**Supplementary Table 6A:**

|  |  |
| --- | --- |
| **Dependent Variable:**  **Abundance** | *Komagataeibacter* |
| 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 |
| R² | 0.51 |
| Adjusted R² | 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 6B:**

|  |  |
| --- | --- |
| **Dependent Variable:**  **Abundance** | *Saccharomyces* |
| 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 6C:**

|  |  |
| --- | --- |
| **Dependent Variable:**  **Abundance** | *Gluconobacter* |
| 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 |
| R² | 0.68 |
| Adjusted R² | 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 6D:**

|  |  |
| --- | --- |
|  | **Dependent Variable:**  **Abundance**  *Saccharomyces* |
| 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)