Supplementary Materials

Table S1: Sensory parameters and standard of the score for buckwheat noodles

Table S2: Relative amount of water in different states/distribution for uncooked FBN and DBN (A21 for tightly bound water (TBW); A22 for softly bound water (SBW); A23 for free water (FW))

Figure S1: CPMG and IR signal of FBN-20% and DBN-20%

Table S1. Sensory parameters and standard of the score for buckwheat noodles.

Sensory parameters (Full score)	Score			
Colour **(10)**	**Light colour and bright** **8-10**	Brown and less bright 5-7	Dark-brown 1-4	-
Appearance **(10)**	Smooth and irregular shape 8-10	Less smooth and in shape 5-7	Rough and unshaped 1-4	-
Hardness **(20)**	Suitable hardness 17-20	Harder or softer 12-16	Over hard or soft1-12	-
Elasticity **(25)**	Elastic 21-25	Poor elastic 16-20	Worse elasticity 11-15	Worst elasticity 1-10
Stickiness **(20)**	Non-sticky 16-20	Less sticky 11-25	Sticky 6-10	Very sticky 1-5
Smoothness **(10)**	Smooth 8-10	Less smooth 5-7	Coarse 1-4	-
Flavour **(5)**	Buckwheat flavour 5	Non-smell 3-4	Smell 1-2	-

Table S2. Relative amount of water in different states/distribution for uncooked FBN and DBN (A_{21} for tightly bound water (TBW); A_{22} for softly bound water (SBW); A_{23} for free water (FW)).

Noodles	A_{21}/%	A_{22}/%	A_{23}/%
FBN-20%	18.03 ± 0.29[b1 B]	81.60 ± 0.24[a1 A]	0.37 ± 0.28[b1 B]
DBN-20%	93.58 ± 0.67[a2 A]	3.64 ± 0.90[a2 B]	2.78 ± 0.25[c2 A]
FBN-50%	19.63 ± 1.32[b1 B]	78.27 ± 1.55[b1 A]	2.10 ± 0.24[a1 B]
DBN-50%	89.86 ± 0.77[b2 A]	3.66 ± 0.67[a2 B]	6.34 ± 0.23[b2 A]
FBN-80%	24.88 ± 0.12[a1 B]	72.51 ± 0.14[c1 A]	2.61 ± 0.07[a1 B]
DBN-80%	87.65 ± 1.43[c2 A]	3.85 ± 1.12[a2 B]	8.50 ± 1.59[a2 A]

*The a1, b1 and c1 in a column indicate the proportion of TBW, SBW, and FW respectively within FBN-20/50/80 % is significantly different at $p<0.05$; The a2, b2, and c2 in a column indicate the proportion of TBW, SBW, and FW respectively within DBN-20/50/80 % is significantly different at $p<0.05$; The A and B of FBN and DBN with the same addition of extruded buckwheat flour indicate significantly different at $p<0.05$.
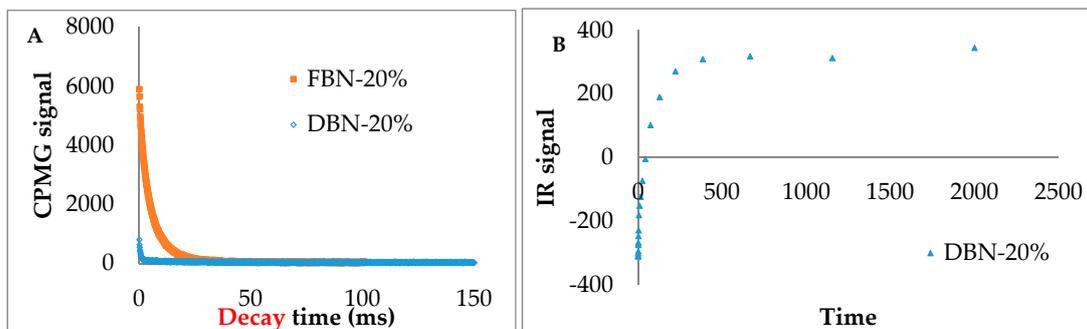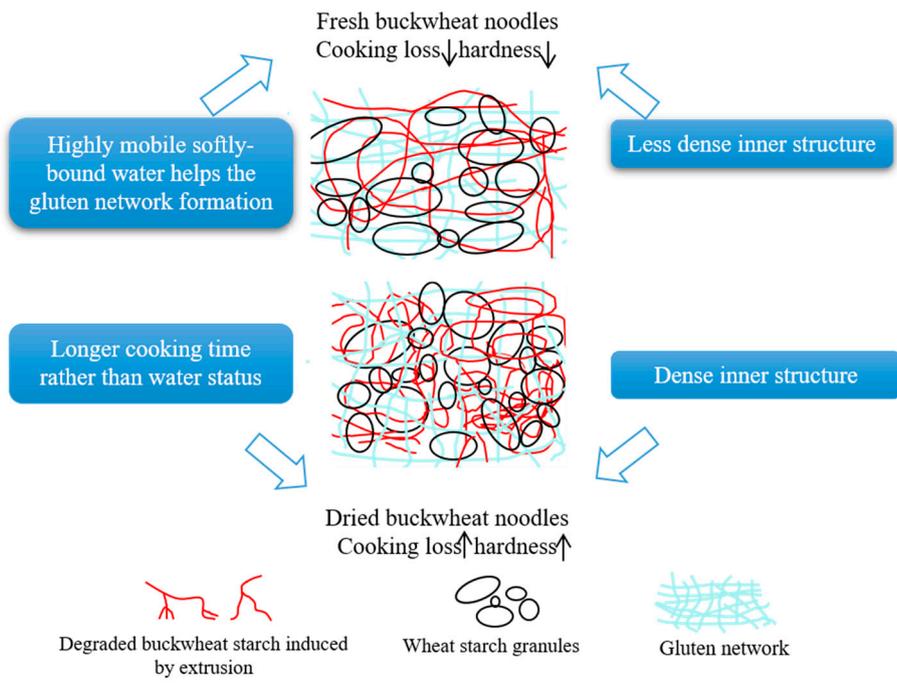

Figure S1. CPMG (A) and IR (B) signal of noodles

Figure S2. Graphical abstract