

Supplementary Table 9A:

	Dependent Variable:
	Abundance
	<i>Komagataeibacter</i>
Constant	6.39 t = 4.83 $p = 0.00005^{***}$
pH	-1.74 t = -4.46 $p = 0.0002^{***}$
Fructose	-0.17 t = -4.41 $p = 0.0002^{***}$
Glucose	0.16 t = 4.19 $p = 0.0003^{***}$
Acetic_acid	-0.33 t = -3.84 $p = 0.0007^{***}$
Observations	32
R ²	0.51
Adjusted R ²	0.44
Residual Std. Error (df = 27)	0.18
F Statistic (df = 4; 27)	7.12 ^{***}

Note: *p<0.1; **p<0.05; ***p<0.01

Model:

```
lmer_k <- lm(Abundance (Komagataeibacter) ~ pH + Fructose1 + glucose1 + Acetic_acid1, data =
lmer_model_Data)
```

Supplementary Table 9B:

	Dependent Variable:
	Abundance
	<i>Saccharomyces</i>
Constant	0.65 t = 0.67 p = 0.5
pH	-0.069 t = -0.218 p = 0.83
Glucose	-0.036 t = -2.14 p = 0.04**
Sucrose	-0.0104 t = -1.24 p = 0.227
Acetic_acid	-0.0845 t = -2.0192 p = 0.0544*
D_gluconic	0.0887 t = 1.2209 p = 0.2336
Succinic acid	1.7153 t = 1.1801 p = 0.2491
Observations	32
R²	0.40
Adjusted R²	0.25
Residual Std. Error (df = 25)	0.12
F Statistic (df = 6; 25)	2.7215**
Note: *p<0.1; **p<0.05; ***p<0.01	

Model:

```
lmer_sacc <- lm(Abundance (Saccharomyces) ~ pH + glucose1 + sucrose1 + Acetic_acid1 +
D_gluconic1 + Succinic_acid1, data = Mixed_Data_sac)
```

Supplementary Table 9C:

	Dependent Variable:
	Abundance
	<i>Gluconobacter</i>
Constant	-0.04 t = -0.44 p = 0.68
Sucrose	0.01 t = 3.61 p = 0.01***
Glucose	-0.10 t = -3.17 p = 0.02**
Fructose	0.14 t = 3.62 p = 0.01***
Succinic_acid	-1.57 t = -2.98 p = 0.02**
Acetic_acid	0.21 t = 1.84 p = 0.11
Observations	14
R ²	0.68
Adjusted R ²	0.48
Residual Std. Error (df = 8)	0.03
F Statistic (df = 5; 8)	3.41*

Note: Overall model showed no statistical significance (p = 0.14)

*p<0.1; **p<0.05; ***p<0.01

Model:

```
gluco_lm <- lm(Abundance ~ sucrose1 + glucose1 + Fructose1 + Succinic_acid1 + Acetic_acid1, data = Gluco_Data)
```

Supplementary Table 9D:

	Dependent Variable:
	Abundance
	<i>Saccharomyces</i>
Constant	0.84 t = 1.61 p = 0.15
Sucrose	0.002 t = 0.13 p = 0.90
Fructose1	0.12 t = 0.47 p = 0.65
Glucose1	-0.14 t = -0.54 p = 0.61
D_gluconic acid	1.77 t = 1.58 p = 0.16
Succinic_acid	-3.44 t = -1.11 p = 0.30
Observations	14
R²	0.52
Adjusted R²	0.21
Residual Std. Error	0.18 (df = 8)
F Statistic	1.71 (df = 5; 8)

Note: Overall model showed no statistical significance (p = 0.44) *p<0.1; **p<0.05; ***p<0.01

Model:

```
sacc_lm <- lm(Abundance ~ sucrose1+Fructose1+glucose1+D_gluconic1+ Succinic_acid1, data =
saccharo_Data)
```