

Figure S1. Comparison of chromatogram resolution of pea protein isolates with a 10 min equilibration Table 30. min equilibration time (blue).

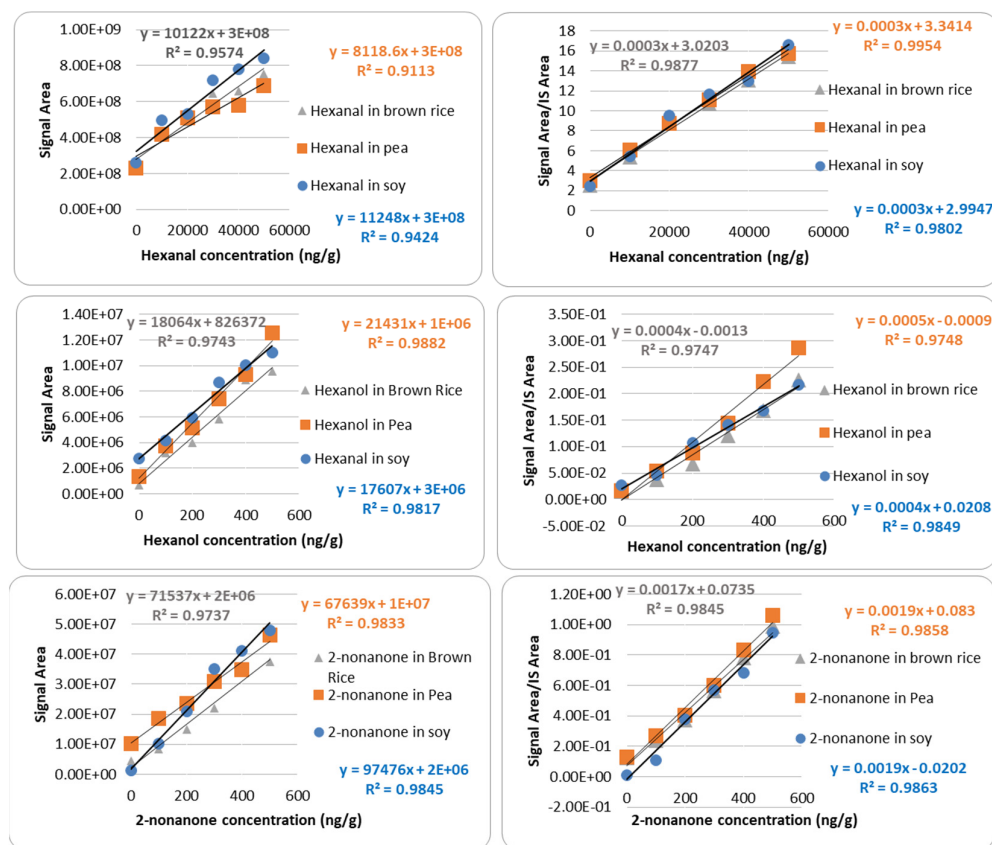


Figure S2. Calibration curves generated for hexanal, 1-hexanol and 2-nonanone in pea and soy protein isolates (calibration curves in red are for pea, and that in blue are for soy).

Table S1. Volatile profile of soy protein, allergen-free pea protein, and allergen-free brown rice protein.

Protein	Compound Identification (Name, CAS, Formula, Molar Mass, OTV(Odour Threshold Value))	Retention Time	Aroma	Concentration (in ng/g) ¹	Odor Activity Value OAV = ln (conc./OTV)
soy protein	Pentane, all isomers 78-78-4, 109-66-0, 463-82-1 C ₅ H ₁₂ 72.15 1290	2.94	Gasoline-like	60.36 ± 23.56	Below Threshold
	n-Hexane 110-54-3 C ₆ H ₁₄ 86.17 1500	2.30	Gasoline-like	25.59 ± 13.80	Below Threshold
	Octane, all isomers 111-65-9, 540-84-1, 86290-81-5 C ₈ H ₁₈ 114.22 660	3.40	Green, minty, herbal, rosemary, cooling	29.67 ± 15.60	Below Threshold
	Furfural 98-01-1 C ₅ H ₄ O ₂ 96.08 2	4.12	Chemical, beany, bready, malty	108.76 ± 34.25	4.00
	n-Valeraldehyde (Pentanal) 110-62-3 C ₅ H ₁₀ O 86.13 0.4	4.50	Fermented, bready, fruity, nutty, berry	89.12 ± 16.04	5.41
	Hexanal 66-25-1 C ₆ H ₁₂ O 100.16 97	6.35	Grassy, tallow, fatty, greeny	1621.71 ± 159.69	2.82
	2-Heptanone (Methyl n-amyl Ketone) 110-43-0 C ₇ H ₁₄ O 114.18 140	9.18	Soapy, sweet, mushroom	72.63 ± 7.88	Below Threshold
	Furan, 2-pentyl 3777-69-3 C ₉ H ₁₄ O 138.21 6	10.52	Fruity, green, earthy, beany, vegetable, metallic	2492.3 ± 199.4	6.03
	2-Octanone 111-13-7 C ₈ H ₁₆ O 128.21 50	13.01	Soapy, fruity	2.86 ± 2.51	Below Threshold
	3-Octen-2-one 4312-99-6 C ₈ H ₁₄ O 126.2	17.82	Mushroom, mouldy, burnt	12.03 ± 0.17	7.79
	1-Octen-3-ol 3391-86-4 C ₈ H ₁₆ O 128.2 1.08	19.43	Mushroomy, earthy, burnt	40.21 ± 9.61	3.62
	Benzaldehyde 100-52-7 C ₇ H ₆ O 106.12	21.24	Almond, burnt sugar, marchpane	286.96 ± 25.56	5.25

pea protein	1.5				
	Octane, all isomers 111-65-9, 540-84-1, 86290- 81-5 C_8H_{18} 114.22 660	3.4	Green, minty, herbal, rosemary, cooling	25.48 ± 23.98	Below Threshold
	n-Valeraldehyde (Pentanal) 110-62-3 $C_5H_{10}O$ 86.13 0.4	4.50	Fermented, bready, fruity, nutty, berry	90.65 ± 13.48	5.42
	Decane 124-18-5 $C_{10}H_{22}$ 142.28 11	5.41	Gasoline-like	15.88 ± 15.91	0.37
	Hexanal 66-25-1 $C_6H_{12}O$ 100.16 97	6.35	Grassy, tallow, fatty, greeny	1138.00 ± 297.3	2.46
	Undecane 1120-21-4 $C_{11}H_{24}$ 156.31 620	7.61	Green, minty, herbal, rosemary, cooling	35.32 ± 62.71	Below Threshold
	2-Heptanone (Methyl n- amyl Ketone) 110-43-0 $C_7H_{14}O$ 114.18 140	9.18	Soapy, sweet, mushroom	25.64 ± 8.099	Below Threshold
	Furan, 2-pentyl 3777-69-3 $C_9H_{14}O$ 138.21 6	10.52	Fruity, green, earthy, beany, vegetable, metallic	638.17 ± 49	4.67
	Dodecane 112-40-3 $C_{12}H_{26}$ 170.33 110	11.42	--	77.93 ± 59.84	Below Threshold
	2-Nonanone 821-55-6 $C_9H_{18}O$ 142.24 5	17.24	Hot milk, soapy, greeny	6.382 ± 0.6214	0.24
	Nonanal 124-19-6 $C_9H_{18}O$ 142.24 1	17.35	Fat, citrus, greeny	31.82 ± 5.51	3.46
	Benzaldehyde 100-52-7 C_7H_6O 106.12 1.5	21.24	Almond, burnt sugar, marchpane	99.19 ± 4.22	4.19
	3, 5-Octadien-2-one 38284-27-4 $C_8H_{12}O$ 124.18 300	23.87	Fruity, fatty, mushroom like	48.71 ± 5.575	Below Threshold
brown rice protein	Pentane, all isomers 78-78- 4, 109-66-0, 463-82-1 C_5H_{12} 72.15 1290	2.94	Gasoline-like, sweet	79.43 ± 4.97	Below Threshold

Heptane, all isomers 142-82-5, 590-35-2, 565-59-3 108-08-7, 591-76-4, 589-34-4 C ₇ H ₁₆ 100.2 410	3.12	Petroleum-like	167.98 ± 36.44	Below Threshold
Acetone 67-64-1 C ₃ H ₆ O 58.08 20000	3.33	Solvent, ethereal, apple, pear	11.38 ± 1.89	Below Threshold
Octane, all isomers 111-65-9, 540-84-1, 86290-81-5 C ₈ H ₁₈ 114.22 660	3.4	Green, minty, herbal, rosemary, cooling	652.63 ± 40.77	Below Threshold
Butyraldehyde 123-72-8 C ₄ H ₈ O 72.11 0.3	3.6	Pungent, ₁ cocoa, ₂ musty, ₂ green malty, ₂ bready	137.19 ± 27.93	6.13
n-Valeraldehyde (Pentanal) 110-62-3 C ₅ H ₁₀ O 86.13 0.4	4.5	Fermented, ₁ bready, ₂ fruity, ₂ nutty, ₂ berry	1837.33 ± 200.36	8.43
Toluene 108-88-3 C ₇ H ₈ 92.13 21	5.3	Sweet	141.19 ± 17.08	1.91
Decane 124-18-5 C ₁₀ H ₂₂ 142.28 11	5.41	Gasoline-like	89.78 ± 7.51	2.10
Furfuryl Alcohol (2-furan methanol) 98-00-0 C ₅ H ₆ O ₂ 98.1 8000	5.69	sweet, ether, alcohol	53.81 ± 6.53	Below Threshold
Hexanal 66-25-1 C ₆ H ₁₂ O 100.16 97	6.35	Grassy, tallow, fatty, greeny	22590.24 ± 1643.70	5.45
2-n-Butyl furan 4466-24-4 C ₈ H ₁₂ O 124.18 51	7.12	Mild, fruity, wine, sweet, spicy	386.40 ± 30.64	2.03
5-undecene 764-96-5 C ₁₁ H ₂₂ 154.3 5	8.1	pleasant, butter-like	1410.36±296.77	5.64
2-Heptanone (Methyl n- amyl Ketone) 110-43-0 C ₇ H ₁₄ O 114.18	9.18	Soapy, sweet, mushroom	782.30 ± 81.94	1.72
Isophorone 78-59-1 C ₉ H ₁₄ O	10.61	sharp	120.13 ± 104.12	Below Threshold

138.2				
190				
2-Methylcyclohexanone 583-60-8 <chem>C7H12O</chem> 112.17 181	10.93		147.85 ± 9.88	Below Threshold
Pentanol, all isomers 71-41-0, 75-85-4, 75-84-3, 123-51-3, 137-32-6, 584-02-1, 598-75-4, 6032-29-7, 30899-19-5, 94624-12-1 <chem>C5H12O</chem> 88.15 5.5	11.45	Fruity	1171.26 ± 31.66	5.36
Diallylamine 124-02-7 <chem>C6H11N</chem> 97.16 2	12.75	Disagreeable, refreshing	113.44 ± 10.41	4.04
2-Octanone 111-13-7 <chem>C8H16O</chem> 128.21	13.01	Soapy, fruity	109.19 ± 11.15	0.78
Octanal 124-13-0 <chem>C8H16O12</chem> 8.21 2	13.22	Fatty, soap, lemon, green, orange, sweet	981.91 ± 97.88	6.20
2-Heptenal (Butylacrolein) 18829-55-5 <chem>C7H12O</chem> 112.17 10	14.47	Green type flavor	134.37 ± 22.74	2.60
2-hexenal, 2-methyl 28467-88-1 <chem>C7H12O</chem> 112.17 17	14.87		1716.45 ± 112.42	4.62
Dimethyl trisulfide 3658-80-8 <chem>C2H6S3</chem> 0.001	15.46	Sulfurous, onion, cooked, onion, savory, meaty	273.51 ± 43.22	12.52
2-heptenal, 2-methyl 30567-26-1 <chem>C8H14O</chem> 13	15.64		1717.48 ± 204.72	4.88
1-Hexanol (n-Hexyl Alcohol) 111-27-3 <chem>C6H14O</chem> 102.18 2.4	15.66	Resin, flowery, greeny	102.04 ± 9.30	3.75
Hexanethioic acid, S-methyl ester (S-Methyl hexanethioate) 2432-77-1 <chem>C7H14OS</chem> 146.25 0.3	17.06	Fruity, ethereal, green, tropical, cabbage, cheesy, rancid, floral, green	169.03 ± 21.49	6.33
2-Nonanone 821-55-6 <chem>C9H18O</chem> 142.24	17.24	Hot milk, soapy, greeny	94.02 ± 12.38	2.93
Nonanal 124-19-6	17.35	Fat, citrus, greeny	1129.05 ± 187.18	7.03

C ₉ H ₁₈ O 142.24 1				
3-Octen-2-one 4312-99-6 C ₈ H ₁₄ O 126.2	17.82	Mushroom, mouldy, burnt	389.34 ± 46.50	11.26
1-TRIDECENE 2437-56-1 C ₁₃ H ₂₆ 182.35 1200	18.44	Mild, pleasant.	137.54 ± 14.33	Below Threshold
2-Octenal 2548-87-0 C ₈ H ₁₄ O 126.20 3	18.74	Fatty	450.75 ± 47.30	5.01
5-decanone (Methyl Octyl Ketone) 693-54-9 C ₁₀ H ₂₀ O 156.26	18.9	Fermented	34.98 ± 4.65	Below Threshold
1-Octen-3-ol, 3391-86-4 C ₈ H ₁₆ O 128.2 1.08	19.43	Mushroomy, earthy, burnt	1850.47±221.00	7.45
1-Heptanol, 111-70-6 C ₇ H ₁₅ OH 116 3	19.71	Greeny	421.46 ± 44.14	4.95
2,6-Dimethyl-5-heptenal 106-72-9 C ₉ H ₁₆ O 140.22 16	19.89	--	125.05 ± 111.33	2.06
Benzaldehyde 100-52-7 C ₇ H ₆ O 106.12 1.5	21.24	Almond, burnt sugar, marchpane	2798.73±367.53	7.53
2-heptenal, 2-propyl 532-27-4 C ₁₀ H ₁₈ O 154.59 16	21.61	fruity	121.15 ± 11.04	2.02
Diisobutyl Ketone 108-83-8 C ₉ H ₁₈ O 142.24 103	21.89	Peppermint	263.69 ± 26.34	0.94
n-Butyl Acrylate 141-32-2 C ₇ H ₁₂ O ₂ 128.17 0.3	22.58	sweet, rancid, plastic	118.36 ± 10.74	5.98
Ethyl Amyl Ketone 541-85-5 C ₈ H ₁₆ O 128.21 5900	22.65	solvent, sharp	89.24 ± 56.36	Below Threshold
6-Undecanone (Diamyl ketone) 927-49-1 C ₁₁ H ₂₂ O 170.29 7	22.9		94.74 ± 9.57	2.61

1-Octanol 111-87-5 <chem>C8H18O</chem> 130.23 0.9	23.71	Waxy green, orange, aldehydic, rose, mushroom	397.56 ± 56.36	6.09
3, 5-Octadien-2-one 38284-27-4 <chem>C8H12O</chem> 124.18 300	23.87	Fruity, fatty, mushroom like	30.40 ± 2.82	Below Threshold
2-Octenal, 2-butyl 13019-16-4 <chem>C12H22O</chem> 182.30 3	24.25	fruity, pineapple, green, aldehydic, sweet, ripe juicy flavor	5906.10 ± 807.06	3.49
Valeric acid (Pentanoic acid) 109-52-4 <chem>C5H10O2</chem> 102.13 940	28.8	Acidic, sweaty, rancid	225.04 ± 47.34	Below Threshold
2,4-Nonadienal 6750-03-4 <chem>C9H14O</chem> 138.21 0.5	28.9	Fatty, melon, waxy, green, violet, leaf, cucumber, fruit, tropical, fruit, chicken, fat	126.44 ± 22.71	5.53
1-Decene 872-05-9 <chem>C10H20</chem> 140.27 6450	33.79	pleasant	192.21 ± 29.43	Below Threshold