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CORRECTION

Correction to: Distinction of volatile flavor profiles in various skim milk products via HS-SPME–GC–MS and E-nose

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In the original publication of the article, Fig. 1 and Table 2 has been published with an error. Also, text has been published with error in few places.

The correct Fig. 1 and Table 2 provided below in this correction.

The original article has been updated with the corrections.

The original article can be found online at https://doi.org/10.1007/s00217-021-03730-0.

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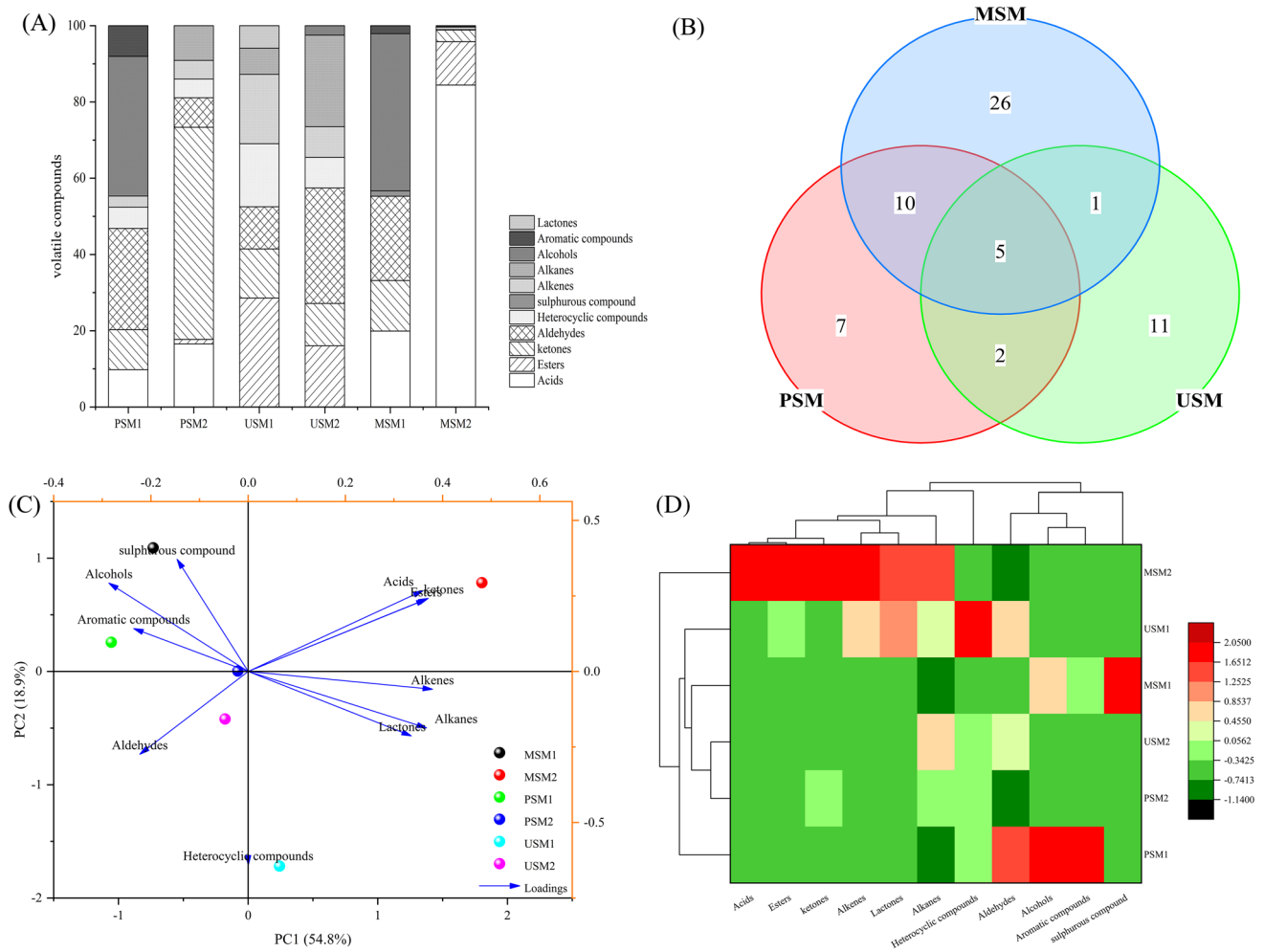

Fig. 1 Statistical analysis of the volatile compounds in skim milk samples. **a** Content ratios in types of volatile compounds; **b** Venn diagram analysis of the samples; **c** classification by PCA of the samples; **d** cluster heatmap analysis upon the classification of the samples and volatile compounds. *PSM* pasteurized skim milk, *USM* ultra-high-temperature skim milk, *MSM* modified skim milk by lipase-catalyzed process

Table 2 Volatile compounds in skim milk samples identified by HS-SPME–GC–MS

Compound name	RI	CAS	Content (μg/L)					
			PSM1	PSM2	USM1	USM2	MSM1	MSM2
Acids								
9-Decenoic acid	1360	14436-32-9	–	–	–	–	–	3.36 ± 0.63
Butanoic acid	792	107-92-6	–	–	–	–	–	30.94 ± 2.77
Dodecanoic acid	1568	143-07-7	–	–	–	–	–	29.39 ± 1.84
Heptanoic acid	1085	111-14-8	–	–	–	–	–	3.90 ± 0.04
Hexanoic acid	984	142-62-1	0.36 ± 0.07	0.20 ± 0.10	–	–	0.37 ± 0.05	414.22 ± 33.95
n-Decanoic acid	1365	334-48-5	0.39 ± 0.08	0.60 ± 0.24	–	–	0.53 ± 0.00	186.45 ± 3.61
Octanoic acid	1175	124-07-2	0.62 ± 0.16	1.35 ± 0.46	–	–	0.59 ± 0.10	369.83 ± 6.83
Tetradecanoic acid	1767	544-63-8	–	–	–	–	–	3.87 ± 2.84
Undecanoic acid	1436	112-37-8	–	–	–	–	–	1.33 ± 0.02
Alcohols								
1-Decanol, 2-hexyl-	1810	2425-77-6	–	–	–	0.20 ± 0.06	–	–
1-Octanol	1037	111-87-5	0.19 ± 0.02	–	–	–	0.21 ± 0.10	–
1-Octen-3-ol	982	3391-86-4	0.19 ± 0.02	–	–	–	0.18 ± 0.05	–
2-Ethylhexanol	1034	104-76-7	4.73 ± 0.58	–	–	–	2.71 ± 0.39	–
Aldehydes								
(*Z*)-2-Nonenal	963	60784-31-8	0.07 ± 0.00	–	–	–	0.29 ± 0.05	–
Decanal	1206	112-31-2	–	0.33 ± 0.12	0.72 ± 0.05	0.67 ± 0.02	–	–
Nonanal	1105	124-19-6	2.54 ± 0.30	0.68 ± 0.26	2.01 ± 0.24	1.82 ± 0.33	1.23 ± 1.22	1.20 ± 0.12
Octanal	1002	124-13-0	0.29 ± 0.05	–	–	–	0.14 ± 0.03	–
Alkanes								
Decane	1059	124-18-5	–	–	0.43 ± 0.07	–	–	–
Dodecane	1199	112-40-3	–	0.27 ± 0.04	0.75 ± 0.26	0.43 ± 0.04	–	–
Eicosane	1800	112-95-8	–	–	0.30 ± 0.02	–	–	–
Heptadecane	1700	629-78-7	–	–	–	0.26 ± 0.07	–	–
Hexadecane	1600	544-76-3	–	–	–	0.30 ± 0.04	–	–
Nonane	903	111-84-2	–	–	–	0.49 ± 0.05	–	–
Octadecane	1792	593-45-3	–	–	–	0.21 ± 0.07	–	–
Tetradecane	1399	629-59-4	–	0.56 ± 0.22	0.21 ± 0.04	0.29 ± 0.02	–	1.70 ± 0.13
Tridecane	1299	629-50-5	–	0.36 ± 0.14	–	–	–	1.14 ± 0.10
Alkenes								
5-Tetradecene, (*E*)-	1384	041446-66-6	–	–	–	–	–	7.16 ± 1.14
6-Dodecene, (*E*)-	1139	68526-77-2		–	0.41 ± 0.11	–	–	–
7-Hexadecene, (*Z*)-	1593	35507-09-6	–	–	–	–	–	1.13 ± 0.68
D-Limonene	1030	5989-27-5	0.41 ± 0.05	0.64 ± 0.27	4.09 ± 0.19	0.66 ± 0.05	–	–
Esters								
Butanoic acid, butyl ester	998	109-21-7	–	0.15 ± 0.06	–	–	–	–
Butanoic acid, ethyl ester	807	105-54-4	–	–	–	–	–	14.02 ± 2.37
Decanoic acid, ethyl ester	1395	110-38-3	–	–	–	–	–	19.83 ± 1.08
Decanoic acid, methyl ester	1354	110-42-9	–	–	–	–	–	0.98 ± 0.03
Dodecanoic acid, ethyl ester	1586	106-33-2	–	–	–	–	–	7.45 ± 0.32
Ethyl 9-tetradecenoate	1771	1000336-60-8	–	–	–	–	–	2.66 ± 3.41
Heptanoic acid, ethyl ester	1096	106-30-9	–	–	–	–	–	1.54 ± 0.09
Hexadecanoic acid, ethyl ester	1997	628-97-7	–	–	–	–	–	0.98 ± 1.10
Hexanoic acid, 2-methylpropyl ester	1450	105-79-3	–	–	–	–	–	2.26 ± 0.13
Hexanoic acid, ethyl ester	994	123-66-0	–	–	–	–	–	28.39 ± 2.03
Nonanoic acid, ethyl ester	1305	123-29-5	–	–	–	–	–	0.85 ± 0.02
Octanoic acid, ethyl ester	1182	106-32-1	–	–	–	–	–	55.79 ± 1.66

Table 2 (continued)

Compound name	RI	CAS	Content (μg/L)					
			PSM1	PSM2	USM1	USM2	MSM1	MSM2
Octanoic acid, methyl ester	1126	111-11-5		–	2.93 ± 0.18	–	–	0.95 ± 0.04
Sulfurous acid, butyl nonyl ester	1035	1000309-17-6	–	–	–	1.32 ± 0.15	–	–
Tetradecanoic acid, ethyl ester	1797	124-06-1	–	–	–	–	–	1.67 ± 0.81
Triacetin	1352	102-76-1	–	–	4.15 ± 0.78	–	–	–
Vinyl butyrate	1324	123-20-6	–	–	–	–	–	2.95 ± 0.37
Ketones								
1-Phenyl-2-butanone	1228	1007-32-5	–	6.28 ± 1.66	–	–	–	–
2-Heptanone	894	110-43-0	–	0.18 ± 0.03	0.85 ± 0.04	–	–	4.31 ± 0.27
2-Nonanone	1093	821-55-6	0.48 ± 0.07	0.78 ± 0.35	1.65 ± 0.05	0.59 ± 0.04	0.55 ± 0.16	21.43 ± 2.47
2-Pentadecanone	1597	2345-28-0	–	–	–	–	–	0.92 ± 0.38
2-Tridecanone	1461	593-08-8	–	–	–	–	–	3.89 ± 0.41
2-Undecanone	1294	112-12-9	0.07 ± 0.02	–	0.69 ± 0.04	0.32 ± 0.05	0.13 ± 0.01	7.41 ± 0.58
3-Octen-2-one	1059	1669-44-9	0.16 ± 0.02	–	–	–	–	–
6-Methyl-5-hepten-2-one	991	110-93-0	0.42 ± 0.13	–	–	–	0.16 ± 0.09	–
Lactones								
2(3*H*)-Furanone, 5-heptyl-dihydro-	1576	104-67-6	–	–	–	–	–	0.82 ± 0.15
2(3*H*)-Furanone, dihydro-5-pentyl-	1367	104-61-0	–	–	1.46 ± 0.11	–	–	–
2*H*-Pyran-2-one, 6-hexyltetrahydro-	1681	710-04-3	–	–	–	–	–	0.81 ± 0.25
Aromatic compounds								
Acetophenone	1058	98-86-2	0.32 ± 0.03	–	–	–	0.16 ± 0.01	–
Benzaldehyde	965	100-52-7	0.8 ± 0.08	–	–	–	–	–
Heterocyclic compound								–
2-Pentyl-furan	992	3777-69-3	0.77 ± 0.55	0.64 ± 0.38	4.09 ± 3.95	0.66 ± 0.55	–	–
Sulphurous compound								
Dimethyl sulfone	925	67-71-0	–	–	–	–	0.11 ± 0.00	–
Total			12.41 ± 1.74	13.02 ± 1.73	24.76 ± 2.23	8.23 ± 1.00	7.35 ± 2.07	1235.53 ± 39.57