

Supplementary Materials

Table S1. QDA sensory quantitative description scores of TPB from different parts.

Attributes	Descriptions	UPB	MPB	LPB	SKM	Significance
Appearance	Bright color (6)	7.40±1.34 ^{ab}	8.20±0.84 ^a	5.80±1.48 ^b	6.40±1.34 ^{ab}	<0.05
	Cup-shaped curls (7)	6.00±1.87 ^a	5.80±1.30 ^a	5.40±0.89 ^a	7.40±0.89 ^a	ns
	Optimal fat/lean ratio					
	(4)	5.20±0.45 ^{bc}	6.40±1.14 ^{ab}	7.20±0.45 ^a	4.60±1.14 ^c	<0.01
Flavor	Overall appearance (6)	6.40±0.55 ^a	6.60±0.55 ^a	6.40±0.55 ^a	6.20±1.10 ^a	ns
	Fatty-aroma (5)	6.80±0.84 ^a	6.40±0.89 ^a	7.00±0.71 ^a	5.60±0.89 ^a	ns
	Fat oxidation-odor (1)	1.40±0.89 ^a	1.80±0.84 ^a	1.20±0.45 ^a	1.80±0.84 ^a	ns
	Meaty (7)	6.20±0.84 ^b	6.40±0.55 ^b	7.40±0.55 ^a	7.80±0.45 ^a	<0.01
	Meaty off-flavor (1)	1.00±0.00 ^a	1.40±0.55 ^a	1.20±0.45 ^a	2.00±1.00 ^a	ns
	Roasted flavor (1)	2.40±0.89 ^{ab}	2.60±0.89 ^{ab}	3.40±0.89 ^a	1.40±0.55 ^b	<0.05
	Sweet (5)	5.40±0.89 ^a	4.80±0.84 ^a	5.40±0.55 ^a	6.20±0.84 ^a	ns
	Creamy (1)	1.80±0.84 ^b	1.40±0.55 ^b	2.60±0.89 ^{ab}	3.60±0.55 ^a	<0.01
	Fresh fragrance (3)	3.80±0.84 ^a	3.60±0.89 ^a	4.40±0.89 ^a	3.80±0.84 ^a	ns
	Burnt-flavor (5)	5.80±0.84 ^{ab}	6.00±0.71 ^{ab}	6.60±0.89 ^a	5.00±0.71 ^b	<0.05
	Overall flavor (5)	6.80±0.84 ^a	6.60±0.89 ^a	6.60±0.89 ^a	5.40±0.55 ^a	ns
Texture	Skin-layer					
	Flexibility (6)	8.20±0.84 ^a	7.80±0.84 ^a	6.00±0.71 ^b	7.60±0.89 ^a	<0.01
	Sticky (6)	6.60±0.89 ^{ab}	6.00±0.71 ^b	7.60±0.89 ^a	7.40±0.89 ^{ab}	<0.05
	Elasticity (6)	8.40±0.55 ^a	7.80±0.84 ^a	7.40±0.89 ^a	7.80±0.84 ^a	ns
	Soft and sticky (5)	5.80±0.45 ^b	5.60±0.89 ^b	7.40±0.55 ^a	6.20±0.84 ^b	<0.01
	Fat-layer					
	Chewiness (5)	5.60±0.55 ^{ab}	5.40±0.55 ^{ab}	6.40±0.55 ^a	5.00±0.71 ^b	<0.05
	Sticky (4)	5.00±0.71 ^{ab}	3.80±0.84 ^b	5.20±0.84 ^a	4.40±0.55 ^{ab}	<0.05
	Oily (5)	5.60±0.89 ^{ab}	5.80±0.84 ^{ab}	6.40±0.55 ^a	5.00±0.71 ^b	ns
	Meat-flavor					
	Chewiness (7)	6.60±0.89 ^c	7.00±0.71 ^{bc}	8.00±0.71 ^{ab}	8.40±0.55 ^a	<0.01
	Dry (7)	7.00±1.00 ^a	7.00±0.71 ^a	7.20±0.84 ^a	7.60±0.55 ^a	ns
Taste	Fiber (7)	6.60±0.89 ^b	6.80±0.84 ^b	7.60±0.55 ^{ab}	8.40±0.55 ^a	<0.01
	Overall texture (6)	6.60±0.89 ^b	7.20±0.45 ^{ab}	8.20±0.45 ^a	6.80±0.84 ^b	<0.05
	Ungreasy (5)	5.40±0.89 ^b	6.20±0.84 ^{ab}	7.00±0.71 ^a	5.20±0.84 ^b	<0.05
	Meaty (7)	6.60±0.55 ^b	6.40±0.89 ^b	7.80±0.84 ^a	8.40±0.55 ^a	<0.01
	Sweetness (6)	6.60±0.89 ^a	6.60±0.89 ^a	7.00±0.71 ^a	6.00±0.71 ^a	ns
	Umami (6)	5.40±0.55 ^b	5.60±0.89 ^b	6.80±0.84 ^a	7.00±0.71 ^a	<0.01
	Saltiness (2)	1.60±0.89 ^a	1.40±0.55 ^a	2.60±0.55 ^a	2.20±0.84 ^a	ns
	Fatty (5)	7.40±0.89 ^a	7.20±0.84 ^a	7.60±0.55 ^a	5.40±0.89 ^b	<0.01
	Overall taste (6)	7.00±1.00 ^b	7.60±0.55 ^{ab}	8.80±0.45 ^a	6.60±0.55 ^b	<0.01
	Fatty (6)	5.60±0.55 ^b	6.20±0.84 ^{ab}	7.00±0.71 ^a	6.40±0.55 ^{ab}	<0.05
	Meaty (7)	6.80±0.84 ^{ab}	6.20±0.45 ^b	7.20±0.45 ^{ab}	7.40±0.55 ^a	<0.05
	Sweetness (2)	2.60±0.89 ^a	3.40±0.55 ^a	3.60±0.55 ^a	2.60±0.89 ^a	ns
Aftertaste	Umami (1)	1.60±0.55 ^a	1.40±0.55 ^a	1.80±0.45 ^a	1.60±0.89 ^a	ns
	Overall liking (5)	5.20±0.84 ^b	6.20±0.45 ^b	8.00±0.71 ^a	5.20±1.30 ^b	<0.01

Note: UPB, MPB, LPB and SKM were respectively represent the TPB from upper pork belly, medium pork belly, lower pork belly, and second-knife meat, all were cooked by SHS. The numbers following the descriptive words were the scale values of TH (the reference standard sample). Data are presented as mean $\pm$ SD.

Table S2. The stable volatile compounds content identified and quantified of TPB

cooked from different cuts.

Numbers	Compounds	RI ^a	RIcal* ^b	Contents (µg/kg)				
				UPB	MPB	LPB	SKM	TH
Aldehydes								
1	Hexanal	800	836	102.10±35.53 ^b	431.27±82.41 ^a	244.37±195.14 ^{ab}	217.12±130.21 ^{ab}	153.18±44.10 ^b
2	Heptanal	901	917	5.25±2.30 ^a	5.80±2.65 ^a	4.05±0.17 ^a	2.65±0.17 ^a	ND
3	Benzaldehyde	962	972	18.37±1.09 ^b	11.37±4.71 ^c	21.27±1.01 ^{ab}	24.37±4.39 ^a	7.17±1.24 ^c
4	Nonanal	1104	1118	47.02±12.33 ^b	43.17±8.70 ^b	93.38±15.02 ^a	59.84±21.34 ^b	36.65±2.56 ^b
5	Octanal	1003	1017	9.00±7.84 ^a	7.72±1.58 ^a	7.09±0.88 ^a	6.59±0.80 ^a	ND
6	(E)-2-octenal	1060	1072	6.71±3.57 ^b	7.16±1.26 ^b	19.02±7.15 ^a	19.93±0.94 ^a	ND
7	4-Ethyl-benzaldehyde	1168	1177	7.72±1.47 ^b	7.62±0.89 ^b	5.72±1.36 ^{bc}	3.78±2.22 ^c	25.02±3.07 ^a
8	Decanal	1206	1223	32.2±16.43 ^a	16.22±9.82 ^{ab}	25.68±1.87 ^{ab}	9.34±1.34 ^b	ND
9	(E)-2-Nonenal	1162	1177	7.67±2.29 ^a	ND	18.94±4.61 ^b	ND	ND
10	(E,E)-2,4-Nonadienal	1216	1230	ND	ND	4.41±0.30	ND	ND
11	(E)-2-Decenal	1263	1276	15.92±1.33 ^b	56.17±13.68 ^a	43.32±7.57 ^a	46.12±3.74 ^a	25.85±3.46 ^b
12	2,4-Decadienal	1317	1306	ND	17.91±16.05	ND	ND	ND
13	(E,E)-2,4-decadienal	1317	1332	15.16±7.48 ^a	29.39±12.16 ^a	29.26±16.30 ^a	27.51±8.74 ^a	23.07±1.55 ^a
14	Undecanal	1307	1322	ND	ND	4.23±0.30 ^a	2.25±1.33 ^a	ND
15	2-Undecenal	1367	1383	11.26±4.27 ^a	23.68±10.92 ^a	22.02±7.96 ^a	20.46±11.82 ^a	16.97±3.46 ^a
16	Dodecanal	1409	1422	5.09±0.46 ^a	ND	12.83±9.16 ^a	3.58±2.33 ^a	ND
17	Tridecanal	1512	1522	ND	ND	3.47±0.46 ^a	4.35±2.41 ^a	2.87±1.03 ^a
18	Tetradecanal	1613	1625	3.66±1.01 ^b	ND	17.49±4.64 ^a	5.09±2.86 ^b	3.99±0.72 ^b
19	Pentadecanal	1715	1726	6.17±1.50 ^a	14.38±4.80 ^a	15.07±11.51 ^a	10.86±0.31 ^a	4.09±0.78 ^a
Alcohols								
1	1-Hexen-3-ol	769	809	ND	ND	332.17±29.08	ND	ND
2	1-Octen-3-ol	980	993	9.32±0.91 ^a	16.00±4.44 ^a	19.18±7.70 ^a	20.66±11.24 ^a	11.83±0.43 ^a
3	1-Heptanol	970	984	ND	ND	ND	1.96±0.54	ND
4	1-Octanol	1071	1085	ND	ND	ND	7.53±3.10	ND
5	2-Thenylthiol	1105	1128	ND	ND	5.36±0.29	ND	ND
6	1-Dodecanol	1473	1488	ND	ND	12.19±1.23	ND	ND
7	1-Decanol	1273	1304	ND	ND	9.85±0.35	ND	ND
Esters								
1	γ-Butyrolactone	915	871	ND	ND	317.07±7.20 ^a	67.14±3.03 ^b	ND
n-Caproic acid vinyl								
2	ester	1244	1200	4.69±0.67 ^c	39.46±8.11 ^a	36.34±20.01 ^a	26.20±8.62 ^{ab}	14.43±1.04 ^{bc}
3	S-methyl thiohexanoate	1063	1020	ND	12.13±1.70	ND	ND	ND
4	Delta-dodecalactone	1719	1726	ND	15.01±7.39	ND	ND	ND
5	Benzyl benzoate	1762	1786	ND	12.51±3.16	ND	ND	ND
Hexadecanoic acid-								
6	methyl ester	1926	1935	15.29±4.75 ^{ab}	11.04±0.61 ^b	22.76±6.20 ^a	7.95±3.87 ^b	ND
7	Methyl stearate	2128	2137	6.34±3.34	ND	ND	ND	ND

8	γ -Dodecalactone	2105	2120	ND	ND	ND	15.63±1.18	ND
Ketones								
1	2,3-Butanedione	595	572	148.98±0.93 ^b	ND	196.47±47.49 ^b	22.87±2.23 ^b	3189.85±443.08 ^a
2	3-Pentanone	688	676	34.55±2.56 ^b	33.68±5.60 ^b	162.8±14.01 ^b	552.64±187.59 ^a	43.76±3.24 ^b
3	Acetophenone	1065	1074	4.89±0.50	ND	ND	ND	ND
4	2-methyl-3-octanone	985	999	ND	13.21±0.62 ^b	42.55±2.29 ^a	ND	ND
5	2(5H)-Furanone	918	977	ND	ND	0.79±0.34 ^b	2.23±0.26 ^a	ND
6	2-Pentadecanone	1698	1710	7.73±0.33 ^b	38.66±18.37 ^a	6.11±1.40 ^b	4.81±2.93 ^b	ND
7	2-Heptadecanone	1904	1912	ND	43.25±5.40 ^a	10.16±4.42 ^b	ND	4.34±0.27 ^b
Others								
1	2-Pentylfuran	993	992	ND	ND	ND	4.22±0.65	ND
2	2-Methyl-benzofuran	1109	1142	4.60±1.44 ^b	5.99±3.39 ^b	21.83±8.10 ^a	8.98±2.33 ^b	24.83±4.43 ^a
3	Tetradecane	1400	1412	ND	ND	16.39±0.98 ^a	3.37±1.44 ^b	3.54±0.55 ^b
4	2-ethyl-6-methyl-pyrazine	1003	1009	ND	2.00±0.36 ^b	3.05±0.15 ^a	ND	ND
5	Thiophene	675	687	ND	ND	ND	1.12±0.18	ND

Note: ^a Retention indexes were obtained from the online database (<https://www.vcf-online.nl/VcfHome.cfm>). ^b R_Ical: Retention indexes were calculated in relation to the retention time of n-alkane (C₇–C₄₀). Data are presented as mean ± SD.

Table S3. The potential aroma contributors of TPB from different cuts were screened by ROAV analysis.

Volatile compounds	Threshold (in water, µg/kg) ^a	ROAV				
		UPB	MPB	LPB	SKM	TH
Hexanal	4.50	19.80	51.05	17.16	28.32	2.44
Heptanal	2.80	1.64	1.21	<1	<1	—
Nonanal	1.10	37.38	22.42	26.73	33.01	2.44
Octanal	0.70	11.32	6.33	3.19	5.71	—
(E)-2-Octenal	4.00	1.47	<1	1.51	3.01	—
Decanal	3.00	9.47	2.67	2.70	1.89	—
(E)-2-Nonenal	0.08	84.26	—	74.98	—	—
(E)-2-Decenal	0.30	46.24	98.56	45.63	93.05	6.23
(E,E)-2,4-Decadienal	0.20	65.45	77.04	46.01	82.61	8.49
2-Undecenal	0.78	12.50	15.39	8.92	15.46	1.56
1-Octen-3-ol	1.00	8.14	8.37	6.09	12.57	<1
n-Caproic acid vinyl ester	5.00	<1	4.24	2.29	3.12	<1
S-methyl thiohexanoate	1.50	—	4.50	—	—	—
γ-Dodecalactone	1.00	—	—	100.00	40.60	—
2,3-Butanedione	2.30	56.54	—	27.01	6.00	100.00
3-Pentanone	82.00	<1	<1	<1	4.13	<1
2-Methyl-3-Octanone	3.00	—	2.45	4.48	—	—
2-Pentadecanone	16.00	<1	1.21	<1	<1	—

Note: ^a The thresholds of odor-active volatile compounds were obtained from online database (<https://www.flavornet.org>; <http://www.odour.org.uk>). “—” represents that the substance was not detected. UPB, MPB, LPB, and SKM respectively represent upper/middle/lower pork belly and second-knife meat, and all samples are cooking by SHS. TH is the TPB stir-fried with SKM.

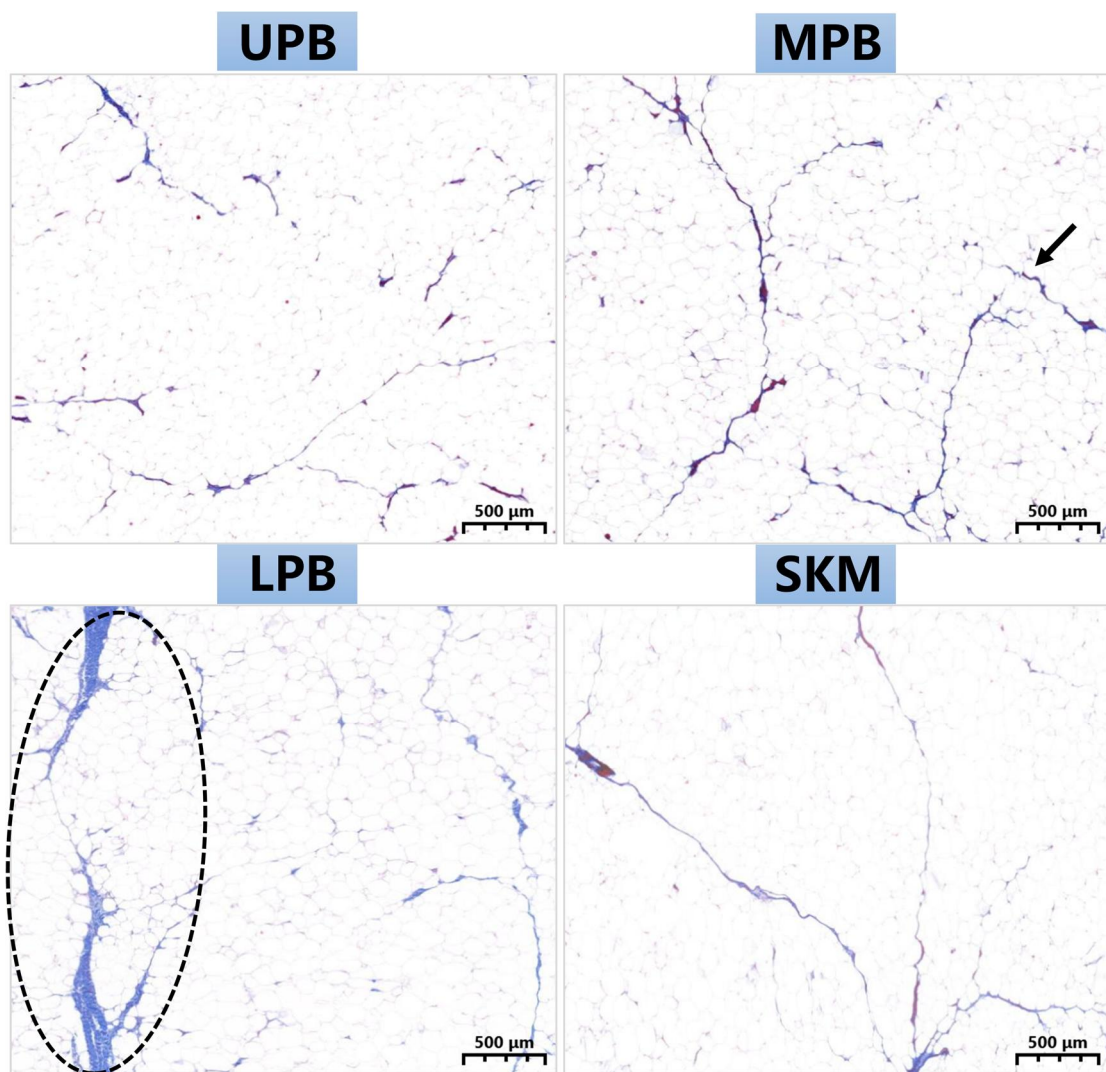


Fig. S1. Masson staining results of fat tissues from different cuts.