Supplementary data

Analysis of fingerroot oil by GC/MS

The essential oil of fingerroot (EOF) was purchased from Thai - China Flavours and Fragrances Industry Co., Ltd. (Ayutthaya, Thailand)

EOF was obtained by steam distillation. Composition of essential oils was determined by Gas Chromatography-Mass Spectrometry, Shimadzu capillary GC-quadrupole MS system QP 5050A, Kyoto, Japan

Column: J&W DB-5 60 m x 0.25 mL, film thickness 0.25 µm Sample size, 1 µL

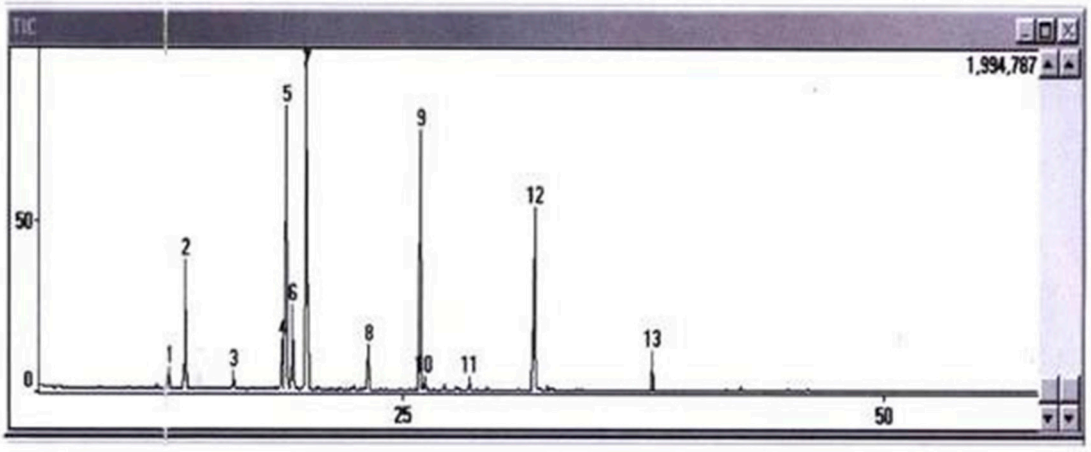
Injection temperature: 250 °C

Detector temperature: 250 °C Split ratio: 1:7

Carrier gas: helium Flow rate: 1.2 mL/min

Temperature program: (a)start at 60 °C for 3 min (b) 60-80 °C (1.5 °C/min) and 80-200 °C (3 °C/min)

Figure S1. Chromatogram of fingerroot oil with composition



Peak No	% SI	Retention time (min)	% Total Area	Possible compounds
1	89	12.811	1.02	α-Pinene
2	94	13.680	7.42	Camphene
3	87	16.176	0.99	β-Myrcene
4	95	18.713	3.23	Limonene
5	91	18.933	18.04	Eucalyptol
6	87	19.266	4.96	cis-β-Ocimene
7	92	19.991	25.77	trans-β-Ocimene
8	90	23.220	2.27	Linalool
9	89	25.929	19.94	Camphor
10	81	26.157	0.65	Isothujol
11	82	28.514	0.71	α-Terpineol
12	91	31.882	12.87	trans-Geraniol
13	89	38.000	2.14	Methyl cinnamate
			100	

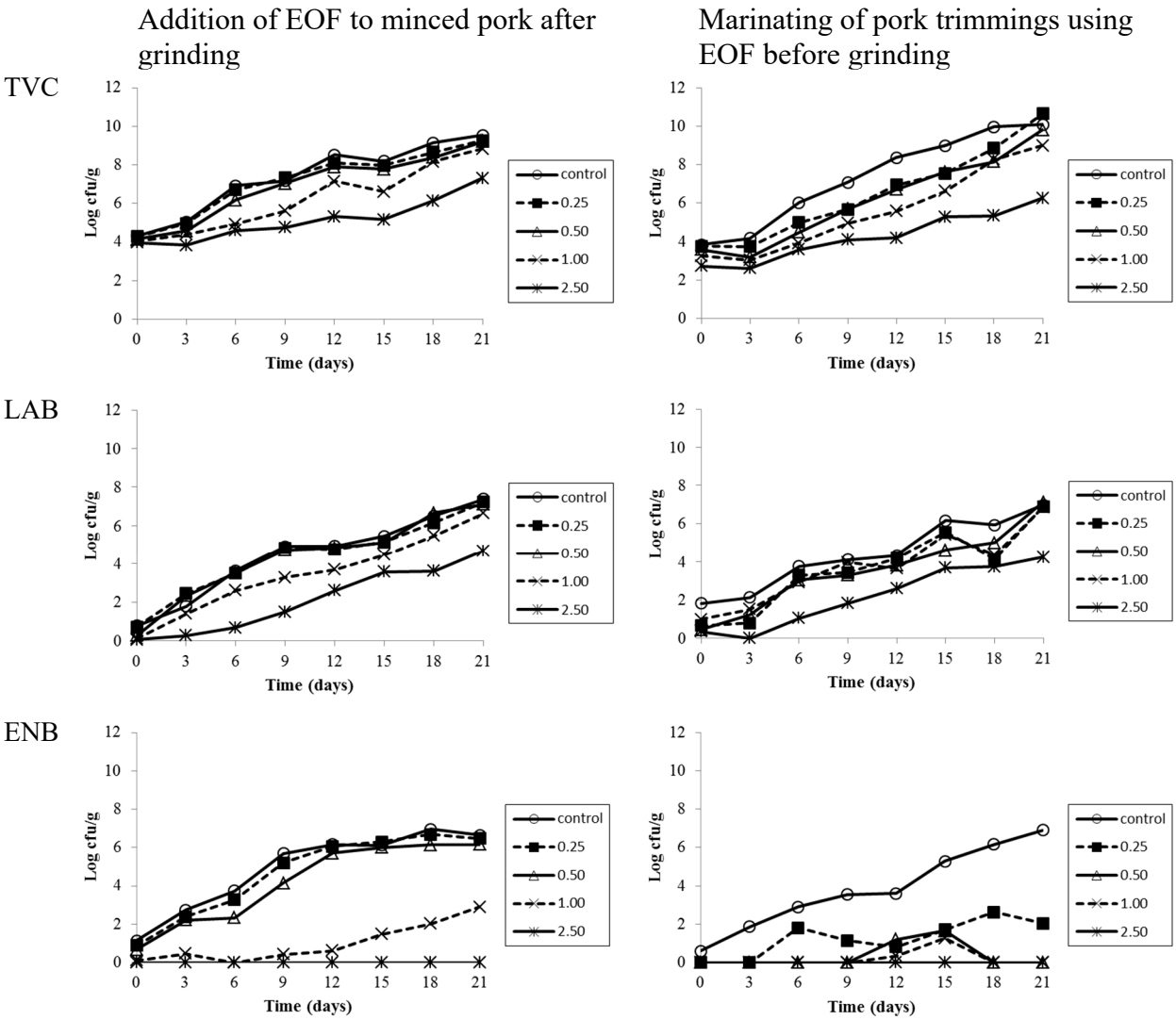


Figure S2. Total viable count (TVC), lactic acid bacteria (LAB) and Enterobacteriaceae bacteria (ENB) in uncooked pork meatballs of the control (without EOF) and added EOF with the concentrations of 0.25, 0.50, 1.00 and 2.50 wt% by marinating (before grinding) and adding after grinding during storage at 6±1 °C for 21 days.

Table S1. Recoveries of HAs in pan-fried meatballs (mean and SD standard deviation)

HAs	EOF Concentrations							
	Control	0.25 wt%	0.5 wt%	1.0 wt%	2.5 wt%	Mean	SD	Coefficient of variation
IQ	52.6 %	57.8 %	57.6 %	52.5 %	58.7 %	55.8 %	3.0 %	5.4 %
IQx	35.2 %	38.6 %	38.6 %	30.2 %	37.2 %	36.0 %	3.5 %	9.7 %
MeIQ	49.6 %	58.8 %	58.8 %	58.3 %	50.5 %	55.2 %	4.7 %	8.5 %
MeIQx	61.9 %	65.5 %	65.5 %	61.5 %	61.4 %	63.2 %	2.2 %	3.5 %
7,8-DiMeIQx	62.2 %	60.3 %	60.3 %	63.6 %	63.1 %	61.9 %	1.6 %	2.5 %
4,8-DiMeIQx	69.9 %	66.5 %	66.5 %	69.6 %	73.6 %	69.2 %	3.0 %	4.3 %
Glu-P-2	58.8 %	42.7 %	36.9 %	50.1 %	44.1 %	46.5 %	8.3 %	17.9 %
Glu-P-1	50.4 %	38.0 %	33.1 %	45.0 %	40.3 %	41.3 %	6.6 %	16.0 %
Norharman	88.9 %	80.8 %	83.4 %	114.7 %	78.0 %	89.2 %	14.9 %	16.7 %
Harman	80.5 %	73.6 %	73.8 %	75.1 %	71.5 %	74.9 %	3.4 %	4.5 %
Trp-P-2	61.3 %	61.3 %	66.5 %	52.9 %	48.9 %	58.2 %	7.1 %	12.2 %
PhIP	41.7 %	41.6 %	30.7 %	46.2 %	40.9 %	40.2 %	5.7 %	14.2 %
Trp-P-1	54.1 %	61.3 %	61.2 %	54.1 %	46.4 %	55.4 %	6.2 %	11.2 %
AaC	105.9 %	60.4 %	70.6 %	56.1 %	73.9 %	73.7 %	22.2 %	24.7 %
MeAaC	66.4 %	65.0 %	67.7 %	49.9 %	34.4 %	56.7 %	14.4 %	25.4 %