

Supplementary Materials

Table S1 Major peaks in the FT-NIR spectra (frequency shifts in cm^{-1}) of C, EW, FG, SG and RG along with corresponding assignments.

EW	C	FG	RG	SG	Band Assignment	Ref.
5900	5900	5915	5915	5915	C-H aromatic/ 1^{st} overtone $\nu_a(\text{CH}_2)$	[5, 9]
5740	5732	5780	5780	5780	1^{st} overtone $\nu_s(\text{CH}_2)$	[5, 9]
5160	5146	5140	5140	5140	$\nu(\text{OH}) + \delta(\text{OH})$	[5, 9]
4865	4860	4896	4896	4896	$\nu_s(\text{NH}) + \delta(\text{NH})$ [$\nu\text{N-H}$ symmetric and Amide II deformation (N-H in plane bending) combination]	[5, 9]
4602	4612	4592	4592	4592	1^{st} overtone $\nu(\text{CO})$ amide I + amide III deformation (C-N stretching/N-H in plane bending)	[5, 9]
4352	4340	4376	4376	4376	$\nu_a(\text{CH}_2) + \delta(\text{CH}_2)$	[5, 9]
4260	4265	4260	4260	4260	$\nu_s(\text{CH}_2) + \delta(\text{CH}_2)$	[5, 9]
4050	4050	4045	4045	4045	CH combination (CH_2)/ 3^{rd} overtone $\delta(\text{CC})$	[5, 9]
3984	3984	3988	3988	3988	1^{st} overtone $\nu(\text{C-N-C})$ amide	[9]

Table S2 Major peaks in the Raman spectra (frequency shifts in cm^{-1}) of C, EW, FG, SG and RG along with corresponding assignments.

EW	C	FG	RG	SG	Band Assignment	Ref.
1666	1658	1665	1666	1671	Amide I	[1, 4]
1605	1616	1607	1603	1603	Phe/Tyr	[4]
1550	1550				Trp	[4]
1446	1450	1450	1452	1450	C-H ₂ scissoring	[1, 4]
1414	1410	1406	-	-	Aspartic and glutamic acids (C=O stretching)	[4]
1341	1322	1318	1312	1322	CH ₂ deformation	[1, 4]
1256	1246	1246	1245	1246	Amide III	[1, 4]
1208	1212	1206	1209	1208	Phe/Tyr	[4]
1122	1120	-	-	-	C-CT stretching	[4]
1098	1090	-	-	-	$\nu(\text{CC})$ (aliphatic)/C-N stretching	[1, 4]
1034	1041	1030	1033	1033	Phe	[4]
1002	1002	1002	1002	1002	Phe ring breathing	[1, 4]
-		975	-	-	C-C vibration $\delta(\text{CH}_2)$	[4]
954	955	-	-	-	C-C vibration, phosphate symmetric stretching	[4]
931	932	934	941	941	C-C stretching	[1, 4]
-	-	922	921	923	C-C vibration $\delta(\text{CH}_3)$	[4]
-	880				Trp	[4]
847	852	856	860	861	Tyr	[4]
827	826	-	-	-	Tyr	[4]
-	-	814	819	813	C-C stretching	[4]

Table S3 Major peaks in the FT-NIR spectra (frequency shifts in cm^{-1}) of EY and WE along with corresponding assignments.

WE	EY	Band Assignment	Ref.
5808	5792	1 st overtone $\nu_a(\text{CH}_2)$	[5, 9]
5680	5680	1 st overtone $\nu_s(\text{CH}_2)$	[5, 9]
5160	5156	$\nu(\text{OH})+\delta(\text{OH})$	[5, 9]
4854	4860	$\nu(\text{NH})+\delta(\text{NH})^*$	[5, 9]
4606	4602	1 st overtone $\nu(\text{CO})$ amide I + amide III deformation (C-N stretching/N-H in plane bending)	[5, 9]
4330	4330	$\nu_a(\text{CH}_2)+\delta_a(\text{CH}_2)^*$	[5, 9]
4260	4260	$\nu_s(\text{CH}_2)+\delta_s(\text{CH}_2)^*$	[5, 9]
4058	4063	CH combination (CH_2)/ 3 rd overtone $\delta(\text{CC})$	[5, 9]

Table S4 Major peaks in the Raman spectra (frequency shifts in cm^{-1}) of EY and WE along with corresponding assignments.

EY	WE	Band Assignment	Ref.
1743	1740	C=O stretching	[4, 18]
1660	1660	Amide I/ <i>cis</i> $\nu(\text{C}=\text{C})$	[1, 4, 18]
1526	1522	Trp	[4]
1442	1435	C-H ₂ scissoring	[1, 4, 18]
1300	1300	In phase methylene twisting motion $\delta(\text{CH}_2)_2$	[18]
1268	1264	Amide III	[1, 4]
1192	1187	Phe/Tyr	[4]
1156	1156	C-CT stretching	[4]
1081	1080	C-C,C-N stretching	[1, 4]
1028	1030	Phe	[4]
1005	1003	Phe ring breathing	[1, 4]
884	892	Trp	[4]
848	836	Tyr	[4]

Table S5 Major peaks in the FT-NIR spectra (frequency shifts in cm^{-1}) of drying oils along with corresponding assignments.

Drying oil	Assignment	Ref.
5790	1 st overtone $\nu_a(\text{CH}_2)$	[5, 9]
5676	1 st overtone $\nu_s(\text{CH}_2)$	[5, 9]
5260	2 nd overtone $\nu(\text{C}=\text{O})$	[9]
5176	2 nd overtone $\nu(\text{C}=\text{O})$ ester	[5, 9]
4686	$\nu(\text{CH}) + \nu(\text{C}=\text{O})$	[5, 9, 19]
(4595)	$[\nu_s(\text{CH}) + \nu(\text{C}=\text{C})]$	[20]
4340	$\nu_a(\text{CH}_2) + \delta(\text{CH}_2)$	[5, 9]
4262	$\nu_s(\text{CH}_2) + \delta(\text{CH}_2)$	[5, 9]

Table S6 Major peaks in the Raman spectra (frequency shifts in cm^{-1}) of drying oils along with corresponding assignments.

Drying oil	Assignment	Ref.
1746	Stretching $\nu(\text{C}=\text{O})$ esters	[22, 23]
1655	Stretching $\nu(\text{C}=\text{C})$ [<i>cis</i> dialkyl C=C double bond]	[18]
1445	Bending $\delta(\text{CH}_2)$	[18]
1302	In phase methylene twisting motion $\delta(\text{CH}_2)_2$	[18]
1267	Rocking deformation of <i>cis</i> dialkyl ethylenes $\nu(\text{CH}=\text{CH})$	[18]
1085	Stretching $\nu(\text{C}-\text{C})$	[21]
864	Stretching $\nu(\text{C}-\text{C})$	[21]

Table S7 Major peaks in the FT-NIR spectra (frequency shifts in cm^{-1}) of AG and TG along with corresponding assignments.

AG	TG	Band Assignment	Ref.
5164	5181	O-H stretching and HOH bending combination (O-H and HOH)	[9]
4761	4812	O-H bending and C-O stretching combination. O-H/C-O polymeric (.O-H and .C-O)	[9]
4268	4454- 4228	C-H stretching and CH_2 deformation combination	[9]
4000	4016	C-H stretching and C-C (and C-O-C) stretching combination	[9]

Table S8 Major peaks in the Raman spectra (frequency shifts in cm^{-1}) of AG and TG along with corresponding assignments.

AG	TG	Band Assignment	Ref.
1460	1445	$\delta(\text{CH}_2)$ scissoring	[1, 24]
1348	1349	$\delta(\text{CH}_2)$ wagging	[1, 24]
1264	1250	$\tau(\text{CH}_2)$	[1, 24]
1078	1084	$\nu(\text{COC})$ ether group (ring)	[1, 24]
974	-	$\delta(\text{CH}_3)$	[1, 24]
950	-	CC symmetrical stretching	[1, 24]
-	941	$\nu(\text{COC})$	[1, 24]
882	857	$\nu(\text{COC})$	[1, 24]
841		$\nu(\text{COC})$	[1, 24]