

Figure S1. X-ray diffraction patterns of second-generation (a and b) and third-generation (c and d) yellow pea (YP) and red lentil (RL) products with feed moisture contents of 0.20 and 0.24 kg water per kg dry flour (MC0.20 and MC0.24, respectively) at 100 °C and 125 °C die temperature (DT100 and DT125, respectively).

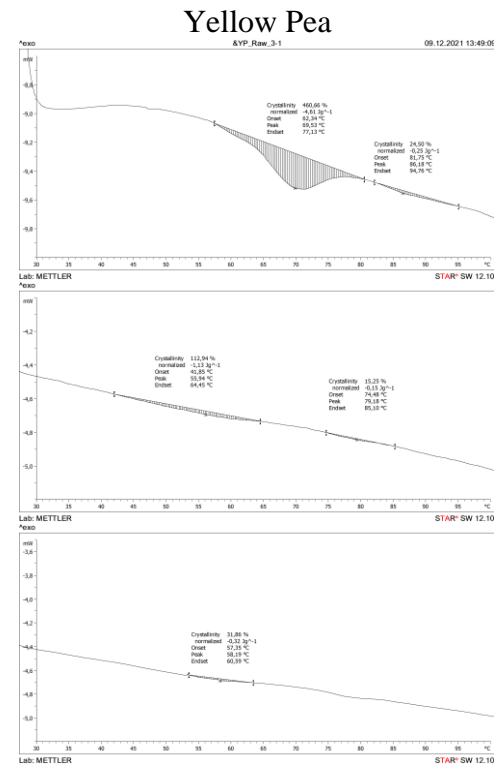
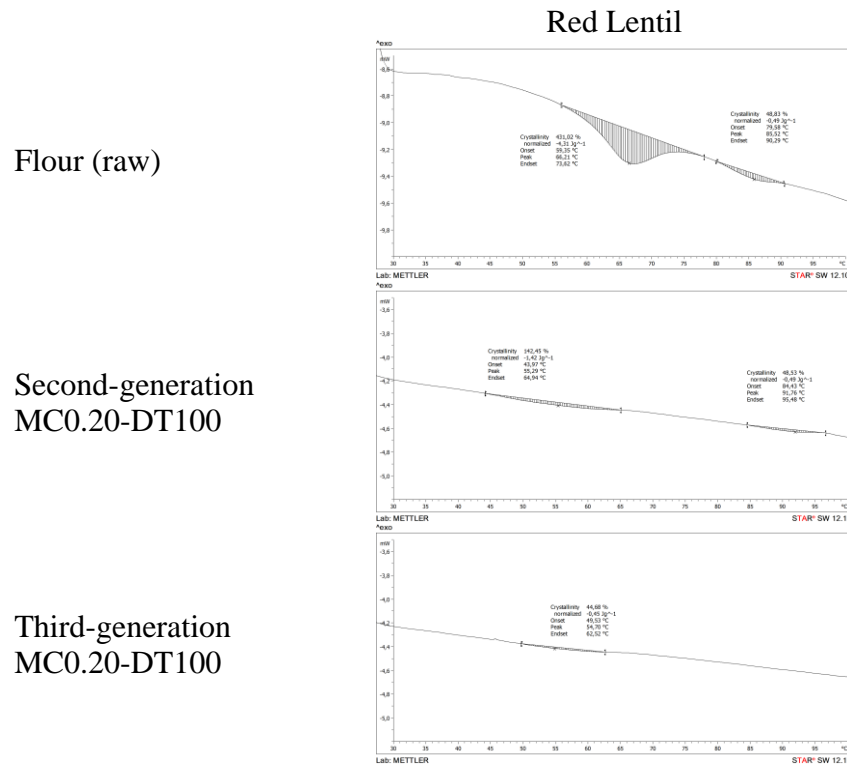


Figure S2. DSC thermograms of red lentil (RL) and yellow pea (YP) flours, second-generation and third-generation red lentil and yellow pea products with feed moisture content of 0.20 kg water per kg dry flour (MC0.20) at 100 °C die temperature (DT100).

Table S1. Pearson correlation coefficients between extrusion variables and extrudate properties in red lentil (RL) third-generation products.

	MC	Torque	Die			Density	L*	a*	b*	ΔE	Hardness	Crunchiness	Crispiness	T ₀	T _p	ΔH
		e	pressure	SME	EI	y					s	s	s			
	0.00			-			-			-						-
DT	0	-0.446	-0.832	0.893	0.700	-0.954	0.781	0.903	0.683	0.757	0.213	0.470	0.358	0.685	0.806	0.620
				-				-	-							-
MC		-0.893	-0.532	0.446	0.254	-0.129	0.417	0.322	0.522	0.373	0.019	0.266	0.150	0.677	0.281	0.688
				-				-	-					-	-	
Torque			0.852	0.801	0.424	0.367	0.002	0.115	0.180	0.061	0.426	-0.350	0.093	0.903	0.594	0.912
Die				-				-	-					-	-	
pressure				0.986	0.749	0.726	0.514	0.608	0.639	0.442	0.268	-0.490	-0.034	0.905	0.777	0.910
				-				-	-					-	-	
SME					0.757	0.812	0.578	0.669	0.679	0.513	0.204	-0.482	-0.031	0.906	0.828	0.881
							-									-
EI						-0.825	0.420	0.587	0.453	0.393	0.144	0.526	0.401	0.674	0.758	0.459
								-	-					-	-	
Density							0.688	0.813	0.583	0.671	-0.181	-0.499	-0.322	0.694	0.871	0.488
								-	-					-	-	
L*								0.961	0.746	0.992	0.134	0.138	0.240	0.219	0.453	0.296
										-						-
a*									0.791	0.939	-0.104	0.003	-0.117	0.330	0.536	0.392
										-						-
b*										0.656	-0.320	-0.018	-0.216	0.423	0.668	0.466
														-	-	
ΔE											0.091	0.153	0.232	0.136	0.355	0.218
														-		
Hardness												0.254	0.757	0.214	0.038	0.529
																-
Crunchiness													0.689	0.565	0.777	0.310
Crispiness														0.110	0.383	0.195
																-
T ₀															0.828	0.857
																-
T _p																0.627

DT: Die temperature; MC: Feed moisture content; SME: Specific mechanical energy; EI: Expansion index; L*: Darkness/lightness; a*: Greenness/redness; b*: Blueness/yellowness; ΔE : Overall colour difference; T₀: Onset temperature; T_p: Peak temperature; ΔH : Enthalpy of starch gelatinization.

Table S2. Pearson correlation coefficients between extrusion variables and extrudate properties in yellow pea (YP) third-generation products.

	MC	Torque	Die			Density	L*	a*	b*	ΔE	Hardness	Crunchiness	Crispiness	T ₀	T _p	ΔH
		e	pressure	SME	EI	y					s	s	s			
	0.00			-			-			-				-		-
DT	0	-0.473	-0.531	0.850	0.431	-0.559	0.195	0.696	0.392	0.090	-0.328	0.226	-0.112	0.092	0.100	0.572
				-	-		-			-				-	-	-
MC		-0.850	-0.819	0.473	0.231	0.665	0.691	0.483	0.642	0.691	0.211	-0.044	0.136	0.204	0.286	0.726
								-	-					-		
Torque			0.988	0.821	0.164	-0.395	0.788	0.550	0.577	0.882	-0.472	-0.607	-0.651	0.031	0.205	0.879
Die								-	-					-		
pressure				0.849	0.163	-0.377	0.834	0.600	0.638	0.917	-0.414	-0.584	-0.642	0.057	0.084	0.886
								-	-							
SME					0.023	0.094	0.964	0.864	0.895	0.963	-0.011	-0.152	-0.260	0.017	0.163	0.826
								-						-		
EI						-0.605	0.213	0.168	0.076	0.276	-0.137	0.173	-0.018	0.278	0.105	0.161
							-	-		-				-		-
Density							0.369	0.208	0.180	0.453	0.285	-0.129	0.224	0.045	0.018	0.262
								-	-					-	-	
L*								0.741	0.951	0.989	-0.017	-0.156	-0.331	0.023	0.014	0.827
										-				-		-
a*									0.878	0.645	-0.081	0.254	0.299	0.018	0.067	0.611
										-				-		-
b*										0.893	-0.043	0.179	0.322	0.061	0.097	0.690
														-		
ΔE											-0.048	-0.137	-0.324	0.071	0.036	0.875
														-		-
Hardness												0.072	0.727	0.263	0.114	0.155
														-	-	-
Crunchiness													0.548	0.079	0.009	0.464
																-
Crispiness														0.006	0.127	0.532
														-	-	-
T ₀															0.213	0.245
T _p																0.264

DT: Die temperature; MC: Feed moisture content; SME: Specific mechanical energy; EI: Expansion index; L*: Darkness/lightness; a*: Greenness/redness; b*: Blueness/yellowness; ΔE : Overall colour difference; T₀: Onset temperature; T_p: Peak temperature; ΔH : Enthalpy of starch gelatinization.