Supplementary Materials

Table S1. Fuzzy if-then rules for the ANFIS-GP1 used in this study.

	Rule description			
	Antecedent part			Consequent part
Rule No.	If x_1 is	and x_2 is	and x_3 is	y_1 equals
1	$MF1_{x1}$	$MF1_{x2}$	$MF1_{x3}$	$MF1_{y1}$
2	$MF1_{x1}$	$MF1_{x2}$	$MF2_{x3}$	$MF2_{y1}$
3	$MF1_{x1}$	$MF2_{x2}$	$MF1_{x3}$	$MF3_{y1}$
4	$MF1_{x1}$	$MF2_{x2}$	$MF2_{x3}$	$MF4_{y1}$
5	$MF2_{x1}$	$MF1_{x2}$	$MF1_{x3}$	$MF5_{y1}$
6	$MF2_{x1}$	$MF1_{x2}$	$MF2_{x3}$	$MF6_{y1}$
7	$MF2_{x1}$	$MF2_{x2}$	$MF1_{x3}$	$MF7_{y1}$
8	$MF2_{x1}$	$MF2_{x2}$	$MF2_{x3}$	$MF8_{y1}$

ANFIS-GP: grid partitioning-based adaptive-neuro fuzzy inference; MF: membership function; MF1 and MF2 are in the form of *trimf* (refer to Table S2 for the *trimf* parameters); x_1: FT; x_2: TMP; x_3: CFV (refer to Table 1 for FT, TMP and CFV values); y_1: predicted normalized flux.

Table S2. Antecedent parameters of the ANFIS-GP1 used in this study.

			Model Inputs		
Input MFs	Type of MFs	MFs' Parameters	x_1	x_2	x_3
MF1	*trimf*	a	-80.000	0.000	-0.040
		b	10.000	0.798	0.585
		c	100.000	1.602	1.172
MF2	*trimf*	a	10.056	0.806	0.575
		b	100.000	1.597	1.206
		c	190.000	2.400	1.820

MF: membership function; *trimf*: triangular-shaped MF; Parameters a and c define the feet of MF, and b defines its peak; x_1: FT; x_2: TMP; x_3: CFV; The values were rounded off to three decimal places.

Table S3. Consequent parameters of the ANFIS-GP1 used in this study.

	Output $MF_i = \alpha_i x_1 + \beta_i x_2 + \gamma_i x_3 + \delta_i;\ i = 1, 2, \ldots, 8$			
Model's output MFs	α_i	β_i	γ_i	δ_i
MF1	-0.150	0.548	3.171	-0.269
MF2	-0.247	1.549	2.854	-1.631
MF3	-0.222	0.556	3.393	-0.044
MF4	-0.541	1.582	3.792	-0.725
MF5	-0.148	8.416	4.015	5.126
MF6	-0.244	18.892	1.249	8.144
MF7	-0.220	8.399	5.684	6.694
MF8	-0.537	18.890	8.038	14.516

MF: membership function; α_i, β_i, γ_i, and δ_i are consequent parameters; x_1: FT; x_2: TMP; x_3: CFV; The values were rounded off to three decimal places.

Table S4. Fuzzy if-then rules for the ANFIS-GP2 used in this study.

Rule No.	Rule description			
	Antecedent part			Consequent part
	If x_1 is	and x_2 is	and x_3 is	y_2 equals
1	$MF1_{x1}$	$MF1_{x2}$	$MF1_{x3}$	$MF1_{y2}$
2	$MF1_{x1}$	$MF1_{x2}$	$MF2_{x3}$	$MF2_{y2}$
3	$MF1_{x1}$	$MF2_{x2}$	$MF1_{x3}$	$MF3_{y2}$
4	$MF1_{x1}$	$MF2_{x2}$	$MF2_{x3}$	$MF4_{y2}$
5	$MF2_{x1}$	$MF1_{x2}$	$MF1_{x3}$	$MF5_{y2}$
6	$MF2_{x1}$	$MF1_{x2}$	$MF2_{x3}$	$MF6_{y2}$
7	$MF2_{x1}$	$MF2_{x2}$	$MF1_{x3}$	$MF7_{y2}$
8	$MF2_{x1}$	$MF2_{x2}$	$MF2_{x3}$	$MF8_{y2}$

MF: membership function; MF1 and MF2 are in the form of *gaussmf* (refer to Table S5 for the *gaussmf* parameters); x_1: FT; x_2: TMP; x_3: CFV (refer to Table 1 for FT, TMP and CFV values); y_2: predicted xylitol concentration.

Table S5. Antecedent parameters of the ANFIS-GP xylitol model used in this study.

Input MFs	Type of MFs	MFs' Parameters	Model inputs		
			x_1	x_2	x_3
MF1	*gaussmf*	σ	38.221	0.106	0.228
		c	10.002	0.696	0.599
MF2	*gaussmf*	σ	38.220	0.350	0.146
		c	100.001	1.579	1.272

MF: membership function; *gaussmf*: Gaussian-shaped MF; "c" represents the center of the MF, and σ indicates the width of the MF; x_1: FT; x_2: TMP; x_3: CFV; The values were rounded off to three decimal places.

Table S6. Consequent parameters of the ANFIS-GP xylitol model used in this study.

Model's output MFs	Output $MF_i = \alpha_i x_1 + \beta_i x_2 + \gamma_i x_3 + \delta_i;\ i = 1, 2, \dots, 8$			
	α_i	β_i	γ_i	δ_i
MF1	-0.031	5.152	1.452	1.370
MF2	-0.084	13.997	3.945	3.722
MF3	-0.012	5.063	-0.084	9.699
MF4	-0.012	-0.638	2.380	14.354
MF5	-0.038	28.614	-6.477	-6.111
MF6	-0.103	77.737	-17.597	-16.601
MF7	-0.028	7.060	6.792	3.644
MF8	-0.004	2.003	14.821	-4.416

MF: membership function; α_i, β_i, γ_i and δ_i are consequent parameters; x_1: FT; x_2: TMP; x_3: CFV; The values were rounded off to three decimal places.