

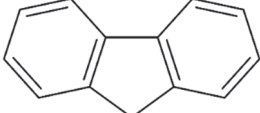
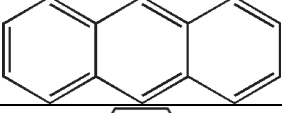
SUPPLEMENTARY MATERIAL TO
**Acetic acid liquid–liquid extraction and UHPLC-DAD detection
of polycyclic aromatic hydrocarbons in toasted and fried foods**

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Table S-I: List of selected PAHs with structures, molecular weights and IARC group classification.

Molecular arrangement	Type of PAH	Structure	MW	IARC Group
Linear	Flourene (FLR)		166	3
	Anthracene (ANT)		178	3
	Phenanthrene (PHE)		178	3

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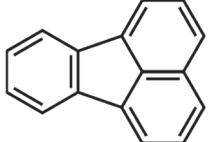
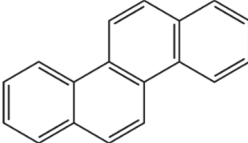
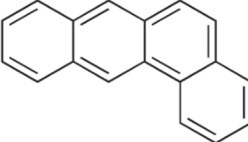
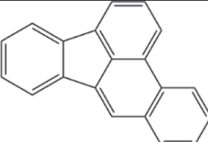
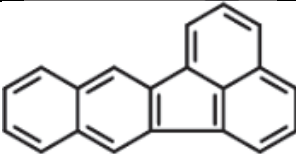
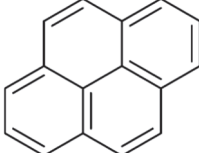
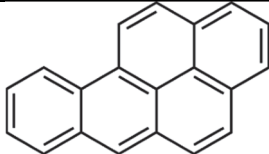
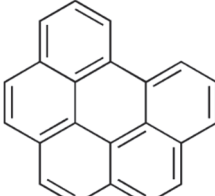
Molecular arrangement	Type of PAH	Structure	MW	IARC Group
Angular	Fluoranthene (FLT)		202	3
	Chrysene (CHR)		228	2B
	Benzo[a]anthracene (BaA)		228	2B
	Benzo[b]fluoranthene (BbF)		252	2B
	Benzo[k]fluoranthene (BkF)		252	2B
Cluster	Pyrene (PYR)		202	3
	Benzo[a]pyrene (BaP)		252	1
	Benzo[ghi]perylene (BghiP)		276	3

Table S-II: Acid composition effects on the percentage recoveries of Chapati and Keropok Lekor

E	F	G	H	I	J	Q	R	S	T	U	V
b4 spe 0% acid (Chapati)						b4 spe 30% acid					
Retention times	Types of PAH	Area	Area	Area	Mean	Retention times	Types of PAH	Area	Area	Area	Mean
11.082 - 11.085	FLR	0.5179	0.5267	0.5340	0.5262	10.697 - 10.696	FLR	0.5829	0.6003	0.5934	0.5922
11.735 - 11.754	PHE	0.5925	0.5708	0.5869	0.5834	11.384 - 11.383	PHE	0.6006	0.6155	0.6076	0.6079
12.208 - 12.212	ANT	0.4709	0.4703	0.4722	0.4711	11.877 - 11.883	ANT	0.5257	0.5355	0.5450	0.5354
13.375 - 13.376	FLT	0.4882	0.4878	0.4893	0.4884	13.077 - 13.076	FLT	0.8150	0.8930	0.8870	0.8650
14.068 - 14.069	PYR	0.4841	0.4829	0.4835	0.4835	13.744 - 13.749	PYR	0.9461	0.9091	0.9568	0.9373
16.448 - 16.450	CHR	0.7286	0.7115	0.7323	0.7241	16.031 - 16.036	CHR	0.7350	0.7458	0.7246	0.7351
16.915 - 16.917	B[a]A	0.4792	0.4874	0.4832	0.4833	16.471 - 16.476	B[a]A	0.6844	0.6941	0.6843	0.6876
18.802 - 18.805	B[b]F	0.6631	0.6936	0.6798	0.6788	20.958 - 20.963	B[b]F	1.0389	1.0632	1.0498	1.0506
21.462 - 21.467	B[k]F	0.9648	0.9798	0.9565	0.9670	22.838 - 22.843	B[k]F	0.8031	0.8058	0.8029	0.8039
23.128 - 23.129	B[a]P	0.6947	0.6980	0.6864	0.6930	26.171 - 26.176	B[a]P	0.7736	0.7771	0.7754	0.7754
26.288 - 26.290	B[ghi]P	0.6025	0.6098	0.6035	0.6053	27.118 - 27.123	B[ghi]P	0.6762	0.6718	0.6772	0.6751
b4 spe 50% acid						b4 spe 70% acid					
Retention times	Types of PAH	Area	Area	Area	Mean	Retention times	Types of PAH	Area	Area	Area	Mean
11.038 - 11.039	FLR	0.5691	0.5723	0.5685	0.5700	10.687 - 10.689	FLR	0.4461	0.4573	0.4501	0.4512
11.698 - 11.701	PHE	0.6116	0.6278	0.6220	0.6205	11.374 - 11.375	PHE	0.4821	0.4859	0.4903	0.4861
12.178 - 12.182	ANT	0.4341	0.4356	0.4358	0.4352	11.874 - 11.876	ANT	0.4155	0.4344	0.4256	0.4252
13.118 - 13.119	FLT	0.3679	0.3682	0.3675	0.3679	13.067 - 13.069	FLT	0.3553	0.3558	0.3565	0.3559
14.038 - 14.040	PYR	0.3648	0.3645	0.3653	0.3649	13.734 - 13.735	PYR	0.3562	0.3578	0.3567	0.3569
16.405 - 16.407	CHR	0.6202	0.6214	0.6223	0.6213	16.007 - 16.011	CHR	0.4992	0.4865	0.4799	0.4885
16.865 - 16.867	B[a]A	0.4547	0.4564	0.4553	0.4555	16.447 - 16.479	B[a]A	0.3516	0.3524	0.3535	0.3525
18.945 - 18.947	B[b]F	0.4706	0.4712	0.4709	0.4709	20.901 - 20.902	B[b]F	0.5964	0.5898	0.5877	0.5913
21.418 - 21.420	B[k]F	0.6728	0.6565	0.6674	0.6656	22.814 - 22.817	B[k]F	0.4730	0.4645	0.4685	0.4687
23.105 - 23.106	B[a]P	0.4519	0.4579	0.4543	0.4547	25.794 - 25.803	B[a]P	0.4741	0.4799	0.4695	0.4745
26.285 - 26.286	B[ghi]P	0.3977	0.3986	0.3965	0.3976	26.714 - 26.716	B[ghi]P	0.3584	0.3568	0.3575	0.3576
E	F	G	H	I	J	P	Q	R	S	T	U
after spe 0% acid (chapati)						30%					
Retention times	Types of PAH	Area	Area	Area	Mean	Retention times	Types of PAH	Area	Area	Area	Mean
11.082	FLR	1.0554	1.1069	1.0721	1.0781	10.697	FLR	1.0560	1.0965	1.1132	1.0881
11.735	PHE	1.5543	1.6754	1.5596	1.5631	11.384	PHE	1.5687	1.6589	1.7231	1.6501
12.208	ANT	1.0219	1.1254	1.0965	1.0811	11.877	ANT	1.0409	1.1004	1.2583	1.1331
13.375	FLT	0.6428	0.6457	0.7032	0.6639	13.077	FLT	0.6490	0.6543	0.6994	0.6671
14.068	PYR	0.6524	0.6555	0.6987	0.6689	13.744	PYR	1.0611	1.1665	1.2312	1.1521
16.448	CHR	3.0426	3.1067	3.0945	3.0811	16.031	CHR	3.0597	3.0954	3.1287	3.0941
16.915	B[a]A	1.0284	1.1002	1.0765	1.0684	16.471	B[a]A	1.0683	1.1798	1.0954	1.1141
18.802	B[b]F	5.0795	5.1324	5.1209	5.1111	20.958	B[b]F	5.3740	5.4744	5.7562	5.5341
21.462	B[k]F	2.5481	2.6745	2.7863	2.6611	22.838	B[k]F	3.0156	3.1743	3.2133	3.1341
23.128	B[a]P	1.0557	1.1243	1.1112	1.0971	23.541	B[a]P	5.0673	5.1639	5.2004	5.1431
26.288	B[ghi]P	0.3567	0.3499	0.3754	0.3605	26.171	B[ghi]P	0.6091	0.6111	0.6324	0.6171
50%						70%					
Retention times	Types of PAH	Area	Area	Area	Mean	Retention times	Types of PAH	Area	Area	Area	Mean
11.038	FLR	1.1293	1.2435	1.1897	1.1875	10.966	FLR	1.2609	1.3002	1.2856	1.2821
11.698	PHE	1.0747	1.1360	1.1422	1.1175	11.619	PHE	1.0992	1.1003	1.1760	1.1251
12.178	ANT	1.0147	1.0648	1.0993	1.0596	12.099	ANT	1.0189	1.0675	1.0483	1.0441
13.338	FLT	0.5941	0.5842	0.5681	0.5808	13.252	FLT	0.5942	0.6012	0.5895	0.5951
14.038	PYR	1.0059	1.0102	1.0566	1.0242	13.932	PYR	1.0057	1.0105	1.0099	1.0081
16.405	CHR	2.9540	2.7932	3.0020	2.9164	16.219	CHR	2.2442	2.3222	2.3451	2.3031
16.865	B[a]A	0.4644	0.4986	0.4761	0.4797	16.659	B[a]A	0.6945	0.6351	0.6744	0.6681
21.418	B[b]F	4.6202	4.7843	4.9037	4.7694	21.092	B[b]F	4.6834	4.6633	5.0734	4.8061
22.996	B[k]F	2.4443	2.5637	2.6424	2.5501	22.906	B[k]F	2.3394	2.4531	2.5211	2.4371
23.105	B[a]P	2.4402	2.6597	2.5553	2.5518	24.013	B[a]P	2.3453	2.3456	2.6759	2.4551
26.285	B[ghi]P	1.0626	1.1165	1.0954	1.0915	26.166	B[ghi]P	1.0542	1.1029	1.0931	1.0831

E	F	G	H	I	J
b4 spe 0% acid (keropok)					
Retention times	Types of PAH	Area	Area	Area	Mean
10.787	FLR	2.0210	2.1431	2.0653	2.07
11.480	PHE	2.6664	2.6576	2.6897	2.67
11.987	ANT	1.7003	1.7898	1.7789	1.75
13.187	FLT	0.6936	0.6795	0.6884	0.68
13.914	PYR	0.8855	0.8663	0.8923	0.88
16.267	CHR	2.4523	2.4442	2.4002	2.43
16.727	B[a]A	0.2017	0.2135	0.2069	0.20
21.374	B[b]F	1.8814	1.9856	1.8790	1.91
22.180	B[k]F	0.7925	0.7734	0.7888	0.78
23.140	B[a]P	1.8112	1.8537	1.8945	1.85
26.360	B[ghi]P	0.7488	0.7675	0.7590	0.75
b4 spe 50%					
Retention times	Types of PAH	Area	Area	Area	Mean
10.852	FLR	0.8336	0.8365	0.8456	0.83
11.546	PHE	1.0769	1.0993	1.0841	1.08
12.052	ANT	0.7972	0.7870	0.7534	0.77
13.259	FLT	0.3491	0.3297	0.3354	0.33
13.986	PYR	0.4174	0.4099	0.4200	0.41
16.439	CHR	1.1752	1.1657	1.1865	1.17
16.926	B[a]A	0.3683	0.3798	0.3743	0.37
21.639	B[b]F	0.7790	0.7854	0.7812	0.78
22.399	B[k]F	0.3893	0.3907	0.3976	0.39
23.286	B[a]P	0.8466	0.8543	0.8632	0.85
26.446	B[ghi]P	0.8044	0.8102	0.8089	0.80
P	Q	R	S	T	U
b4 spe 30%					
Retention times	Types of PAH	Area	Area	Area	Mean
10.856	FLR	2.1226	2.1354	2.1456	2.1345
11.549	PHE	2.7972	2.7786	2.7893	2.7884
12.056	ANT	1.7751	1.7884	1.7902	1.7846
13.276	FLT	0.7238	0.7343	0.7297	0.7293
13.982	PYR	0.9254	0.9854	0.9533	0.9547
16.476	CHR	2.6558	2.6699	2.6705	2.6654
16.976	B[a]A	0.2659	0.2765	0.2831	0.2752
21.729	B[b]F	2.0089	2.1001	2.0065	2.0385
22.469	B[k]F	0.8337	0.8376	0.8431	0.8381
23.322	B[a]P	1.8609	1.8953	1.8532	1.8698
26.456	B[ghi]P	0.9653	0.9703	0.9876	0.9744
b4 spe 70%					
Retention times	Types of PAH	Area	Area	Area	Mean
10.874	FLR	1.7364	1.7675	1.7743	1.7594
11.568	PHE	2.2987	2.2876	2.2697	2.2853
12.074	ANT	1.6265	1.6345	1.6299	1.6303
13.288	FLT	0.5847	0.5987	0.5905	0.5913
14.014	PYR	0.7454	0.7555	0.7398	0.7469
16.501	CHR	2.5537	2.5435	2.5421	2.5464
16.994	B[a]A	0.3143	0.3131	0.3203	0.3159
21.714	B[b]F	1.5903	1.5876	1.5799	1.5859
22.481	B[k]F	0.6642	0.6543	0.6621	0.6602
23.348	B[a]P	1.4723	1.4689	1.4645	1.4686
26.474	B[ghi]P	0.9172	0.9108	0.9143	0.9141
E	F	G	H	I	J
after spe 0% acid (keropok)					
Retention times	Types of PAH	Area	Area	Area	Mean
10.901	FLR	4.1033	4.2121	4.2198	4.1784
11.594	PHE	4.6047	4.6298	4.6423	4.6256
12.101	ANT	4.2324	4.3354	4.3043	4.2907
13.321	FLT	3.5295	3.5505	3.6465	3.5755
14.047	PYR	3.7780	3.8912	3.7856	3.8183
16.581	CHR	6.2677	6.3232	6.3797	6.3235
17.087	B[a]A	3.4819	3.5921	3.4869	3.5203
21.854	B[b]F	2.7390	2.7456	2.8632	2.7826
22.574	B[k]F	4.1808	4.2997	4.2044	4.2283
23.414	B[a]P	5.9994	5.9812	6.0736	6.0181
26.514	B[ghi]P	2.7229	2.7354	2.8429	2.7671
after spe 50%					
Retention times	Types of PAH	Area	Area	Area	Mean
10.941	FLR	3.7355	3.8876	3.9821	3.8684
11.635	PHE	4.1588	4.1698	4.3001	4.2096
12.141	ANT	3.8868	3.9945	3.7612	3.8808
13.368	FLT	3.3927	3.3021	3.2980	3.3309
14.095	PYR	3.5552	3.4673	3.5025	3.5083
16.668	CHR	5.5764	5.5551	5.7322	5.6212
17.195	B[a]A	2.5830	2.8431	2.6983	2.7081
21.968	B[b]F	4.9925	4.9824	4.7527	4.9092
22.661	B[k]F	3.8552	3.7982	3.6548	3.7694
23.475	B[a]P	5.1392	5.0012	5.2234	5.1213
26.541	B[ghi]P	3.4720	3.4985	3.5109	3.4938
P	Q	R	S	T	U
after spe 30%					
Retention times	Types of PAH	Area	Area	Area	Mean
10.937	FLR	3.1960	3.2823	3.1905	3.2229
11.630	PHE	3.3080	3.3156	3.4249	3.3495
12.137	ANT	3.2385	3.3467	3.4378	3.3410
13.364	FLT	3.1018	3.2099	3.2156	3.1758
14.090	PYR	3.1486	3.1973	3.1739	3.1733
16.664	CHR	3.8360	3.5765	3.6522	3.6882
17.190	B[a]A	3.3819	3.2991	3.3795	3.3535
21.964	B[b]F	3.4950	3.5864	3.5790	3.5535
22.664	B[k]F	3.2179	3.3223	3.2014	3.2472
23.477	B[a]P	3.5340	3.6542	3.5829	3.5904
26.544	B[ghi]P	3.7683	3.6954	3.7721	3.7453
after spe 70%					
Retention times	Types of PAH	Area	Area	Area	Mean
10.922	FLR	5.3326	5.3698	5.4002	5.3675
11.651	PHE	6.6239	6.7453	6.6984	6.6892
12.122	ANT	5.7056	5.7239	5.8015	5.7437
13.348	FLT	4.2066	4.2951	4.3011	4.2676
14.075	PYR	4.7304	4.9346	4.8762	4.8471
16.635	CHR	7.8997	7.6497	7.7767	7.7754
17.155	B[a]A	3.6984	3.7003	3.8654	3.7547
21.942	B[b]F	8.1168	8.1254	8.2288	8.1570
22.642	B[k]F	2.5707	2.6503	2.7050	2.6420
23.462	B[a]P	6.5675	6.6732	6.7899	6.6769
26.542	B[ghi]P	3.0936	3.1231	3.1457	3.1208

Table S-III: The extraction percentage recovery of different solvents

(c) Solvent effect

Solvent	% Rec
Acetonitrile	100
Ethyl Acetate	100
Ethanol	25
Bromomethane	35
Toluene	100

Table S-IV: Analytical characteristics of the HPLC method

PAH	Linear range (µg/L)	Regression equation	R ²	Intraday (%RSD) (n=3)		Interday (%RSD) (n=3)		LOD (µg/L)	LOQ (µg/L)
				t _R	Area	t _R	Area		
FLR	10 - 1000	y = 0.0011x + 0.0018	0.99	0.75	2.64	0.84	1.70	0.045	0.138
			97	60	99	00	71	7	4
PHE	10 - 1000	y = 0.0011x + 0.0131	0.99	0.10	1.55	0.12	1.02	0.047	0.143
			94	98	23	20	80	4	8

ANT	10 -	$y = 0.0010x +$	0.99	0.07	1.81	0.10	1.82	0.033	0.101
	1000	0.0039	97	06	86	85	17	5	4
FLT	10 -	$y = 0.0009x +$	0.99	0.08	2.44	0.20	2.41	0.004	0.014
	1000	0.0058	87	60	71	96	80	9	9
PYR	10 -	$y = 0.0017x +$	0.99	0.07	1.98	0.17	3.27	0.083	0.252
	1000	0.0415	90	16	28	96	23	5	9
CHR	10 -	$y = 0.0010x +$	0.99	0.09	3.78	0.10	1.13	0.104	0.429
	1000	0.4640	85	27	24	30	36	3	9
BaA	10 -	$y = 0.0014x +$	0.99	0.03	1.26	0.09	1.31	0.058	0.176
	1000	0.0581	91	01	31	35	22	4	9
BbF	10 -	$y = 0.0016x +$	0.99	0.03	1.98	0.05	3.48	0.105	0.319
	1000	0.0533	97	41	95	79	07	6	9
BkF	10 -	$y = 0.0011x +$	0.99	0.10	3.03	0.11	1.34	0.111	0.339
	1000	0.0331	91	79	79	99	49	9	1
BaP	10 -	$y = 0.0011x +$	0.99	0.06	1.10	0.07	3.11	0.097	0.296
	1000	0.0515	84	86	13	62	74	7	0
Ghi	10 -	$y = 0.0012x +$	0.99	0.35	1.76	0.59	2.54	0.123	0.373
	1000	0.0052	85	48	88	43	33	2	2

x, concentration of amine (mg/L); y, peak area of SPAs; R^2 , square of regression coefficient; LOD, limit of detection; LOQ, limit of quantification; RSD, relative standard deviation.

Table S-V: Recoveries and RSD of PAHs (5000 $\mu\text{g/L}$) when spiked to selected food samples using 30:70 acetic acid and acetonitrile extraction solvent

PAHs	% Recovery					
	50 $\mu\text{g L}^{-1}$		200 $\mu\text{g L}^{-1}$		400 $\mu\text{g L}^{-1}$	
	Chapati	Keropok Lekor	Chapati	Keropok Lekor	Chapati	Keropok Lekor
FLU	49.5 $\pm$ 0.5	80.9 $\pm$ 1.2	57.9 $\pm$ 0.4	109.3 $\pm$ 0.8	65.7 $\pm$ 0.8	90.4 $\pm$ 0.9
PHE	47.3 $\pm$ 0.4	84.6 $\pm$ 1.0	56.9 $\pm$ 0.6	95.7 $\pm$ 1.1	70.7 $\pm$ 0.7	110.5 $\pm$ 0.6
ANT	59.2 $\pm$ 0.25	100.2 $\pm$ 1.3	66.3 $\pm$ 0.3	119.6 $\pm$ 1.0	87.5 $\pm$ 0.3	111.8 $\pm$ 0.7
FLT	93.4 $\pm$ 0.58	89.3 $\pm$ 0.7	83.8 $\pm$ 0.5	113.3 $\pm$ 1.0	103.0 $\pm$ 0.6	102.9 $\pm$ 0.4
PYR	87.0 $\pm$ 0.96	99.3 $\pm$ 0.9	95.3 $\pm$ 0.5	116.1 $\pm$ 0.5	111.6 $\pm$ 0.9	85.8 $\pm$ 0.7
CHR	61.9 $\pm$ 0.7	87.2 $\pm$ 0.3	79.2 $\pm$ 0.1	119.4 $\pm$ 0.7	89.7 $\pm$ 0.7	107.9 $\pm$ 0.2
BaA	104.7 $\pm$ 0.6	115.9 $\pm$ 0.7	114.2 $\pm$ 0.3	116.0 $\pm$ 0.3	119.7 $\pm$ 0.8	104.8 $\pm$ 1.0
BbF	73.3 $\pm$ 0.5	101.3 $\pm$ 1.2	114.2 $\pm$ 0.8	101.6 $\pm$ 0.2	116.2 $\pm$ 0.5	96.7 $\pm$ 0.4
BkF	110.5 $\pm$ 0.8	99.6 $\pm$ 0.8	114.9 $\pm$ 0.4	106.2 $\pm$ 0.3	115.3 $\pm$ 0.6	86.7 $\pm$ 0.5
BaP	69.6 $\pm$ 1.0	116.6 $\pm$ 0.3	84.6 $\pm$ 0.1	98.7 $\pm$ 0.5	86.0 $\pm$ 0.9	78.3 $\pm$ 0.7
Ghi	114.8 $\pm$ 0.4	108.5 $\pm$ 0.7	119.7 $\pm$ 0.5	77.3 $\pm$ 0.8	107.7 $\pm$ 1.0	85.2 $\pm$ 0.8

All results reported in $\bar{x} \pm \text{SD}$

Table S-VI. Comparison between slopes of the developed microwave HPLC method with and without matrix effects by linear regression lines

Method	Sample	Concentration range (mg L ⁻¹)	Regression equation of each PAH	R ²	LOD (mg L ⁻¹)	LOQ (mg L ⁻¹)	Matrix effect (%)
Without matrix	-	5 – 80	y = 86478x + 186310 (FLR)	0.9764	0.5126	1.5533	-
			y = 48935x + 61678 (PHE)	0.9786	0.4880	1.4790	-
			y = 0.20 y = 362022x - 132927 (ANT)	0.9924	0.2893	0.8768	-
			y = 8512.2x - 7013.1 (FLT)	0.9963	0.2833	0.8585	-
			y = 57761x + 45872 (PYR)	0.9958	0.3640	1.1030	-
			y = 27152x - 64306 (CHR)	0.9980	0.1493	0.4527	-
			y = 374719x + 415886 (B[a]A)	0.9925	0.2859	0.8665	-
			y = 13775x - 16546 (B[b]F)	0.9961	0.2064	0.6257	-
			y = 130905x - 91267 (B[k]F)	0.9961	0.2067	0.6264	-
			y = 106025x - 28987 (B[a]P)	0.9975	0.1662	0.5038	-
			y = 32510x - 12084 (B[ghi]P)	0.9970	0.1808	0.5480	-
With matrix	Chapati	5 – 80	y = 35985x + 45014 (FLR)	0.9841	0.4191	1.2700	-58.39
			y = 22062x + 4409.4 (PHE)	0.9761	0.5164	1.5649	-54.92

			$y = 0.20 \ y$ $= 181558x$ $+ 162794$ (ANT)	0.9679	0.6010	1.8212	-49.85
			$y = 9838.7x$ $- 14320$ (FLT)	0.9975	0.1658	0.5024	15.58
			$y = 56788x$ $+ 103031$ (PYR)	0.9943	0.2500	0.7577	1.68
			$y = 15581x$ $- 57197$ (CHR)	0.9987	0.1202	0.3643	-42.62
			$y = 424549x$ $- 768308$ (B[a]A)	0.9911	0.3119	0.9452	13.29
			$y = 9699.7x$ $- 6290.3$ (B[b]F)	0.9856	0.3987	1.2082	-29.58
			$y = 133466x$ $+ 138210$ (B[k]F)	0.9677	0.6033	1.8283	1.95
			$y = 74297x$ $- 164049$ (B[a]P)	0.9980	0.1465	0.4440	-29.93
			$y = 35606x$ $- 70824$ (B[ghi]P)	0.9986	0.3664	1.1104	9.52
With matrix	Keropok lekor	5 – 80	$y = 89997x$ $+ 216395$ (FLR)	0.9975	0.5010	1.5181	4.06
			$y = 65280x$ $- 31335$ (PHE)	0.9823	0.4434	1.3438	33.40
			$y = 0.20 \ y$ $= 431559x -$ 365265 (ANT)	0.9996	0.0676	0.2049	19.20
			$y = 9299x -$ 10469 (FLT)	0.9944	0.2475	0.7501	9.24
			$y = 58663x$ $+ 96555$ (PYR)	0.9887	0.3527	1.0688	1.56

$y = 33858x$ - 71182 (CHR)	0.9914	0.3067	0.9295	24.70
$y = 330608x$ - 634396 (B[a]A)	0.9957	0.2164	0.6558	11.77
$y = 14375x$ - 21463 (B[b]F)	0.9972	0.1735	0.5257	4.35
$y = 132511x$ + 201298 (B[k]F)	0.9754	0.5235	1.5865	1.22
$y = 113716x$ - 107985 (B[a]P)	0.9849	0.4086	1.2381	7.25
$y = 34440x$ + 51027 (B[ghi]P)	0.9729	0.5508	1.6692	5.93

TRP, tryptamine; PEA, phenylethylamine; PUT, putrescine; CAD, cadaverine; HIS, histamine; TYR, tyramine; SPD, spermidine.

Table S-VII: Concentrations of PAHs found in toasted and fried food samples (n=3)

Concentration, $\mu\text{g kg}^{-1}$														
Toasted Food	Light PAHs							Heavy PAHs						
<i>Roti Canai</i>	FLR	PHE	ANT	FLT	PYR	CHR	BaA	Sub-total	BbF	BkF	BaP	Ghi	Sub-total	Total
1	N.D.	N.D.	2.62 ± 0.8	5.9 ± 0.2	N.D.	N.D.	N.D.	38.5 ± 0.3	N.D.	N.D.	N.D.	N.D.	0	38.5 ± 0.3
2	N.D.	N.D.	10.2 ± 0.3	8.1 ± 0.4	N.D.	N.D.	N.D.	68.3 ± 0.6	N.D.	N.D.	N.D.	N.D.	0	68.3 ± 0.6
3	N.D.	N.D.	N.D.	34.5 ± 0.1	N.D.	N.D.	N.D.	34.5 ± 0.1	N.D.	156.8 ± 2.4	N.D.	N.D.	156.8 ± 2.4	191.3 ± 2.4
$\bar{x}$	0	0	4.3 ± 0.1	76.2 ± 0.1	0	0	0	180.5 ± 0.1	0	52.3 ± 0.8	0	0	12.3 ± 0.1	32.7 ± 1.1
<i>Chapati</i>														
1	143.3 ± 0.9	N.D.	250.0 ± 0.6	N.D.	N.D.	N.D.	35.5 ± 0.4	128.8 ± 1.5	N.D.	N.D.	N.D.	N.D.	0	128.8 ± 1.5
2	N.D.	N.D.	5.1 ± 0.7	6.2 ± 0.4	N.D.	N.D.	N.D.	101.3 ± 1.1	N.D.	N.D.	N.D.	N.D.	0	101.3 ± 1.1
3	48.4 ± 0.3	89.3 ± 0.8	N.D.	41.3 ± 1.1	N.D.	N.D.	N.D.	179.0 ± 2.1	N.D.	N.D.	N.D.	N.D.	0	179.1 ± 2.1
$\bar{x}$	159.4 ± 0.4	29.8 ± 0.3	35.0 ± 0.4	9.2 ± 0.5	0	0	11.8 ± 0.1	165.2 ± 1.1	0	0	0	0	0	165.2 ± 1.1
<i>Thosai</i>														
1	1.4 ± 0.6	6.1 ± 0.8	N.D.	N.D.	N.D.	N.D.	N.D.	7.5 ± 1.4	N.D.	N.D.	N.D.	28.2 ± 0.4	8.2 ± 0.3	35.7 ± 1.8
2	N.D.	3.7 ± 1.9	N.D.	100.3 ± 1.1	N.D.	N.D.	367.2 ± 1.4	571.2 ± 4.6	N.D.	N.D.	N.D.	84.0 ± 2.4	4.0 ± 2.1	55.2 ± 7.6
3	94.1 ± 0.1	N.D.	N.D.	51.0 ± 0.2	N.D.	N.D.	N.D.	155.1 ± 0.1	N.D.	20.2 ± 0.1	N.D.	12.0 ± 2.2	0.1 ± 0.1	87.3 ± 0.1

		0.1 31.8 ± 0.2	3.3 ± 0.9	0	37.1 ± 0.5	0	0	122.4 ± 0.5	144.6 ± 2.1	0	6.7 ± 0.0	0	0.4 41.5 ± 1.1	8.2 ± 1.1	92.8 ± 3.1
Kuih Tayap															
1		13.4 ± 0.3	N.D.	N.D.	75.8 ± 3.3	N.D.	N.D.	N.D.	89.2 ± 3.6	N.D.	N.D.	5.8 ± 0.1	N.D.	5.8 ± 0.1	95.2 ± 3.6
2		106.1 ± 1.2	N.D.	308.3 ± 3.2	37.0 ± 0.6	N.D.	N.D.	N.D.	151.4 ± 5.1	N.D.	N.D.	N.D.	N.D.	0	151.4 ± 5.1
3		27.3 ± 0.4	N.D.	43.0 ± 1.3	44.4 ± 0.2	N.D.	N.D.	N.D.	114.7 ± 1.5	N.D.	N.D.	N.D.	N.D.	0	14.7 ± 1.5
		48.9 ± 0.6	N.D.	117.1 ± 1.5	52.4 ± 1.4	0	0	0	118.4 ± 3.4	0	0	1.9 ± 0.0	0	1.9 ± 0.0	120.4 ± 3.4
Apam Balik															
1		27.1 ± 1.5	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	27.1 ± 1.5	N.D.	N.D.	N.D.	N.D.	0	27.1 ± 1.5
2		107.6 ± 2.1	N.D.	245.1 ± 0.4	N.D.	N.D.	N.D.	N.D.	152.7 ± 2.4	N.D.	N.D.	N.D.	N.D.	0	152.7 ± 2.4
3		143.9 ± 0.8	N.D.	215.0 ± 0.6	N.D.	N.D.	N.D.	N.D.	158.9 ± 1.4	N.D.	N.D.	N.D.	N.D.	0	158.9 ± 1.4
		92.9 ± 1.5	N.D.	153.4 ± 0.3	N.D.	N.D.	N.D.	N.D.	146.3 ± 1.8	N.D.	N.D.	N.D.	N.D.	0	146.3 ± 1.8
Mean total		133 ± 2.1	33.1 ± 1.2	359.8 ± 2.3	94.9 ± 2.1	0	0	134.2 ± 0.6	1255.0 ± 9.1	0	59.0 ± 0.8	1.9 ± 0.0	41.5 ± 1.7	102.4 ± 2.5	1357.4 ± 11.6
Mean		66.6 ± 0.5	6.6 ± 0.2	71.9 ± 0.5	78.9 ± 0.5	0	0	26.8 ± 0.1	151.0 ± 1.8	0	11.8 ± 0.2	0.4 ± 0.0	1.3 ± 0.0	10.5 ± 0.4	142.9 ± 2.1
Fried food															
		Light PAHs										Heavy PAHs			
Youtiao															
1		N.D.	2.9 ± 0.1	N.D.	23.6 ± 0.1	N.D.	N.D.	N.D.	126.5 ± 0.6	N.D.	N.D.	N.D.	N.D.	0	26.5 ± 0.6
2		691.4 ± 2.2	1.6 ± 0.3	N.D.	111.6 ± 0.1	273.7 ± 0.2	N.D.	35.5 ± 0.2	1178.3 ± 3.2	N.D.	1305.1 ± 1.2	N.D.	506.1 ± 0.3	1811.2 ± 1.5	2989.5 ± 4.7
3		245.6 ± 1.0	N.D.	N.D.	N.D.	8.4 ± 0.1	N.D.	N.D.	154.0 ± 1.1	N.D.	N.D.	5.8 ± 0.5	N.D.	N.D.	154.0 ± 1.1
		315.2 ± 1.1	1.5 ± 0.1	0	11.7 ± 0.1	91.2 ± 0.1	0	11.8 ± 0.1	131.4 ± 1.1	0	435.0 ± 0.1	1.9 ± 0.2	168.7 ± 0.1	605.6 ± 0.4	1137.0 ± 2.1
Keropok															
Lekor															
1		404.8 ± 2.1	N.D.	N.D.	1032.2 ± 1.6	N.D.	N.D.	N.D.	1437.0 ± 3.7	N.D.	N.D.	25.8 ± 1.1	N.D.	15.8 ± 1.1	1462.9 ± 4.8
2		N.D.	N.D.	19.2 ± 1.1	198.1 ± 1.1	N.D.	N.D.	N.D.	117.3 ± 2.1	N.D.	N.D.	N.D.	N.D.	0	117.3 ± 2.1
3		N.D.	N.D.	213.3 ± 3.4	103.7 ± 0.1	N.D.	N.D.	N.D.	117.0 ± 4.1	N.D.	N.D.	N.D.	N.D.	0	117.0 ± 4.1
		134.9 ± 0.7	0	77.5 ± 1.5	44.7 ± 1.1	0	0	0	157.1 ± 3.4	0	0	8.6 ± 0.4	0	8.6 ± 0.4	465.7 ± 3.1
Pisang Goreng															
1		N.D.	N.D.	N.D.	46.3 ± 3.1	681.5 ± 0.5	N.D.	N.D.	127.8 ± 3.1	N.D.	93.8 ± 0.5	N.D.	N.D.	13.8 ± 0.1	121.7 ± 4.1
2		N.D.	N.D.	116.7 ± 1.1	14.8 ± 1.1	N.D.	N.D.	N.D.	131.5 ± 1.8	N.D.	N.D.	N.D.	N.D.	0	131.5 ± 1.8

t-Test results (Chapati)

[illegible]

data	with Matrix	without M	calculation	ANT1	ANT2
conc	ANT1	ANT2	slope =	181557.9964	362022.4960
5	705750.7	1485790.9	n =	5	5
10	1761697.8	3420772.4	SE(reg) =	1164362.2655	1117795.2605
20	3320245.4	6324276.9	SE(slope) =	19090.4714	18326.9753
40	9198921.8	15998124.8	difference =		180464.4996
80	13968843.3	28219885.5	SE(difference) =		26463.6377
			t-stat =		6.8193
			df =		6
			p =		0.0005



Figure S-1: The toasted and fried foods analyzed in this study.