

Supplementary Materials

# Qualitative and Quantitative Analysis of Ejiao-Related Animal Gelatins through Peptide Markers Using LC-QTOF-MS/MS and Scheduled Multiple Reaction Monitoring (MRM) by LC-QQQ-MS/MS

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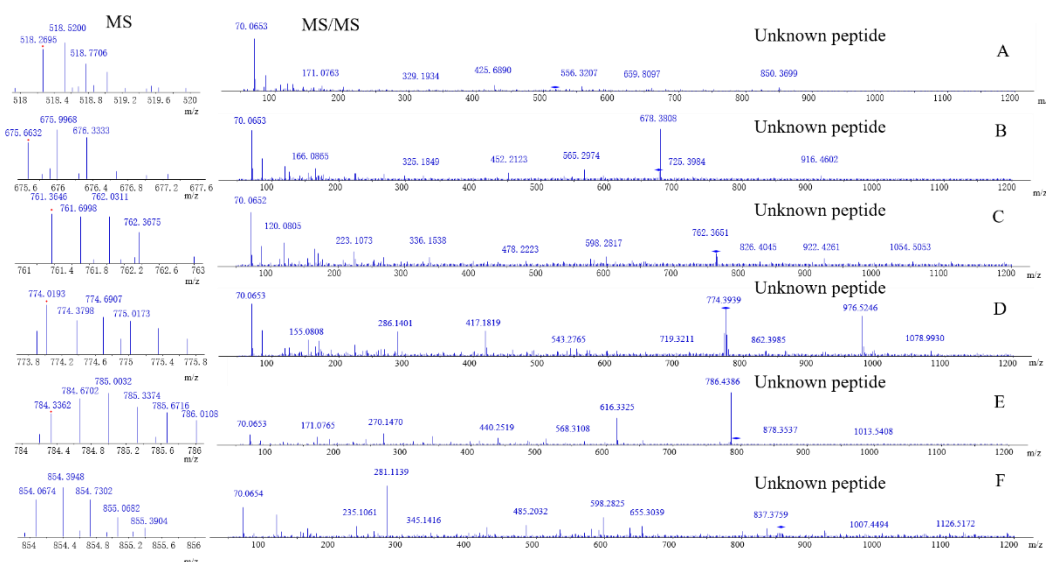
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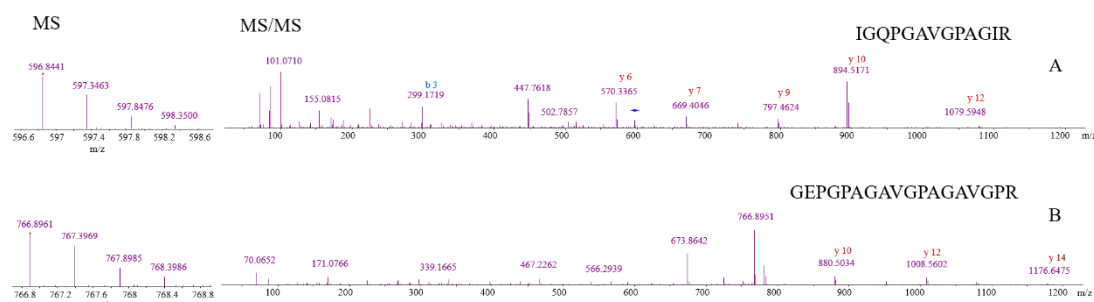
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**Figure S1.** MS and MS/MS spectra of (A) donkey-specific marker 1, (B) donkey-specific marker 2 and (C) donkey-specific marker 3, (D) donkey-specific marker 5, (E) donkey-specific marker 6 and (F) donkey-specific marker 7.

**Notes:** A: (DM1) donkey-specific marker 1, m/z 518.2695±0.1, 18.92 min; B: (DM2) donkey-specific marker 2, m/z 675.6632±0.1, 23.36 min; C: (DM3) donkey-specific marker 3, m/z 761.3672±0.1, 24.24 min; D: (DM5) donkey-specific marker 5, m/z 774.0218±0.1, 23.36 min; E: (DM6) donkey-specific

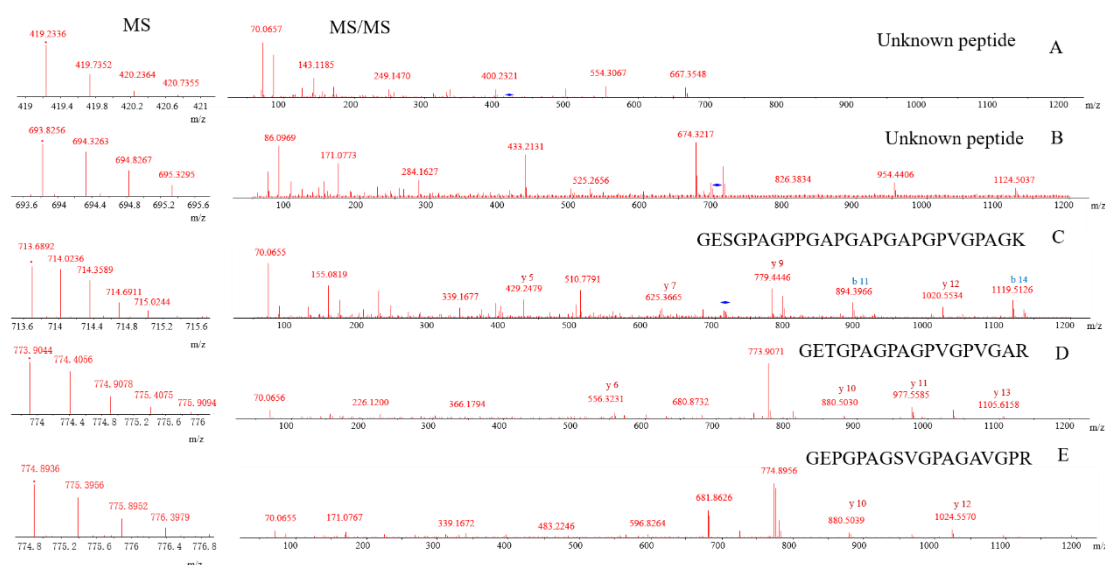
marker 6,  $m/z$  784.3392 $\pm$ 0.1, 23.36 min; F: (DM7) donkey-specific marker 7,  $m/z$  854.0603 $\pm$ 0.1, 27.08 min. Three donkey-specific markers, including DM1 (KCSLDYGKDHEPVQVGPR), DM2 (CFWKYNGLPGSAFCFDK) and DM3 (NPTWNKPKPAYGHAGVGSMDK), are determined by de novo MS/MS sequencing.



**Figure S2.** MS and MS/MS spectra of (A) cattle-specific marker 1 and (B) cattle-specific marker 3.

**Notes:** A: (CM1) cattle-specific marker 1,  $m/z$  596.8454 $\pm$ 0.1, 18.90 min; B: (CM3) cattle-specific marker 3,  $m/z$  766.8957 $\pm$ 0.1, 18.34 min.

Peptide sequences of A and B are obtained by searching protein databases. By comparing with Skyline software, their matched b and y ions are indicated.

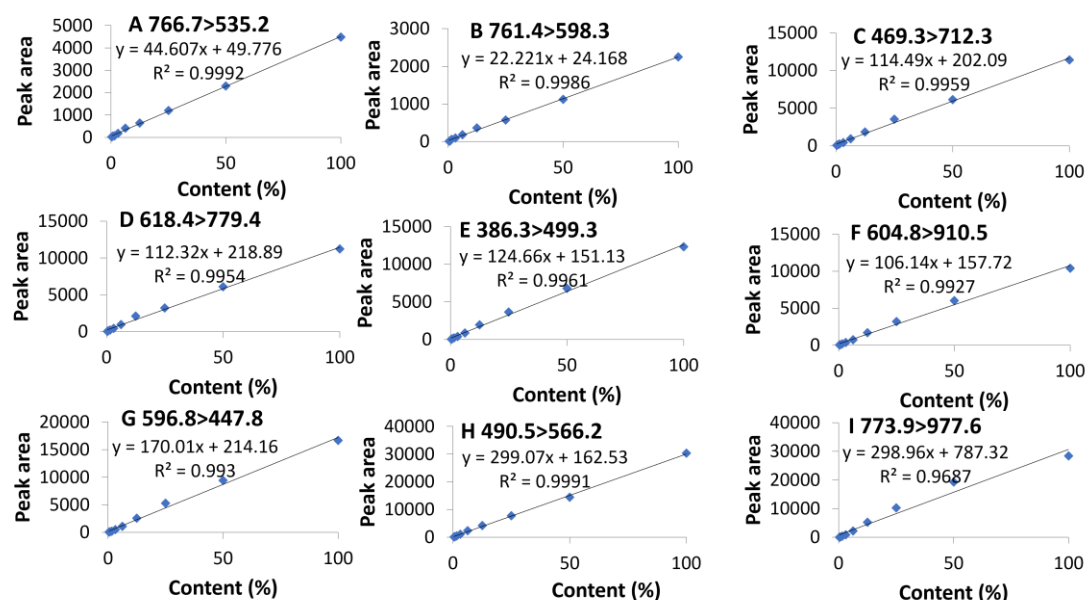


**Figure S3.** MS and MS/MS spectra of (A) pig-specific marker 1, (B) pig-specific marker 3, (C) pig-specific marker 4, (D) pig-specific marker 5 and (E) pig-specific marker 6.

**Notes:** A: (PM1) pig-specific marker 1,  $m/z$  419.2446 $\pm$ 0.1, 14.04 min; B: (PM3) pig-specific marker 3,  $m/z$  693.8432 $\pm$ 0.1, 26.7 min; C: (PM4) pig-specific marker 4,  $m/z$  713.6902 $\pm$ 0.1, 17.79 min; D: (PM5) pig-specific marker 5,  $m/z$  773.9237 $\pm$ 0.1, 18.51 min; E: (PM6) pig-specific marker 6,  $m/z$  774.9121 $\pm$ 0.2, 17.79 min.

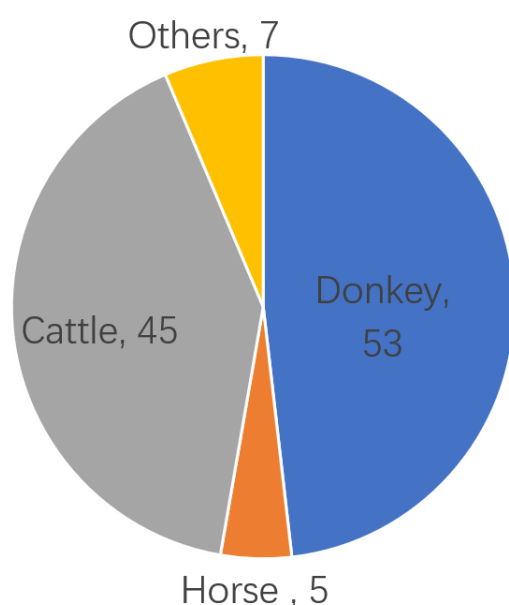
Peptide sequences of C, D and E are obtained by searching protein databases. By comparing with Skyline software, their matched b and y ions are indicated. Another two pig-specific markers,

including PM1 (KLGPAGPR) and PM3 (GYGLAGLLGMGAHK), are determined by de novo MS/MS sequencing.



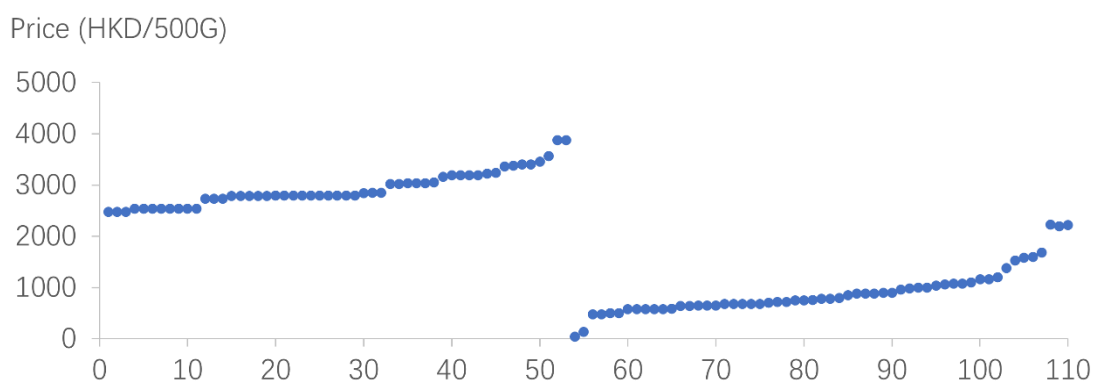
**Figure S4.** Linearity relationship between standard material content and specific-peptide marker including (A) donkey-specific marker 4, 766.7>535.2; (B) donkey-specific marker 3, 761.4>598.3; (C) donkey marker in the Chinese Pharmacopoeia, 469.3>712.3; (D) donkey marker in the Chinese Pharmacopoeia, 618.4>779.4; (E) horse-specific marker 1, 386.3>499.3; (F) cattle-specific marker 2, 604.8>910.5; (G) cattle-specific marker 1, 596.8>447.8; (H) pig-specific marker 2, 490.5>566.2; and (I) pig-specific marker 5, 773.9>977.6.

**Notes:** The ion pairs are detected by UPLC-QQQ-MS/MS in MRM mode.



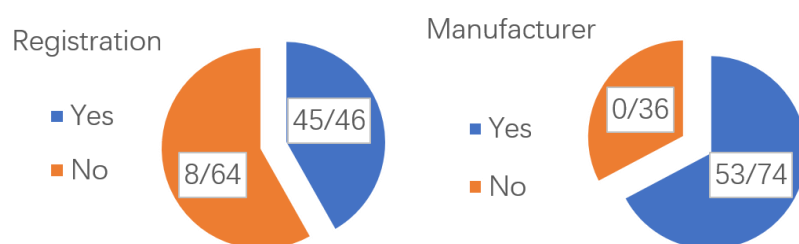
**Figure S5.** The authentication results of 110 commercial Ejiao samples.

**Notes:** Others includes 3 pig/horse-gelatin, 2 donkey/horse-gelatin, 1 cattle/horse- gelatin and 1 fake product which did not contain any gelatins.



**Figure S6.** The relationships between authenticity and price.

**Notes:** 53 samples on the upper left are authentic products, and 57 samples on the lower right are fake products.



**Figure S7.** The relationships between authenticity and registration/manufacturers.

**Notes:** Registration represents having National Medical Products Administration (NMPA) approval number.

**Supplementary Table S1**

Markers selection for donkey-hide gelatin (Ejiao) from peptide fragments based on trypsin digestion followed by LC-Q-TOF-MS analysis.

Fig. 1 No.	Donkey marker No.	m/z	RT (min)	Charge	Donkey	Horse	Cattle	Pig
1	/	189.1288	5.31	1	+	+	+	+
2	/	228.6384	5.31	2	+	+	+	+
3	/	237.6447	5.31	2	+	+	+	+
4	/	233.1565	5.55	1	+	+	+	+
5	/	281.1566	5.59	1	+	+	+	+
6	/	260.2043	6.27	1	+	+	+	+
7	/	267.6266	6.27	2	+	+	+	+
8	/	288.2116	6.30		+	+	+	+
9	/	290.1784	6.30		+	+	+	+
10	/	276.1632	7.57	1	+	+	+	+
11	/	231.1771	7.77		+	+	+	+
12	/	216.6198	8.26	2	+	+	+	+
13	/	223.1141	8.27	1	+	+	+	+
14	/	236.6544	9.34	2	+	+	+	+
15	/	272.1795	9.40	1	+	+	+	+
16	/	260.1678	9.58	1	+	+	+	+
17	/	277.1257	9.74	1	+	+	+	+
18	/	237.6260	10.08	2	+	+	+	+
19	/	242.1565	10.08	1	+	+	+	+
20	/	249.6631	10.08	2	+	+	+	+
21	/	270.2001	10.08	1	+	+	+	+
22	/	274.1954	10.08	1	+	+	+	+
23	/	281.1213	10.08	1	+	+	+	+
24	/	295.1740	10.08	1	+	+	+	+
25	/	258.1766	10.10	2	+	+	+	+
26	/	231.1762	10.44	1	+	+	+	+
27	/	219.1404	10.98	1	+	+	+	+
28	/	295.1730	10.98	1	+	+	+	+
29	/	229.6280	12.09	2	+	+	+	+
30	/	272.6535	12.27	2	+	+	+	+
31	/	283.8095	12.27	2	+	+	+	+
32	/	292.6630	12.27	2	+	+	+	+
33	/	278.6662	12.50	2	+	+	+	+
34	/	297.6402	12.50	2	+	+	+	+

35	/	265.1621	13.32	1	+	+	+	+
36	/	245.1925	14.24	1	+	+	+	+
37	/	245.1925	15.38	1	+	+	+	+
38	/	243.1408	15.75	1	+	+	+	+
39	/	279.1418	17.53	1	+	+	+	+
40	/	279.1777	18.20	1	+	+	+	+
41	/	288.2009	20.49		+	+	+	+
42	/	234.1024	22.27		+	+	+	+
43	/	224.1352	31.00	1	+	+	+	+
44	/	250.1855	32.78	1	+	+	+	+
45	/	329.2007	5.31	1	+	+	+	+
46	/	345.2333	5.31	1	+	+	+	+
47	/	391.1910	5.31	1	+	+	+	+
48	/	321.1817	5.59	1	+	+	+	+
49	/	324.1811	5.59	2	+	+	+	+
50	/	372.6956	5.59	2	+	+	+	+
51	/	301.1832	6.30	2	+	+	+	+
52	/	303.6207	6.30	1	+	+	+	+
53	/	306.1739	6.30		+	+	+	+
54	/	317.1910	6.30	3	+	+	+	+
55	/	323.1587	6.30		+	+	+	+
56	/	323.4940	6.30		+	+	+	+
57	/	329.1909	6.30	2	+	+	+	+
58	/	369.7033	6.30	2	+	+	+	+
59	/	373.2899	6.30	1	+	+	+	+
60	/	388.2293	6.30		+	+	+	+
61	/	398.1658	6.30		+	+	-	+
62	/	347.2014	7.77	1	+	+	+	+
63	/	375.2342	7.77	1	+	+	+	+
64	/	325.6760	8.17	2	+	+	-	-
65	/	301.6758	8.27	2	+	+	+	+
66	/	320.1866	8.27	1	+	+	+	-
67	/	365.8721	8.27		+	+	+	-
68	/	385.2063	8.27	2	+	+	+	+
69	/	384.2149	8.64	2	+	+	+	-
70	/	395.6893	8.94	2	+	+	+	+
71	/	385.2661	9.40	1	+	+	+	+
72	/	393.2091	9.40	2	+	+	+	+
73	/	345.1529	9.63	1	+	+	+	+
74	/	350.1806	9.63	1	+	+	+	+
75	/	322.6805	10.06	2	+	+	+	+
76	/	302.1801	10.08	1	+	+	+	+

77	/	359.2392	10.08	1	+	+	+	+
78	/	385.2297	10.08	1	+	+	+	+
79	/	398.2194	10.08		+	+	+	-
80	/	372.2159	10.36	2	+	+	+	+
81	/	390.2222	10.60	2	+	+	+	+
82	/	339.1935	10.87	2	+	+	+	+
83	/	371.2385	10.98	1	+	+	+	+
84	/	379.7035	10.98	2	+	+	+	+
85	/	389.2488	11.01	1	+	+	+	+
86	/	393.2267	11.01	2	+	+	+	-
87	/	314.7013	11.46	2	+	+	+	-
88	/	347.7072	11.46	2	+	+	+	+
89	/	377.1953	11.46	1	+	+	+	+
90	/	305.6956	11.52	2	+	+	+	+
91	/	339.6729	11.52	2	+	+	+	+
92	/	314.6831	12.07	2	+	+	+	+
93	/	322.8205	12.27	3	+	+	+	+
94	/	327.8098	12.27	3	+	+	+	+
95	/	343.2051	12.27		+	+	+	+
96	/	388.2296	12.27		+	+	+	+
97	/	309.6738	12.35	2	+	+	+	+
98	/	374.7011	12.41	2	+	+	+	+
99	/	300.6175	12.78	2	+	+	+	+
100	/	320.2031	12.78	3	+	+	+	+
101	/	330.2011	12.78	2	+	+	+	+
102	/	390.8836	12.91	3	+	+	-	-
103	/	392.2315	13.05	2	+	+	+	+
104	/	321.1797	13.31	2	+	+	+	-
105	/	369.2061	13.59	3	+	+	+	+
106	/	377.1926	13.59	1	+	+	+	+
107	/	381.8550	13.59	3	+	+	+	+
108	/	385.5505	13.59	3	+	+	-	-
109	/	386.8436	13.59	3	+	+	+	+
110	/	350.6348	14.08	2	+	+	+	+
111	/	359.6404	14.08	2	+	+	+	+
112	/	378.6137	14.08	2	+	+	+	+
113	/	398.2504	14.18	1	+	+	+	+
114	/	301.6768	14.24	2	+	+	+	+
115	/	332.2266	14.24	1	+	+	+	+
116	/	374.8536	14.46	3	+	+	+	+
117	/	379.8415	14.46	3	+	+	+	+
118	/	382.5030	14.46	3	+	+	+	+



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119	/	396.2707	14.62	1	+	+	+	+
120	/	320.1733	14.88	1	+	+	+	+
121	/	353.4912	14.88	3	+	+	+	+
122	/	372.8516	14.88	3	+	+	-	-
123	/	377.8407	14.88	3	+	+	-	-
124	/	329.2282	15.00	2	+	+	+	+
125	/	383.7419	15.00	2	+	+	+	-
126	/	398.2272	15.00	3	+	+	+	+
127	/	371.7236	16.41	2	+	+	+	+
128	/	312.8329	16.42	3	+	+	+	+
129	/	399.2711	17.34	1	+	+	+	+
130	/	366.2176	17.35	2	+	+	+	+
131	/	302.2166	18.21	1	+	+	+	+
132	/	391.2092	18.32	1	+	+	+	+
133	/	332.2273	18.89	1	+	+	+	+
134	/	374.2389	18.89	1	+	+	+	+
135	/	302.2159	19.22	1	+	+	+	+
136	/	316.2312	19.63	1	+	+	+	+
137	/	387.8462	19.63	3	+	+	+	+
138	/	330.1635	19.95	1	+	+	+	+
139	/	337.1392	20.13	2	+	+	-	-
140	/	392.9530	20.13	4	+	+	-	-
141	/	396.6962	20.13	4	+	+	+	-
142	/	344.2632	20.16	1	+	+	+	+
143	/	338.8360	21.02		+	+	-	-
144	/	335.1611	21.76	3	+	+	+	+
145	/	306.1484	23.08	2	+	+	+	+
146	/	393.7321	23.66	2	+	+	-	-
147	/	379.2181	24.94	2	+	+	+	+
148	/	422.2127	5.31	1	+	+	+	+
149	/	474.2799	5.31	1	+	+	+	+
150	/	459.2685	5.59	1	+	+	+	+
151	/	473.2346	5.59		+	+	+	-
152	/	490.2600	5.59		+	+	+	+
153	/	431.2478	6.30	1	+	+	+	+
154	/	443.2353	6.30	1	+	+	+	+
155	/	447.2105	6.30	1	+	+	+	+
156	/	462.2302	6.30	1	+	+	+	+
157	/	484.2314	6.30	2	+	+	+	+
158	/	445.2527	7.80	1	+	+	+	+
159	/	499.2625	7.80	1	+	+	+	+
160	/	432.2315	8.27	1	+	+	+	+

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161	/	446.2717	8.27	1	+	+	+	+
162	/	426.7299	8.94	2	+	+	+	+
163	/	456.2434	8.94	2	+	+	+	+
164	/	400.2297	9.40	1	+	+	+	+
165	/	404.2236	9.40	1	+	+	+	+
166	/	472.2992	9.40	1	+	+	+	+
167	/	405.2186	9.63	2	+	+	+	+
168	/	421.7331	9.63	2	+	+	+	+
169	/	498.7538	9.63	2	+	+	+	+
170	/	402.2567	10.08	1	+	+	+	+
171	/	444.2303	10.08	2	+	+	+	+
172	/	469.2535	10.08	2	+	+	-	-
173	/	474.2429	10.08	1	+	+	+	+
174	/	405.2085	10.36		+	+	-	-
175	/	418.7339	10.36	2	+	+	+	+
176	/	448.2467	10.36	2	+	+	+	+
177	/	475.7502	10.57	2	+	+	+	+
178	/	434.7471	10.81	2	+	+	+	+
179	/	411.2322	10.98	1	+	+	+	+
180	/	427.7393	10.98	2	+	+	-	-
181	/	459.2678	10.98	1	+	+	+	+
182	/	427.7383	11.01	2	+	+	-	-
183	/	467.7517	11.01	2	+	+	+	+
184	/	461.2554	11.46	2	+	+	-	-
185	/	446.7472	11.52	2	+	+	+	+
186	/	468.2369	11.52	1	+	+	+	+
187	/	474.2428	11.52	1	+	+	+	+
188	/	458.2476	12.10	2	+	+	+	+
189	/	492.5855	12.10	3	+	+	-	-
190	/	406.2358	12.21	2	+	+	+	+
191	/	464.7522	12.26	2	+	+	+	+
192	/	414.2457	12.27	1	+	+	+	+
193	/	442.7441	12.27	2	+	+	+	+
194	/	453.2203	12.27		+	+	+	+
195	/	457.7509	12.27	2	+	+	+	+
196	/	459.1892	12.27	2	+	+	+	+
197	/	474.2679	12.27	2	+	+	+	+
198	/	474.2682	12.27	1	+	+	+	+
199	/	476.2476	12.35	2	+	+	+	+
200	/	421.2412	12.45	2	+	+	+	+
201	/	400.2298	12.78	2	+	+	+	+
202	/	430.2411	12.78	1	+	+	+	+

203	/	479.7979	12.78	2	+	+	+	+
204	/	471.7388	12.84	2	+	+	+	+
205	/	420.1979	13.01	1	+	+	+	+
206	/	469.2711	13.03	2	+	+	-	-
207	/	456.2456	13.15	2	+	+	+	+
208	/	406.2352	13.25	2	+	+	+	-
209	/	472.2880	13.31	1	+	+	+	+
210	/	431.2253	13.59	2	+	+	+	+
211	/	447.2085	13.59	1	+	+	+	+
212	/	478.7565	13.59	2	+	+	+	+
213	/	454.7644	13.80	2	+	+	+	+
214	/	464.2263	13.90	1	+	+	+	+
215	/	413.2410	14.18	2	+	+	+	+
216	/	499.2998	14.24	1	+	+	-	-
217	/	414.2108	14.52	2	+	+	-	-
218	/	447.2542	14.60	1	+	+	+	+
219	/	486.3042	14.60	1	+	+	+	+
220	/	446.7659	14.62	2	+	+	+	+
221	/	486.3052	14.62	1	+	+	+	+
222	/	414.2413	14.88	3	+	+	+	+
223	/	457.2030	14.88	2	+	+	+	+
224	/	465.2464	14.88	1	+	+	+	+
225	/	403.2657	15.00	1	+	+	+	+
226	/	410.8747	15.00	3	+	+	+	+
227	/	415.8626	15.00	3	+	+	+	+
228	/	421.2612	15.00	2	+	+	+	+
229	/	412.2540	15.75	2	+	+	+	+
230	/	407.2195	15.76	2	+	+	+	+
231	/	403.2657	16.04	1	+	+	-	-
232	/	412.2536	16.04	2	+	+	+	+
233	/	449.7704	16.48	2	+	+	+	+
234	/	478.2575	16.50	2	+	+	-	+
235	/	446.2722	16.69	1	+	+	+	+
236	/	434.2619	17.34	2	+	+	+	+
237	/	479.2622	17.50	1	+	+	+	+
238	/	418.2195	17.95	1	+	+	+	+
239	/	467.7294	17.95	2	+	+	+	+
240	/	473.2079	18.21	2	+	+	+	+
241	/	441.7730	18.54	2	+	+	+	+
242	/	460.4769	18.89	4	+	+	-	-
243	/	464.4752	18.89	4	+	+	-	-
244	/	472.5596	18.89	3	+	+	+	+

245	/	476.2273	18.89	1	+	+	+	+
246	/	462.2472	19.19	1	+	+	+	+
247	/	493.2424	19.19	1	+	+	+	+
248	/	455.2042	19.61	1	+	+	+	+
249	/	404.4604	19.63	4	+	+	+	+
250	/	407.9573	19.63	4	+	+	+	+
251	/	411.6992	19.63	4	+	+	+	+
252	/	446.5774	19.63	3	+	+	-	-
253	/	459.2278	19.63	3	+	+	+	+
254	/	421.2432	20.13	2	+	+	+	+
255	/	441.2521	20.49	2	+	+	+	+
256	/	444.2936	20.49	1	+	+	+	+
257	/	430.2775	20.63	1	+	+	+	+
258	/	429.2826	21.01	1	+	+	+	+
259	/	499.7645	21.01	2	+	+	+	+
260	/	472.2893	21.02	1	+	+	+	+
261	/	488.7716	21.02	2	+	+	-	-
262	/	413.2866	21.76	1	+	+	+	+
263	/	480.2565	21.76	1	+	+	+	+
264	/	431.5276	21.95	3	+	+	+	+
265	/	459.2935	21.96	1	+	+	+	+
266	/	451.2280	22.27	1	+	+	+	+
267	/	429.2457	22.30	1	+	+	+	+
268	/	402.5164	22.63	3	+	+	+	+
269	/	415.2447	22.63	1	+	+	+	+
270	/	480.7737	22.63	2	+	+	-	-
271	/	491.7648	22.63	2	+	+	-	-
272	/	456.2925	23.26	1	+	+	+	+
273	/	437.7673	31.77	2	+	+	+	+
274	/	526.2750	5.31	1	+	+	+	+
275	/	573.2644	5.31	1	+	+	+	+
276	/	578.2752	5.31	1	+	+	+	+
277	/	558.3128	5.59		+	+	+	+
278	/	501.2429	6.30	1	+	+	+	+
279	/	534.2432	6.30	1	+	+	+	+
280	/	568.2868	6.30	1	+	+	+	+
281	/	584.3129	6.30		+	+	+	+
282	/	515.3429	10.06	1	+	+	+	+
283	/	569.7932	10.06	2	+	+	+	+
284	/	581.3193	11.52	1	+	+	+	+
285	/	527.2957	12.10	1	+	+	+	+
286	/	570.3125	12.10	1	+	+	+	+

287	/	583.8135	12.10	2	+	+	+	+
288	/	596.3298	12.10	1	+	+	+	+
289	/	531.2907	12.27	1	+	+	+	+
290	/	571.2819	12.27	1	+	+	+	+
291	/	578.3000	12.27	2	+	+	+	+
292	/	536.7798	12.35	2	+	+	+	-
293	/	544.2973	12.40	1	+	+	+	+
294	/	589.2899	12.40	3	+	+	-	+
295	/	504.7541	12.50	2	+	+	+	-
296	/	578.3056	12.53	1	+	+	+	+
297	/	556.3212	12.55	1	+	+	+	+
298	/	552.6142	12.58	3	+	+	+	+
299	/	538.2274	12.65	2	+	+	+	+
300	/	531.7855	12.78	2	+	+	+	+
301	/	562.2794	12.78	1	+	+	+	+
302	/	531.7965	13.21	2	+	+	-	-
303	/	556.6228	13.31	3	+	+	-	-
304	/	560.3174	13.31	1	+	+	+	+
305	/	553.7987	13.56	2	+	+	+	+
306	/	514.2510	13.59	2	+	+	-	+
307	/	553.3052	13.59	2	+	+	+	+
308	/	579.7647	13.59	2	+	+	+	+
309	/	564.2942	13.60	2	+	+	+	+
310	/	572.2779	13.60	2	+	+	+	+
311	/	577.8215	13.75	2	+	+	-	-
312	/	599.8293	14.00	2	+	+	-	-
313	/	535.2696	14.08	1	+	+	+	+
314	/	587.1737	14.08	1	+	+	+	+
315	/	550.7959	14.24	2	+	+	+	+
316	/	542.7990	14.46	2	+	+	+	+
317	/	545.3081	14.46	2	+	+	+	+
318	/	555.7896	14.46	2	+	+	-	-
319	/	569.6130	14.46	3	+	+	+	+
320	/	573.2504	14.46	2	+	+	+	+
321	/	575.3018	14.46	2	+	+	+	+
322	/	583.6149	14.46	3	+	+	-	+
323	/	594.2725	14.46	2	+	+	+	+
324	/	539.7992	14.82	2	+	+	-	-
325	/	591.8301	14.95	2	+	+	-	-
326	/	596.8323	14.97	2	+	+	+	+
327	/	579.6278	15.28	3	+	+	-	-
328	/	585.3025	15.28	1	+	+	-	-

329	/	589.3338	15.44	1	+	+	+	+
330	/	508.2906	15.50	1	+	+	+	+
331	/	564.2834	15.75	1	+	+	+	+
332	/	517.6038	16.04	3	+	+	-	+
333	/	546.7834	16.04	2	+	+	+	+
334	/	588.8368	16.04	2	+	+	+	+
335	/	587.3193	16.26	1	+	+	+	-
336	/	586.3359	16.42	1	+	+	+	+
337	/	512.2539	16.68	2	+	+	+	+
338	/	544.7864	16.68	2	+	+	+	+
339	/	510.2391	16.77	2	+	+	+	+
340	/	556.7927	17.20	2	+	+	+	+
341	/	538.7866	17.27	2	+	+	+	+
342	/	544.7866	17.43	2	+	+	+	+
343	/	581.8293	17.50	2	+	+	+	+
344	/	535.8036	17.75	2	+	+	+	+
345	/	524.8132	17.94	2	+	+	+	-
346	/	563.8012	17.94	2	+	+	+	+
347	/	532.2520	18.39	2	+	+	-	-
348	/	530.7887	18.89	2	+	+	+	+
349	1	518.2695	18.92	4	+	-	-	-
350	/	509.7630	19.19	2	+	+	+	+
351	/	543.3277	19.19	1	+	+	-	-
352	/	565.3103	19.19	1	+	+	-	-
353	/	529.6020	19.40	3	+	+	+	+
354	/	515.2510	19.50	2	+	+	+	+
355	/	512.5736	19.63	3	+	+	+	+
356	/	530.9570	19.63	3	+	+	+	+
357	/	538.2836	19.63	3	+	+	+	+
358	/	543.6046	19.63	3	+	+	+	+
359	/	548.9296	19.63	3	+	+	+	+
360	/	581.2635	19.63	2	+	+	+	+
361	/	507.7421	19.80	2	+	+	+	+
362	/	511.7312	19.81	2	+	+	+	+
363	/	518.7344	19.81	2	+	+	+	+
364	/	526.7177	19.81	2	+	+	+	+
365	/	534.1999	19.81	2	+	+	+	+
366	/	571.3244	19.81	1	+	+	+	-
367	/	528.9272	20.10	3	+	+	+	-
368	/	510.9530	20.13	3	+	+	-	-
369	/	523.6025	20.13	3	+	+	-	-
370	/	528.5910	20.13	3	+	+	-	-

371	/	595.6501	20.13	3	+	+	-	-
372	/	518.2789	20.15	3	+	+	-	-
373	/	513.7482	20.49	2	+	+	+	+
374	/	598.3134	20.60	2	+	+	-	-
375	/	535.6320	21.32	3	+	+	-	-
376	/	591.8236	21.95	2	+	+	+	-
377	/	599.3923	22.27	1	+	+	+	+
378	/	573.3398	23.14	1	+	+	+	+
379	/	511.2845	23.66	2	+	+	+	+
380	/	501.7630	24.02	2	+	+	+	+
381	/	512.7552	24.02	2	+	+	+	+
382	/	520.7371	24.02	2	+	+	+	+
383	/	561.3171	24.91	1	+	+	+	+
384	/	572.3803	25.69	1	+	+	+	+
385	/	544.3862	26.81	1	+	+	+	+
386	/	547.7753	27.08	2	+	+	+	+
387	/	558.7653	27.09	2	+	+	+	+
388	/	574.2337	27.09	2	+	+	+	+
389	/	539.7781	28.50	2	+	+	+	+
390	/	602.3390	8.27	1	+	+	+	+
391	/	604.3075	9.40	1	+	+	+	+
392	/	644.3510	10.06	1	+	+	+	+
393	/	677.3781	10.98	1	+	+	+	+
394	/	694.4061	11.52	1	+	+	+	+
395	/	628.3564	12.10	2	+	+	+	+
396	/	604.2905	12.35	1	+	+	+	+
397	/	618.3392	12.35	1	+	+	+	+
398	/	600.2304	12.78		+	+	+	+
399	/	629.8132	12.78	2	+	+	+	+
400	/	655.3930	13.03	1	+	+	+	+
401	/	696.8466	13.03	2	+	+	+	-
402	/	666.8469	13.20	2	+	+	+	+
403	/	618.3262	13.31	2	+	+	-	-
404	/	602.2936	14.24	1	+	+	+	+
405	/	655.8360	14.50	2	+	+	+	-
406	/	690.8569	14.62	2	+	+	-	-
407	/	607.8255	14.80	2	+	+	+	+
408	/	660.3497	15.00	2	+	+	+	+
409	/	655.3567	15.28	1	+	+	-	+
410	/	607.2546	15.50	1	+	+	+	+
411	/	670.3497	15.50	2	+	+	+	+
412	/	624.3507	15.75	1	+	+	+	+

413	/	643.3687	16.42	1	+	+	+	+
414	/	614.6549	16.68	3	+	+	-	-
415	/	608.3549	16.74	1	+	+	+	+
416	/	654.3494	16.74	2	+	+	-	-
417	/	644.8290	16.75	2	+	+	+	-
418	/	602.3176	17.10	3	+	+	-	+
419	/	621.9774	17.10	3	+	+	+	-
420	/	662.3516	17.34	2	+	+	+	+
421	/	609.8244	17.75	2	+	+	+	+
422	/	647.3307	17.75	1	+	+	+	+
423	/	654.3328	17.94	2	+	+	+	+
424	/	601.3122	18.39	2	+	+	+	+
425	/	600.9833	18.89	3	+	+	-	-
426	/	649.3496	18.89	3	+	+	-	-
427	/	672.3542	18.90	2	+	+	+	+
428	/	698.3878	19.19	1	+	+	-	-
429	/	607.2905	19.63	1	+	+	+	+
430	/	669.3605	19.63	2	+	+	-	-
431	/	649.3000	19.82	1	+	+	+	+
432	/	672.8430	20.00	2	+	+	+	+
433	/	648.3511	20.10	2	+	+	+	+
434	/	600.3867	20.13	1	+	+	+	+
435	/	635.3197	20.13	1	+	+	-	-
436	/	688.4038	20.13	1	+	+	+	+
437	/	683.8020	20.49	2	+	+	+	+
438	/	664.8443	20.70	2	+	+	+	+
439	/	661.3627	20.80	2	+	+	-	-
440	/	621.3747	21.95	1	+	+	+	+
441	/	646.7862	21.95	2	+	+	+	+
442	/	656.8466	21.95	2	+	+	+	+
443	/	603.2689	22.63	2	+	+	+	+
444	/	649.3232	22.63	2	+	+	+	+
445	/	623.8404	23.30	2	+	+	-	-
446	/	641.3310	23.36	2	+	+	+	+
447	/	648.8497	23.36	2	+	+	+	+
448	/	670.4318	23.36	1	+	+	+	+
449	2	675.6632	23.36	3	+	-	-	-
450	/	656.4151	23.66	1	+	+	-	-
451	/	676.8740	26.90	2	+	+	-	-
452	/	745.3828	5.59		+	+	+	+
453	/	767.4245	8.27	1	+	+	+	-
454	/	771.3333	10.39	1	+	+	+	+



455	/	785.4468	10.98	1	+	+	+	-
456	/	726.3605	11.86	1	+	+	+	+
457	/	780.7086	11.86	3	+	+	-	-
458	/	773.3523	12.10		+	+	+	+
459	/	748.3914	12.40	1	+	+	+	+
460	/	731.8613	12.90	2	+	+	-	+
461	/	762.8742	13.03	2	+	+	-	+
462	/	783.4554	13.03	1	+	+	+	+
463	/	723.3107	13.49	1	+	+	+	+
464	/	746.8769	13.70	2	+	+	-	-
465	/	763.8432	13.80	2	+	+	-	-
466	/	724.3671	13.88	2	+	+	-	+
467	/	766.7067	13.88	3	+	+	+	+
468	/	708.6879	14.08	3	+	+	+	+
469	/	718.2710	14.08	1	+	+	+	+
470	/	703.3402	14.46	2	+	+	+	+
471	/	761.0394	14.46	3	+	+	+	+
472	/	778.3712	14.88	2	+	+	+	+
473	/	749.0318	14.89	3	+	+	+	+
474	/	753.8639	14.89	2	+	+	+	+
475	/	767.7089	14.89	3	+	+	+	-
476	/	755.7079	15.33	3	+	+	+	+
477	/	710.8729	15.35	2	+	+	+	+
478	/	745.8657	15.95	2	+	+	-	+
479	/	775.9012	16.04	2	+	+	-	+
480	/	798.9020	16.04	2	+	+	-	+
481	/	733.3679	16.20	2	+	+	-	-
482	/	730.3692	16.42	2	+	+	+	+
483	/	760.8886	16.89	2	+	+	-	-
484	/	732.3417	17.04	1	+	+	+	+
485	/	723.7094	17.26	3	+	+	+	-
486	/	724.0438	17.34	3	+	+	+	-
487	/	718.7115	18.11	3	+	+	+	-
488	/	792.8801	18.34	2	+	+	+	+
489	/	737.6915	18.80	3	+	+	-	-
490	/	708.3562	18.89	2	+	+	+	+
491	/	713.0401	19.05	3	+	+	+	-
492	/	793.8986	19.40	2	+	+	+	+
493	/	795.9306	19.61	2	+	+	+	+
494	/	785.8968	19.81	2	+	+	+	+
495	/	765.9196	20.10	2	+	+	+	-
496	/	726.3114	20.13	2	+	+	+	+

497	/	765.9238	20.13	2	+	+	-	-
498	/	776.9109	20.13	2	+	+	-	-
499	/	784.8969	20.13	2	+	+	+	+
500	/	761.0683	20.49	3	+	+	-	-
501	/	705.8646	21.52	2	+	+	+	-
502	/	753.3849	21.52	2	+	+	-	-
503	/	781.9374	21.52	2	+	+	+	+
504	/	728.4091	22.27	2	+	+	-	-
505	/	781.9127	22.43	2	+	+	+	+
506	4	766.6952	23.36	3	+	-	-	-
507	5	774.0218	23.36	3	+	-	-	-
508	6	784.3392	23.36	3	+	-	-	-
509	/	786.4556	23.66	1	+	+	-	-
510	3	761.3672	24.24	3	+	-	-	-
511	/	757.4285	24.97	1	+	+	+	-
512	/	868.4834	10.62	1	+	+	+	+
513	/	800.3909	11.86	2	+	+	+	-
514	/	811.4634	12.10	1	+	+	+	+
515	/	811.4623	12.27	1	+	+	+	+
516	/	928.4948	12.27	1	+	+	+	+
517	/	811.4610	12.30	1	+	+	+	+
518	/	883.4320	12.40	2	+	+	-	+
519	/	937.5318	13.03	1	+	+	-	-
520	/	811.4614	13.13	1	+	+	+	-
521	/	811.4615	13.20	1	+	+	+	-
522	/	804.8810	13.59	2	+	+	+	+
523	/	854.4121	14.46	2	+	+	+	+
524	/	874.9170	14.46	2	+	+	-	+
525	/	892.5215	14.62	1	+	+	+	+
526	/	868.9328	14.88	2	+	+	-	-
527	/	845.9125	15.33	2	+	+	+	+
528	/	813.4302	15.75	1	+	+	+	+
529	/	823.5000	15.75	1	+	+	+	-
530	/	816.4244	16.24	2	+	+	+	+
531	/	898.5327	16.42	1	+	+	+	+
532	/	825.9096	16.49	2	+	+	-	-
533	/	921.4785	16.68	2	+	+	-	-
534	/	852.4311	17.04	1	+	+	+	+
535	/	834.7436	17.43	3	+	+	+	+
536	/	934.4512	17.75	1	+	+	+	+
537	/	874.7801	17.92	3	+	+	+	+
538	/	804.3942	18.11	2	+	+	-	+

539	/	811.7179	18.34	3	+	+	+	+
540	/	900.9699	18.89	2	+	+	-	-
541	/	829.4146	19.19	2	+	+	-	-
542	/	824.4354	19.63	2	+	+	+	+
543	/	892.9678	20.00	2	+	+	-	-
544	/	841.4766	20.13	1	+	+	+	+
545	/	821.4173	20.49	2	+	+	-	-
546	/	850.4249	21.02	3	+	+	+	+
547	/	976.5327	21.02	1	+	+	-	-
548	/	821.3904	21.20	1	+	+	+	+
549	/	802.9475	21.40	2	+	+	-	-
550	/	845.4240	22.27	3	+	+	+	+
551	/	960.5383	22.63	1	+	+	-	-
552	/	844.4641	23.36	1	+	+	+	-
553	/	926.5504	23.66	1	+	+	+	+
554	7	854.0603	27.08	3	+	-	-	-
555	/	874.5250	31.78	1	+	+	+	+
556	/	1008.4980	12.55	1	+	+	+	-
557	/	1027.4908	13.59	1	+	+	-	+
558	/	1105.5997	13.59	1	+	+	+	+
559	/	1149.5944	14.46	1	+	+	+	+
560	/	1078.5911	14.88	1	+	+	-	-
561	/	1192.6607	15.00	1	+	+	+	+
562	/	1092.5548	16.04	1	+	+	+	+
563	/	1088.5613	17.34	1	+	+	+	+
564	/	1018.5114	19.19	1	+	+	+	+
565	/	1029.4871	19.50	1	+	+	+	+
566	/	1014.4776	19.81	1	+	+	+	+
567	4	1150.0642	23.40	2	+	-	-	-
568	/	1021.5555	23.66		+	+	+	+
569	/	1094.5447	27.08	1	+	+	+	+

**Notes:** The number in the first column is the same as Fig. 1. Candidates were firstly screened from BPC of standard substance of donkey-hide. Subsequently, they further confirmed by comparing EIC of four animal species. “+” indicates that the marker candidate was detected by UPLC-Q-TOF-MS. “-” indicates that the marker candidate was not detected. These marker candidates showed two/three/four charges and were deduced to be peptides.

**Supplementary Table S2**

Markers selection for horse-hide gelatin from peptide fragments based on trypsin digestion followed by LC-Q-TOF-MS analysis.

Horse marker No.	m/z	RT (min)	Charge	Donkey	Horse	Cattle	Pig
/	189.1288	5.31	1	+	+	+	+
/	216.6198	8.26	2	+	+	+	+
/	219.1404	10.98	1	+	+	+	+
/	223.1141	8.27	1	+	+	+	+
/	224.1352	31.00	1	+	+	+	+
/	228.6384	5.31	2	+	+	+	+

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/	229.6280	12.09	2	+	+	+	+
/	231.1762	10.44	1	+	+	+	+
/	231.1771	7.77		+	+	+	+
/	233.1565	5.55	1	+	+	+	+
/	234.1024	22.27		+	+	+	+
/	236.6544	9.34	2	+	+	+	+
/	237.6260	10.08	2	+	+	+	+
/	237.6447	5.31	2	+	+	+	+
/	242.1565	10.08	1	+	+	+	+
/	243.1408	15.75	1	+	+	+	+
/	245.1925	14.24	1	+	+	+	+
/	245.1925	15.38	1	+	+	+	+
/	249.6631	10.08	2	+	+	+	+
/	250.1855	32.78	1	+	+	+	+
/	258.1766	10.10	2	+	+	+	+
/	260.1678	9.58	1	+	+	+	+
/	260.2043	6.27	1	+	+	+	+
/	265.1621	13.32	1	+	+	+	+
/	267.6266	6.27	2	+	+	+	+
/	270.2001	10.08	1	+	+	+	+
/	272.1795	9.40	1	+	+	+	+
/	272.6535	12.27	2	+	+	+	+
/	274.1954	10.08	1	+	+	+	+
/	276.1632	7.57	1	+	+	+	+
/	277.1257	9.74	1	+	+	+	+
/	278.6662	12.50	2	+	+	+	+
/	279.1418	17.53	1	+	+	+	+
/	279.1777	18.20	1	+	+	+	+
/	281.1213	10.08	1	+	+	+	+
/	281.1566	5.59	1	+	+	+	+
/	283.8095	12.27	2	+	+	+	+
/	288.2009	20.49		+	+	+	+
/	288.2116	6.30		+	+	+	+
/	290.1784	6.30		+	+	+	+
/	292.6630	12.27	2	+	+	+	+
/	295.1730	10.98	1	+	+	+	+
/	295.1740	10.08	1	+	+	+	+
/	297.6402	12.50	2	+	+	+	+
/	300.6175	12.78	2	+	+	+	+
/	301.1832	6.30	2	+	+	+	+
/	301.6758	8.27	2	+	+	+	+
/	301.6768	14.24	2	+	+	+	+

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/	302.1801	10.08	1	+	+	+	+
/	302.2159	19.22	1	+	+	+	+
/	302.2166	18.21	1	+	+	+	+
/	303.6207	6.30	1	+	+	+	+
/	305.6956	11.52	2	+	+	+	+
/	306.1484	23.08	2	+	+	+	+
/	306.1739	6.30		+	+	+	+
/	309.6738	12.35	2	+	+	+	+
/	312.8329	16.42	3	+	+	+	+
/	314.6831	12.07	2	+	+	+	+
/	314.7013	11.46	2	+	+	+	-
/	316.2312	19.63	1	+	+	+	+
/	317.1910	6.30	3	+	+	+	+
/	320.1733	14.88	1	+	+	+	+
/	320.1866	8.27	1	+	+	+	-
/	320.2031	12.78	3	+	+	+	+
/	321.1797	13.31	2	+	+	+	-
/	321.1817	5.59	1	+	+	+	+
/	322.6805	10.06	2	+	+	+	+
/	322.8205	12.27	3	+	+	+	+
/	323.1587	6.30		+	+	+	+
/	323.4940	6.30		+	+	+	+
/	324.1811	5.59	2	+	+	+	+
/	325.6760	8.17	2	+	+	-	-
/	327.8098	12.27	3	+	+	+	+
/	329.1909	6.30	2	+	+	+	+
/	329.2007	5.31	1	+	+	+	+
/	329.2282	15.00	2	+	+	+	+
/	330.1635	19.95	1	+	+	+	+
/	330.2011	12.78	2	+	+	+	+
/	332.2266	14.24	1	+	+	+	+
/	332.2273	18.89	1	+	+	+	+
/	335.1611	21.76	3	+	+	+	+
/	337.1392	20.13	2	+	+	-	-
/	338.8360	21.02		+	+	-	-
/	339.1935	10.87	2	+	+	+	+
/	339.6729	11.52	2	+	+	+	+
/	343.2051	12.27		+	+	+	+
/	344.2632	20.16	1	+	+	+	+
/	345.1529	9.63	1	+	+	+	+
/	345.2333	5.31	1	+	+	+	+
/	347.2014	7.77	1	+	+	+	+

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/	347.7072	11.46	2	+	+	+	+
/	350.1806	9.63	1	+	+	+	+
/	350.6348	14.08	2	+	+	+	+
/	353.4912	14.88	3	+	+	+	+
/	359.2392	10.08	1	+	+	+	+
/	359.6404	14.08	2	+	+	+	+
/	365.8721	8.27		+	+	+	-
/	366.2176	17.35	2	+	+	+	+
/	369.2061	13.59	3	+	+	+	+
/	369.7033	6.30	2	+	+	+	+
/	371.2385	10.98	1	+	+	+	+
/	371.7236	16.41	2	+	+	+	+
/	372.2159	10.36	2	+	+	+	+
/	372.6956	5.59	2	+	+	+	+
/	372.8516	14.88	3	+	+	-	-
/	373.2899	6.30	1	+	+	+	+
/	374.2389	18.89	1	+	+	+	+
/	374.7011	12.41	2	+	+	+	+
/	374.8536	14.46	3	+	+	+	+
/	375.2342	7.77	1	+	+	+	+
/	377.1926	13.59	1	+	+	+	+
/	377.1953	11.46	1	+	+	+	+
/	377.8407	14.88	3	+	+	-	-
/	378.6137	14.08	2	+	+	+	+
/	379.2181	24.94	2	+	+	+	+
/	379.7035	10.98	2	+	+	+	+
/	379.8415	14.46	3	+	+	+	+
/	381.8550	13.59	3	+	+	+	+
/	382.5030	14.46	3	+	+	+	+
/	383.7419	15.00	2	+	+	+	-
/	384.2149	8.64	2	+	+	+	-
/	385.2063	8.27	2	+	+	+	+
/	385.2297	10.08	1	+	+	+	+
/	385.2661	9.40	1	+	+	+	+
/	385.5505	13.59	3	+	+	-	-
1	386.2108	10.36	2	-	+	-	-
/	386.8436	13.59	3	+	+	+	+
/	387.8462	19.63	3	+	+	+	+
/	388.2293	6.30		+	+	+	+
/	388.2296	12.27		+	+	+	+
/	389.2488	11.01	1	+	+	+	+
/	390.2222	10.60	2	+	+	+	+

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/	390.8836	12.91	3	+	+	-	-
/	391.1910	5.31	1	+	+	+	+
/	391.2092	18.32	1	+	+	+	+
/	392.2315	13.05	2	+	+	+	+
/	392.9530	20.13	4	+	+	-	-
/	393.2091	9.40	2	+	+	+	+
/	393.2267	11.01	2	+	+	+	-
/	393.7321	23.66	2	+	+	-	-
/	395.6893	8.94	2	+	+	+	+
/	396.2707	14.62	1	+	+	+	+
/	396.6962	20.13	4	+	+	+	-
/	398.1658	6.30		+	+	-	+
/	398.2194	10.08		+	+	+	-
/	398.2272	15.00	3	+	+	+	+
/	398.2504	14.18	1	+	+	+	+
/	399.2711	17.34	1	+	+	+	+
/	400.2297	9.40	1	+	+	+	+
/	400.2298	12.78	2	+	+	+	+
/	402.2567	10.08	1	+	+	+	+
/	402.5164	22.63	3	+	+	+	+
/	403.2657	15.00	1	+	+	+	+
/	403.2657	16.04	1	+	+	-	-
/	404.2236	9.40	1	+	+	+	+
/	404.4604	19.63	4	+	+	+	+
/	405.2085	10.36		+	+	-	-
/	405.2186	9.63	2	+	+	+	+
/	406.2352	13.25	2	+	+	+	-
/	406.2358	12.21	2	+	+	+	+
/	407.2195	15.76	2	+	+	+	+
/	407.9573	19.63	4	+	+	+	+
/	410.8747	15.00	3	+	+	+	+
/	411.2322	10.98	1	+	+	+	+
/	411.6992	19.63	4	+	+	+	+
/	412.2536	16.04	2	+	+	+	+
/	412.2540	15.75	2	+	+	+	+
/	413.2410	14.18	2	+	+	+	+
/	413.2866	21.76	1	+	+	+	+
/	414.2108	14.52	2	+	+	-	-
/	414.2413	14.88	3	+	+	+	+
/	414.2457	12.27	1	+	+	+	+
/	415.2447	22.63	1	+	+	+	+
/	415.8626	15.00	3	+	+	+	+

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/	418.2195	17.95	1	+	+	+	+
/	418.7339	10.36	2	+	+	+	+
/	420.1979	13.01	1	+	+	+	+
/	421.2412	12.45	2	+	+	+	+
/	421.2432	20.13	2	+	+	+	+
/	421.2612	15.00	2	+	+	+	+
/	421.7331	9.63	2	+	+	+	+
/	422.2127	5.31	1	+	+	+	+
/	426.7299	8.94	2	+	+	+	+
/	427.7383	11.01	2	+	+	-	-
/	427.7393	10.98	2	+	+	-	-
/	429.2457	22.30	1	+	+	+	+
/	429.2826	21.01	1	+	+	+	+
/	430.2411	12.78	1	+	+	+	+
/	430.2775	20.63	1	+	+	+	+
/	431.2253	13.59	2	+	+	+	+
/	431.2478	6.30	1	+	+	+	+
/	431.5276	21.95	3	+	+	+	+
/	432.2315	8.27	1	+	+	+	+
/	434.2619	17.34	2	+	+	+	+
/	434.7471	10.81	2	+	+	+	+
/	437.7673	31.77	2	+	+	+	+
/	441.2521	20.49	2	+	+	+	+
/	441.7730	18.54	2	+	+	+	+
/	442.7441	12.27	2	+	+	+	+
/	443.2353	6.30	1	+	+	+	+
/	444.2303	10.08	2	+	+	+	+
/	444.2936	20.49	1	+	+	+	+
/	445.2527	7.80	1	+	+	+	+
/	446.2717	8.27	1	+	+	+	+
/	446.2722	16.69	1	+	+	+	+
/	446.5774	19.63	3	+	+	-	-
/	446.7472	11.52	2	+	+	+	+
/	446.7659	14.62	2	+	+	+	+
/	447.2085	13.59	1	+	+	+	+
/	447.2105	6.30	1	+	+	+	+
/	447.2542	14.60	1	+	+	+	+
/	448.2467	10.36	2	+	+	+	+
/	449.7704	16.48	2	+	+	+	+
/	451.2280	22.27	1	+	+	+	+
/	453.2203	12.27		+	+	+	+
/	454.7644	13.80	2	+	+	+	+

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/	455.2042	19.61	1	+	+	+	+
2	455.2539	10.90	2	-	+	-	-
/	456.2434	8.94	2	+	+	+	+
/	456.2456	13.15	2	+	+	+	+
/	456.2925	23.26	1	+	+	+	+
/	457.2030	14.88	2	+	+	+	+
/	457.7509	12.27	2	+	+	+	+
/	458.2476	12.10	2	+	+	+	+
/	459.1892	12.27	2	+	+	+	+
/	459.2278	19.63	3	+	+	+	+
/	459.2678	10.98	1	+	+	+	+
/	459.2685	5.59	1	+	+	+	+
/	459.2935	21.96	1	+	+	+	+
/	460.4769	18.89	4	+	+	-	-
/	461.2554	11.46	2	+	+	-	-
/	462.2302	6.30	1	+	+	+	+
/	462.2472	19.19	1	+	+	+	+
/	464.2263	13.90	1	+	+	+	+
/	464.4752	18.89	4	+	+	-	-
/	464.7522	12.26	2	+	+	+	+
/	465.2464	14.88	1	+	+	+	+
/	467.7294	17.95	2	+	+	+	+
/	467.7517	11.01	2	+	+	+	+
/	468.2369	11.52	1	+	+	+	+
/	469.2535	10.08	2	+	+	-	-
/	469.2711	13.03	2	+	+	-	-
/	471.7388	12.84	2	+	+	+	+
/	472.2880	13.31	1	+	+	+	+
/	472.2893	21.02	1	+	+	+	+
/	472.2992	9.40	1	+	+	+	+
/	472.5596	18.89	3	+	+	+	+
/	473.2079	18.21	2	+	+	+	+
/	473.2346	5.59		+	+	+	-
/	474.2428	11.52	1	+	+	+	+
/	474.2429	10.08	1	+	+	+	+
/	474.2679	12.27	2	+	+	+	+
/	474.2682	12.27	1	+	+	+	+
/	474.2799	5.31	1	+	+	+	+
/	475.7502	10.57	2	+	+	+	+
/	476.2273	18.89	1	+	+	+	+
/	476.2476	12.35	2	+	+	+	+
/	478.2575	16.50	2	+	+	-	+

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/	478.7565	13.59	2	+	+	+	+
/	479.2622	17.50	1	+	+	+	+
/	479.7979	12.78	2	+	+	+	+
/	480.2565	21.76	1	+	+	+	+
/	480.7737	22.63	2	+	+	-	-
/	484.2314	6.30	2	+	+	+	+
/	486.3042	14.60	1	+	+	+	+
/	486.3052	14.62	1	+	+	+	+
/	488.7716	21.02	2	+	+	-	-
/	490.2600	5.59		+	+	+	+
/	491.7648	22.63	2	+	+	-	-
/	492.5855	12.10	3	+	+	-	-
/	493.2424	19.19	1	+	+	+	+
/	498.7538	9.63	2	+	+	+	+
/	499.2625	7.80	1	+	+	+	+
/	499.2998	14.24	1	+	+	-	-
/	499.7645	21.01	2	+	+	+	+
/	501.2429	6.30	1	+	+	+	+
/	501.7630	24.02	2	+	+	+	+
/	504.7541	12.50	2	+	+	+	-
/	507.7421	19.80	2	+	+	+	+
/	508.2906	15.50	1	+	+	+	+
/	509.7630	19.19	2	+	+	+	+
/	510.2391	16.77	2	+	+	+	+
/	510.9530	20.13	3	+	+	-	-
/	511.2845	23.66	2	+	+	+	+
/	511.7312	19.81	2	+	+	+	+
/	512.2539	16.68	2	+	+	+	+
/	512.5736	19.63	3	+	+	+	+
/	512.7552	24.02	2	+	+	+	+
/	513.7482	20.49	2	+	+	+	+
/	514.2510	13.59	2	+	+	-	+
/	515.2510	19.50	2	+	+	+	+
/	515.3429	10.06	1	+	+	+	+
/	517.6038	16.04	3	+	+	-	+
/	518.2789	20.15	3	+	+	-	-
/	518.7344	19.81	2	+	+	+	+
/	520.7371	24.02	2	+	+	+	+
/	520.9586	20.16	3	-	+	+	-
/	523.6025	20.13	3	+	+	-	-
/	524.7756	11.14	2	-	+	+	-
/	524.8132	17.94	2	+	+	+	-

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/	526.2750	5.31	1	+	+	+	+
/	526.7177	19.81	2	+	+	+	+
/	527.2957	12.10	1	+	+	+	+
/	528.5910	20.13	3	+	+	-	-
/	528.9272	20.10	3	+	+	+	-
/	529.6020	19.40	3	+	+	+	+
/	530.7887	18.89	2	+	+	+	+
/	530.9570	19.63	3	+	+	+	+
/	531.2907	12.27	1	+	+	+	+
/	531.7855	12.78	2	+	+	+	+
/	531.7965	13.21	2	+	+	-	-
/	532.2520	18.39	2	+	+	-	-
/	534.1999	19.81	2	+	+	+	+
/	534.2432	6.30	1	+	+	+	+
/	535.2696	14.08	1	+	+	+	+
/	535.6320	21.32	3	+	+	-	-
/	535.8036	17.75	2	+	+	+	+
/	536.7798	12.35	2	+	+	+	-
/	538.2274	12.65	2	+	+	+	+
/	538.2836	19.63	3	+	+	+	+
/	538.7866	17.27	2	+	+	+	+
/	539.7781	28.50	2	+	+	+	+
/	539.7992	14.82	2	+	+	-	-
/	542.7990	14.46	2	+	+	+	+
/	543.3277	19.19	1	+	+	-	-
/	543.6046	19.63	3	+	+	+	+
/	544.2973	12.40	1	+	+	+	+
/	544.3862	26.81	1	+	+	+	+
/	544.7864	16.68	2	+	+	+	+
/	544.7866	17.43	2	+	+	+	+
/	545.3081	14.46	2	+	+	+	+
/	546.7834	16.04	2	+	+	+	+
/	547.7753	27.08	2	+	+	+	+
/	548.9296	19.63	3	+	+	+	+
/	550.7959	14.24	2	+	+	+	+
/	552.6142	12.58	3	+	+	+	+
3	552.7825	15.98	2	-	+	-	-
/	553.3052	13.59	2	+	+	+	+
/	553.7987	13.56	2	+	+	+	+
/	555.7896	14.46	2	+	+	-	-
/	556.3212	12.55	1	+	+	+	+
/	556.6228	13.31	3	+	+	-	-

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/	556.7927	17.20	2	+	+	+	+
/	558.3128	5.59		+	+	+	+
/	558.7653	27.09	2	+	+	+	+
/	560.3174	13.31	1	+	+	+	+
/	561.3171	24.91	1	+	+	+	+
/	562.2794	12.78	1	+	+	+	+
/	563.8012	17.94	2	+	+	+	+
/	564.2834	15.75	1	+	+	+	+
/	564.2942	13.60	2	+	+	+	+
/	565.3103	19.19	1	+	+	-	-
/	568.2868	6.30	1	+	+	+	+
/	569.6130	14.46	3	+	+	+	+
/	569.7932	10.06	2	+	+	+	+
/	570.3125	12.10	1	+	+	+	+
/	571.2687	13.00	1	-	+	+	+
/	571.2819	12.27	1	+	+	+	+
/	571.3244	19.81	1	+	+	+	-
/	572.2779	13.60	2	+	+	+	+
/	572.3803	25.69	1	+	+	+	+
/	573.2504	14.46	2	+	+	+	+
/	573.2644	5.31	1	+	+	+	+
/	573.3398	23.14	1	+	+	+	+
/	574.2337	27.09	2	+	+	+	+
/	575.3018	14.46	2	+	+	+	+
/	577.8215	13.75	2	+	+	-	-
/	578.2752	5.31	1	+	+	+	+
/	578.3000	12.27	2	+	+	+	+
/	578.3056	12.53	1	+	+	+	+
/	579.6278	15.28	3	+	+	-	-
/	579.7647	13.59	2	+	+	+	+
/	581.2635	19.63	2	+	+	+	+
/	581.3193	11.52	1	+	+	+	+
/	581.8293	17.50	2	+	+	+	+
/	583.6149	14.46	3	+	+	-	+
/	583.8135	12.10	2	+	+	+	+
/	584.3129	6.30		+	+	+	+
/	585.3025	15.28	1	+	+	-	-
/	586.3359	16.42	1	+	+	+	+
/	587.1737	14.08	1	+	+	+	+
/	587.3193	16.26	1	+	+	+	-
/	588.8368	16.04	2	+	+	+	+
/	589.2899	12.40	3	+	+	-	+

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/	589.3338	15.44	1	+	+	+	+
/	591.8236	21.95	2	+	+	+	-
/	591.8301	14.95	2	+	+	-	-
/	594.2725	14.46	2	+	+	+	+
/	595.6501	20.13	3	+	+	-	-
/	596.3298	12.10	1	+	+	+	+
/	596.8323	14.97	2	+	+	+	+
/	598.3134	20.60	2	+	+	-	-
/	599.3923	22.27	1	+	+	+	+
/	599.8293	14.00	2	+	+	-	-
/	600.2304	12.78		+	+	+	+
/	600.3867	20.13	1	+	+	+	+
/	600.9833	18.89	3	+	+	-	-
/	601.3122	18.39	2	+	+	+	+
/	602.2936	14.24	1	+	+	+	+
/	602.3176	17.10	3	+	+	-	+
/	602.3390	8.27	1	+	+	+	+
/	603.2689	22.63	2	+	+	+	+
/	604.2905	12.35	1	+	+	+	+
/	604.3075	9.40	1	+	+	+	+
/	607.2546	15.50	1	+	+	+	+
/	607.2905	19.63	1	+	+	+	+
/	607.8255	14.80	2	+	+	+	+
/	608.3549	16.74	1	+	+	+	+
/	609.8244	17.75	2	+	+	+	+
/	614.6549	16.68	3	+	+	-	-
/	618.3262	13.31	2	+	+	-	-
/	618.3392	12.35	1	+	+	+	+
/	621.3747	21.95	1	+	+	+	+
/	621.9774	17.10	3	+	+	+	-
/	623.8404	23.30	2	+	+	-	-
/	624.3507	15.75	1	+	+	+	+
/	628.3564	12.10	2	+	+	+	+
/	629.8132	12.78	2	+	+	+	+
/	635.3197	20.13	1	+	+	-	-
/	641.3310	23.36	2	+	+	+	+
/	643.3687	16.42	1	+	+	+	+
/	644.3510	10.06	1	+	+	+	+
/	644.8290	16.75	2	+	+	+	-
/	646.7862	21.95	2	+	+	+	+
/	647.3307	17.75	1	+	+	+	+
/	648.3511	20.10	2	+	+	+	+

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/	648.8497	23.36	2	+	+	+	+
/	649.3000	19.82	1	+	+	+	+
/	649.3232	22.63	2	+	+	+	+
/	649.3496	18.89	3	+	+	-	-
/	654.3328	17.94	2	+	+	+	+
/	654.3494	16.74	2	+	+	-	-
/	655.3567	15.28	1	+	+	-	+
/	655.3930	13.03	1	+	+	+	+
/	655.8360	14.50	2	+	+	+	-
/	656.4151	23.66	1	+	+	-	-
/	656.8466	21.95	2	+	+	+	+
/	660.3497	15.00	2	+	+	+	+
/	661.3627	20.80	2	+	+	-	-
/	662.3516	17.34	2	+	+	+	+
/	664.8443	20.70	2	+	+	+	+
/	666.8469	13.20	2	+	+	+	+
/	669.3605	19.63	2	+	+	-	-
/	670.3497	15.50	2	+	+	+	+
/	670.4318	23.36	1	+	+	+	+
/	672.3542	18.90	2	+	+	+	+
/	672.8430	20.00	2	+	+	+	+
/	676.8740	26.90	2	+	+	-	-
/	677.3781	10.98	1	+	+	+	+
/	683.8020	20.49	2	+	+	+	+
/	688.4038	20.13	1	+	+	+	+
/	690.3999	25.69	1	-	+	+	-
/	690.8569	14.62	2	+	+	-	-
/	694.4061	11.52	1	+	+	+	+
/	696.8466	13.03	2	+	+	+	-
/	698.3878	19.19	1	+	+	-	-
/	703.3402	14.46	2	+	+	+	+
/	705.8646	21.52	2	+	+	+	-
/	708.3562	18.89	2	+	+	+	+
/	708.6879	14.08	3	+	+	+	+
/	710.8729	15.35	2	+	+	+	+
/	713.0401	19.05	3	+	+	+	-
4	716.4201	27.31	1	-	+	-	-
/	718.2710	14.08	1	+	+	+	+
/	718.7115	18.11	3	+	+	+	-
/	723.3107	13.49	1	+	+	+	+
/	723.7094	17.26	3	+	+	+	-
/	724.0438	17.34	3	+	+	+	-

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/	724.3671	13.88	2	+	+	-	+
/	726.3114	20.13	2	+	+	+	+
/	726.3605	11.86	1	+	+	+	+
/	728.4091	22.27	2	+	+	-	-
/	730.3692	16.42	2	+	+	+	+
/	731.8613	12.90	2	+	+	-	+
/	732.3417	17.04	1	+	+	+	+
/	733.3679	16.20	2	+	+	-	-
/	737.6915	18.80	3	+	+	-	-
/	745.3828	5.59		+	+	+	+
/	745.8657	15.95	2	+	+	-	+
/	745.8669	15.33	2	-	+	+	-
/	746.8769	13.70	2	+	+	-	-
/	748.3914	12.40	1	+	+	+	+
/	749.0318	14.89	3	+	+	+	+
/	753.3849	21.52	2	+	+	-	-
/	753.8639	14.89	2	+	+	+	+
/	755.7079	15.33	3	+	+	+	+
/	757.4285	24.97	1	+	+	+	-
/	760.8886	16.89	2	+	+	-	-
/	761.0394	14.46	3	+	+	+	+
/	761.0683	20.49	3	+	+	-	-
/	762.3766	22.94	3	-	+	-	+
/	762.8742	13.03	2	+	+	-	+
/	763.8432	13.80	2	+	+	-	-
/	765.9196	20.10	2	+	+	+	-
/	765.9238	20.13	2	+	+	-	-
/	766.7067	13.88	3	+	+	+	+
/	767.4245	8.27	1	+	+	+	-
/	767.7089	14.89	3	+	+	+	-
/	771.3333	10.39	1	+	+	+	+
/	773.3523	12.10		+	+	+	+
/	775.9012	16.04	2	+	+	-	+
/	776.9109	20.13	2	+	+	-	-
/	778.3712	14.88	2	+	+	+	+
/	780.7086	11.86	3	+	+	-	-
/	780.9306	20.10	2	-	+	+	+
/	781.9127	22.43	2	+	+	+	+
/	781.9374	21.52	2	+	+	+	+
/	783.4554	13.03	1	+	+	+	+
/	784.8969	20.13	2	+	+	+	+
/	785.4468	10.98	1	+	+	+	-

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/	785.8968	19.81	2	+	+	+	+
/	786.4556	23.66	1	+	+	-	-
/	790.9093	15.95	2	-	+	+	-
/	792.8801	18.34	2	+	+	+	+
/	793.8986	19.40	2	+	+	+	+
/	795.9306	19.61	2	+	+	+	+
/	798.9020	16.04	2	+	+	-	+
/	800.3909	11.86	2	+	+	+	-
/	802.9475	21.40	2	+	+	-	-
/	804.3942	18.11	2	+	+	-	+
/	804.8810	13.59	2	+	+	+	+
/	811.4610	12.30	1	+	+	+	+
/	811.4614	13.13	1	+	+	+	-
/	811.4615	13.20	1	+	+	+	-
/	811.4623	12.27	1	+	+	+	+
/	811.4634	12.10	1	+	+	+	+
/	811.7179	18.34	3	+	+	+	+
/	813.4302	15.75	1	+	+	+	+
/	816.4244	16.24	2	+	+	+	+
/	821.3904	21.20	1	+	+	+	+
/	821.4173	20.49	2	+	+	-	-
/	823.5000	15.75	1	+	+	+	-
/	824.4354	19.63	2	+	+	+	+
/	825.9096	16.49	2	+	+	-	-
/	829.4146	19.19	2	+	+	-	-
/	834.7436	17.43	3	+	+	+	+
/	841.4766	20.13	1	+	+	+	+
/	842.9218	18.95	2	-	+	+	-
/	844.4641	23.36	1	+	+	+	-
/	845.4240	22.27	3	+	+	+	+
/	845.9125	15.33	2	+	+	+	+
/	849.7429	26.80	3	-	+	-	+
/	850.4249	21.02	3	+	+	+	+
/	852.4311	17.04	1	+	+	+	+
/	854.4121	14.46	2	+	+	+	+
/	868.4834	10.62	1	+	+	+	+
/	868.9328	14.88	2	+	+	-	-
/	874.5250	31.78	1	+	+	+	+
/	874.7801	17.92	3	+	+	+	+
/	874.9170	14.46	2	+	+	-	+
/	883.4320	12.40	2	+	+	-	+
/	892.5215	14.62	1	+	+	+	+

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/	892.9678	20.00	2	+	+	-	-
/	898.5327	16.42	1	+	+	+	+
/	900.9699	18.89	2	+	+	-	-
/	921.4785	16.68	2	+	+	-	-
/	926.5504	23.66	1	+	+	+	+
/	928.4948	12.27	1	+	+	+	+
/	934.4512	17.75	1	+	+	+	+
/	937.5318	13.03	1	+	+	-	-
/	960.5383	22.63	1	+	+	-	-
/	976.5327	21.02	1	+	+	-	-
/	1008.4980	12.55	1	+	+	+	-
/	1014.4776	19.81	1	+	+	+	+
/	1018.5114	19.19	1	+	+	+	+
/	1021.5555	23.66		+	+	+	+
/	1027.4908	13.59	1	+	+	-	+
/	1029.4871	19.50	1	+	+	+	+
/	1078.5911	14.88	1	+	+	-	-
/	1088.5613	17.34	1	+	+	+	+
/	1092.5548	16.04	1	+	+	+	+
/	1094.5447	27.08	1	+	+	+	+
/	1105.5997	13.59	1	+	+	+	+
/	1149.5944	14.46	1	+	+	+	+
/	1192.6607	15.00	1	+	+	+	+

**Notes:** Candidates were firstly screened from BPC of home-made horse-hide gelatin. Subsequently, they further confirmed by comparing EIC of four animal species. “+” indicates that the marker candidate was detected by UPLC-Q-TOF-MS. “-” indicates that the marker candidate was not detected. These marker candidates showed two/three/four charges and were deduced to be peptides.

**Supplementary Table S3**

Markers selection for cattle-hide gelatin from peptide fragments based on trypsin digestion followed by LC-Q-TOF-MS analysis.

Cattle marker No.	m/z	RT (min)	Charge	Donkey	Horse	Cattle	Pig
/	189.1288	5.31	1	+	+	+	+
/	216.6198	8.26	2	+	+	+	+
/	219.1404	10.98	1	+	+	+	+
/	223.1141	8.27	1	+	+	+	+
/	224.1352	31.00	1	+	+	+	+
/	228.6384	5.31	2	+	+	+	+
/	229.6280	12.09	2	+	+	+	+
/	231.1762	10.44	1	+	+	+	+
/	231.1771	7.77		+	+	+	+
/	233.1565	5.55	1	+	+	+	+
/	234.1024	22.27		+	+	+	+
/	236.6544	9.34	2	+	+	+	+
/	237.6260	10.08	2	+	+	+	+
/	237.6447	5.31	2	+	+	+	+
/	242.1565	10.08	1	+	+	+	+
/	243.1408	15.75	1	+	+	+	+
/	245.1925	14.24	1	+	+	+	+
/	245.1925	15.38	1	+	+	+	+

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/	249.6631	10.08	2	+	+	+	+
/	250.1855	32.78	1	+	+	+	+
/	258.1766	10.10	2	+	+	+	+
/	260.1678	9.58	1	+	+	+	+
/	260.2043	6.27	1	+	+	+	+
/	265.1621	13.32	1	+	+	+	+
/	267.6266	6.27	2	+	+	+	+
/	270.2001	10.08	1	+	+	+	+
/	272.1795	9.40	1	+	+	+	+
/	272.6535	12.27	2	+	+	+	+
/	274.1954	10.08	1	+	+	+	+
/	276.1632	7.57	1	+	+	+	+
/	277.1257	9.74	1	+	+	+	+
/	278.6662	12.50	2	+	+	+	+
/	279.1418	17.53	1	+	+	+	+
/	279.1777	18.20	1	+	+	+	+
/	281.1213	10.08	1	+	+	+	+
/	281.1566	5.59	1	+	+	+	+
/	283.8095	12.27	2	+	+	+	+
/	288.2009	20.49		+	+	+	+
/	288.2116	6.30		+	+	+	+
/	290.1784	6.30		+	+	+	+
/	292.6630	12.27	2	+	+	+	+
/	295.1730	10.98	1	+	+	+	+
/	295.1740	10.08	1	+	+	+	+
/	297.6402	12.50	2	+	+	+	+
/	300.6175	12.78	2	+	+	+	+
/	301.1832	6.30	2	+	+	+	+
/	301.6758	8.27	2	+	+	+	+
/	301.6768	14.24	2	+	+	+	+
/	302.1801	10.08	1	+	+	+	+
/	302.2159	19.22	1	+	+	+	+
/	302.2166	18.21	1	+	+	+	+
/	303.6207	6.30	1	+	+	+	+
/	305.6956	11.52	2	+	+	+	+
/	306.1484	23.08	2	+	+	+	+
/	306.1739	6.30		+	+	+	+
/	309.6738	12.35	2	+	+	+	+
/	312.8329	16.42	3	+	+	+	+
/	314.6831	12.07	2	+	+	+	+
/	314.7013	11.46	2	+	+	+	-
/	316.2312	19.63	1	+	+	+	+

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/	317.1910	6.30	3	+	+	+	+
/	320.1733	14.88	1	+	+	+	+
/	320.1866	8.27	1	+	+	+	-
/	320.2031	12.78	3	+	+	+	+
/	321.1797	13.31	2	+	+	+	-
/	321.1817	5.59	1	+	+	+	+
/	322.6805	10.06	2	+	+	+	+
/	322.8205	12.27	3	+	+	+	+
/	323.1587	6.30		+	+	+	+
/	323.4940	6.30		+	+	+	+
/	324.1811	5.59	2	+	+	+	+
/	327.8098	12.27	3	+	+	+	+
/	329.1909	6.30	2	+	+	+	+
/	329.2007	5.31	1	+	+	+	+
/	329.2282	15.00	2	+	+	+	+
/	330.1635	19.95	1	+	+	+	+
/	330.2011	12.78	2	+	+	+	+
/	332.2266	14.24	1	+	+	+	+
/	332.2273	18.89	1	+	+	+	+
/	335.1611	21.76	3	+	+	+	+
/	339.1935	10.87	2	+	+	+	+
/	339.6729	11.52	2	+	+	+	+
/	343.2051	12.27		+	+	+	+
/	344.2632	20.16	1	+	+	+	+
/	345.1529	9.63	1	+	+	+	+
/	345.2333	5.31	1	+	+	+	+
/	347.2014	7.77	1	+	+	+	+
/	347.7072	11.46	2	+	+	+	+
/	350.1806	9.63	1	+	+	+	+
/	350.6348	14.08	2	+	+	+	+
/	353.4912	14.88	3	+	+	+	+
/	359.2392	10.08	1	+	+	+	+
/	359.6404	14.08	2	+	+	+	+
/	365.8721	8.27		+	+	+	-
/	366.2176	17.35	2	+	+	+	+
/	369.2061	13.59	3	+	+	+	+
/	369.7033	6.30	2	+	+	+	+
/	371.2385	10.98	1	+	+	+	+
/	371.7236	16.41	2	+	+	+	+
/	372.2159	10.36	2	+	+	+	+
/	372.6956	5.59	2	+	+	+	+
/	373.2899	6.30	1	+	+	+	+

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/	374.2389	18.89	1	+	+	+	+
/	374.7011	12.41	2	+	+	+	+
/	374.8536	14.46	3	+	+	+	+
/	375.2342	7.77	1	+	+	+	+
/	377.1926	13.59	1	+	+	+	+
/	377.1953	11.46	1	+	+	+	+
/	378.6137	14.08	2	+	+	+	+
/	379.2181	24.94	2	+	+	+	+
/	379.7035	10.98	2	+	+	+	+
/	379.8415	14.46	3	+	+	+	+
/	381.8550	13.59	3	+	+	+	+
/	382.5030	14.46	3	+	+	+	+
/	383.7419	15.00	2	+	+	+	-
/	384.2149	8.64	2	+	+	+	-
/	385.2063	8.27	2	+	+	+	+
/	385.2297	10.08	1	+	+	+	+
/	385.2661	9.40	1	+	+	+	+
/	386.8436	13.59	3	+	+	+	+
/	387.8462	19.63	3	+	+	+	+
/	388.2293	6.30		+	+	+	+
/	388.2296	12.27		+	+	+	+
/	389.2488	11.01	1	+	+	+	+
/	390.2222	10.60	2	+	+	+	+
/	391.1910	5.31	1	+	+	+	+
/	391.2092	18.32	1	+	+	+	+
/	392.2315	13.05	2	+	+	+	+
/	393.2091	9.40	2	+	+	+	+
/	393.2267	11.01	2	+	+	+	-
/	395.6893	8.94	2	+	+	+	+
/	396.2707	14.62	1	+	+	+	+
/	396.6962	20.13	4	+	+	+	-
/	398.2194	10.08		+	+	+	-
/	398.2272	15.00	3	+	+	+	+
/	398.2504	14.18	1	+	+	+	+
/	399.2711	17.34	1	+	+	+	+
/	400.2297	9.40	1	+	+	+	+
/	400.2298	12.78	2	+	+	+	+
/	402.2567	10.08	1	+	+	+	+
/	402.5164	22.63	3	+	+	+	+
/	403.2657	15.00	1	+	+	+	+
/	404.2236	9.40	1	+	+	+	+
/	404.4604	19.63	4	+	+	+	+

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/	405.2186	9.63	2	+	+	+	+
/	406.2352	13.25	2	+	+	+	-
/	406.2358	12.21	2	+	+	+	+
/	407.2195	15.76	2	+	+	+	+
/	407.9573	19.63	4	+	+	+	+
/	410.8747	15.00	3	+	+	+	+
/	411.2322	10.98	1	+	+	+	+
/	411.6992	19.63	4	+	+	+	+
/	412.2536	16.04	2	+	+	+	+
/	412.2540	15.75	2	+	+	+	+
/	413.2410	14.18	2	+	+	+	+
/	413.2866	21.76	1	+	+	+	+
/	414.2413	14.88	3	+	+	+	+
/	414.2457	12.27	1	+	+	+	+
/	415.2447	22.63	1	+	+	+	+
/	415.8626	15.00	3	+	+	+	+
/	418.2195	17.95	1	+	+	+	+
/	418.7339	10.36	2	+	+	+	+
/	420.1979	13.01	1	+	+	+	+
/	421.2412	12.45	2	+	+	+	+
/	421.2432	20.13	2	+	+	+	+
/	421.2612	15.00	2	+	+	+	+
/	421.7331	9.63	2	+	+	+	+
/	422.2127	5.31	1	+	+	+	+
/	426.7299	8.94	2	+	+	+	+
/	429.2457	22.30	1	+	+	+	+
/	429.2826	21.01	1	+	+	+	+
/	430.2411	12.78	1	+	+	+	+
/	430.2775	20.63	1	+	+	+	+
/	431.2253	13.59	2	+	+	+	+
/	431.2478	6.30	1	+	+	+	+
/	431.5276	21.95	3	+	+	+	+
/	432.2315	8.27	1	+	+	+	+
/	434.2619	17.34	2	+	+	+	+
/	434.7471	10.81	2	+	+	+	+
/	437.7673	31.77	2	+	+	+	+
/	441.2521	20.49	2	+	+	+	+
/	441.7730	18.54	2	+	+	+	+
/	442.7441	12.27	2	+	+	+	+
/	443.2353	6.30	1	+	+	+	+
/	444.2303	10.08	2	+	+	+	+
/	444.2936	20.49	1	+	+	+	+

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/	445.2527	7.80	1	+	+	+	+
/	446.2717	8.27	1	+	+	+	+
/	446.2722	16.69	1	+	+	+	+
/	446.7472	11.52	2	+	+	+	+
/	446.7659	14.62	2	+	+	+	+
/	447.2085	13.59	1	+	+	+	+
/	447.2105	6.30	1	+	+	+	+
/	447.2542	14.60	1	+	+	+	+
/	448.2467	10.36	2	+	+	+	+
/	449.7704	16.48	2	+	+	+	+
/	451.2280	22.27	1	+	+	+	+
/	453.2203	12.27		+	+	+	+
/	454.7644	13.80	2	+	+	+	+
/	455.2042	19.61	1	+	+	+	+
/	456.2434	8.94	2	+	+	+	+
/	456.2456	13.15	2	+	+	+	+
/	456.2925	23.26	1	+	+	+	+
/	457.2030	14.88	2	+	+	+	+
/	457.7509	12.27	2	+	+	+	+
/	458.2476	12.10	2	+	+	+	+
/	459.1892	12.27	2	+	+	+	+
/	459.2278	19.63	3	+	+	+	+
/	459.2678	10.98	1	+	+	+	+
/	459.2685	5.59	1	+	+	+	+
/	459.2935	21.96	1	+	+	+	+
/	462.2302	6.30	1	+	+	+	+
/	462.2472	19.19	1	+	+	+	+
/	464.2263	13.90	1	+	+	+	+
/	464.7522	12.26	2	+	+	+	+
/	465.2464	14.88	1	+	+	+	+
/	467.7294	17.95	2	+	+	+	+
/	467.7517	11.01	2	+	+	+	+
/	468.2369	11.52	1	+	+	+	+
/	471.7388	12.84	2	+	+	+	+
/	472.2880	13.31	1	+	+	+	+
/	472.2893	21.02	1	+	+	+	+
/	472.2992	9.40	1	+	+	+	+
/	472.5596	18.89	3	+	+	+	+
/	473.2079	18.21	2	+	+	+	+
/	473.2346	5.59		+	+	+	-
/	474.2428	11.52	1	+	+	+	+
/	474.2429	10.08	1	+	+	+	+

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/	474.2679	12.27	2	+	+	+	+
/	474.2682	12.27	1	+	+	+	+
/	474.2799	5.31	1	+	+	+	+
/	475.7502	10.57	2	+	+	+	+
/	476.2273	18.89	1	+	+	+	+
/	476.2476	12.35	2	+	+	+	+
/	478.7565	13.59	2	+	+	+	+
/	479.2622	17.50	1	+	+	+	+
/	479.7979	12.78	2	+	+	+	+
/	480.2565	21.76	1	+	+	+	+
/	484.2314	6.30	2	+	+	+	+
/	486.3042	14.60	1	+	+	+	+
/	486.3052	14.62	1	+	+	+	+
/	490.2600	5.59		+	+	+	+
/	493.2424	19.19	1	+	+	+	+
/	498.7538	9.63	2	+	+	+	+
/	499.2625	7.80	1	+	+	+	+
/	499.7645	21.01	2	+	+	+	+
/	501.2429	6.30	1	+	+	+	+
/	501.7630	24.02	2	+	+	+	+
/	504.7541	12.50	2	+	+	+	-
/	507.7421	19.80	2	+	+	+	+
/	508.2906	15.50	1	+	+	+	+
/	509.7630	19.19	2	+	+	+	+
/	510.2391	16.77	2	+	+	+	+
/	511.2845	23.66	2	+	+	+	+
/	511.7312	19.81	2	+	+	+	+
/	512.2539	16.68	2	+	+	+	+
/	512.5736	19.63	3	+	+	+	+
/	512.7552	24.02	2	+	+	+	+
/	513.7482	20.49	2	+	+	+	+
/	515.2510	19.50	2	+	+	+	+
/	515.3429	10.06	1	+	+	+	+
/	518.7344	19.81	2	+	+	+	+
/	520.7371	24.02	2	+	+	+	+
/	520.9586	20.16	3	-	+	+	-
/	524.7756	11.14	2	-	+	+	-
/	524.8132	17.94	2	+	+	+	-
/	525.7364	25.65	2	-	-	+	+
/	526.2750	5.31	1	+	+	+	+
/	526.7177	19.81	2	+	+	+	+
/	527.2957	12.10	1	+	+	+	+

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/	528.9272	20.10	3	+	+	+	-
/	529.6020	19.40	3	+	+	+	+
/	530.7887	18.89	2	+	+	+	+
/	530.9570	19.63	3	+	+	+	+
/	531.2907	12.27	1	+	+	+	+
/	531.7855	12.78	2	+	+	+	+
/	534.1999	19.81	2	+	+	+	+
/	534.2432	6.30	1	+	+	+	+
/	535.2696	14.08	1	+	+	+	+
/	535.8036	17.75	2	+	+	+	+
/	536.7798	12.35	2	+	+	+	-
/	538.2274	12.65	2	+	+	+	+
/	538.2836	19.63	3	+	+	+	+
/	538.7866	17.27	2	+	+	+	+
/	539.7781	28.50	2	+	+	+	+
/	542.7990	14.46	2	+	+	+	+
/	543.6046	19.63	3	+	+	+	+
/	544.2973	12.40	1	+	+	+	+
/	544.3862	26.81	1	+	+	+	+
/	544.7864	16.68	2	+	+	+	+
/	544.7866	17.43	2	+	+	+	+
/	545.3081	14.46	2	+	+	+	+
/	546.7834	16.04	2	+	+	+	+
/	547.7753	27.08	2	+	+	+	+
/	548.9296	19.63	3	+	+	+	+
/	550.7959	14.24	2	+	+	+	+
/	552.6142	12.58	3	+	+	+	+
/	553.3052	13.59	2	+	+	+	+
/	553.7987	13.56	2	+	+	+	+
/	556.3212	12.55	1	+	+	+	+
/	556.7927	17.20	2	+	+	+	+
/	558.3128	5.59		+	+	+	+
/	558.7653	27.09	2	+	+	+	+
/	560.3174	13.31	1	+	+	+	+
/	561.3171	24.91	1	+	+	+	+
/	562.2794	12.78	1	+	+	+	+
/	563.8012	17.94	2	+	+	+	+
/	564.2834	15.75	1	+	+	+	+
/	564.2942	13.60	2	+	+	+	+
/	568.2868	6.30	1	+	+	+	+
/	569.6130	14.46	3	+	+	+	+
/	569.7932	10.06	2	+	+	+	+

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/	570.3125	12.10	1	+	+	+	+
/	571.2687	13.00	1	-	+	+	+
/	571.2819	12.27	1	+	+	+	+
/	571.3244	19.81	1	+	+	+	-
/	572.2779	13.60	2	+	+	+	+
/	572.3803	25.69	1	+	+	+	+
/	573.2504	14.46	2	+	+	+	+
/	573.2644	5.31	1	+	+	+	+
/	573.3398	23.14	1	+	+	+	+
/	574.2337	27.09	2	+	+	+	+
/	575.3018	14.46	2	+	+	+	+
/	578.2752	5.31	1	+	+	+	+
/	578.3000	12.27	2	+	+	+	+
/	578.3056	12.53	1	+	+	+	+
/	579.7647	13.59	2	+	+	+	+
/	581.2635	19.63	2	+	+	+	+
/	581.3193	11.52	1	+	+	+	+
/	581.8293	17.50	2	+	+	+	+
/	583.8135	12.10	2	+	+	+	+
/	584.3129	6.30		+	+	+	+
/	586.3359	16.42	1	+	+	+	+
/	587.1737	14.08	1	+	+	+	+
/	587.3193	16.26	1	+	+	+	-
/	588.8368	16.04	2	+	+	+	+
/	589.3338	15.44	1	+	+	+	+
/	591.8236	21.95	2	+	+	+	-
/	594.2725	14.46	2	+	+	+	+
/	596.3298	12.10	1	+	+	+	+
/	596.8323	14.97	2	+	+	+	+
<b>1</b>	596.8454	18.90	2	-	-	+	-
/	599.3923	22.27	1	+	+	+	+
/	600.2304	12.78		+	+	+	+
/	600.3867	20.13	1	+	+	+	+
/	601.3122	18.39	2	+	+	+	+
/	602.2936	14.24	1	+	+	+	+
/	602.3390	8.27	1	+	+	+	+
/	603.2689	22.63	2	+	+	+	+
/	604.2905	12.35	1	+	+	+	+
/	604.3075	9.40	1	+	+	+	+
<b>2</b>	604.8556	17.84	2	-	-	+	-
/	607.2546	15.50	1	+	+	+	+
/	607.2905	19.63	1	+	+	+	+

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/	607.8255	14.80	2	+	+	+	+
/	608.3549	16.74	1	+	+	+	+
/	609.8244	17.75	2	+	+	+	+
/	618.3392	12.35	1	+	+	+	+
/	621.3747	21.95	1	+	+	+	+
/	621.9774	17.10	3	+	+	+	-
/	624.3507	15.75	1	+	+	+	+
/	628.3564	12.10	2	+	+	+	+
/	629.8132	12.78	2	+	+	+	+
/	641.3310	23.36	2	+	+	+	+
/	643.3687	16.42	1	+	+	+	+
/	644.3510	10.06	1	+	+	+	+
/	644.8290	16.75	2	+	+	+	-
/	646.7862	21.95	2	+	+	+	+
/	647.3307	17.75	1	+	+	+	+
/	648.3511	20.10	2	+	+	+	+
/	648.8497	23.36	2	+	+	+	+
/	649.3000	19.82	1	+	+	+	+
/	649.3232	22.63	2	+	+	+	+
/	654.3328	17.94	2	+	+	+	+
/	655.3930	13.03	1	+	+	+	+
/	655.8360	14.50	2	+	+	+	-
/	656.8466	21.95	2	+	+	+	+
/	660.3497	15.00	2	+	+	+	+
/	662.3516	17.34	2	+	+	+	+
/	664.8443	20.70	2	+	+	+	+
/	666.8469	13.20	2	+	+	+	+
/	670.3497	15.50	2	+	+	+	+
/	670.4318	23.36	1	+	+	+	+
/	672.3542	18.90	2	+	+	+	+
/	672.8430	20.00	2	+	+	+	+
/	677.3781	10.98	1	+	+	+	+
/	683.8020	20.49	2	+	+	+	+
/	688.4038	20.13	1	+	+	+	+
/	690.3999	25.69	1	-	+	+	-
/	694.4061	11.52	1	+	+	+	+
/	696.8466	13.03	2	+	+	+	-
/	703.3402	14.46	2	+	+	+	+
/	705.8646	21.52	2	+	+	+	-
/	708.3562	18.89	2	+	+	+	+
/	708.6879	14.08	3	+	+	+	+
/	710.8729	15.35	2	+	+	+	+

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/	713.0401	19.05	3	+	+	+	-
/	718.2710	14.08	1	+	+	+	+
/	718.7115	18.11	3	+	+	+	-
/	723.3107	13.49	1	+	+	+	+
/	723.7094	17.26	3	+	+	+	-
/	724.0438	17.34	3	+	+	+	-
/	726.3114	20.13	2	+	+	+	+
/	726.3605	11.86	1	+	+	+	+
/	730.3692	16.42	2	+	+	+	+
/	732.3417	17.04	1	+	+	+	+
/	745.3828	5.59		+	+	+	+
/	745.8669	15.33	2	-	+	+	-
/	748.3914	12.40	1	+	+	+	+
/	749.0318	14.89	3	+	+	+	+
/	753.8639	14.89	2	+	+	+	+
/	755.7079	15.33	3	+	+	+	+
/	757.4285	24.97	1	+	+	+	-
/	761.0394	14.46	3	+	+	+	+
/	765.9196	20.10	2	+	+	+	-
/	766.7067	13.88	3	+	+	+	+
3	766.8957	18.34	2	-	-	+	-
/	767.4245	8.27	1	+	+	+	-
/	767.7089	14.89	3	+	+	+	-
/	771.3333	10.39	1	+	+	+	+
/	773.3523	12.10		+	+	+	+
/	778.3712	14.88	2	+	+	+	+
/	780.9306	20.10	2	-	+	+	+
/	781.9127	22.43	2	+	+	+	+
/	781.9374	21.52	2	+	+	+	+
/	783.4554	13.03	1	+	+	+	+
/	784.8969	20.13	2	+	+	+	+
/	785.4468	10.98	1	+	+	+	-
/	785.8968	19.81	2	+	+	+	+
/	790.9093	15.95	2	-	+	+	-
/	792.8801	18.34	2	+	+	+	+
/	793.8986	19.40	2	+	+	+	+
/	795.9306	19.61	2	+	+	+	+
/	800.3909	11.86	2	+	+	+	-
/	804.8810	13.59	2	+	+	+	+
/	811.4610	12.30	1	+	+	+	+
/	811.4614	13.13	1	+	+	+	-
/	811.4615	13.20	1	+	+	+	-

/	811.4623	12.27	1	+	+	+	+
/	811.4634	12.10	1	+	+	+	+
/	811.7179	18.34	3	+	+	+	+
/	813.4302	15.75	1	+	+	+	+
/	816.4244	16.24	2	+	+	+	+
/	821.3904	21.20	1	+	+	+	+
/	823.5000	15.75	1	+	+	+	-
/	824.4354	19.63	2	+	+	+	+
/	834.7436	17.43	3	+	+	+	+
/	841.4766	20.13	1	+	+	+	+
/	842.9218	18.95	2	-	+	+	-
/	844.4641	23.36	1	+	+	+	-
/	845.4240	22.27	3	+	+	+	+
/	845.9125	15.33	2	+	+	+	+
/	850.4249	21.02	3	+	+	+	+
/	852.4311	17.04	1	+	+	+	+
/	854.4121	14.46	2	+	+	+	+
/	868.4834	10.62	1	+	+	+	+
/	874.5250	31.78	1	+	+	+	+
/	874.7801	17.92	3	+	+	+	+
/	892.5215	14.62	1	+	+	+	+
/	898.5327	16.42	1	+	+	+	+
/	926.5504	23.66	1	+	+	+	+
/	928.4948	12.27	1	+	+	+	+
/	934.4512	17.75	1	+	+	+	+
/	1008.4980	12.55	1	+	+	+	-
/	1014.4776	19.81	1	+	+	+	+
/	1018.5114	19.19	1	+	+	+	+
/	1021.5555	23.66		+	+	+	+
/	1029.4871	19.50	1	+	+	+	+
/	1088.5613	17.34	1	+	+	+	+
/	1092.5548	16.04	1	+	+	+	+
/	1094.5447	27.08	1	+	+	+	+
/	1105.5997	13.59	1	+	+	+	+
/	1149.5944	14.46	1	+	+	+	+
/	1192.6607	15.00	1	+	+	+	+

**Notes:** Candidates were firstly screened from BPC of standard substance of cattle-hide gelatin. Subsequently, they further confirmed by comparing EIC of four animal species. “+” indicates that the marker candidate was detected by UPLC-Q-TOF-MS. “-” indicates that the marker candidate was not detected. These marker candidates showed two/three/four charges and were deduced to be peptides.

**Supplementary Table S4**

Markers selection for pig-hide gelatin from peptide fragments based on trypsin digestion followed by LC-Q-TOF-MS analysis.

Pig marker No.	m/z	RT (min)	Charge	Donkey	Horse	Cattle	Pig
/	189.1288	5.31	1	+	+	+	+
/	216.6198	8.26	2	+	+	+	+
/	219.1404	10.98	1	+	+	+	+
/	223.1141	8.27	1	+	+	+	+
/	224.1352	31.00	1	+	+	+	+
/	228.6384	5.31	2	+	+	+	+
/	229.6280	12.09	2	+	+	+	+
/	231.1762	10.44	1	+	+	+	+
/	231.1771	7.77		+	+	+	+
/	233.1565	5.55	1	+	+	+	+
/	234.1024	22.27		+	+	+	+
/	236.6544	9.34	2	+	+	+	+
/	237.6260	10.08	2	+	+	+	+
/	237.6447	5.31	2	+	+	+	+
/	242.1565	10.08	1	+	+	+	+
/	243.1408	15.75	1	+	+	+	+
/	245.1925	14.24	1	+	+	+	+
/	245.1925	15.38	1	+	+	+	+
/	249.6631	10.08	2	+	+	+	+
/	250.1855	32.78	1	+	+	+	+
/	258.1766	10.10	2	+	+	+	+
/	260.1678	9.58	1	+	+	+	+
/	260.2043	6.27	1	+	+	+	+
/	265.1621	13.32	1	+	+	+	+
/	267.6266	6.27	2	+	+	+	+
/	270.2001	10.08	1	+	+	+	+
/	272.1795	9.40	1	+	+	+	+
/	272.6535	12.27	2	+	+	+	+
/	274.1954	10.08	1	+	+	+	+
/	276.1632	7.57	1	+	+	+	+
/	277.1257	9.74	1	+	+	+	+
/	278.6662	12.50	2	+	+	+	+
/	279.1418	17.53	1	+	+	+	+
/	279.1777	18.20	1	+	+	+	+
/	281.1213	10.08	1	+	+	+	+
/	281.1566	5.59	1	+	+	+	+
/	283.8095	12.27	2	+	+	+	+
/	288.2009	20.49		+	+	+	+
/	288.2116	6.30		+	+	+	+



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/	290.1784	6.30		+	+	+	+
/	292.6630	12.27	2	+	+	+	+
/	295.1730	10.98	1	+	+	+	+
/	295.1740	10.08	1	+	+	+	+
/	297.6402	12.50	2	+	+	+	+
/	300.6175	12.78	2	+	+	+	+
/	301.1832	6.30	2	+	+	+	+
/	301.6758	8.27	2	+	+	+	+
/	301.6768	14.24	2	+	+	+	+
/	302.1801	10.08	1	+	+	+	+
/	302.2159	19.22	1	+	+	+	+
/	302.2166	18.21	1	+	+	+	+
/	303.6207	6.30	1	+	+	+	+
/	305.6956	11.52	2	+	+	+	+
/	306.1484	23.08	2	+	+	+	+
/	306.1739	6.30		+	+	+	+
/	309.6738	12.35	2	+	+	+	+
/	312.8329	16.42	3	+	+	+	+
/	314.6831	12.07	2	+	+	+	+
/	316.2312	19.63	1	+	+	+	+
/	317.1910	6.30	3	+	+	+	+
/	320.1733	14.88	1	+	+	+	+
/	320.2031	12.78	3	+	+	+	+
/	321.1817	5.59	1	+	+	+	+
/	322.6805	10.06	2	+	+	+	+
/	322.8205	12.27	3	+	+	+	+
/	323.1587	6.30		+	+	+	+
/	323.4940	6.30		+	+	+	+
/	324.1811	5.59	2	+	+	+	+
/	327.8098	12.27	3	+	+	+	+
/	329.1909	6.30	2	+	+	+	+
/	329.2007	5.31	1	+	+	+	+
/	329.2282	15.00	2	+	+	+	+
/	330.1635	19.95	1	+	+	+	+
/	330.2011	12.78	2	+	+	+	+
/	332.2266	14.24	1	+	+	+	+
/	332.2273	18.89	1	+	+	+	+
/	335.1611	21.76	3	+	+	+	+
/	339.1935	10.87	2	+	+	+	+
/	339.6729	11.52	2	+	+	+	+
/	343.2051	12.27		+	+	+	+
/	344.2632	20.16	1	+	+	+	+

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/	345.1529	9.63	1	+	+	+	+
/	345.2333	5.31	1	+	+	+	+
/	347.2014	7.77	1	+	+	+	+
/	347.7072	11.46	2	+	+	+	+
/	350.1806	9.63	1	+	+	+	+
/	350.6348	14.08	2	+	+	+	+
/	353.4912	14.88	3	+	+	+	+
/	359.2392	10.08	1	+	+	+	+
/	359.6404	14.08	2	+	+	+	+
/	366.2176	17.35	2	+	+	+	+
/	369.2061	13.59	3	+	+	+	+
/	369.7033	6.30	2	+	+	+	+
/	371.2385	10.98	1	+	+	+	+
/	371.7236	16.41	2	+	+	+	+
/	372.2159	10.36	2	+	+	+	+
/	372.6956	5.59	2	+	+	+	+
/	373.2899	6.30	1	+	+	+	+
/	374.2389	18.89	1	+	+	+	+
/	374.7011	12.41	2	+	+	+	+
/	374.8536	14.46	3	+	+	+	+
/	375.2342	7.77	1	+	+	+	+
/	377.1926	13.59	1	+	+	+	+
/	377.1953	11.46	1	+	+	+	+
/	378.6137	14.08	2	+	+	+	+
/	379.2181	24.94	2	+	+	+	+
/	379.7035	10.98	2	+	+	+	+
/	379.8415	14.46	3	+	+	+	+
/	381.8550	13.59	3	+	+	+	+
/	382.5030	14.46	3	+	+	+	+
/	385.2063	8.27	2	+	+	+	+
/	385.2297	10.08	1	+	+	+	+
/	385.2661	9.40	1	+	+	+	+
/	386.8436	13.59	3	+	+	+	+
/	387.8462	19.63	3	+	+	+	+
/	388.2293	6.30		+	+	+	+
/	388.2296	12.27		+	+	+	+
/	389.2488	11.01	1	+	+	+	+
/	390.2222	10.60	2	+	+	+	+
/	391.1910	5.31	1	+	+	+	+
/	391.2092	18.32	1	+	+	+	+
/	392.2315	13.05	2	+	+	+	+
/	393.2091	9.40	2	+	+	+	+

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/	395.6893	8.94	2	+	+	+	+
/	396.2707	14.62	1	+	+	+	+
/	398.1658	6.30		+	+	-	+
/	398.2272	15.00	3	+	+	+	+
/	398.2504	14.18	1	+	+	+	+
/	399.2711	17.34	1	+	+	+	+
/	400.2297	9.40	1	+	+	+	+
/	400.2298	12.78	2	+	+	+	+
/	402.2567	10.08	1	+	+	+	+
/	402.5164	22.63	3	+	+	+	+
/	403.2657	15.00	1	+	+	+	+
/	404.2236	9.40	1	+	+	+	+
/	404.4604	19.63	4	+	+	+	+
/	405.2186	9.63	2	+	+	+	+
/	406.2358	12.21	2	+	+	+	+
/	407.2195	15.76	2	+	+	+	+
/	407.9573	19.63	4	+	+	+	+
/	410.8747	15.00	3	+	+	+	+
/	411.2322	10.98	1	+	+	+	+
/	411.6992	19.63	4	+	+	+	+
/	412.2536	16.04	2	+	+	+	+
/	412.2540	15.75	2	+	+	+	+
/	413.2410	14.18	2	+	+	+	+
/	413.2866	21.76	1	+	+	+	+
/	414.2413	14.88	3	+	+	+	+
/	414.2457	12.27	1	+	+	+	+
/	415.2447	22.63	1	+	+	+	+
/	415.8626	15.00	3	+	+	+	+
/	418.2195	17.95	1	+	+	+	+
/	418.7339	10.36	2	+	+	+	+
<b>1</b>	419.2446	14.04	2	-	-	-	+
/	420.1979	13.01	1	+	+	+	+
/	421.2412	12.45	2	+	+	+	+
/	421.2432	20.13	2	+	+	+	+
/	421.2612	15.00	2	+	+	+	+
/	421.7331	9.63	2	+	+	+	+
/	422.2127	5.31	1	+	+	+	+
/	426.7299	8.94	2	+	+	+	+
/	429.2457	22.30	1	+	+	+	+
/	429.2826	21.01	1	+	+	+	+
/	430.2411	12.78	1	+	+	+	+
/	430.2775	20.63	1	+	+	+	+

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/	431.2253	13.59	2	+	+	+	+
/	431.2478	6.30	1	+	+	+	+
/	431.5276	21.95	3	+	+	+	+
/	432.2315	8.27	1	+	+	+	+
/	434.2619	17.34	2	+	+	+	+
/	434.7471	10.81	2	+	+	+	+
/	437.7673	31.77	2	+	+	+	+
/	441.2521	20.49	2	+	+	+	+
/	441.7730	18.54	2	+	+	+	+
/	442.7441	12.27	2	+	+	+	+
/	443.2353	6.30	1	+	+	+	+
/	444.2303	10.08	2	+	+	+	+
/	444.2936	20.49	1	+	+	+	+
/	445.2527	7.80	1	+	+	+	+
/	446.2717	8.27	1	+	+	+	+
/	446.2722	16.69	1	+	+	+	+
/	446.7472	11.52	2	+	+	+	+
/	446.7659	14.62	2	+	+	+	+
/	447.2085	13.59	1	+	+	+	+
/	447.2105	6.30	1	+	+	+	+
/	447.2542	14.60	1	+	+	+	+
/	448.2467	10.36	2	+	+	+	+
/	449.7704	16.48	2	+	+	+	+
/	451.2280	22.27	1	+	+	+	+
/	453.2203	12.27		+	+	+	+
/	454.7644	13.80	2	+	+	+	+
/	455.2042	19.61	1	+	+	+	+
/	456.2434	8.94	2	+	+	+	+
/	456.2456	13.15	2	+	+	+	+
/	456.2925	23.26	1	+	+	+	+
/	457.2030	14.88	2	+	+	+	+
/	457.7509	12.27	2	+	+	+	+
/	458.2476	12.10	2	+	+	+	+
/	459.1892	12.27	2	+	+	+	+
/	459.2278	19.63	3	+	+	+	+
/	459.2678	10.98	1	+	+	+	+
/	459.2685	5.59	1	+	+	+	+
/	459.2935	21.96	1	+	+	+	+
/	462.2302	6.30	1	+	+	+	+
/	462.2472	19.19	1	+	+	+	+
/	464.2263	13.90	1	+	+	+	+
/	464.7522	12.26	2	+	+	+	+

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/	465.2464	14.88	1	+	+	+	+
/	467.7294	17.95	2	+	+	+	+
/	467.7517	11.01	2	+	+	+	+
/	468.2369	11.52	1	+	+	+	+
/	471.7388	12.84	2	+	+	+	+
/	472.2880	13.31	1	+	+	+	+
/	472.2893	21.02	1	+	+	+	+
/	472.2992	9.40	1	+	+	+	+
/	472.5596	18.89	3	+	+	+	+
/	473.2079	18.21	2	+	+	+	+
/	474.2428	11.52	1	+	+	+	+
/	474.2429	10.08	1	+	+	+	+
/	474.2679	12.27	2	+	+	+	+
/	474.2682	12.27	1	+	+	+	+
/	474.2799	5.31	1	+	+	+	+
/	475.7502	10.57	2	+	+	+	+
/	476.2273	18.89	1	+	+	+	+
/	476.2476	12.35	2	+	+	+	+
/	478.2575	16.50	2	+	+	-	+
/	478.7565	13.59	2	+	+	+	+
/	479.2622	17.50	1	+	+	+	+
/	479.7979	12.78	2	+	+	+	+
/	480.2565	21.76	1	+	+	+	+
/	484.2314	6.30	2	+	+	+	+
/	486.3042	14.60	1	+	+	+	+
/	486.3052	14.62	1	+	+	+	+
/	490.2600	5.59		+	+	+	+
/	493.2424	19.19	1	+	+	+	+
/	498.7538	9.63	2	+	+	+	+
/	499.2625	7.80	1	+	+	+	+
<b>2</b>	490.5942	14.40	3	-	-	-	+
/	499.7645	21.01	2	+	+	+	+
/	501.2429	6.30	1	+	+	+	+
/	501.7630	24.02	2	+	+	+	+
/	507.7421	19.80	2	+	+	+	+
/	508.2906	15.50	1	+	+	+	+
/	509.7630	19.19	2	+	+	+	+
/	510.2391	16.77	2	+	+	+	+
/	511.2845	23.66	2	+	+	+	+
/	511.7312	19.81	2	+	+	+	+
/	512.2539	16.68	2	+	+	+	+
/	512.5736	19.63	3	+	+	+	+

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/	512.7552	24.02	2	+	+	+	+
/	513.7482	20.49	2	+	+	+	+
/	514.2510	13.59	2	+	+	-	+
/	515.2510	19.50	2	+	+	+	+
/	515.3429	10.06	1	+	+	+	+
/	517.6038	16.04	3	+	+	-	+
/	518.7344	19.81	2	+	+	+	+
/	520.7371	24.02	2	+	+	+	+
/	525.7364	25.65	2	-	-	+	+
/	526.2750	5.31	1	+	+	+	+
/	526.7177	19.81	2	+	+	+	+
/	527.2957	12.10	1	+	+	+	+
/	529.6020	19.40	3	+	+	+	+
/	530.7887	18.89	2	+	+	+	+
/	530.9570	19.63	3	+	+	+	+
/	531.2907	12.27	1	+	+	+	+
/	531.7855	12.78	2	+	+	+	+
/	534.1999	19.81	2	+	+	+	+
/	534.2432	6.30	1	+	+	+	+
/	535.2696	14.08	1	+	+	+	+
/	535.8036	17.75	2	+	+	+	+
/	538.2274	12.65	2	+	+	+	+
/	538.2836	19.63	3	+	+	+	+
/	538.7866	17.27	2	+	+	+	+
/	539.7781	28.50	2	+	+	+	+
/	542.7990	14.46	2	+	+	+	+
/	543.6046	19.63	3	+	+	+	+
/	544.2973	12.40	1	+	+	+	+
/	544.3862	26.81	1	+	+	+	+
/	544.7864	16.68	2	+	+	+	+
/	544.7866	17.43	2	+	+	+	+
/	545.3081	14.46	2	+	+	+	+
/	546.7834	16.04	2	+	+	+	+
/	547.7753	27.08	2	+	+	+	+
/	548.9296	19.63	3	+	+	+	+
/	550.7959	14.24	2	+	+	+	+
/	552.6142	12.58	3	+	+	+	+
/	553.3052	13.59	2	+	+	+	+
/	553.7987	13.56	2	+	+	+	+
/	556.3212	12.55	1	+	+	+	+
/	556.7927	17.20	2	+	+	+	+
/	558.3128	5.59		+	+	+	+

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/	558.7653	27.09	2	+	+	+	+
/	560.3174	13.31	1	+	+	+	+
/	561.3171	24.91	1	+	+	+	+
/	562.2794	12.78	1	+	+	+	+
/	563.8012	17.94	2	+	+	+	+
/	564.2834	15.75	1	+	+	+	+
/	564.2942	13.60	2	+	+	+	+
/	568.2868	6.30	1	+	+	+	+
/	569.6130	14.46	3	+	+	+	+
/	569.7932	10.06	2	+	+	+	+
/	570.3125	12.10	1	+	+	+	+
/	571.2687	13.00	1	-	+	+	+
/	571.2819	12.27	1	+	+	+	+
/	572.2779	13.60	2	+	+	+	+
/	572.3803	25.69	1	+	+	+	+
/	573.2504	14.46	2	+	+	+	+
/	573.2644	5.31	1	+	+	+	+
/	573.3398	23.14	1	+	+	+	+
/	574.2337	27.09	2	+	+	+	+
/	575.3018	14.46	2	+	+	+	+
/	578.2752	5.31	1	+	+	+	+
/	578.3000	12.27	2	+	+	+	+
/	578.3056	12.53	1	+	+	+	+
/	579.7647	13.59	2	+	+	+	+
/	581.2635	19.63	2	+	+	+	+
/	581.3193	11.52	1	+	+	+	+
/	581.8293	17.50	2	+	+	+	+
/	583.6149	14.46	3	+	+	-	+
/	583.8135	12.10	2	+	+	+	+
/	584.3129	6.30		+	+	+	+
/	586.3359	16.42	1	+	+	+	+
/	587.1737	14.08	1	+	+	+	+
/	588.8368	16.04	2	+	+	+	+
/	589.2899	12.40	3	+	+	-	+
/	589.3338	15.44	1	+	+	+	+
/	594.2725	14.46	2	+	+	+	+
/	596.3298	12.10	1	+	+	+	+
/	596.8323	14.97	2	+	+	+	+
/	599.3923	22.27	1	+	+	+	+
/	600.2304	12.78		+	+	+	+
/	600.3867	20.13	1	+	+	+	+
/	601.3122	18.39	2	+	+	+	+

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/	602.2936	14.24	1	+	+	+	+
/	602.3176	17.10	3	+	+	-	+
/	602.3390	8.27	1	+	+	+	+
/	603.2689	22.63	2	+	+	+	+
/	604.2905	12.35	1	+	+	+	+
/	604.3075	9.40	1	+	+	+	+
/	607.2546	15.50	1	+	+	+	+
/	607.2905	19.63	1	+	+	+	+
/	607.8255	14.80	2	+	+	+	+
/	608.3549	16.74	1	+	+	+	+
/	609.8244	17.75	2	+	+	+	+
/	618.3392	12.35	1	+	+	+	+
/	621.3747	21.95	1	+	+	+	+
/	624.3507	15.75	1	+	+	+	+
/	628.3564	12.10	2	+	+	+	+
/	629.8132	12.78	2	+	+	+	+
/	641.3310	23.36	2	+	+	+	+
/	643.3687	16.42	1	+	+	+	+
/	644.3510	10.06	1	+	+	+	+
/	646.7862	21.95	2	+	+	+	+
/	647.3307	17.75	1	+	+	+	+
/	648.3511	20.10	2	+	+	+	+
/	648.8497	23.36	2	+	+	+	+
/	649.3000	19.82	1	+	+	+	+
/	649.3232	22.63	2	+	+	+	+
/	654.3328	17.94	2	+	+	+	+
/	655.3567	15.28	1	+	+	-	+
/	655.3930	13.03	1	+	+	+	+
/	656.8466	21.95	2	+	+	+	+
/	660.3497	15.00	2	+	+	+	+
/	662.3516	17.34	2	+	+	+	+
/	664.8443	20.70	2	+	+	+	+
/	666.8469	13.20	2	+	+	+	+
/	670.3497	15.50	2	+	+	+	+
/	670.4318	23.36	1	+	+	+	+
/	672.3542	18.90	2	+	+	+	+
/	672.8430	20.00	2	+	+	+	+
/	677.3781	10.98	1	+	+	+	+
/	683.8020	20.49	2	+	+	+	+
/	688.4038	20.13	1	+	+	+	+
3	693.8432	26.70	2	-	-	-	+
/	694.4061	11.52	1	+	+	+	+



/	703.3402	14.46	2	+	+	+	+
/	708.3562	18.89	2	+	+	+	+
/	708.6879	14.08	3	+	+	+	+
/	710.8729	15.35	2	+	+	+	+
4	713.6902	17.79	3	-	-	-	+
/	718.2710	14.08	1	+	+	+	+
/	723.3107	13.49	1	+	+	+	+
/	724.3671	13.88	2	+	+	-	+
/	726.3114	20.13	2	+	+	+	+
/	726.3605	11.86	1	+	+	+	+
/	730.3692	16.42	2	+	+	+	+
/	731.8613	12.90	2	+	+	-	+
/	732.3417	17.04	1	+	+	+	+
/	745.3828	5.59		+	+	+	+
/	745.8657	15.95	2	+	+	-	+
/	748.3914	12.40	1	+	+	+	+
/	749.0318	14.89	3	+	+	+	+
/	753.8639	14.89	2	+	+	+	+
/	755.7079	15.33	3	+	+	+	+
/	761.0394	14.46	3	+	+	+	+
/	762.3766	22.94	3	-	+	-	+
/	762.8742	13.03	2	+	+	-	+
/	766.7067	13.88	3	+	+	+	+
/	771.3333	10.39	1	+	+	+	+
/	773.3523	12.10		+	+	+	+
5	773.9237	18.51	2	-	-	-	+
6	774.9121	17.79	2	-	-	-	+
/	775.9012	16.04	2	+	+	-	+
/	778.3712	14.88	2	+	+	+	+
/	780.9306	20.10	2	-	+	+	+
/	781.9127	22.43	2	+	+	+	+
/	781.9374	21.52	2	+	+	+	+
/	783.4554	13.03	1	+	+	+	+
/	784.8969	20.13	2	+	+	+	+
/	785.8968	19.81	2	+	+	+	+
/	792.8801	18.34	2	+	+	+	+
/	793.8986	19.40	2	+	+	+	+
/	795.9306	19.61	2	+	+	+	+
/	798.9020	16.04	2	+	+	-	+
/	804.3942	18.11	2	+	+	-	+
/	804.8810	13.59	2	+	+	+	+
/	811.4610	12.30	1	+	+	+	+

/	811.4623	12.27	1	+	+	+	+
/	811.4634	12.10	1	+	+	+	+
/	811.7179	18.34	3	+	+	+	+
/	813.4302	15.75	1	+	+	+	+
/	816.4244	16.24	2	+	+	+	+
/	821.3904	21.20	1	+	+	+	+
/	824.4354	19.63	2	+	+	+	+
/	834.7436	17.43	3	+	+	+	+
/	841.4766	20.13	1	+	+	+	+
/	845.4240	22.27	3	+	+	+	+
/	845.9125	15.33	2	+	+	+	+
/	849.7429	26.80	3	-	+	-	+
/	850.4249	21.02	3	+	+	+	+
/	852.4311	17.04	1	+	+	+	+
/	854.4121	14.46	2	+	+	+	+
/	868.4834	10.62	1	+	+	+	+
/	874.5250	31.78	1	+	+	+	+
/	874.7801	17.92	3	+	+	+	+
/	874.9170	14.46	2	+	+	-	+
/	883.4320	12.40	2	+	+	-	+
/	892.5215	14.62	1	+	+	+	+
/	898.5327	16.42	1	+	+	+	+
/	926.5504	23.66	1	+	+	+	+
/	928.4948	12.27	1	+	+	+	+
/	934.4512	17.75	1	+	+	+	+
/	1014.4776	19.81	1	+	+	+	+
/	1018.5114	19.19	1	+	+	+	+
/	1021.5555	23.66		+	+	+	+
/	1027.4908	13.59	1	+	+	-	+
/	1029.4871	19.50	1	+	+	+	+
/	1088.5613	17.34	1	+	+	+	+
/	1092.5548	16.04	1	+	+	+	+
/	1094.5447	27.08	1	+	+	+	+
/	1105.5997	13.59	1	+	+	+	+
/	1149.5944	14.46	1	+	+	+	+
/	1192.6607	15.00	1	+	+	+	+

**Notes:** Candidates were firstly screened from BPC of standard substance of pig-hide gelatin. Subsequently, they further confirmed by comparing EIC of four animal species. “+” indicates that the marker candidate was detected by UPLC-Q-TOF-MS. “-” indicates that the marker candidate was not detected. These marker candidates showed two/three/four charges and were deduced to be peptides.