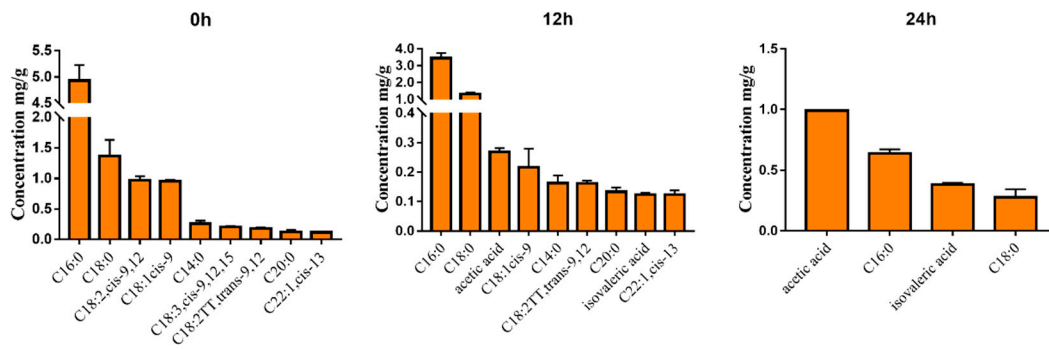
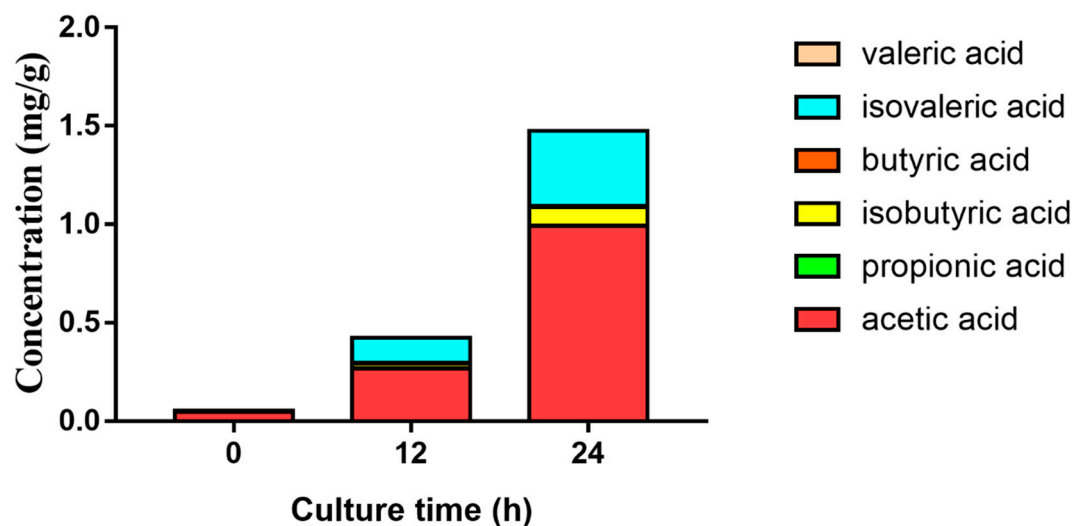


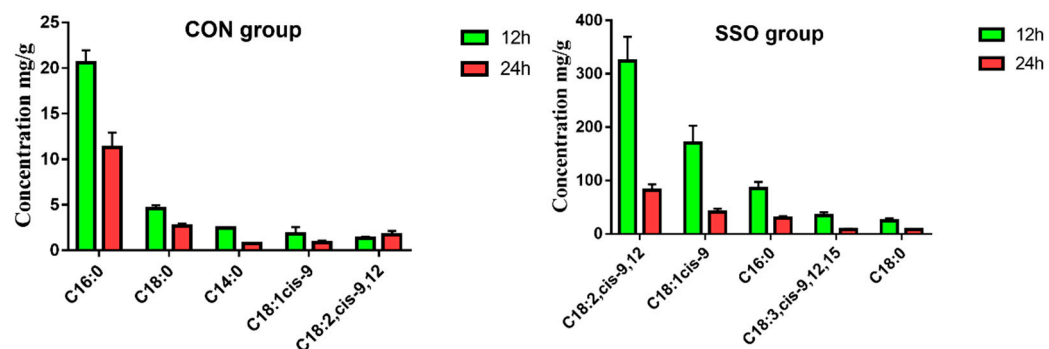
## Supplementary Materials



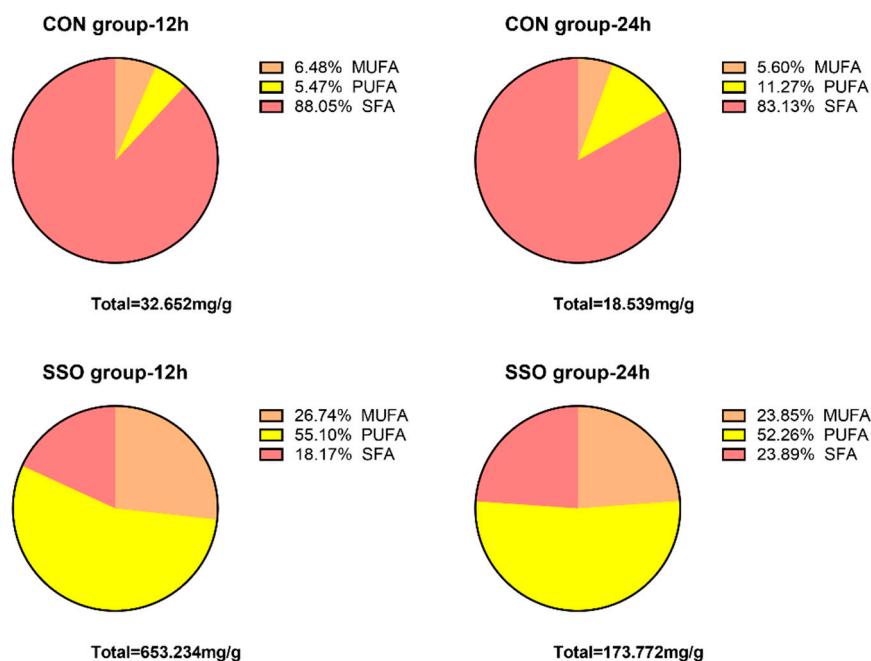
**Figure S1.** Main types and contents of fatty acids in the supernatant of BPY medium after 0, 12, and 24 h of culture. The content of fatty acid is more than 0.1 mg/mL. Abbreviations of fatty acids: C16:0, Palmitic acid; C18:0, Stearic acid; C18:2, cis-9, 12, Linoleic acid; C18:1 cis-9, Oleic acid; C14:0, myristic acid; C18:3, cis-9,12,15, linolenic acid; C18:2 TT, trans -9,12, trans-linoleic acid; C20:0, arachidic acid; C22:1, cis-13, erucic acid.



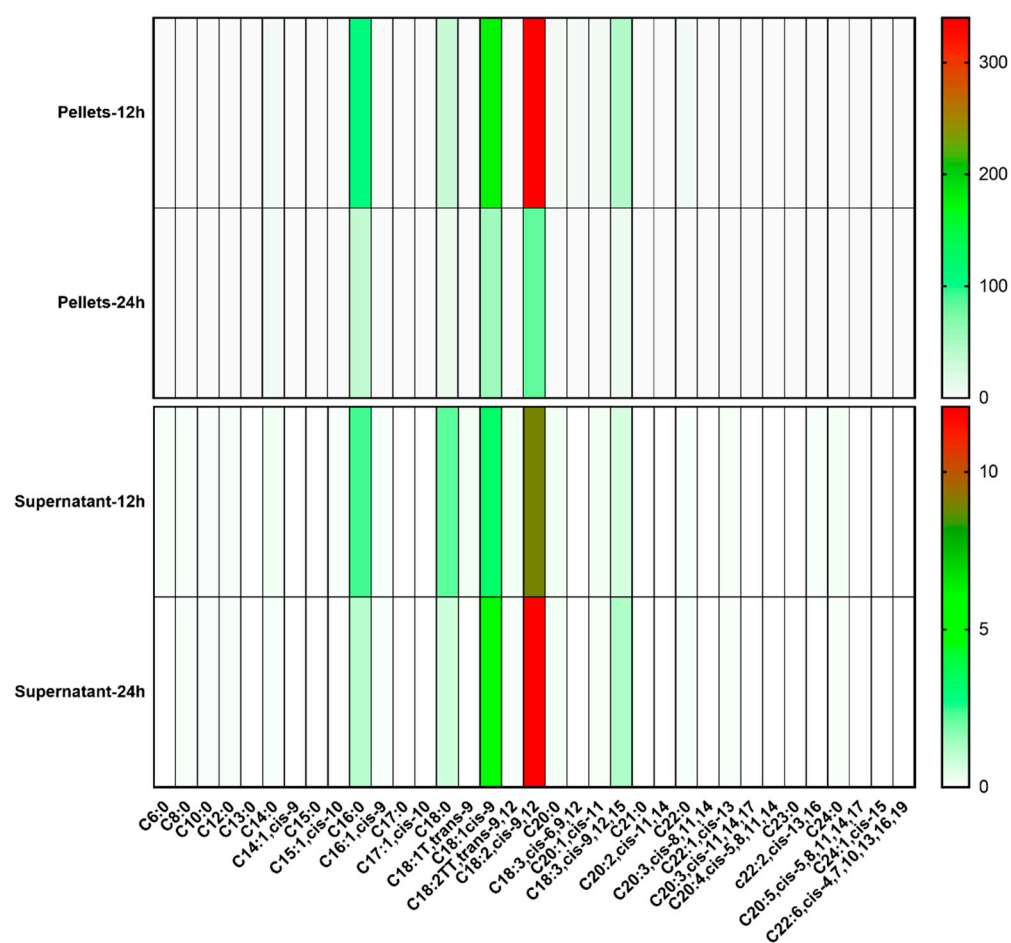
**Figure S2.** The content of SCFA in the supernatant of BPY medium after 0, 12, and 24 h of culture.



**Figure S3.** Main types and contents of fatty acids in *Bacillus* LFB112 pellets after 12, and 24 h of culture. The content of fatty acid is more than 0.1 mg/mL.



**Figure S4.** The proportion of fatty acids in *Bacillus* LFB112 pellets after 0, 12, and 24 h of culture.



**Figure S5.** The fatty acid profile between *Bacillus* LFB112 vitro and vivo.

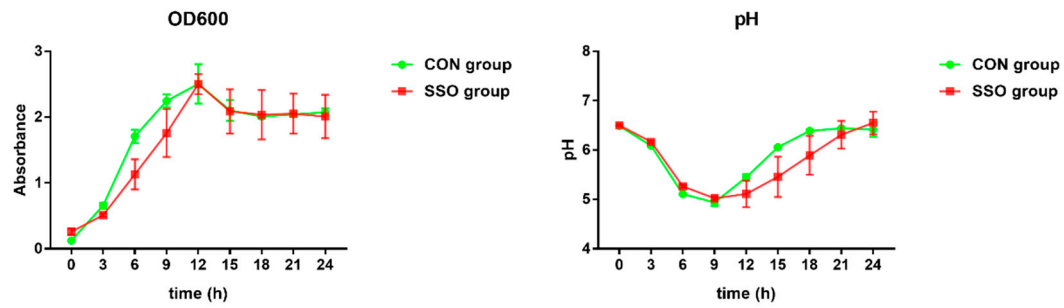


Figure S6. The Growth curve of Bacillus LFB112 under different nutrient conditions.

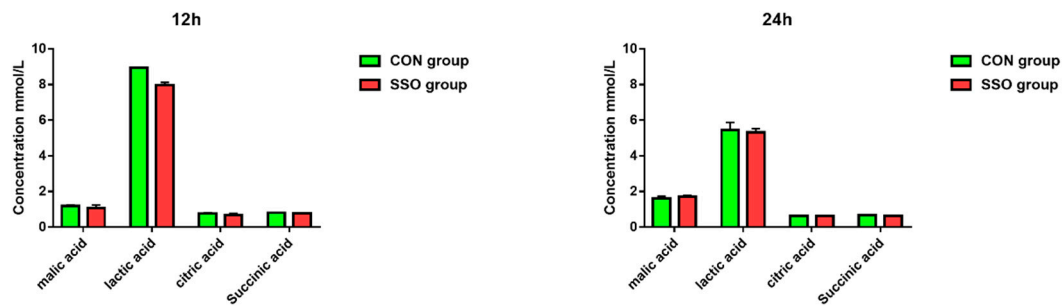


Figure S7. Organic acid content in the TCA cycle.

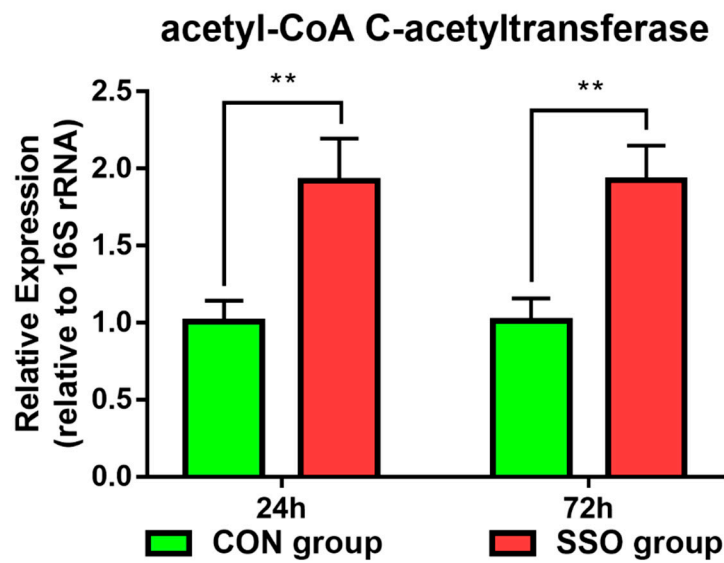


Figure S8. Bacillus LFB112 mRNA levels of *acat-C*. The double asterisk (\*\*) symbol is used to indicate statistical significance at the 0.01 level.

**Table S1.** Primers used for quantitative real-time PCR

Gene	Accession number	Forward primer (5' → 3')	Reverse primer (5' → 3')
16S rRNA	FN662486.1	GGCTTCGGCTACCACTTACAGATG	ATCACCTCTCAGGTCGGCTAC
<i>ack</i>	YP_008951165.1	CGATGCCTGAGCAATCTTACCTGTA	GTATTTATGAGAAGTGCCGTGGAACC
<i>pyk</i>	YP_008951146.1	CGCCACACGCACGGAAGAAT	CGTCATGCCGACCTGATCTCTG
<i>ldh</i>	YP_008948730.1	CGGTGAAGTAATGGCAAGCGGATT	CTGAATGTCCATGTCGCATAAGTGAGA
<i>acc</i>	YP_008950267.1	TCAATCAGGACCTCTCCTTCATCAGT	GCAGCGGGTACGGTGAAAGAA
<i>fabD</i>	YP_008948648.1	TTACAACCTGGAACAATGAGGAATACGC	CTTGACGGCTGACGACCTGATG
<i>fabH</i>	YP_008949391.1	AGAACCGTGCCTGAGGAATGC	CGCTGTGAGGAACGAACCAATC
<i>pptT</i>	YP_008948889.1	TCGACATCGTTGAACTGCACAGA	CGTATTCAGCCTCCGTCAATATTCTT
<i>fabF</i>	YP_008949492.1	GCCCGTTCTTTGTTCCGATGATGA	ATGCCGTCACCGTACAGGAGTT
<i>fabI</i>	YP_008949532.1	GGAAGCATCGTTACACTCACTTACCT	GGCTAAATATCTCACGCTCGCATCA
<i>fabG</i>	YP_008950358.1	ATCATTCGCTGCTGCCGATGTAA	GATGTCAACCTCACCGAGTTCTTCTT
<i>fabZ</i>	YP_008951866.1	TCGCTATCCGTTTCTTCTGGTAGAC	TTTATATCCCGCCGCCCGTTT
<i>acs</i>	YP_008949407.1	CGTTCGGCAGTAATATCGCAAGGT	CGGAACAGATCGCAATTCAGACAGA
<i>acL</i>	YP_008948836.1	CGCCTGAGTTTGACGCTTTATTGAC	GTTGTATATGCCGCCGTGAGTGAT
<i>faaL</i>	YP_008949399.1	TGATTCTCGTCGGCGGATACAATG	CGATGACCACGGCTTCTTTAATGC
<i>acat-C</i>	YP_008951490.1	AAACGGGCAGGCGGCTATGA	ATCCTTGTTTCGGCTTCAGGTGTTG
Note: <i>ackA</i> : acetate kinase; <i>pyk</i> : pyruvate kinase; <i>ldh</i> : lactate dehydrogenase; <i>acc</i> : acetyl-CoA carboxylase; <i>fabD</i> : Malonyl CoA-acyl carrier protein transacylase; <i>fabH</i> : 3-oxoacyl-ACP synthase III; <i>pptT</i> : 4'-phosphopantetheinyl transferase; <i>fabF</i> : 3-oxoacyl-ACP synthase II; <i>fabI</i> : enoyl-ACP reductase; <i>fabG</i> : 3-ketoacyl-ACP reductase; <i>fabZ</i> : 3-hydroxyacyl-ACP dehydratase; <i>acs</i> : acyl-CoA synthetase; <i>acL</i> : acyl-CoA ligase; <i>faaL</i> : long-chain fatty acid-CoA ligase. <i>acat-C</i> : acetyl-CoA acetyltransferase			