Supplementary Materials: **Figure S1:** Standard curve. **Figure S2 :**Analysis of Substrate Consumption at Different Fermentation Stages.(a) Total fat; (b) Ash; (c) Protein; (d) Total sugars. **Figure S3:** Growth curve of *B. subtilis* 55033 during fermentation. **Figure S4:** Total Ion Current chromatograms a. Standard sample b. Fermentation sample. **Figure S5.:**High-resolution mass spectra of surfactin homologs from *B. subtilis* 55033 a. Mass spectrum of C14-surfactin showing at m/z 1008.6590 b. Mass spectrum of C15-surfactin showing at m/z 1022.6757 c. Mass spectrum of C16-surfactin showing at m/z 1036.6906.**Figure S6:** Substrate consumption, bacterial biomass, and surfactin yield under optimized conditions.

Figure S1. Standard curve.

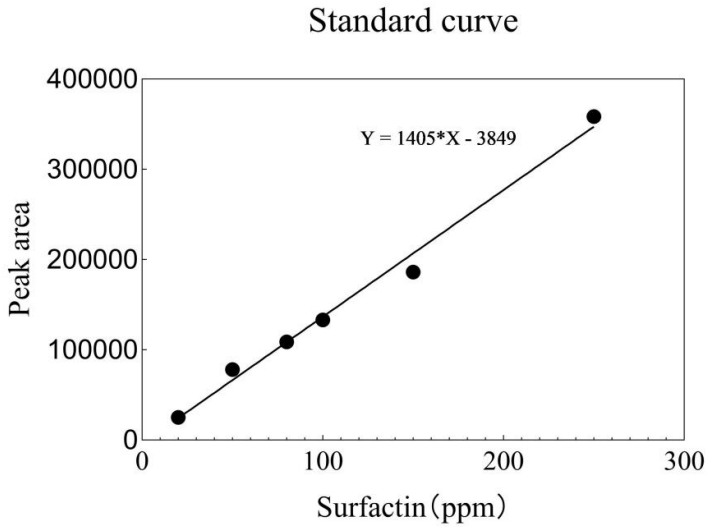


Figure S2. Analysis of Substrate Consumption at Different Fermentation Stages.(a) Total fat; (b) Ash; (c) Protein; (d) Total sugars.

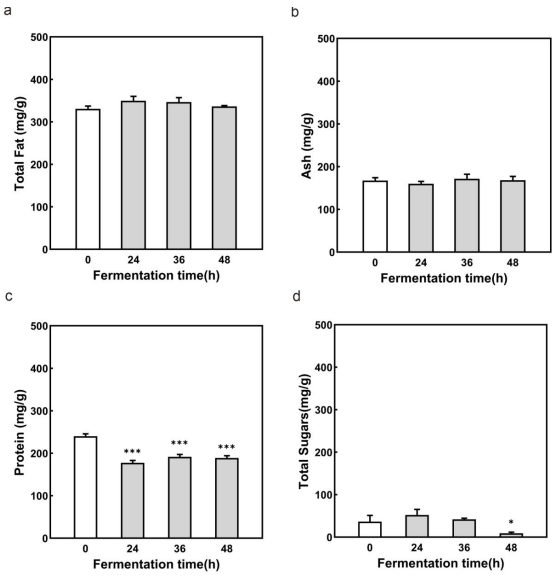


Figure S3. Growth curve of *B. subtilis* 55033 during fermentation.

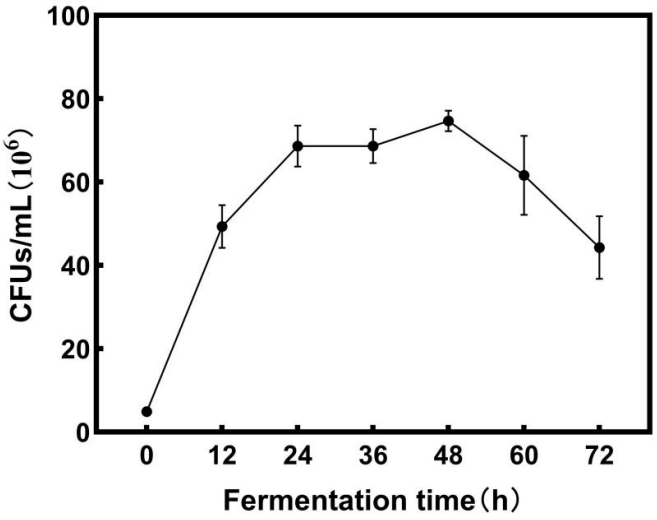


Figure S4. Total Ion Current chromatograms a. Standard sample b. Fermentation sample.

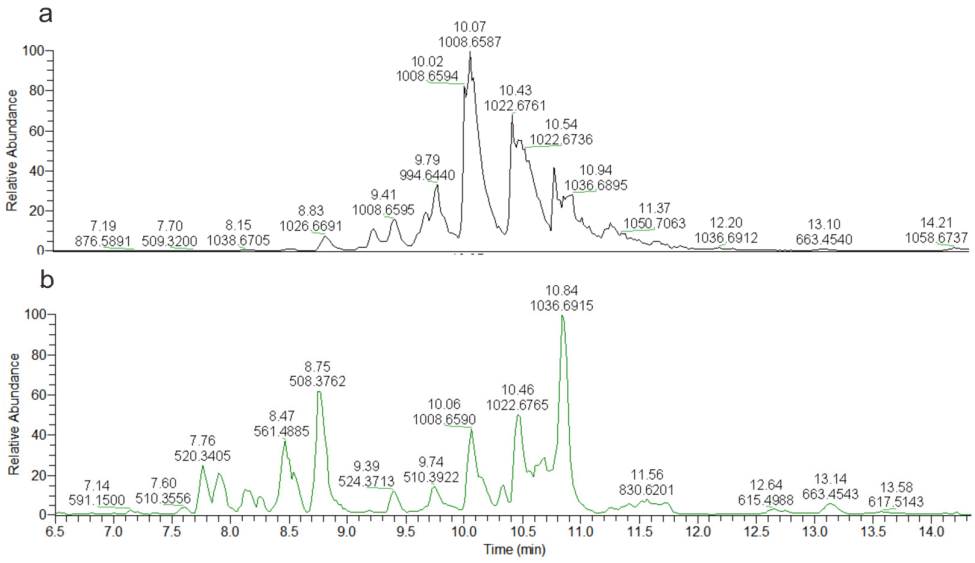


Figure S5. High-resolution mass spectra of surfactin homologs from *B. subtilis* 55033 a. Mass spectrum of C14-surfactin showing at m/z 1008.6590 b. Mass spectrum of C15-surfactin showing at m/z 1022.6757 c. Mass spectrum of C16-surfactin showing at m/z 1036.6906

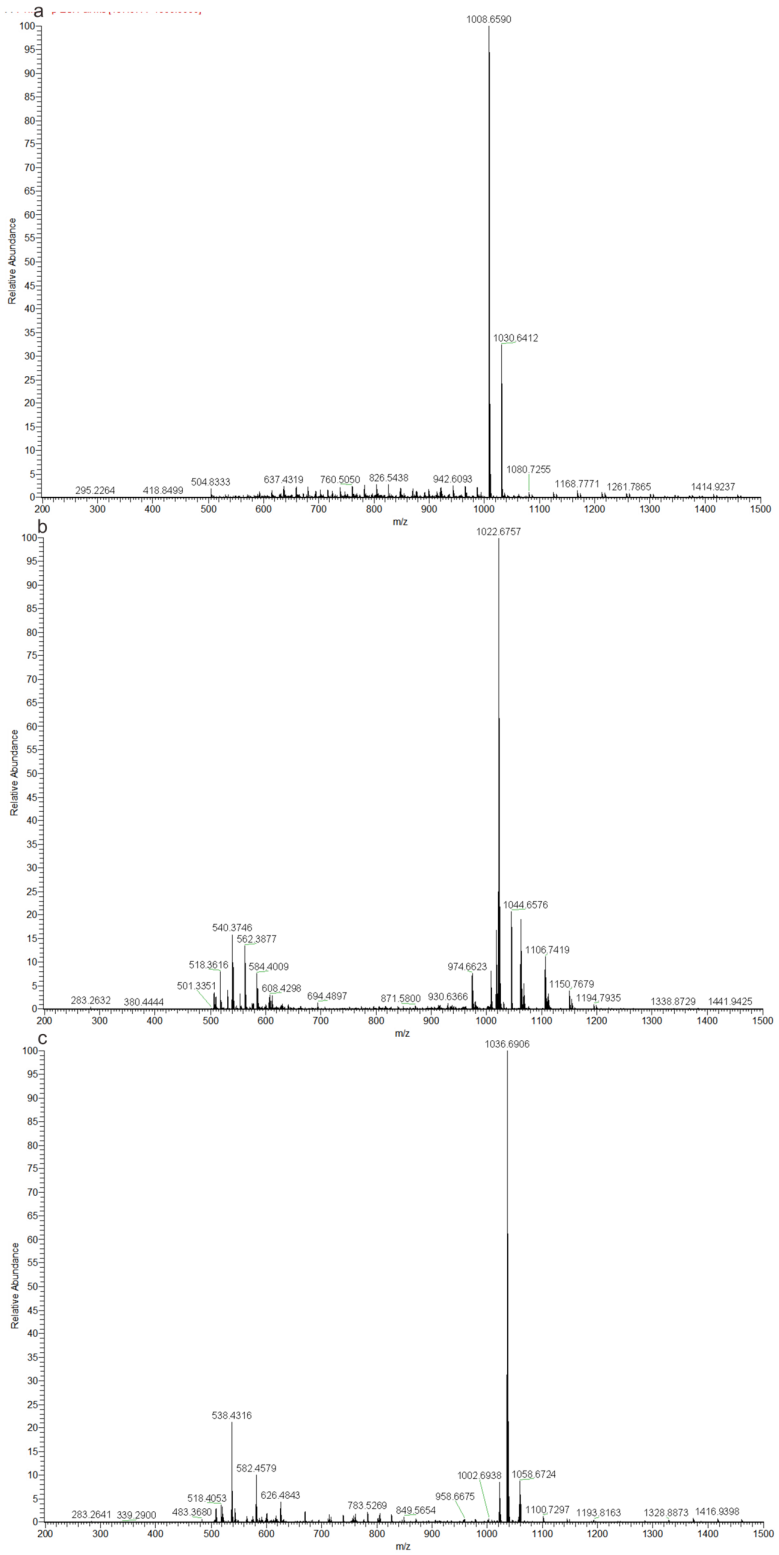
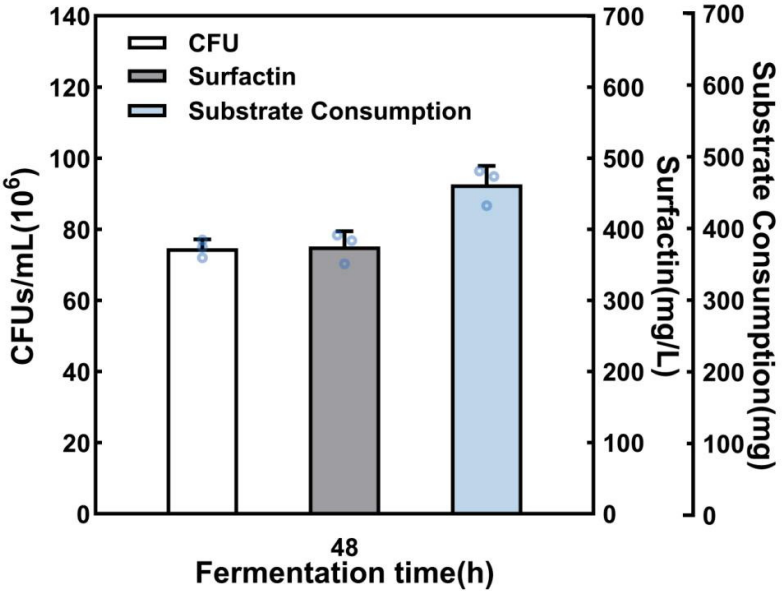


Figure S6. Substrate consumption, bacterial biomass, and surfactin yield under optimized conditions.


CFU
Surfactin
Substrate Consumption
CFUs/mL(10^6)
Surfactin(mg/L)
Substrate Consumption(mg)
0
20
40
60
80
100
120
140
0
100
200
300
400
500
600
700
0
100
200
300
400
500
600
700
48
Fermentation time(h)