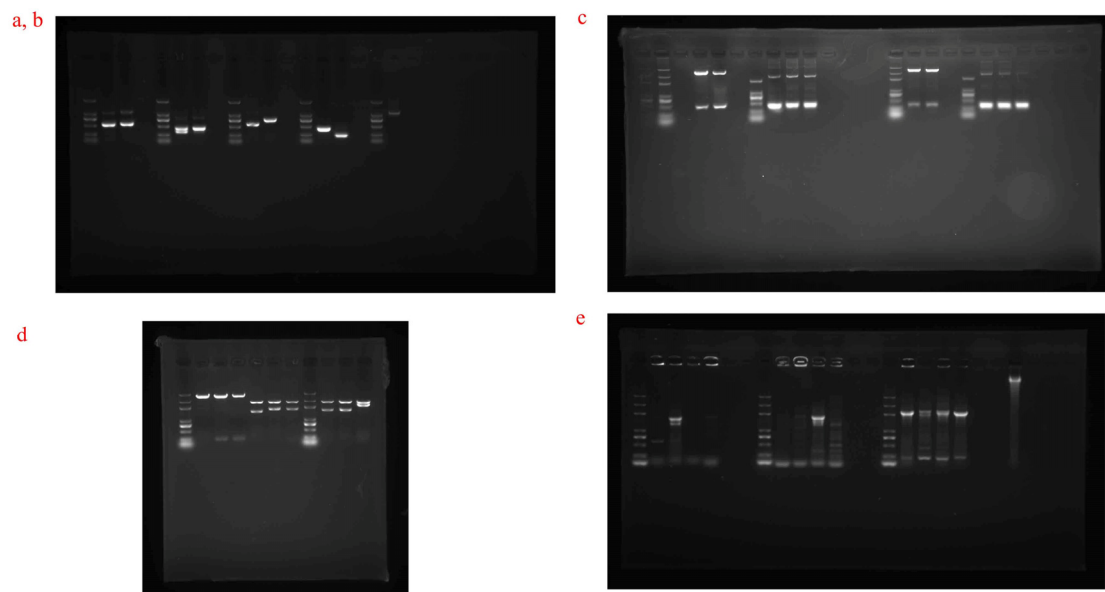


Figure S1. Construction and transformation of *sdaAA* homologous recombination knockout vector. **A** Amplification of HLarm and HRarm (M: DL2000marker, line 1: HLarm, line 2: HRarm). **B** Amplification of *cm* (M: DL2000marker, line 1: *cm*). **C** Double digestion of the knockout vector by *EcoR* I and *Kpn* I (M: DL2000marker, lines 2-3: double digestion). **D** Double digestion of the knockout vector by *BamH* I and *Pst* I (M: DL5000marker, lines 2-3: double digestion). **E** Double-exchange PCR validation by *sdaAA* DEDP1 F and *sdaAA* DEDP1 R (M: DL5000marker, line 1: BJ3-2, lines 2-3: transformants).



a, b is the original picture of Figure S1A and B. **c** is the original picture of Figure S1C. **d** is the original picture of Figure S1D. **e** is the original picture of Figure S1E.

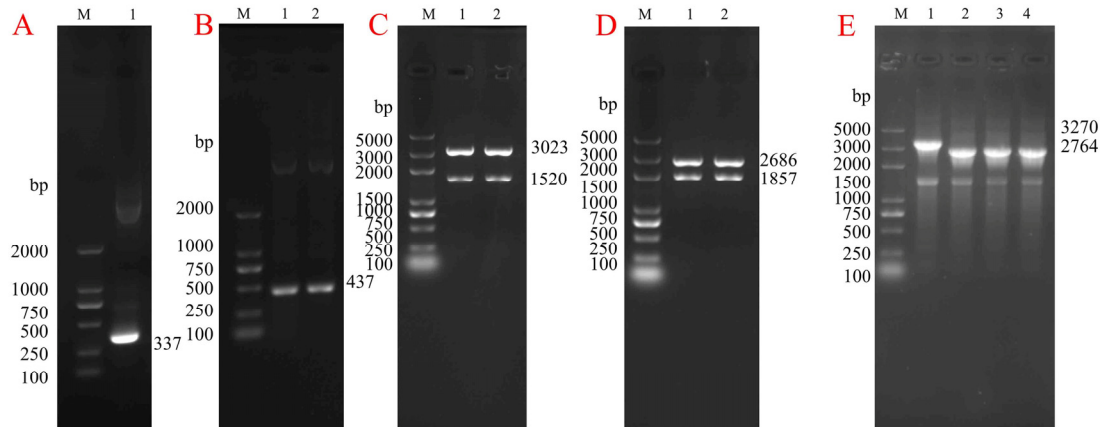
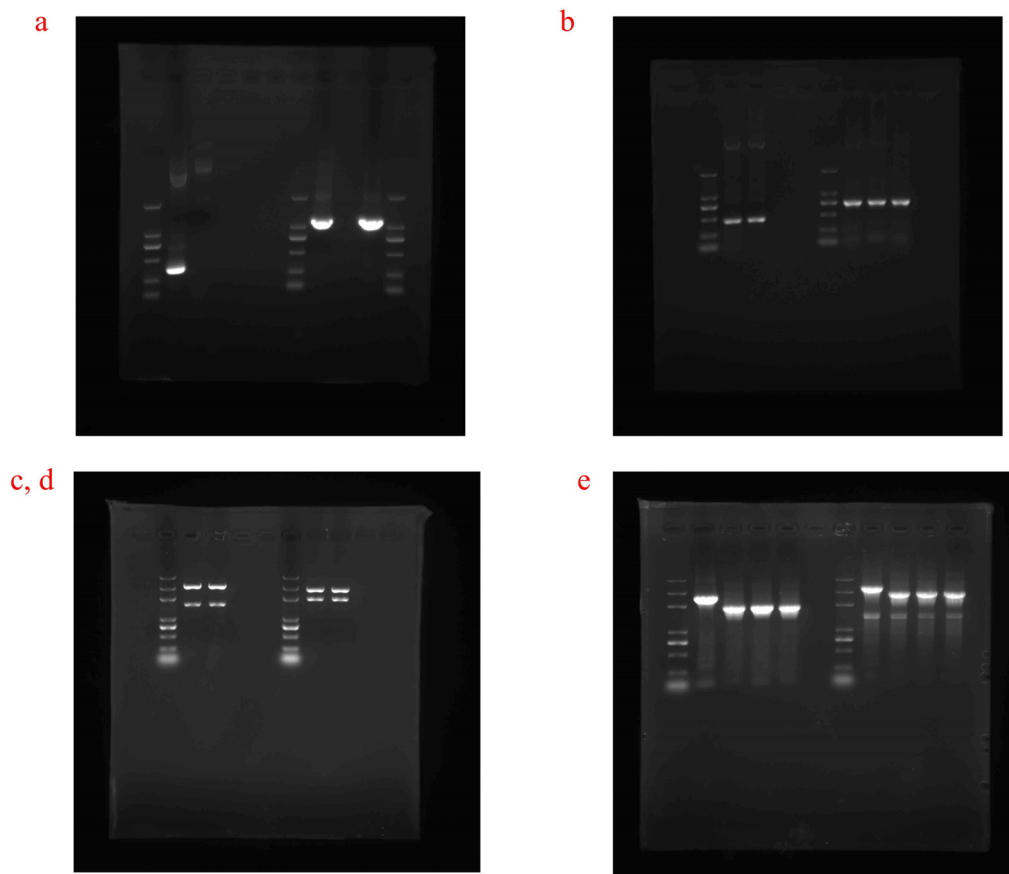


Figure S2. Construction and transformation of *katX* homologous recombination knockout vector. **A** Amplification of HLarm (M: DL2000marker, line 1: HLarm). **B** Amplification of HRarm (M: DL2000marker, lines 1-2: HRarm). **C** Double digestion of the knockout vector by *Kpn* I and *Pst* I (M: DL5000marker, lines 1-2: double digestion). **D** Double digestion of the knockout vector by *EcoR* I and *Pst* I (M: DL5000marker, lines 1-2: double digestion). **E** Double-exchange PCR validation by *katX* DEDP F and *katX* DEDP R (M: DL5000marker, line 1: BJ3-2, lines 2-4: transformants).



a is the original picture of Figure S2A. **b** is the original picture of Figure S2B. **c, d** is the original picture of Figure S2C and D. **e** is the original picture of Figure S2E.

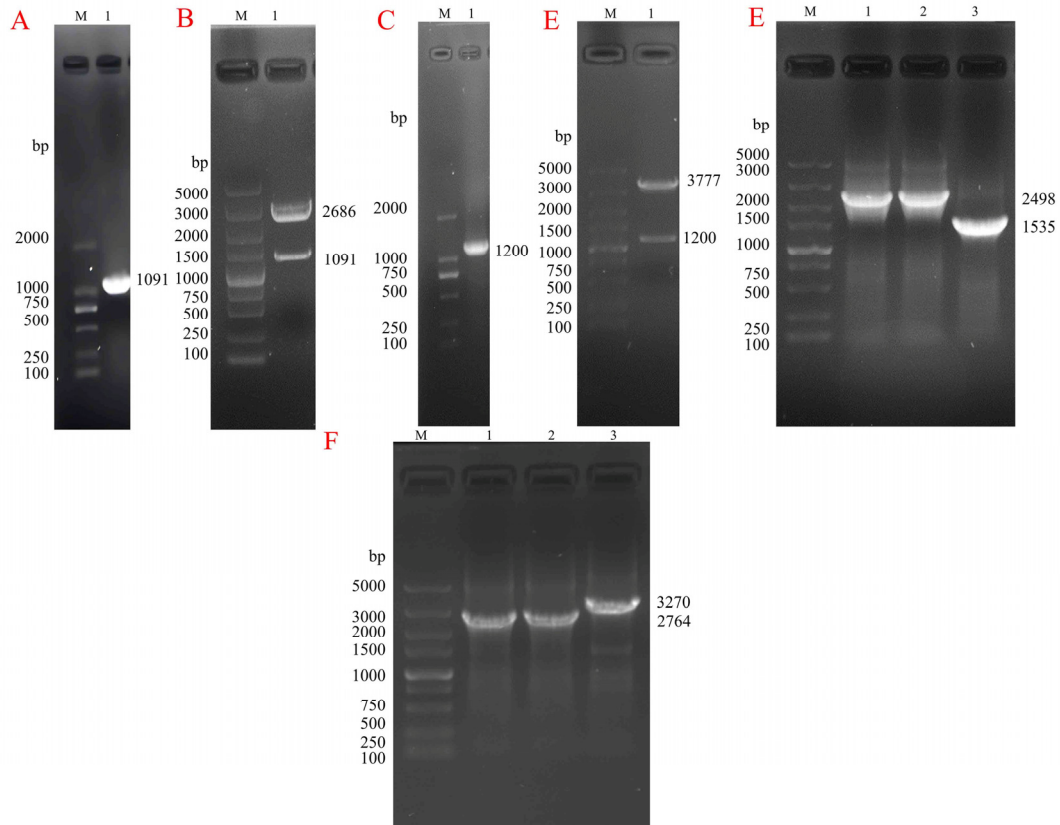
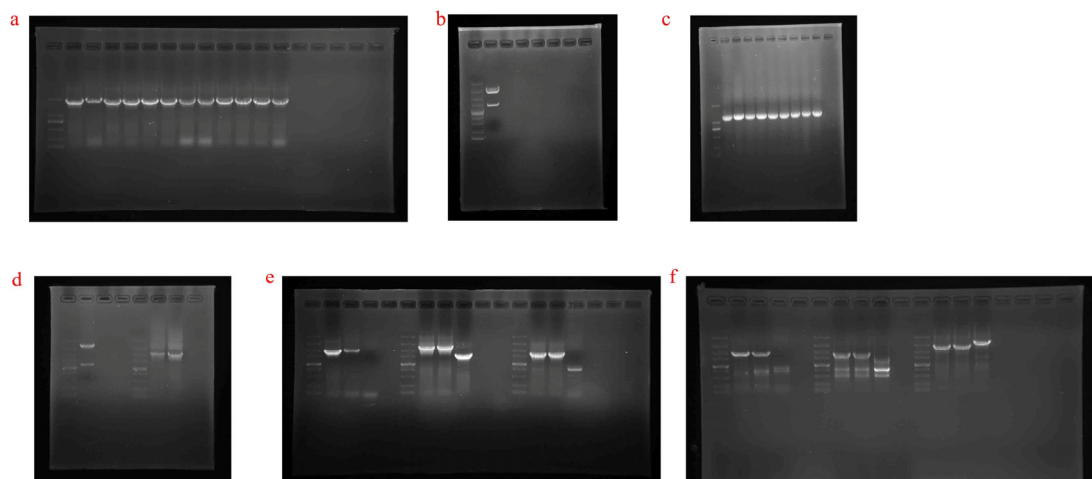


Figure S3. Construction and transformation of *sdaAA* and *katX* homologous recombination knockout vector. **A** Amplification of *sdaAA* (M: DL2000marker, line 1: *sdaAA*). **B** Double digestion of the knockout vector by *Kpn* I and *Hind* III (M: DL5000marker, line1: double digestion). **C** Amplification of *erm* (M: DL2000marker, line 1: *erm*). **D** Double digestion of the knockout vector by *Pst* I and *Nco* I (M: DL5000marker, line 1: double digestion). **E** Double-exchange PCR validation by *sdaAA* DEDP2 F and *sdaAA* DEDP2 R (M: DL5000marker, lines 1-2: transformants, line 3: BJ3-2). **F** Double-exchange PCR validation by *katX* DEDP F and *katX* DEDP R (M: DL5000marker, lines 1-2: transformants, line 3: BJ3-2).



a is the original picture of Figure S3A. **b** is the original picture of Figure S3B. **c** is the original picture of Figure S3C. **d** is the original picture of Figure S3D. **e** is the original picture of Figure S3E; **f** is the original picture of Figure S3F.

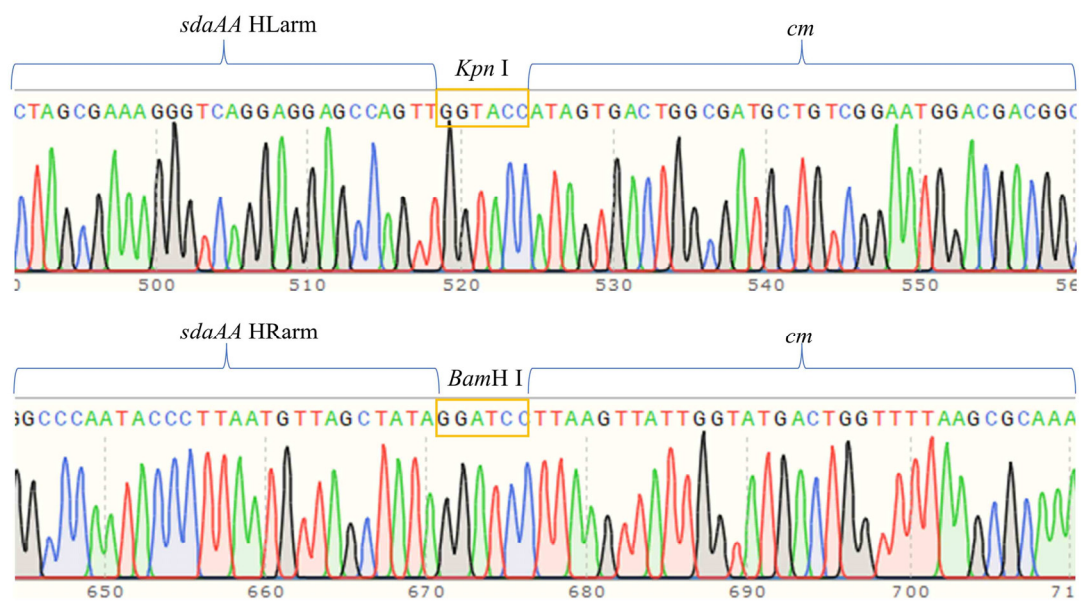


Figure S4. Sequencing of BJJ-2Δ*sdaAA*.

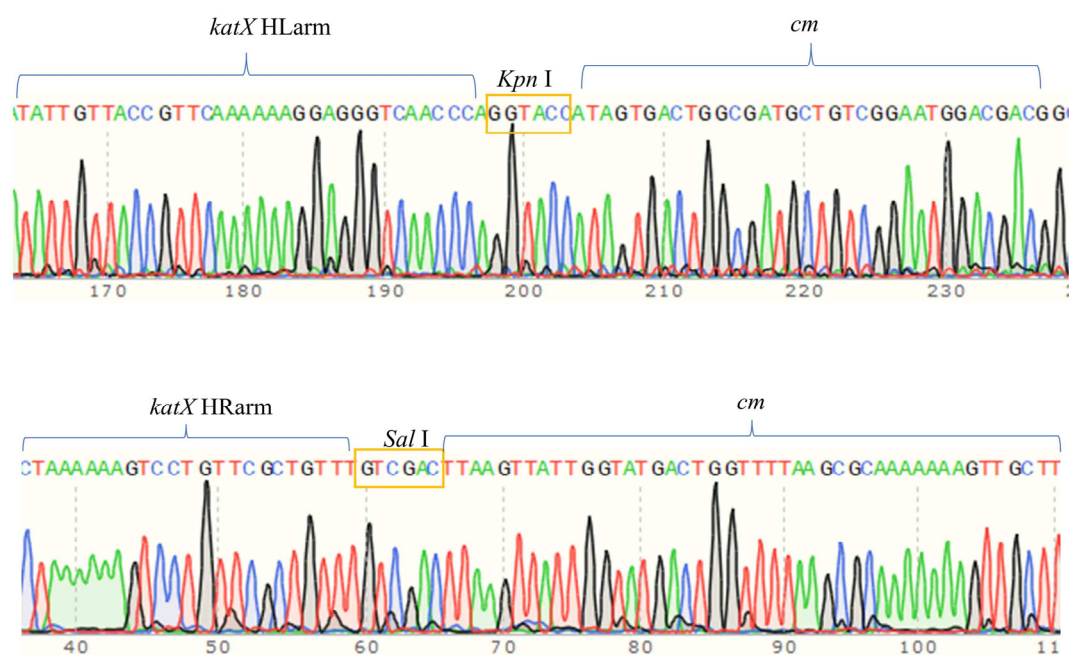


Figure S5. Sequencing of BJ3-2 Δ *katX*.

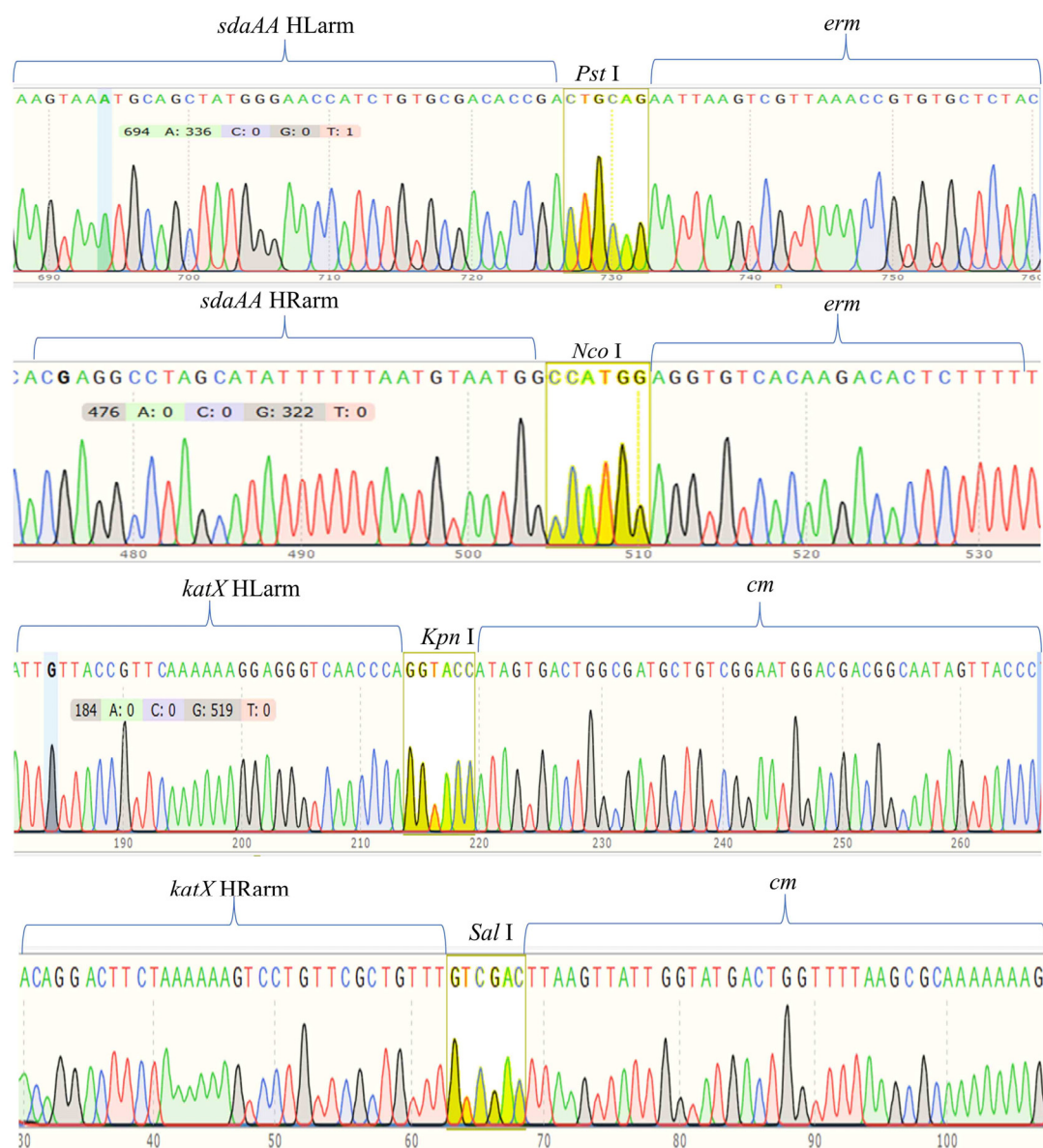


Figure S6. Sequencing of BJ3-2 Δ sdaAA Δ katX.

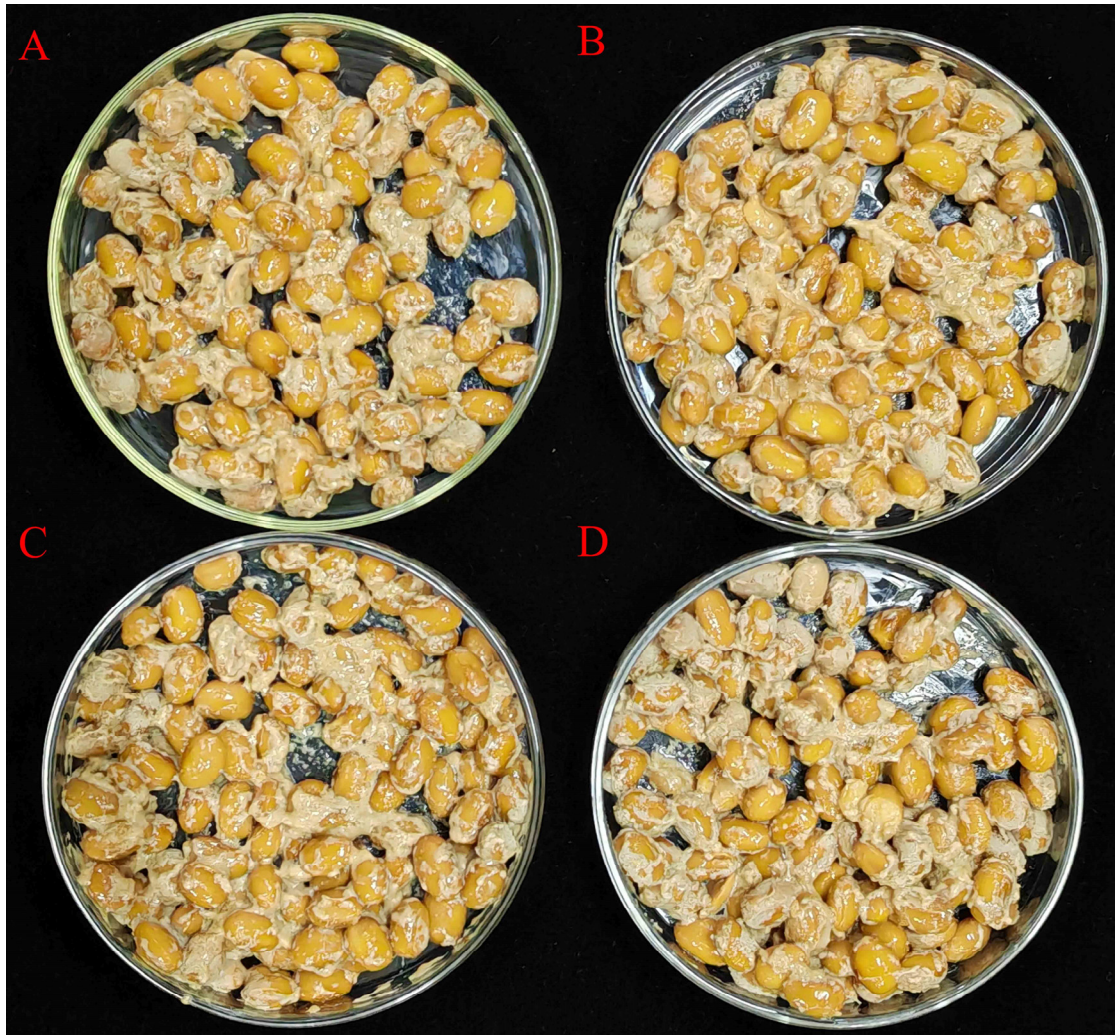


Figure S7. Fermented soybeans with BJ3-2, BJ3-2 Δ *sdaAA*, BJ3-2 Δ *katX* and BJ3-2 Δ *sdaAA* Δ *katX* at 37°C. **A** Fermented soybeans with BJ3-2 at 37°C. **B** Fermented soybeans with BJ3-2 Δ *sdaAA* at 37°C. **C** Fermented soybeans with BJ3-2 Δ *katX* at 37°C. **D** Fermented soybeans with BJ3-2 Δ *sdaAA* Δ *katX* at 37°C.