

Supplementary

Table S1: List and definition of sensory properties.

Attributes	Description
<i>Evenness of colour</i>	The overall evenness of colour of the biscuit
<i>Hardness of first bite</i>	Force needed to break the biscuit on first bite using the molars
<i>Sound at break of first bite</i>	Level of noise produced when biting into the biscuit with the molars
<i>Hardness during chewing/</i>	Force required to break down the biscuit during chewing
<i>Graininess</i>	Degree to which the biscuit contains particles of various sizes
<i>Dryness</i>	Perception of pastiness in the mouth in terms of salivation and difficulty in swallowing
<i>Buttery flavour</i>	Intensity of buttery flavour perceived while chewing the biscuit
<i>Sweetness</i>	Intensity of sweetness of the biscuit
<i>Aftertaste</i>	The presence of an aftertaste 30 seconds after swallowing

Table S2: ANOVA for the models of the response factors water absorption, biscuit hardness, diameter, lightness (L*-value), dough hardness, dough stickiness and water activity.

Response Factor	Model	ANOVA- Models			ANOVA- Lack of Fit		
		F-value	P-value	Significance	F-value	P-value	Significance
Water Absorption [%]	Linear	241.605	0.866	Not significant	241.605	0.004	Significant
	<i>Fibersym RW</i>	<i>0.179</i>	<i>0.694</i>	<i>Not significant</i>			
	<i>VITACEL L 600-30</i>	<i>17.013</i>	<i>0.146</i>	<i>Not significant</i>			
	<i>AgriFiber BFG</i>	<i>25.771</i>	<i>0.071</i>	<i>Not significant</i>			
	Two-way interaction	295.466	0.719	Not significant	295.466	0.003	Significant
	<i>Fibersym RW * VITACEL L 600-30</i>	<i>0.338</i>	<i>0.592</i>	<i>Not significant</i>			
	<i>Fibersym RW * AgriFiber BFG</i>	<i>0.338</i>	<i>0.592</i>	<i>Not significant</i>			
	<i>VITACEL L 600-30* AgriFiber BFG</i>	<i>9.734</i>	<i>0.065</i>	<i>Not significant</i>			
Biscuit Hardness [N]	Linear	1.331	0.011	Significant	1.331	0.456	Not Significant
	<i>Fibersym RW</i>	<i>1.032</i>	<i>0.367</i>	<i>Not significant</i>			
	<i>VITACEL L 600-30</i>	<i>21.879</i>	<i>0.016</i>	<i>Significant</i>			
	<i>AgriFiber BFG</i>	<i>15.831</i>	<i>0.016</i>	<i>Significant</i>			
	Two-way interaction	1.382	0.457	Not significant	1.382	0.434	Not Significant
	<i>Fibersym RW * VITACEL L 600-30</i>	<i>3.574</i>	<i>0.032</i>	<i>Significant</i>			
	<i>Fibersym RW * AgriFiber BFG</i>	<i>0.095</i>	<i>0.773</i>	<i>Not significant</i>			
	<i>VITACEL L 600-30* AgriFiber BFG</i>	<i>0.080</i>	<i>0.792</i>	<i>Not significant</i>			

Diameter [mm]	Linear	32.776	0.435	Not significant	32.776	0.008	Significant
	<i>Fibersym RW</i>	<i>0.001</i>	<i>0.983</i>	<i>Not significant</i>			
	<i>VITACEL L 600-30</i>	<i>0.701</i>	<i>0.450</i>	<i>Not significant</i>			
	<i>AgriFiber BFG</i>	<i>44.684</i>	<i>0.260</i>	<i>Not significant</i>			
	Two-way interaction	13.478	0.074	Not significant	13.478	0.278	Not Significant
	<i>Fibersym RW * VITACEL L 600-30</i>	<i>15.880</i>	<i>0.163</i>	<i>Not significant</i>			
	<i>Fibersym RW * AgriFiber BFG</i>	<i>63.009</i>	<i>0.136</i>	<i>Not significant</i>			
	<i>VITACEL L 600-30* AgriFiber BFG</i>	<i>150.084</i>	<i>0.255</i>	<i>Not significant</i>			
L*-value [-]	Linear	86.871	0.088	Not significant	86.871	0.002	Significant
	<i>Fibersym RW</i>	<i>0.013</i>	<i>0.916</i>	<i>Not significant</i>			
	<i>VITACEL L 600-30</i>	<i>0.572</i>	<i>0.491</i>	<i>Not significant</i>			
	<i>AgriFiber BFG</i>	<i>0.420</i>	<i>0.552</i>	<i>Not significant</i>			
	Two-way interaction	95.376	0.462	Not significant	95.376	0.002	Significant
	<i>Fibersym RW * VITACEL L 600-30</i>	<i>3.533</i>	<i>0.133</i>	<i>Not significant</i>			
	<i>Fibersym RW * AgriFiber BFG</i>	<i>0.313</i>	<i>0.606</i>	<i>Not significant</i>			
	<i>VITACEL L 600-30* AgriFiber BFG</i>	<i>1.594</i>	<i>0.275</i>	<i>Not significant</i>			
Dough Hardness [N]	Linear	10.802	0.065	Not significant	10.802	0.037	Significant
	<i>Fibersym RW</i>	<i>1.920</i>	<i>0.238</i>	<i>Not significant</i>			
	<i>VITACEL L 600-30</i>	<i>23.916</i>	<i>0.810</i>	<i>Not significant</i>			
	<i>AgriFiber BFG</i>	<i>0.920</i>	<i>0.392</i>	<i>Not significant</i>			
	Two-way interaction	7.505	0.056	Not significant	7.505	0.062	Significant

	<i>Fibersym RW * VITACEL L 600-30</i>	3.683	0.127	<i>Not significant</i>			
	<i>Fibersym RW * AgriFiber BFG</i>	18.088	0.013	<i>Not significant</i>			
	<i>VITACEL L 600-30* AgriFiber BFG</i>	0.000	0.994	<i>Not significant</i>			
Dough Stickiness [N]	Linear	2.772	0.060	Not significant	2.772	0.217	Not Significant
	<i>Fibersym RW</i>	0.060	0.818	<i>Not significant</i>			
	<i>VITACEL L 600-30</i>	18.303	0.013	<i>Significant</i>			
	<i>AgriFiber BFG</i>	1.393	0.303	<i>Not significant</i>			
	Two-way interaction	3.410	0.763	Not significant	3.410	0.171	Not Significant
	<i>Fibersym RW * VITACEL L 600-30</i>	2.633	0.180	<i>Not significant</i>			
	<i>Fibersym RW * AgriFiber BFG</i>	0.039	0.854	<i>Not significant</i>			
	<i>VITACEL L 600-30* AgriFiber BFG</i>	0.118	0.748	<i>Not significant</i>			
Water activity [-]	Linear	3.229	0.771	Not significant	3.229	0.182	Not Significant
	<i>Fibersym RW</i>	4.285	0.107	<i>Not significant</i>			
	<i>VITACEL L 600-30</i>	0.376	0.573	<i>Not significant</i>			
	<i>AgriFiber BFG</i>	0.512	0.514	<i>Not significant</i>			
	Two-way interaction	2.218	0.276	Not significant	2.218	0.276	Not Significant
	<i>Fibersym RW * VITACEL L 600-30</i>	0.690	0.453	<i>Not significant</i>			
	<i>Fibersym RW * AgriFiber BFG</i>	1.474	0.292	<i>Not significant</i>			
	<i>VITACEL L 600-30* AgriFiber BFG</i>	15.190	0.018	<i>Significant</i>			

1 **Table S3:** Analysis of variance (ANOVA) results for response models of the response surface methodology (RSM) trial.

Response	Unit	Minimum	Maximum	Model	P-value	LOF P-value
Dough Hardness	N	1.482	8.98	Linear	0.145	0.678
Dough Stickiness	N	0.144	0.328	Linear	0.078	0.156
Biscuit Hardness	N	18.92	78.875	Linear	1.9x10-4*	0.034*
Diameter	mm	67.67	72.459	Linear	0.321	0.266
Lightness (L*)	-	48.76	78.25533381	Linear	0.289	0.567
Water activity (a _w)	-	0.09	0.251	Linear	0.096	0.096

2 *p≤0.05; LOF- Lack of Fit