

Table 1 Volatile flavor compounds identified in different thermally processed dried salted Spanish mackerel meat

Count	Compound	Odor type	CAS	Formula	MW	RI	RT [sec]	Dt [a.u.]
1	cyclohexanone	Mint, Cool	C108941	C6H10O	98.1	1256.6	736.19	1.15536
3	2-Butanone, 3-hydroxy	Butter	C513860	C4H8O2	88.1	1296.1	798.508	1.05784
2	2-Butanone, 3-hydroxy (D)	— Blue Cheese, Fruit, Green,	C513860	C4H8O2	88.1	1295.2	797.342	1.33122
6	2-Heptanone	Nut, Spice	C110430	C7H14O	114.2	1196.7	649.276	1.26431
7	2-Heptanone (D)	—	C110430	C7H14O	114.2	1197.3	650.123	1.63352
17	2-Pentanone	Fruit, Pungent	C107879	C5H10O	86.1	1002.2	360.623	1.12265
36	2-Pentanone (D)	— Fragrant,	C107879	C5H10O	86.1	1001.4	359.901	1.3728
33	2-Butanone	Fruit, Pleasant	C78933	C4H8O	72.1	916.6	301.955	1.06026
34	2-Butanone (D)	—	C78933	C4H8O	72.1	917.1	302.289	1.24743
25	Acetone	Pungent Balsamic, Fruit, Green, Pungent,	C67641	C3H6O	58.1	839.5	257.978	1.11697
4	1-Pentanol	Yeast	C71410	C5H12O	88.1	1263.9	747.599	1.25699
5	1-Butanol, 3-methyl	Fresh, fruity, floral	C123513	C5H12O	88.1	1222.1	684.877	1.2481

14	1-Propanol, 2-methyl	Apple, Bitter, Cocoa, Wine Alcohol, Candy,	C78831	C4H10O	74.1	1109.7	487.73	1.17323
15	1-Propanol	Pungent	C71238	C3H8O	60.1	1056.1	418.021	1.11201
16	1-Propanol (D)	— Butter, Fish, Green, Oxidized,	C71238	C3H8O	60.1	1055.8	417.661	1.25055
41	1-Penten-3-ol	Wet Earth	C616251	C5H10O	86.1	1176.2	609.665	0.94754
42	1-Penten-3-ol (D)	—	C616251	C5H10O	86.1	1176.5	610.173	1.34507
8	Heptaldehyde Heptaldehyde	Citrus, Fat, Green, Nut	C111717	C7H14O	114.2	1199.9	653.72	1.33143
9	(D)	—	C111717	C7H14O	114.2	1200.8	654.895	1.69418
11	(E)-2-Pentenal	Stimulating Apple, Fat, Fresh, Green,	C1576870	C5H8O	84.1	1118	501.479	1.0957
12	1-hexanal	Oil	C66251	C6H12O	100.2	1103.2	477.353	1.26195
13	1-hexanal (D)	— Almond, Bitter, Malt,	C66251	C6H12O	100.2	1103.3	477.391	1.56143
18	n-valeraldehyde	Oil, Pungent	C110623	C5H10O	86.1	1004.8	363.243	1.18203
19	n-valeraldehyde	—	C110623	C5H10O	86.1	1003.8	362.29	1.42471

(D)								
22	3-Methylbutanal	Chocalate, Malty Banana, Green,	C590863	C5H10O	86.1	915	300.994	1.19509
23	Butanal	Pungent	C123728	C4H8O	72.1	892	287.173	1.12221
24	Butanal (D)	—	C123728	C4H8O	72.1	891.3	286.747	1.28367
28	2-Methylbutanal	Almond, Cocoa, Fermented, Hazelnut,	C96173	C5H10O	86.1	925.1	307.213	1.15973
29	2-Methylbutanal (D)	Malt —	C96173	C5H10O	86.1	925.9	307.717	1.39955
30	Acetic acid ethyl ester	Aromatic, Brandy, Grape	C141786	C4H8O2	88.1	921.3	304.864	1.09239
31	Acetic acid ethyl ester (D)	—	C141786	C4H8O2	88.1	925	307.184	1.32737
35	Butanoic acid, 2-methyl-, ethyl ester	Apple, Ester, Green Apple, Kiwi, Strawberry	C7452791	C7H14O2	130.2	1029.3	388.49	1.23675
10	(+)-limonene	Citrus, Mint	C10H16	C10H16	136.2	1175.7	608.524	1.21915

20	Alpha-Pinene	Cedarwood, Pine, Sharp Burnt, Green, Iron Scorch, Must, Peanut Butter, Roasted,	C10H16	C10H16	136.2	1015.3	373.872	1.21583
39	ethylpyrazine	Rum, Wood	C13925003	C6H8N2	108.1	945.4	320.225	1.13384
21	2,5-Dimethylfuran	Savory	C625865	C6H8O	96.1	970.5	337.087	1.04677
38	3-Methylpentanoic acid	Fetid	C105431	C6H12O2	116.2	948.3	322.096	1.27067
26	1	—	unidentified	*	0	831.2	253.646	1.20909
27	2	—	unidentified	*	0	832	254.113	1.28465
32	3	—	unidentified	*	0	912.6	299.51	1.86891
37	4	—	unidentified	*	0	908.5	296.976	1.67315
40	5	—	unidentified	*	0	1030.4	389.584	1.03425
44	6	—	unidentified	*	0	1175.5	608.155	1.58726
43	7	—	unidentified	*	0	1144.3	547.777	1.1568
45	8	—	unidentified	*	0	1144.9	548.984	1.2413

Table 2 Composition (mg/L) of free amino acids in different thermally processed dried salted Spanish mackerel meat

	A64	A66	S64	S66	F64	F66
Histidine ug/mL	173.65±22.35a	250.92±68.42a	273.86±71.41a	231.62±23.13a	243.59±46.92a	169.43±11.2a
4-Hydroxy-L-Proline ug/mL	2.85±0.31a	3.37±0.96a	4.24±1.32a	2.76±0.11a	4.26±0.96a	2.20±0.17a
Arginine ug/mL	14.12±1.88c	41.11±13.35a	35.93±9.69ab	27.20±1.35abc	30.83±6.24abc	21.24±0.33bc
Asparagine ug/mL	0.06±0.02a	0.15±0.07a	0.06±0.01a	0.07±0.01a	0.09±0.05a	0.13±0.14a
Glutamine ug/mL						
Serine ug/mL	3.94±0.64b	8.60±3.1ab	11.97±3.01a	9.12±1.28a	10.97±1.08a	7.61±0.06ab
Glycine ug/mL						
Aspartic acid ug/mL	11.49±1.30b	25.21±8.37a	21.54±5.47ab	19.69±1.82ab	19.52±1.9ab	15.14±0.05ab
L-Citrulline ug/mL	30.04±3.28a	38.57±7.70a	34.45±4.48a	38.93±0.95a	33.29±0.05a	34.34±0.07a
Glutamic acid ug/mL	1.71±0.09b	16.24±5.88a	2.29±0.52b	6.63±0.98b	6.16±0.13b	3.92±0.19b
Threonine ug/mL						
Alanine ug/mL						
Gamma-Aminobutyric acid ug/mL	2.36±0.18ab	3.62±1.26ab	3.93±1.12a	3.74±0.25ab	1.98±0.26b	3.38±0.02ab
Proline ug/mL						
L-Ornithine ug/mL	22.89±3.90b	47.89±16.96a	27.20±7.34ab	38.54±5.21ab	34.70±0.60ab	29.60±0.14ab

D-2-Aminobutyric						
ug/mL	29.14±5.32a	40.44±13.37a	40.40±10.82a	36.59±2.93a	33.90±3.07a	27.18±0.22a
Lysine	ug/mL					
Cystine	68.85±11.46a	102.35±34.70a	101.25±25.66a	102.13±11.64a	89.51±2.87a	77.12±1.55a
ug/mL	0.31±0.05a	0.39±0.25a	0.43±0.14a	0.32±0.01a	0.31±0.00a	0.28±0.04a
Tyrosine						
ug/mL	20.28±3.82b	45.40±16.27a	25.51±7.11b	32.38±2.48ab	23.89±2.30b	25.10±0.85b
Methionine	ug/mL					
Valine	ug/mL	9.30±1.92a	12.22±5.09a	10.08±2.54a	15.36±2.56a	8.52±0.49a
Isoleucine	ug/mL					
Leucine	ug/mL	1.19±0.24ab	1.76±0.65a	0.87±0.17b	1.92±0.18a	0.82±0.00b
Phenylalanine						
ug/mL						
Tryptophan	ug/mL	90.67±20.12b	227.65±114.6ab	272.14±80.95ab	178.27±32.10ab	185.83±22.76ab
	0	0	0	0	0	0
	14.05±1.80b	30.68±7.26a	21.95±6.23ab	20.53±0.86ab	19.15±4.90ab	17.64±1.16b
	12.14±2.14b	27.15±8.27a	20.02±5.46ab	19.52±1.18ab	16.53±3.25ab	16.22±0.25ab
	18.06±3.13b	36.17±12.35a	27.17±7.58ab	30.85±2.71ab	25.06±3.14ab	24.82±0.04ab
	12.52±2.09b	29.02±10.09a	20.86±5.58ab	22.27±1.82ab	17.30±2.11ab	18.14±0.19ab
	23.88±4.04b	58.40±20.15a	44.66±12.07ab	42.95±3.29ab	34.10±4.06ab	34.67±0.26ab

14.84±1.38b	31.16±7.54a	25.67±6.87ab	19.64±0.37ab	19.48±4.78ab	17.28±1.02b
3.02±0.18b	6.22±1.39a	4.06±1.06b	3.88±0.02b	3.18±0.76b	3.54±0.18b