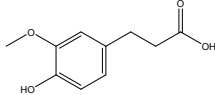
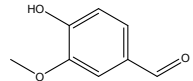
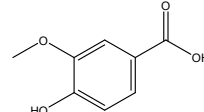
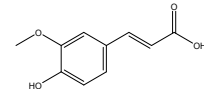
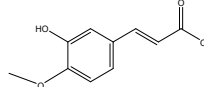
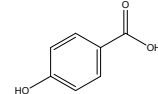
MD	417.84±7.48 ^b	449.73±8.57 ^b	468.68±7.59 ^b	505.48±8.37 ^{bc}	521.43±7.55 ^c
HD	419.75±7.52 ^b	446.65±7.11 ^b	471.34±7.45 ^b	493.66±7.91 ^b	511.43±7.05 ^{bc}

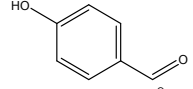
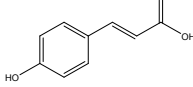
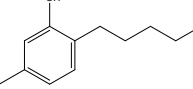
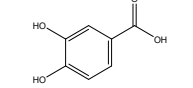
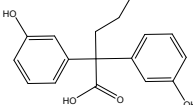
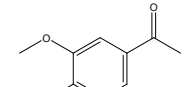
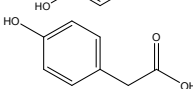
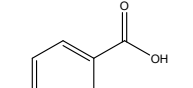
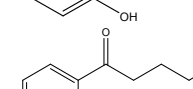
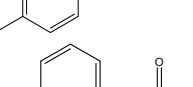
8 Data are presented as Mean ± SD (n=8). Values in the same row with different letters are significantly different (P<0.05)

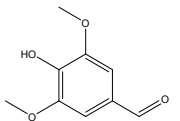
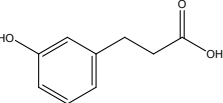
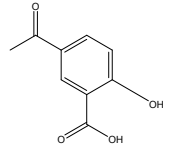
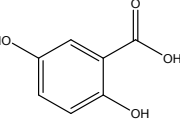
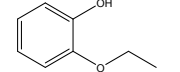
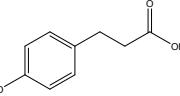
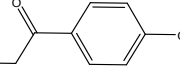
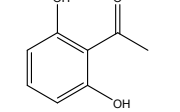
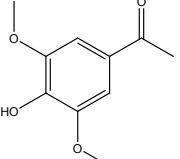
9

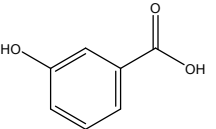
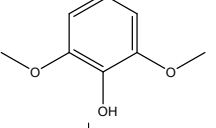
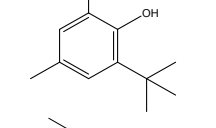
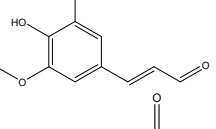
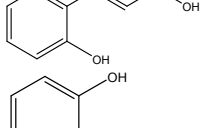
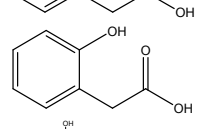
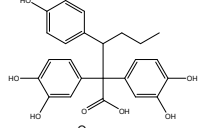
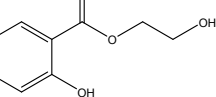

11 Name is the name of polyphenol derivatives, and Structure is the corresponding polyphenol structure.



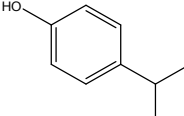
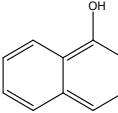
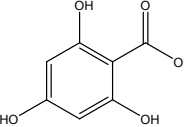
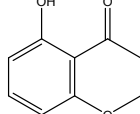
12 **Table S2** Results of polyphenol detected by GC×GC-MS in SAVEP

	Name	Retention I (min)	Retention II (sec)	Volume	Concentration (mg/mL)	Structure
Internal Standard Substance	2,4,5-Trihydroxybenzoic acid, 4TMS derivative	47.84 ± 0.05	2.32 ± 0.05	66901361.07 ± 4479462.63	0.200000 ± 0.000000	
1	2,3-Dimethylphenol, TMS derivative	20.94 ± 0.07	2.89 ± 0.07	22596771.78 ± 886422.37	0.045870 ± 0.040223	
2	3-(4-Hydroxy-3-methoxyphenyl)propionic acid, 2TMS derivative	46.29 ± 0.89	3.04 ± 0.09	26879754.21 ± 4565211.04	0.080977 ± 0.017270	
3	Vanillin, TMS derivative	32.72 ± 0.06	3.86 ± 0.05	19712497.76 ± 2263546.80	0.059213 ± 0.009002	
4	Vanillic Acid, 2TMS derivative	41.12 ± 0.15	2.97 ± 0.05	19292239.93 ± 5475138.78	0.057391 ± 0.014381	
5	Ferulic acid, 2TMS derivative	55.72 ± 0.85	2.56 ± 0.19	14296488.32 ± 2731143.00	0.042516 ± 0.005798	
6	Isoferulic acid, 2TMS derivative	56.52 ± 1.36	2.81 ± 0.44	12236447.99 ± 298657.66	0.036681 ± 0.002402	
7	4-Hydroxybenzoic acid, 2TMS derivative	36.12 ± 0.06	2.69 ± 0.05	10651409.13 ± 2893114.58	0.031846 ± 0.008179	

8	4-Hydroxybenzaldehyde, TMS derivative	26.19 ± 0.00	3.38 ± 0.05	6875447.10 ± 1439765.48	0.020436 ± 0.003223	
9	4-Coumaric acid, 2TMS derivative	46.64 ± 0.35	3.18 ± 0.34	6126283.37 ± 645207.47	0.012473 ± 0.011107	
10	Trimethyl(5-methyl-2-pentylphenoxy)silane	32.99 ± 0.00	3.08 ± 0.07	3224860.43 ± 3017689.76	0.006257 ± 0.007978	
11	Protocatechoic acid, 3TMS derivative	43.72 ± 1.18	2.44 ± 0.05	1704607.09 ± 1391599.11	0.005031 ± 0.003877	
12	(3-Hydroxyphenyl)pentanoic acid, bis(O-trimethylsilyl)-	60.14 ± 0.21	2.18 ± 0.13	2483237.12 ± 50517.36	0.005027 ± 0.004370	
13	Acetovanillone, TMS derivative	35.92 ± 0.06	3.73 ± 0.20	7642029.90 ± 10262674.34	0.022409 ± 0.029835	
14	4-Hydroxybenzeneacetic acid, 2TMS derivative	36.59 ± 0.10	2.88 ± 0.05	1770051.00 ± 191434.52	0.005284 ± 0.000303	
15	Salicylic acid, 2TMS derivative	31.86 ± 0.06	2.72 ± 0.05	1975224.72 ± 453300.63	0.005893 ± 0.001197	
16	4'-Hydroxyvalerophenone, TMS derivative	30.09 ± 0.00	3.51 ± 0.00	2320847.26 ± 792771.42	0.004471 ± 0.004228	
17	3-Hydroxyphenylacetic acid, 2TMS derivative	38.89 ± 0.17	2.56 ± 0.50	1226301.70 ± 125370.37	0.003666 ± 0.000282	

18	Syringaldehyde, TMS derivative	39.02 ± 0.15	4.14 ± 0.05	1584326.31 ± 632489.35	0.004731 ± 0.001799	
19	3-Hydroxyphenylpropionic acid, ethyl ester, TMS	55.92 ± 0.75	3.32 ± 0.00	1104665.88 ± 90112.58	0.003309 ± 0.000290	
20	Trimethylsilyl 5-acetyl-2-(trimethylsilyloxy)benzoic acid	39.69 ± 0.00	2.70 ± 0.07	532496.48 ± 295278.53	0.001052 ± 0.001054	
21	Gentisic acid, 3TMS derivative	14.69 ± 0.10	2.81 ± 0.14	533654.52 ± 87905.66	0.001595 ± 0.000231	
22	2-Ethoxyphenol, TMS derivative	18.86 ± 0.06	2.88 ± 0.05	520457.89 ± 98599.35	0.001562 ± 0.000319	
23	Phloretic acid, 2TMS derivative	38.96 ± 0.12	3.38 ± 0.05	644789.56 ± 138966.52	0.001925 ± 0.000369	
24	Paroxypropione, TMS derivative	42.62 ± 1.62	2.69 ± 0.20	402629.83 ± 250069.45	0.001173 ± 0.000698	
25	2,6-Dihydroxyacetophenone, 2TMS derivative	37.86 ± 0.06	2.81 ± 0.05	533547.37 ± 308157.59	0.001570 ± 0.000866	
26	1-(4-((tert-Butyldimethylsilyl)oxy)-3,5-dimethoxyphenyl)ethanone	39.32 ± 0.06	3.64 ± 0.14	482990.91 ± 153400.44	0.001440 ± 0.000423	

27	3-Hydroxybenzoic acid, 2TMS derivative	33.82 ± 0.06	2.69 ± 0.11	418432.71 ± 230215.56	0.001238 ± 0.000648	
28	Syringol, TMS derivative	27.39 ± 0.00	3.32 ± 0.00	527569.56 ± 202484.03	0.001587 ± 0.000612	
29	6-tert-Butyl-2,4-dimethylphenol	39.79 ± 0.10	3.54 ± 0.30	221811.82 ± 47651.97	0.000663 ± 0.000133	
30	Sinapaldehyde, TMS derivative	37.99 ± 0.10	3.35 ± 0.05	236122.46 ± 54749.19	0.000701 ± 0.000123	
31	o-Coumaric acid, 2TMS derivative	47.99 ± 1.56	3.73 ± 0.22	254024.55 ± 77861.37	0.000754 ± 0.000202	
32	2-Hydroxyphenethyl alcohol, TMS derivative A	30.66 ± 0.12	3.16 ± 0.14	217355.11 ± 130644.57	0.000640 ± 0.000369	
33	2-Hydroxybenzeneacetic acid, 2TMS derivative	54.42 ± 0.21	1.61 ± 0.09	193482.22 ± 72167.53	0.000573 ± 0.000193	
34	(3,4-Dihydroxyphenyl)hexanoic acid, tris(O-trimethylsilyl)-	34.02 ± 0.06	2.75 ± 0.28	309417.57 ± 117017.18	0.000942 ± 0.000410	
35	Glycol salicylate, 2TMS derivative	34.06 ± 0.63	3.16 ± 0.52	216327.13 ± 41920.66	0.000648 ± 0.000124	

36	o-Cresol, TMS derivative	17.24 ± 0.07	2.32 ± 0.07	240789.33 ± 89528.25	0.000464 ± 0.000445	
37	2-Methyl-6-tert-butylphenol, TMS derivative	27.26 ± 0.06	2.97 ± 0.05	300451.05 ± 162613.72	0.000899 ± 0.000470	
38	4-Isopropylphenol, TMS derivative	36.82 ± 0.06	2.81 ± 0.27	151121.81 ± 53446.37	0.000447 ± 0.000139	
39	1-Naphthalenol, TMS derivative	31.19 ± 0.00	3.54 ± 0.05	62216.59 ± 21045.57	0.000184 ± 0.000052	
40	Phloroglucinic acid, 4TMS	32.32 ± 0.12	2.66 ± 0.34	55767.88 ± 10190.83	0.000166 ± 0.000021	
41	2'-Hydroxy-6'-methoxyacetophenone, TMS derivative	35.42 ± 0.06	4.27 ± 0.00	61785.63 ± 9543.97	0.000186 ± 0.000040	

13 Date in the table are represent mean ± S.D. (n = 3)

Table S3 List of microbial names in Figure 5E

Vehicle	PC	NC	Model	HD
p_Bacteroidetes	p_Firmicutes	o_Bacteroidales	c_Clostridia	g_Prevotella_9
c_Bacteroidia	g_Faecalibaculum	g_Blautia	o_Clostridiales	f_Prevotellaceae
g_Lactobacillus	f_Erysipelotrichaceae	g_Alloprevotella	g_Romboutsia	c_Bacilli
f_Lactobacillaceae	o_Erysipelotrichales	f_Oscill0spiraceae	f_Peptostreptococcaceae	o_Lactobacillales
f_Burkholderiaceae	c_Erysipelotrichia	g_Oscillibacter	g_Lachnostridium	p_Proteobacteria
o_Betaproteobacteriales			f_Verruciaceae	c_Gammaproteobacteria
g_Anaerostipes			c_Verrucomicrobiae	p_Actinobacteria
			p_verrucomicrobia	c_Actinobacteria
			o_Verrucomicrobiales	o_Micrococcales
			g_akkermansia	f_Micrococcaceae
			g_Bacteroides	g_Rothia
			f_Bacteroidaceae	o_Enterobacteriales
			g_Dubosiella	f_Enterobacteriaceae
				g_Escherichia_Shigella
				g_Streptococcus
				f_Streptococcaceae
				f_Desulfovibrionaceae
				o_Desulfobacterales

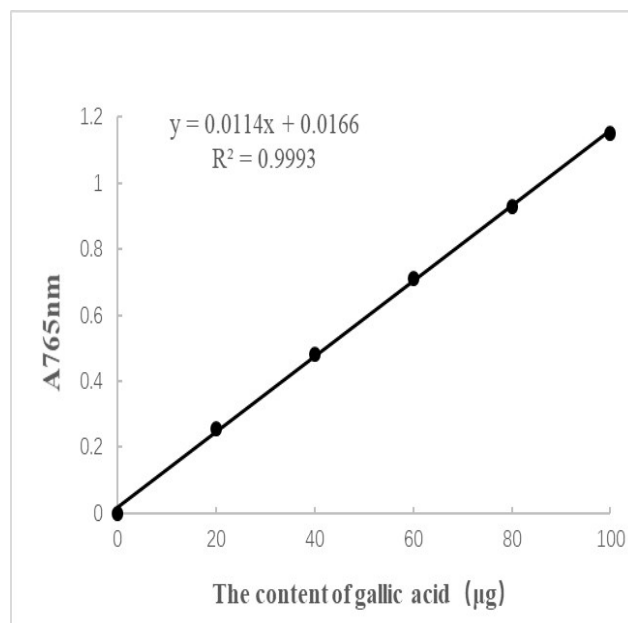


Figure S1. Standard curve of gallic acid