

Figure S1. DSC thermograms of starch slurries (1:2 w/w) in water and the measured onset temperature, peak temperature, and ΔH of gelatinization.

Table S1. The onset T_{gel} s of wheat starch in sweetener solutions grouped by similar solution solids content (same monomeric unit concentration) as follows: Group 1 contains 1M mono-, 0.5M disaccharide solutions; Group 2 contains 2M mono-, 1M disaccharide solutions; Group 3 contains 3M mono- and 1.5M disaccharide solutions; and Group 4 contains 4M mono- and 2M disaccharide.

Sweetener	Onset T_{gel} ($^{\circ}$ C) Averages, Standard Deviations, and Statistical Groups											
	Group 1*			Group 2			Group 3			Group 4		
Fructose	63.87	\pm 0.13	BCD	69.04	\pm 0.10	A	75.12	\pm 0.19	A	82.22	\pm 0.10	A
Galactose	64.53	\pm 0.17	DE	71.13	\pm 0.42	CD	N/A			N/A		
Mannose	63.91	\pm 0.12	BCD	68.45	\pm 0.24	A	74.48	\pm 0.12	A	82.21	\pm 0.08	A
Glucose	64.55	\pm 0.08	DE	70.41	\pm 0.20	BC	77.18	\pm 0.51	B	86.19	\pm 0.64	B
Sorbitol	64.76	\pm 0.12	E	71.62	\pm 0.68	DE	78.91	\pm 0.38	C	88.76	\pm 0.03	C
Sucrose	64.32	\pm 0.12	CDE	72.28	\pm 0.16	EF	79.98	\pm 0.07	D	89.64	\pm 0.13	D
Isomaltulose	63.67	\pm 0.33	BC	73.16	\pm 0.30	F	83.45	\pm 0.49	E	N/A		
Isomalt	64.26	\pm 0.47	CDE	73.22	\pm 0.54	F	82.33	\pm 0.49	D	N/A		
Trehalose	64.51	\pm 0.24	DE	71.36	\pm 0.17	CDE	79.73	\pm 0.17	CD	N/A		
Maltose	63.10	\pm 0.61	B	70.10	\pm 0.13	B	77.39	\pm 0.37	B	N/A		
Maltitol	63.83	\pm 0.19	BCD	72.05	\pm 0.22	DE	81.36	\pm 0.23	D	N/A		

Statistical differences are indicated within the concentration groupings by capital letters (vertical columns).

*The control water starch slurry (onset T_{gel} = 60.78 ± 0.09 $^{\circ}$ C) was included in Group 1 statistical analysis and was in statistical group A.

Table S2. Pearson correlation coefficients (r) and P-values of T_{gel} s and sweetener solution viscosities (log(centipoise)). Solution viscosities were from Allan and others (2018).

Starch	r	P-value
Dent Corn	0.98	<0.001
HA55CS	0.99	<0.001
HA70CS	0.96	<0.001
Potato	0.99	<0.001
Waxy Corn	0.98	<0.001
Wheat	0.97	<0.001

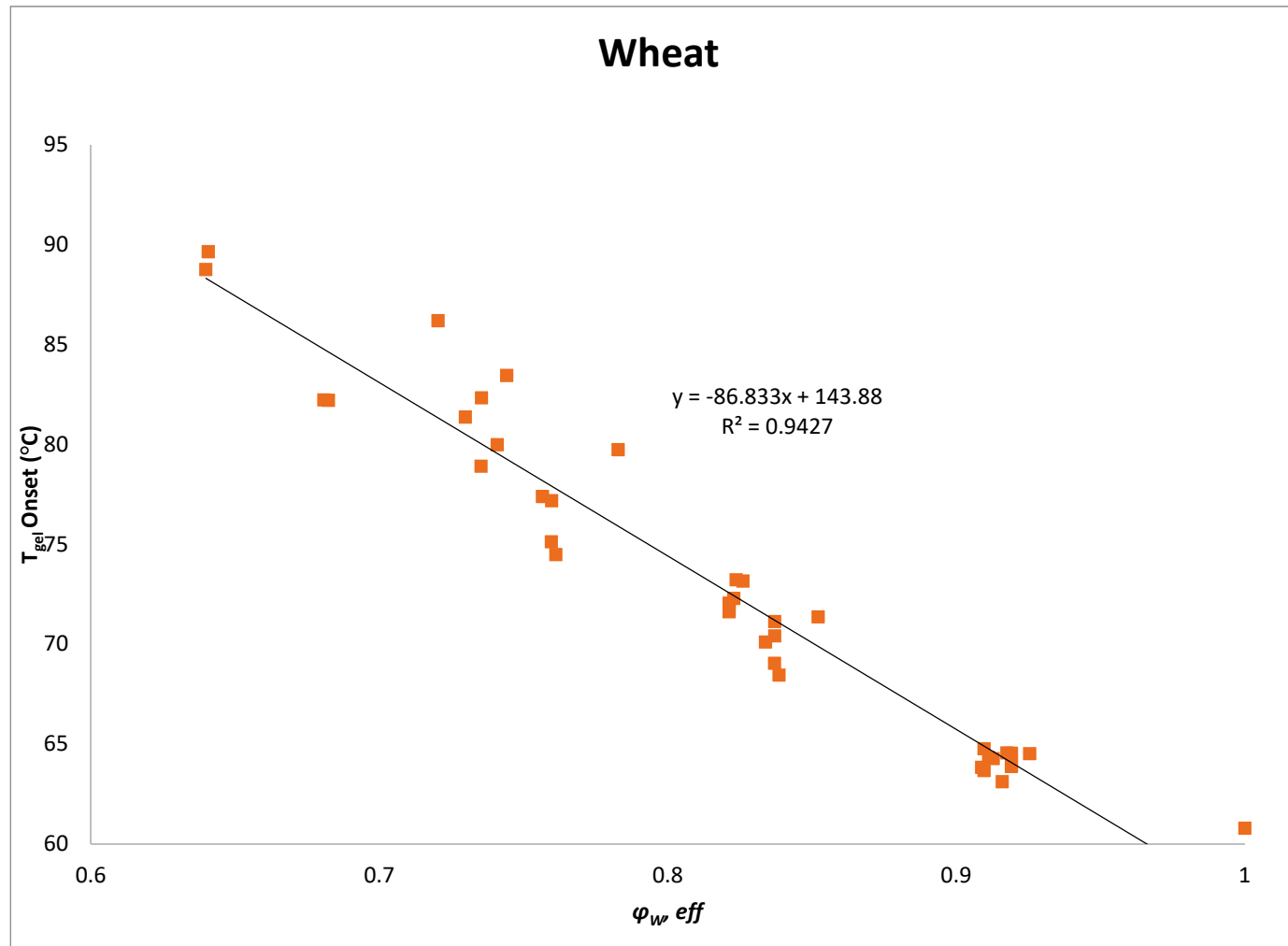


Figure S2. Wheat starch T_{gel} onsets in sweetener solutions in respect to the effective water content (φ_w , *eff*) reported in van der Sman and Mauer (2019).

Table S3. The onset T_{gel} s of waxy corn starch in sweetener solutions grouped by similar solution solids content (same monomeric unit concentration) as follows: Group 1 contains 1M mono-, 0.5M disaccharide solutions; Group 2 contains 2M mono-, 1M disaccharide solutions; Group 3 contains 3M mono- and 1.5M disaccharide solutions; and Group 4 contains 4M mono- and 2M disaccharide.

Sweetener	Onset T_{gel} (°C) Averages and Standard Deviations											
	Group 1*			Group 2			Group 3			Group 4		
Fructose	69.23	± 0.19	B	73.32	± 0.24	A	79.19	± 0.11	A	84.92	± 0.25	A
Galactose	69.71	± 0.32	BCD	74.57	± 0.78	BC	N/A			N/A		
Mannose	69.68	± 0.16	BC	74.00	± 0.40	AB	80.09	± 0.41	AB	87.34	± 0.44	B
Glucose	70.03	± 0.19	CDE	75.62	± 0.11	D	80.91	± 0.34	B	89.26	± 1.05	B
Sorbitol	69.90	± 0.21	BCD	75.83	± 0.21	D	81.39	± 0.13	BC	93.62	± 0.37	C
Sucrose	70.40	± 0.26	DEF	75.93	± 0.21	D	82.64	± 0.54	CD	92.25	± 1.43	C
Isomaltulose	70.62	± 0.17	EF	75.75	± 0.05	D	84.32	± 1.08	E	N/A		
Isomalt	70.83	± 0.15	F	77.83	± 0.17	E	86.98	± 0.97	F	N/A		
Trehalose	69.91	± 0.33	BCD	75.52	± 0.10	D	83.66	± 0.24	DE	N/A		
Maltose	70.70	± 0.12	EF	75.54	± 0.40	CD	80.44	± 0.59	AB	N/A		
Maltitol	70.05	± 0.38	CDE	76.31	± 0.21	D	84.87	± 0.47	E	N/A		

Statistical differences are indicated within the concentration groupings by capital letters (vertical columns).

*The control water starch slurry (onset T_{gel} = 65.84± 0.25 °C) was included in Group 1 statistical analysis and was in statistical group A.

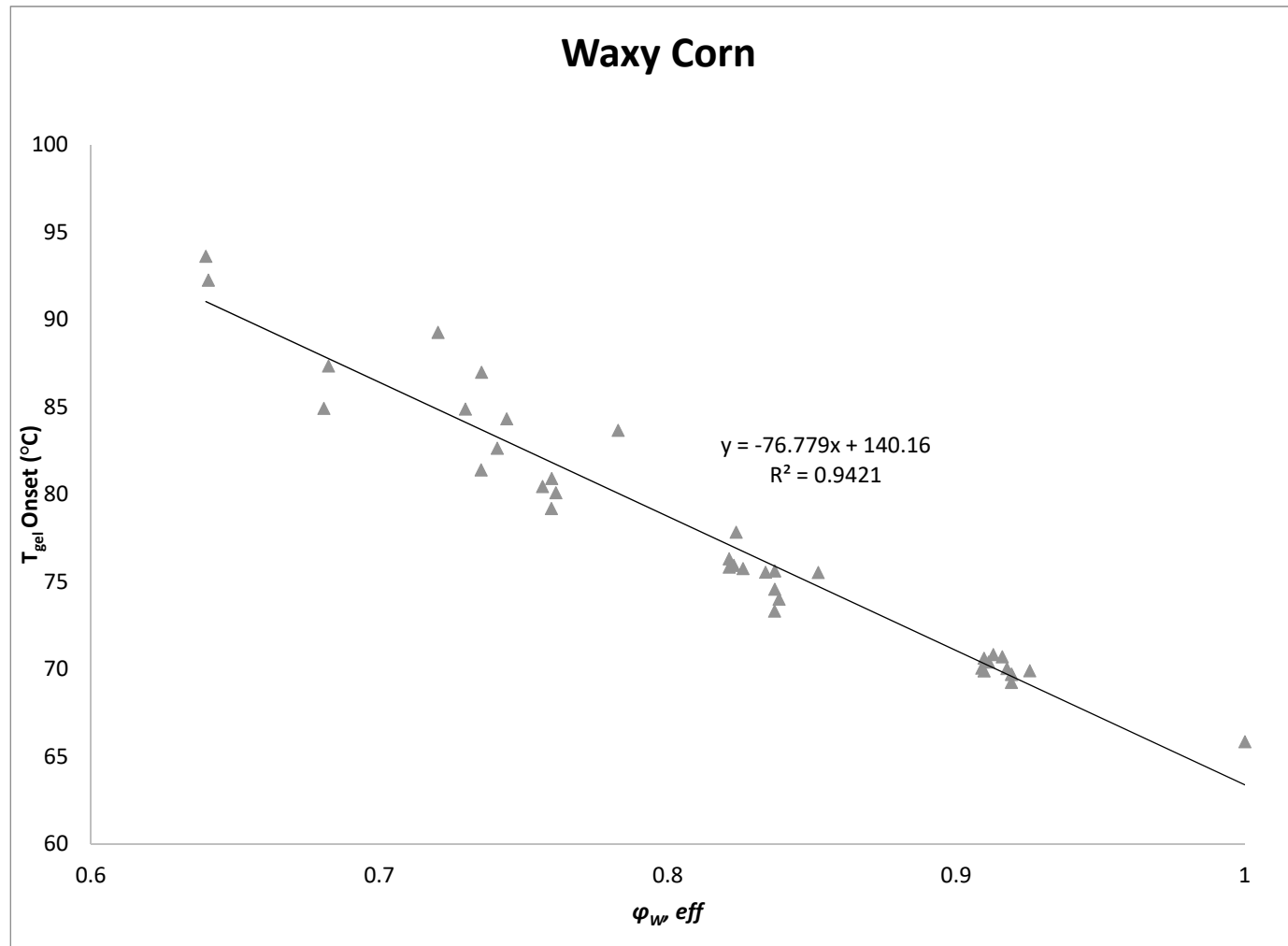


Figure S3. Waxy corn starch T_{gel} onsets in sweetener solutions in respect to the effective water content (φ_w, eff) reported in van der Sman and Mauer (2019).

Table S4. The onset T_{gel} s of dent corn starch in sweetener solutions grouped by similar solution solids content (same monomeric unit concentration) as follows: Group 1 contains 1M mono-, 0.5M disaccharide solutions; Group 2 contains 2M mono-, 1M disaccharide solutions; Group 3 contains 3M mono- and 1.5M disaccharide solutions; and Group 4 contains 4M mono- and 2M disaccharide.

Sweetener	Onset T_{gel} ($^{\circ}$ C) Averages, Standard Deviations, and Statistical Groups											
	Group 1*			Group 2			Group 3			Group 4		
Fructose	69.96	\pm 0.07	B	73.59	\pm 0.19	A	80.82	\pm 0.28	A	87.38	\pm 0.56	A
Galactose	70.27	\pm 0.12	BC	75.01	\pm 0.39	B	N/A			N/A		
Mannose	70.45	\pm 0.35	BC	74.91	\pm 0.30	B	81.69	\pm 0.50	A	88.96	\pm 0.47	B
Glucose	70.38	\pm 0.57	BC	76.72	\pm 0.43	CD	83.09	\pm 0.46	B	91.36	\pm 0.70	C
Sorbitol	70.97	\pm 0.13	CD	76.99	\pm 0.12	CD	83.06	\pm 0.18	B	95.02	\pm 0.49	D
Sucrose	71.07	\pm 0.17	CD	77.31	\pm 0.34	CD	84.33	\pm 0.36	C	95.87	\pm 0.12	D
Isomaltulose	71.65	\pm 0.08	D	77.78	\pm 0.71	D	86.88	\pm 0.12	D	N/A		
Isomalt	71.95	\pm 0.40	D	79.18	\pm 0.70	E	89.36	\pm 0.28	E	N/A		
Trehalose	70.59	\pm 0.45	BC	76.36	\pm 0.27	C	86.10	\pm 0.32	D	N/A		
Maltose	70.99	\pm 0.23	CD	77.06	\pm 0.23	CD	83.00	\pm 0.45	B	N/A		
Maltitol	71.17	\pm 0.14	CD	77.13	\pm 0.50	CD	86.56	\pm 0.46	D	N/A		

Statistical differences are indicated within the concentration groupings by capital letters (vertical columns).

*The control water starch slurry (onset T_{gel} = 66.19 ± 0.65 $^{\circ}$ C) was included in Group 1 statistical analysis and was in statistical group A.

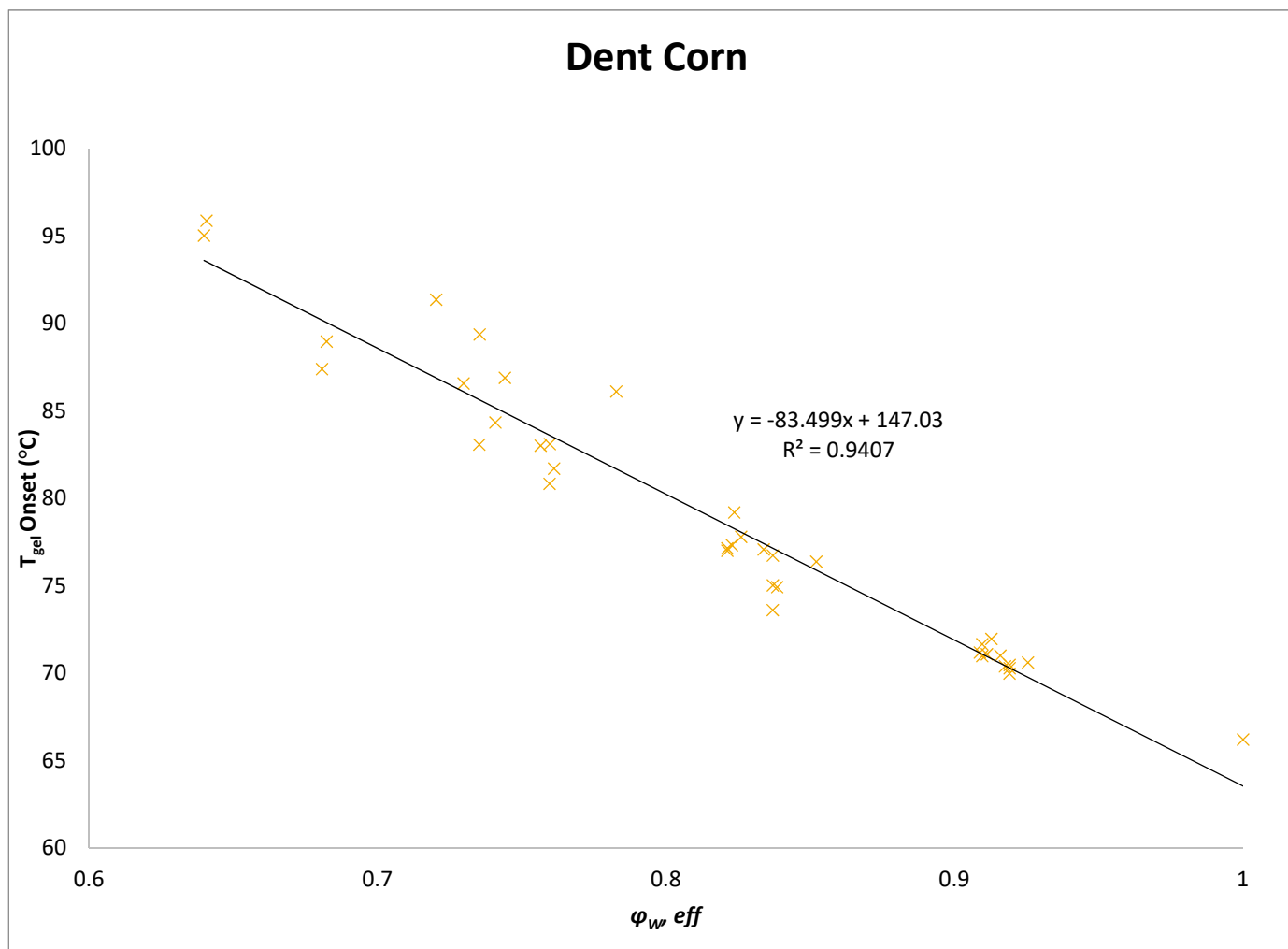


Figure S4. Dent corn starch T_{gel} onsets in sweetener solutions in respect to the effective water content (φ_w, eff) reported in van der Sman and Mauer (2019).

Table S5. The onset T_{gel} s of HAC55 starch in sweetener solutions grouped by similar solution solids content (same monomeric unit concentration) as follows: Group 1 contains 1M mono-, 0.5M disaccharide solutions; Group 2 contains 2M mono-, 1M disaccharide solutions; Group 3 contains 3M mono- and 1.5M disaccharide solutions; and Group 4 contains 4M mono- and 2M disaccharide.

Sweetener	Onset T_{gel} ($^{\circ}$ C) Averages, Standard Deviations, and Statistical Groups											
	Group 1*			Group 2			Group 3			Group 4		
Fructose	75.90	\pm 0.29	B	79.74	\pm 0.59	A	86.20	\pm 0.21	A	92.35	\pm 0.44	A
Galactose	75.87	\pm 0.32	B	80.96	\pm 0.25	B	N/A			N/A		
Mannose	76.54	\pm 0.11	BC	80.90	\pm 0.13	B	86.96	\pm 0.11	AB	93.97	\pm 0.32	B
Glucose	76.38	\pm 0.30	BC	81.97	\pm 0.34	CD	87.54	\pm 0.29	BC	95.39	\pm 0.24	C
Sorbitol	76.24	\pm 0.25	BC	82.54	\pm 0.12	D	87.71	\pm 0.34	BC	98.03	\pm 0.01	D
Sucrose	76.15	\pm 0.18	BC	81.28	\pm 0.18	BC	88.09	\pm 0.37	CD	99.50	\pm 0.29	E
Isomaltulose	76.79	\pm 0.19	C	82.67	\pm 0.30	D	89.72	\pm 0.60	E	N/A		
Isomalt	76.88	\pm 0.33	C	83.71	\pm 0.22	E	91.63	\pm 0.25	F	N/A		
Trehalose	76.19	\pm 0.20	BC	81.81	\pm 0.16	BCD	89.66	\pm 0.66	E	N/A		
Maltose	76.58	\pm 0.28	BC	81.40	\pm 0.26	BC	86.30	\pm 0.03	A	N/A		
Maltitol	75.92	\pm 0.24	B	81.21	\pm 0.50	BC	88.95	\pm 0.29	DE	N/A		

Statistical differences are indicated within the concentration groupings by capital letters (vertical columns).

*The control water starch slurry (onset T_{gel} = 71.81 ± 0.25 $^{\circ}$ C) was included in Group 1 statistical analysis and was in statistical group A.

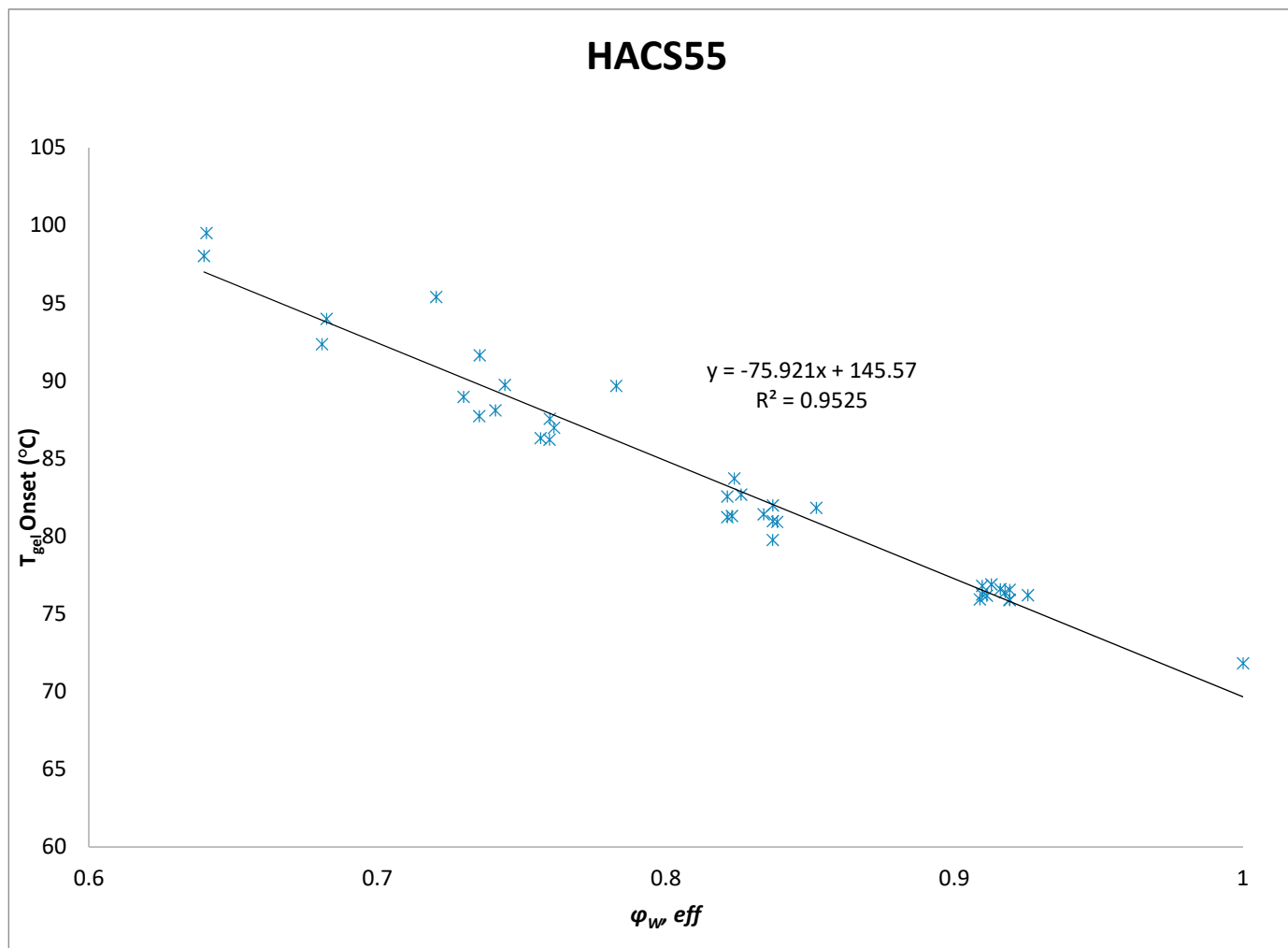


Figure S5. HACS55 T_{gel} onsets in sweetener solutions in respect to the effective water content (φ_w, eff) reported in van der Sman and Mauer (2019).

Table S6. The onset T_{gel} s of HACS70 starch in sweetener solutions grouped by similar solution solids content (same monomeric unit concentration) as follows: Group 1 contains 1M mono-, 0.5M disaccharide solutions; Group 2 contains 2M mono-, 1M disaccharide solutions; Group 3 contains 3M mono- and 1.5M disaccharide solutions; and Group 4 contains 4M mono- and 2M disaccharide.

Sweetener	Onset T_{gel} (°C) Averages, Standard Deviations, and Statistical Groups											
	Group 1*			Group 2			Group 3			Group 4		
Fructose	75.01	± 0.18	BC	78.40	± 0.31	A	84.61	± 0.49	A	88.36	± 0.80	A
Galactose	75.25	± 0.19	BCD	79.97	± 0.44	B	N/A			N/A		
Mannose	75.00	± 0.19	BC	79.71	± 0.36	AB	85.73	± 0.52	A	92.26	± 0.49	B
Glucose	74.75	± 0.79	B	80.51	± 0.13	BC	86.18	± 0.52	A	94.31	± 1.28	C
Sorbitol	75.49	± 0.23	BCD	80.98	± 0.21	BC	89.02	± 1.21	B	96.65	± 0.22	D
Sucrose	75.33	± 0.30	BCD	80.71	± 0.40	BC	88.63	± 1.48	B	102.98	± 0.19	E
Isomaltulose	75.61	± 0.80	BCD	81.71	± 0.39	CD	89.09	± 0.32	BC	N/A		
Isomalt	76.33	± 0.37	D	82.77	± 0.53	D	91.19	± 0.26	C	N/A		
Trehalose	75.12	± 0.38	BC	80.58	± 0.25	BC	88.71	± 0.33	B	N/A		
Maltose	76.03	± 0.31	CD	81.11	± 0.10	BC	86.07	± 0.59	A	N/A		
Maltitol	75.35	± 0.06	BCD	81.88	± 1.29	CD	89.03	± 0.22	B	N/A		

Statistical differences are indicated within the concentration groupings by capital letters (vertical columns).

*The control water starch slurry (onset T_{gel} = 71.27 ± 0.37 °C) was included in Group 1 statistical analysis and was in statistical group A.

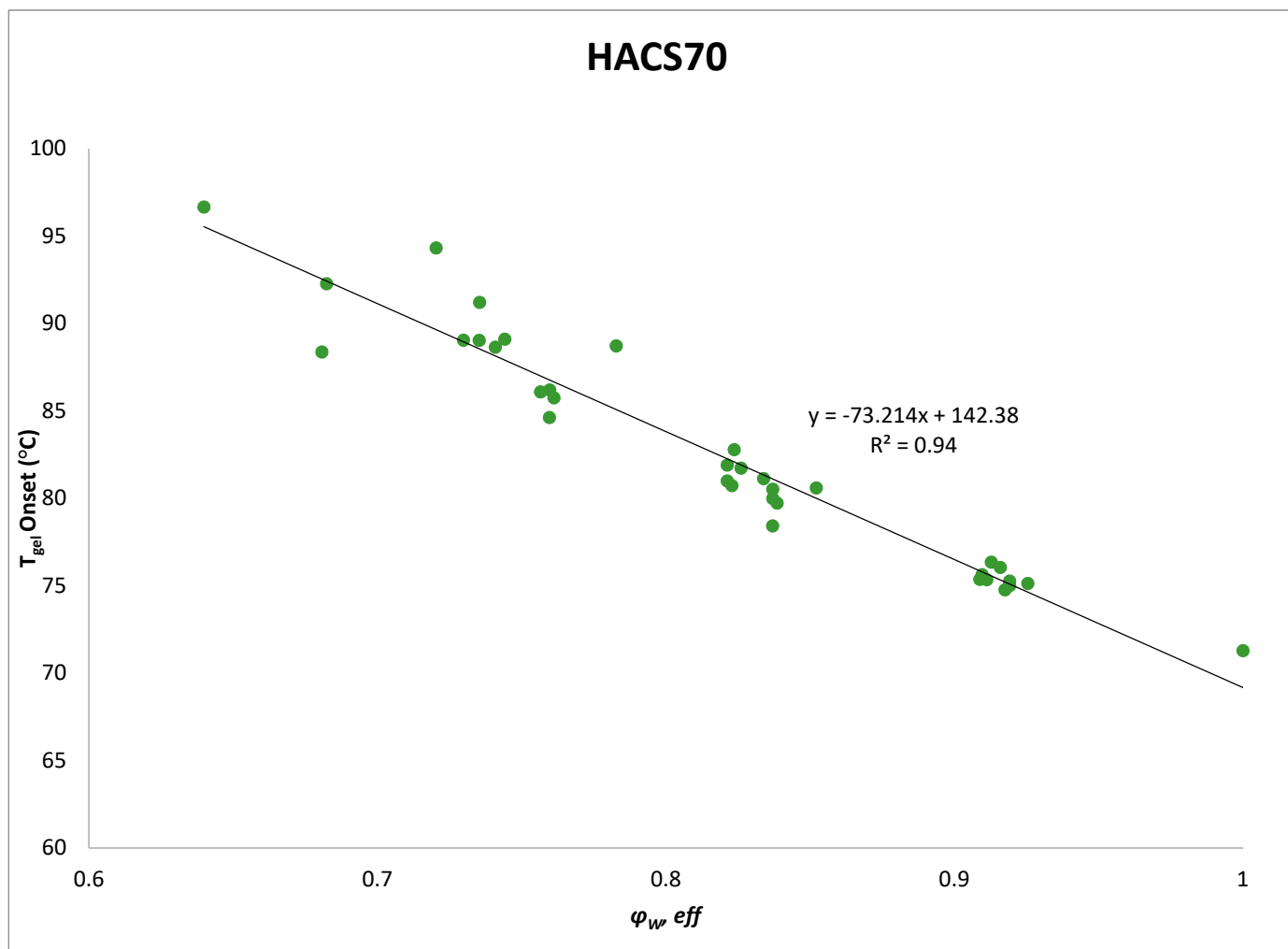


Figure S6. HACS70 T_{gel} onsets in sweetener solutions in respect to the effective water content (φ_w , *eff*) reported in van der Sman and Mauer (2019).

Table S7. The onset T_{gel} s of potato starch in sweetener solutions grouped by similar solution solids content (same monomeric unit concentration) as follows: Group 1 contains 1M mono-, 0.5M disaccharide solutions; Group 2 contains 2M mono-, 1M disaccharide solutions; Group 3 contains 3M mono- and 1.5M disaccharide solutions; and Group 4 contains 4M mono- and 2M disaccharide.

Sweetener	Onset T_{gel} ($^{\circ}$ C) Averages, Standard Deviations, and Statistical Groups											
	Group 1*			Group 2			Group 3			Group 4		
Fructose	65.77	\pm 0.02	DE	71.03	\pm 0.55	AB	78.43	\pm 0.50	CDE	85.92	\pm 0.03	A
Galactose	65.62	\pm 0.19	DE	70.88	\pm 0.07	AB	N/A			N/A		
Mannose	65.71	\pm 0.25	DE	70.95	\pm 0.47	AB	78.25	\pm 0.32	CDE	86.46	\pm 0.15	B
Glucose	65.51	\pm 0.33	CDE	71.22	\pm 0.44	AB	77.51	\pm 0.63	BCD	87.51	\pm 0.28	C
Sorbitol	65.20	\pm 0.55	BCD	71.31	\pm 0.31	B	77.25	\pm 0.26	BC	88.52	\pm 0.12	D
Sucrose	65.17	\pm 0.01	BCD	70.47	\pm 0.35	AB	76.90	\pm 0.64	B	87.11	\pm 0.13	C
Isomaltulose	65.54	\pm 0.19	DE	71.31	\pm 0.29	B	79.19	\pm 0.29	E	N/A		
Isomalt	65.98	\pm 0.17	E	72.84	\pm 0.71	C	81.07	\pm 0.26	F	N/A		
Trehalose	64.76	\pm 0.24	B	70.40	\pm 0.44	AB	78.51	\pm 0.14	CDE	N/A		
Maltose	65.71	\pm 0.32	DE	70.60	\pm 0.17	AB	74.83	\pm 0.18	A	N/A		
Maltitol	64.80	\pm 0.23	BC	70.09	\pm 0.22	A	78.57	\pm 0.72	DE	N/A		

Statistical differences are indicated within the concentration groupings by capital letters (vertical columns).

*The control water starch slurry (onset T_{gel} = 61.32 ± 0.19 $^{\circ}$ C) was included in Group 1 statistical analysis and was in statistical group A.

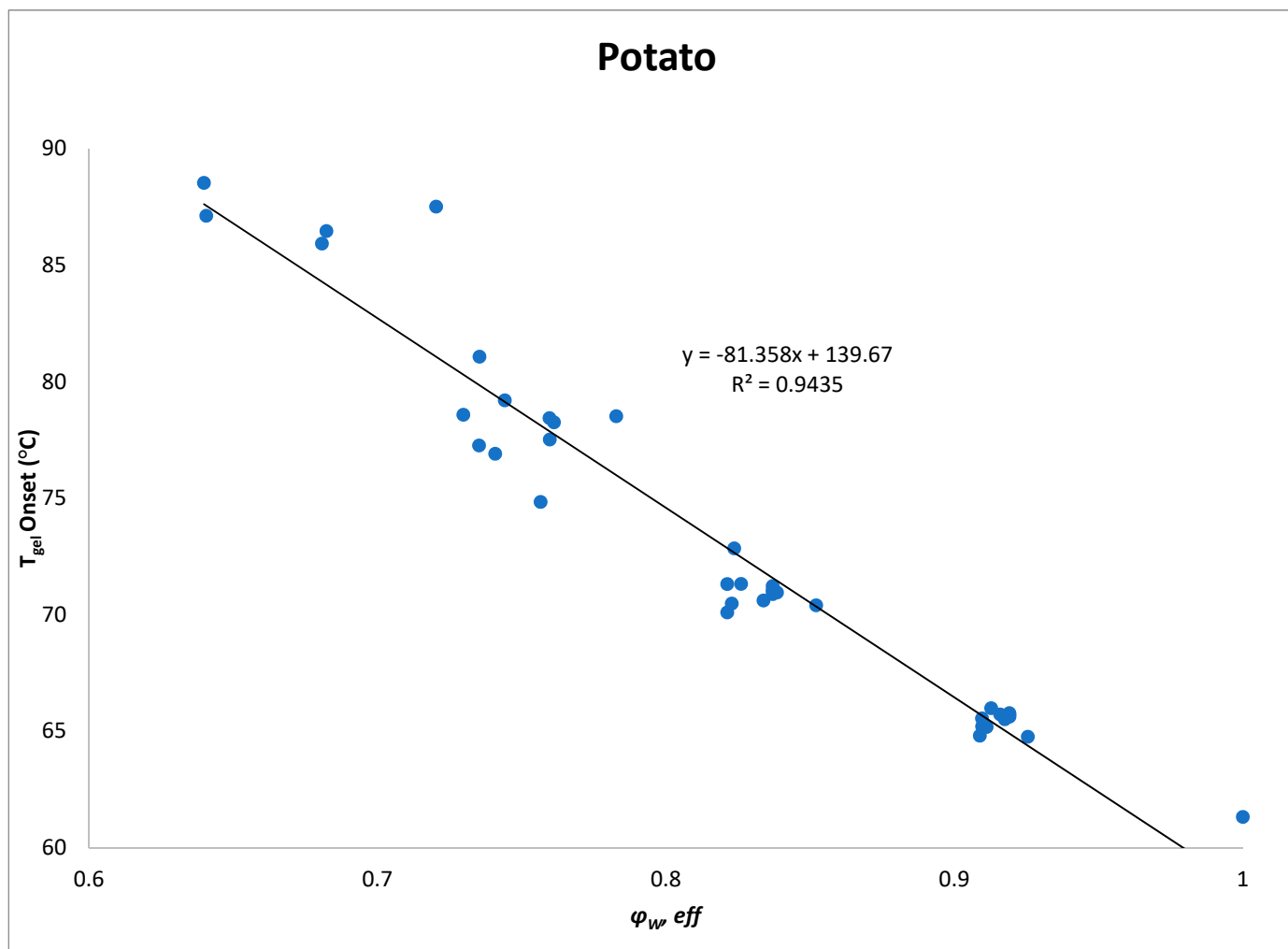


Figure S7. Potato starch T_{gel} onsets in sweetener solutions in respect to the effective water content (φ_w, eff) reported in van der Sman and Mauer (2019).

Table S8. Comparisons of correlation coefficients (R) of the log T_{gel} slopes and ΔT_{gel(i-0)}s in 3 M monomeric unit concentrations (ΔT_{gel(3M-0)}) of a sweetener in respect to the amylose contents of starches.

Sweetener	Pearson Coefficient					
	Apparent Amylose		Absolute Amylose		% Crystallinity	
	log T _{gel}	ΔT _{gel(3M-0)}	log T _{gel}	ΔT _{gel(3M-0)}	log T _{gel}	ΔT _{gel(3M-0)}
Fructose	-0.291	0.018	-0.297	-0.111	0.566	0.517
Galactose	-0.354	NA	-0.082	NA	-0.067	NA
Glucose	-0.436	-0.162	-0.305	0.007	0.470	0.055
Isomalt	-0.621	-0.494	-0.374	-0.216	0.349	0.019
Isomaltulose	-0.421	-0.318	-0.119	0.034	0.030	-0.242
Maltitol	-0.579	-0.515	-0.262	-0.169	0.143	-0.074
Maltose	-0.470	-0.156	-0.169	0.197	0.125	-0.436
Mannose	-0.274	0.138	-0.337	-0.093	0.693	0.531
Sorbitol	-0.522	0.411	-0.290	0.698	0.330	-0.619
Sucrose	-0.214	-0.105	0.129	0.266	-0.124	-0.489
Trehalose	-0.519	-0.276	-0.237	0.022	0.139	-0.247

* P values were <0.10

** P-values were <0.05

Table S9. Averages with 1 standard deviation and P value of Log T_{gel}s and ΔT_{gel(3M-0)} in A and B-type starches.

Starch Type	Log T _{gel}		ΔT _{gel(3M-0)}	
	Average	P-value	Average	P-value
A	0.034±0.004	0.004	17.7±2.7	0.063
B	0.031±0.004		16.6±1.7	

