

## Supplementary materials

**Table S1** Hydrolysis rate of the multigrain reconstituted rice at different extrusion temperatures.

Samples	T60	T70	T80	T90	T100	T110	T120
0min	3.02±0.01 <sup>d</sup>	3.01±0.05 <sup>d</sup>	3.45±0.06 <sup>e</sup>	3.55±0.29 <sup>bc</sup>	3.83±0.20 <sup>abc</sup>	3.96±0.20 <sup>a</sup>	3.92±0.33 <sup>ab</sup>
5min	24.41±0.59 <sup>b</sup>	24.39±1.08 <sup>b</sup>	23.35±0.20 <sup>b</sup>	24.58±0.38 <sup>b</sup>	24.38±0.40 <sup>b</sup>	30.44±1.24 <sup>a</sup>	31.35±0.73 <sup>a</sup>
10min	31.57±1.48 <sup>c</sup>	29.92±1.46 <sup>cd</sup>	27.69±0.56 <sup>d</sup>	27.66±0.56 <sup>d</sup>	30.27±0.75 <sup>cd</sup>	35.71±1.77 <sup>b</sup>	38.89±2.01 <sup>a</sup>
15min	32.95±1.31 <sup>cd</sup>	34.00±2.12 <sup>bc</sup>	29.84±0.45 <sup>e</sup>	31.01±1.84 <sup>de</sup>	36.19±1.00 <sup>b</sup>	40.89±1.06 <sup>a</sup>	43.04±1.08 <sup>a</sup>
20min	38.03±1.51 <sup>d</sup>	38.41±1.26 <sup>d</sup>	37.63±0.99 <sup>d</sup>	37.86±2.09 <sup>d</sup>	41.65±0.69 <sup>c</sup>	45.54±1.61 <sup>b</sup>	49.50±1.31 <sup>a</sup>
30min	44.33±1.07 <sup>bc</sup>	42.76±0.48 <sup>e</sup>	43.55±0.94 <sup>bc</sup>	43.56±1.16 <sup>bc</sup>	45.69±2.18 <sup>b</sup>	50.12±0.54 <sup>a</sup>	51.77±0.85 <sup>a</sup>
45min	48.62±1.08 <sup>d</sup>	48.32±0.42 <sup>d</sup>	47.84±1.20 <sup>d</sup>	50.37±1.35 <sup>d</sup>	53.34±2.05 <sup>b</sup>	55.99±0.29 <sup>a</sup>	57.37±1.57 <sup>a</sup>
60min	55.48±0.83 <sup>c</sup>	51.82±0.48 <sup>d</sup>	53.65±0.76 <sup>bc</sup>	55.56±2.94 <sup>bc</sup>	59.02±1.82 <sup>a</sup>	58.55±0.71 <sup>ab</sup>	60.96±1.46 <sup>a</sup>
90min	61.50±1.48 <sup>cd</sup>	59.13±1.62 <sup>d</sup>	60.13±0.66 <sup>d</sup>	59.97±2.14 <sup>d</sup>	63.15±1.57 <sup>bc</sup>	65.23±1.72 <sup>b</sup>	71.02±0.13 <sup>a</sup>
120min	64.42±0.33 <sup>c</sup>	65.25±0.65 <sup>e</sup>	61.98±0.32 <sup>d</sup>	61.26±1.86 <sup>d</sup>	68.85±0.87 <sup>b</sup>	68.43±0.39 <sup>b</sup>	74.14±0.67 <sup>a</sup>
180min	64.78±0.34 <sup>c</sup>	67.15±0.51 <sup>e</sup>	65.02±0.87 <sup>c</sup>	67.07±3.28 <sup>c</sup>	71.57±1.76 <sup>b</sup>	74.84±2.68 <sup>ab</sup>	78.58±1.48 <sup>a</sup>

Note: Values are expressed as means ± standard deviation and different letters in the same column indicate significant differences ( $p < 0.05$ ).

**Table S2** The blood glucose response data of the multigrain constituted rice and standard glucose (mmol/L).

Time (min)	T60	T70	T80	T90	T100	T110	T120	Glucose
0	5.10±0.05 <sup>b</sup>	5.23±0.10 <sup>ab</sup>	5.40±0.08 <sup>a</sup>	5.06±0.08 <sup>b</sup>	5.04±0.05 <sup>b</sup>	5.11±0.05 <sup>b</sup>	5.16±0.06 <sup>b</sup>	5.03±0.01 <sup>b</sup>
15	6.97±0.14 <sup>ef</sup>	6.77±0.26 <sup>f</sup>	7.30±0.17 <sup>dc</sup>	7.81±0.31 <sup>c</sup>	7.69±0.28 <sup>cd</sup>	8.25±0.27 <sup>b</sup>	9.30±0.18 <sup>a</sup>	9.43±0.40 <sup>a</sup>
30	8.00±0.13 <sup>bc</sup>	7.93±0.19 <sup>c</sup>	8.13±0.10 <sup>ab</sup>	8.21±0.37 <sup>bc</sup>	8.31±0.30 <sup>bc</sup>	8.45±0.17 <sup>ab</sup>	8.41±0.15 <sup>abc</sup>	8.83±0.64 <sup>a</sup>
45	7.47±0.25 <sup>b</sup>	7.57±0.14 <sup>b</sup>	6.97±0.26 <sup>b</sup>	7.36±0.45 <sup>b</sup>	7.39±0.33 <sup>b</sup>	7.15±0.40 <sup>b</sup>	7.39±0.21 <sup>b</sup>	8.47±0.62 <sup>a</sup>
60	6.60±0.40 <sup>cd</sup>	6.43±0.38 <sup>ab</sup>	6.37±0.21 <sup>d</sup>	6.71±0.25 <sup>bcd</sup>	6.80±0.42 <sup>bcd</sup>	6.85±0.38 <sup>bcd</sup>	7.06±0.20 <sup>abc</sup>	7.70±0.82 <sup>a</sup>
90	5.57±0.06 <sup>c</sup>	6.20±0.22 <sup>ab</sup>	6.30±0.13 <sup>ab</sup>	5.97±0.15 <sup>bc</sup>	6.16±0.36 <sup>ab</sup>	6.05±0.38 <sup>ab</sup>	6.35±0.15 <sup>a</sup>	6.30±0.32 <sup>ab</sup>
120	5.07±0.08 <sup>a</sup>	5.17±0.23 <sup>a</sup>	5.87±0.10 <sup>a</sup>	5.44±0.13 <sup>a</sup>	5.40±0.15 <sup>a</sup>	5.53±0.21 <sup>a</sup>	5.47±0.25 <sup>a</sup>	5.00±0.67 <sup>a</sup>
IAUG	166.96±4.99 <sup>d</sup>	176.61±4.14 <sup>d</sup>	189.96±6.36 <sup>c</sup>	201.70±5.73 <sup>bc</sup>	205.65±5.52 <sup>b</sup>	205.73±5.22 <sup>b</sup>	208.20±3.61 <sup>b</sup>	276.38±5.56 <sup>a</sup>

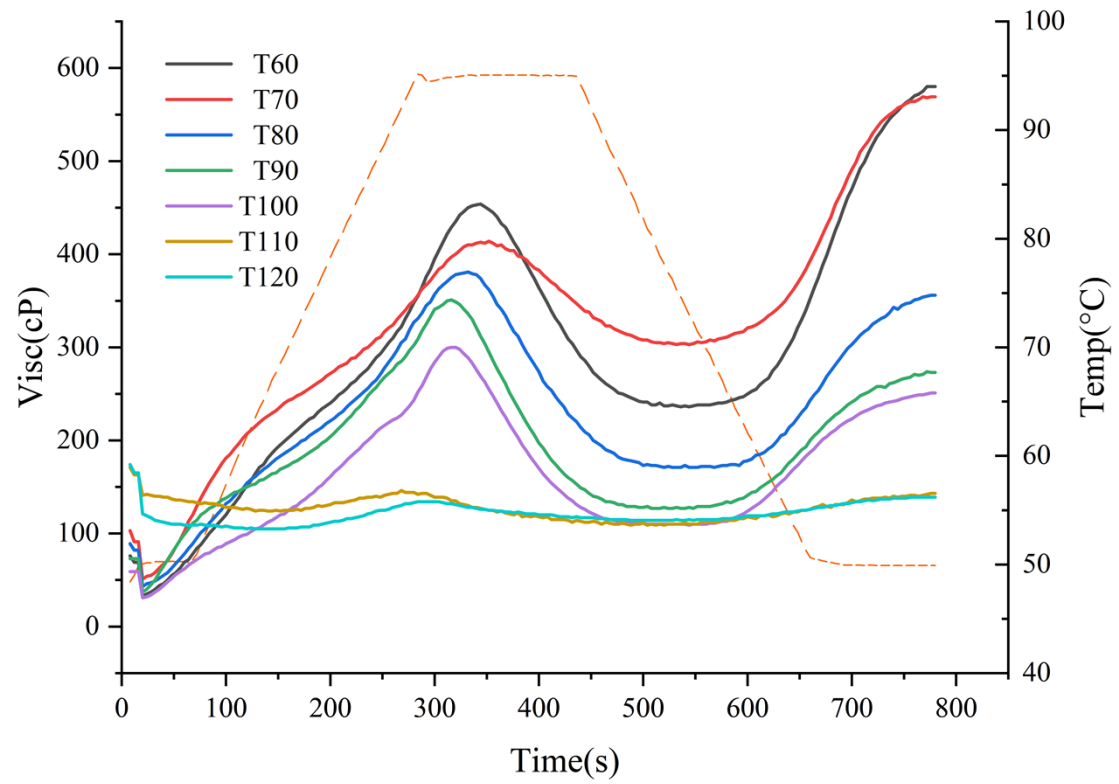
Note: IAUG, the area under the glycemic curve.

Values are expressed as means ± standard deviation and different letters in the same column indicate significant differences ( $p < 0.05$ ).

**Table S3** Correlation analysis among structural properties, physicochemical properties, digestive characteristics, estimated glycemic index and glycemic index of the multigrain reconstituted rice.

	DG	Cry	WAI	WSI	PV	TV	BD	FV	SB	$\Delta H$	Sen	$L^*$	$a^*$	$b^*$	Har	Adh	Che	Gum	CL	RR	Exp	$C_{\infty}$	RS	eGI	GI
DG	1	-0.98771**	0.87343*	0.90015**	-0.92820**	-0.85986*	-0.59446	-0.95882**	-0.95226**	-0.98457**	0.15805	-0.87540**	0.89542**	0.98790**	-0.92005**	0.96417**	-0.91171**	-0.90665**	0.99154**	0.90232**	0.82956*	0.90097**	-0.96067**	0.88560**	0.94714**
Cry		1	-0.86045*	-0.91144**	0.93262**	0.83312*	0.62265	0.96707**	0.98274**	0.99462**	-0.14151	0.85046*	-0.92188**	-0.98576**	0.91579**	-0.97080**	0.94665**	0.94511**	-0.97982**	-0.95266**	-0.85017*	-0.88006**	0.98246**	-0.86348*	-0.9536**
WAI			1	0.94477**	-0.94923**	-0.69991	-0.75552*	-0.84868*	-0.88281**	-0.87616**	-0.30246	-0.87721**	0.89573**	0.92109**	-0.79506*	0.88610**	-0.88462**	-0.89223**	0.91572**	0.77327*	0.64804	0.95488**	-0.90133**	0.97609**	0.75596*
WSI				1	-0.95144**	-0.65269	-0.79746*	-0.85902*	-0.92997**	-0.94122**	-0.17902	-0.88931**	0.95518**	0.94458**	-0.79531*	0.91835**	-0.97407**	-0.97390**	0.91867**	0.90038**	0.74444	0.96017**	-0.94861**	0.96399**	0.81830*
PV					1	0.71230	0.81652*	0.88701**	0.93523**	0.94455**	0.20404	0.88097**	-0.88319**	-0.96999**	0.91539**	-0.94887**	0.92410**	0.93546**	-0.94002**	-0.85985*	-0.64409	-0.96723**	0.93375**	-0.96097**	-0.79979*
TV						1	0.17641	0.93066**	0.81631*	0.79006*	-0.30968	0.82124*	-0.75962*	-0.79818*	0.84313*	-0.86475*	0.70652	0.69521	-0.87898**	-0.69443	-0.76683*	-0.63290	0.81498*	-0.66505	-0.90452**
BD							1	0.47846	0.64014	0.67480	0.54087	0.56000	-0.61379	-0.70379	0.59025	-0.61942	0.71484	0.74006	-0.59532	-0.63468	-0.27253	-0.83587*	0.63915	-0.80066*	-0.37763
FV								1	0.97105**	0.94522**	-0.15071	0.88521**	-0.92278**	-0.94205**	0.91330**	-0.97451**	0.90891**	0.90556**	-0.97364**	-0.89639**	-0.85109*	-0.80940*	0.96763**	-0.82362*	-0.96658**
SB									1	0.97637**	-0.03575	0.86127*	-0.96081**	-0.96606**	0.89132**	-0.97384**	0.97358**	0.97568**	-0.96318**	-0.96171**	-0.84294*	-0.86455*	0.99547**	-0.86601*	-0.93536**
$\Delta H$										1	-0.10035	0.86265*	-0.93129**	-0.99041**	0.89867**	-0.96624**	0.96217**	0.95946**	-0.97539**	-0.95719**	-0.83930*	-0.91221**	0.98179**	-0.89331**	-0.93575**
Sen											1	0.08905	-0.02714	0.02070	-0.04048	0.02476	0.04303	0.08053	0.07954	0.14722	0.43278	-0.22719	-0.04142	-0.27565	0.35412
$L^*$												1	-0.88117**	-0.87582**	0.86084*	-0.93810**	0.86634*	0.85761*	-0.90702**	-0.75953*	-0.66309	-0.87402*	0.87652**	-0.91390**	-0.82053*
$a^*$													1	0.91611**	-0.76957*	0.92730**	-0.98093**	-0.97465**	0.92520**	0.93237**	0.86883*	0.85535*	-0.97601**	0.87866**	0.90447**
$b^*$														1	-0.91390**	0.96629**	-0.94207**	-0.94317**	0.98653**	0.91554**	0.79081*	0.94432**	-0.97279**	0.92938**	0.90807**
Har															1	-0.95069**	0.81568*	0.82386*	-0.91335**	-0.79704*	-0.60896	-0.82751*	0.86944*	-0.81900*	-0.83177*
Adh																1	-0.94202**	-0.94167**	0.97481**	0.90444**	0.77264*	0.88838**	-0.97015**	0.89748**	0.92154**
Che																	1	0.99833**	-0.92378**	-0.96818**	-0.82846*	-0.88996**	0.98043**	-0.89242**	-0.88778**
Gum																		1	-0.92016**	-0.96506**	-0.80565*	-0.89398**	0.97884**	-0.89554**	-0.87282*
CL																			1	0.89030**	0.82556*	0.91022**	-0.97304**	0.91135**	0.94243**
RR																				1	0.87937**	0.80072*	-0.95951**	0.77975*	0.91470**
Exp																					1	0.62000	-0.86599*	0.61747	0.94292**
$C_{\infty}$																						1	-0.88508**	0.99009**	0.74656
RS																							1	-0.88813**	-0.94316**
eGI																								1	0.74593
GI																									1

Note: DG = degree of gelatinization; Cry = crystallinity; WAI = water solubility index; WSI = water absorption index; PV = peak viscosity; TV = trough viscosity; BD = breakdown; FV = final viscosity; SB = setback;  $\Delta H$  = heat absorption enthalpy; Sen = sensory;  $L^*$  = lightness;  $a^*$  = redness;  $b^*$  = yellowness; Har = hardness; Adh = adhesiveness; Che = chewiness; Gum = gumminess; CL = cooking loss; RR = rehydration ratio; Exp = expansivity; ;  $C_{\infty}$  = the starch digestibility at the end of digestion; RS = resistant starch; eGI = estimated glycemic index; GI = glycemic index. \* Represents significant difference between data,  $p < 0.05$ ; \*\* represents extremely significant difference between data,  $p < 0.01$ .



**Fig.S1** Pasting properties of the multigrain reconstituted rice.