

## 1. Methods of analysis

The procedure of assay of  $\alpha$ -glucosidase activity is as follows: 1 mL of fermentation substrate was taken; then 1 mL of 0.1% p-nitrophenyl- $\alpha$ -D-glucopyranoside and 2 mL of 0.2M Tris-HCL buffer were added and homogenized into vials with the substrate, and then the vials were subsequently incubated in an incubation shaker at 37°C for 60 min. Afterwards, the test vials were located into a boiling water bath and heated for 3 min to terminate the reaction. Finally, the supernatant was taken and the absorbance of the sample was measured at 410 nm.

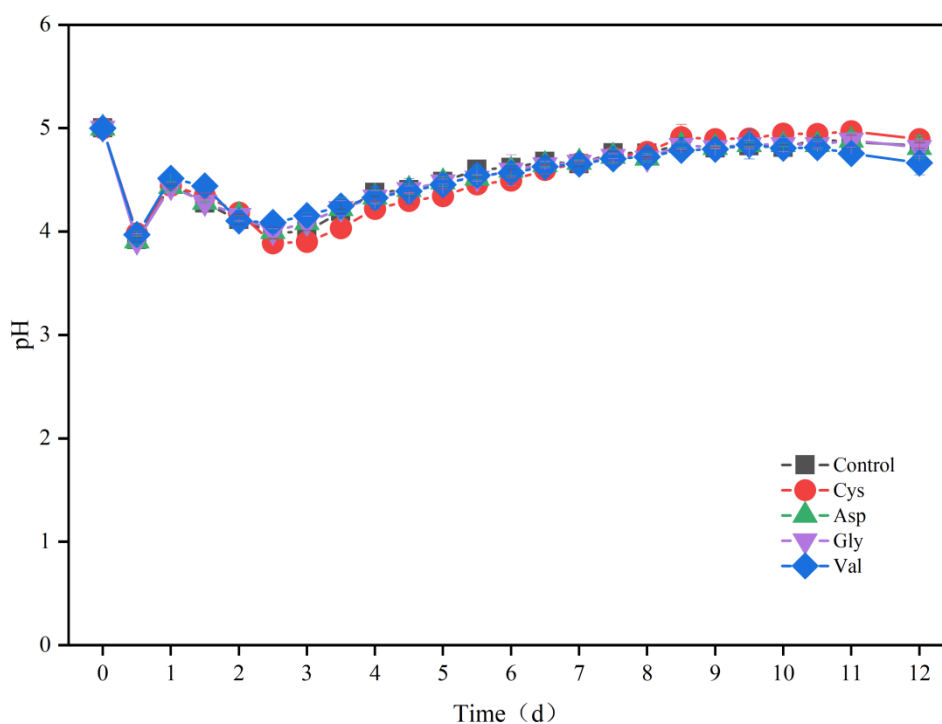


Figure S1. Variations of pH in the reactors with pH adjustment every 12 hours.

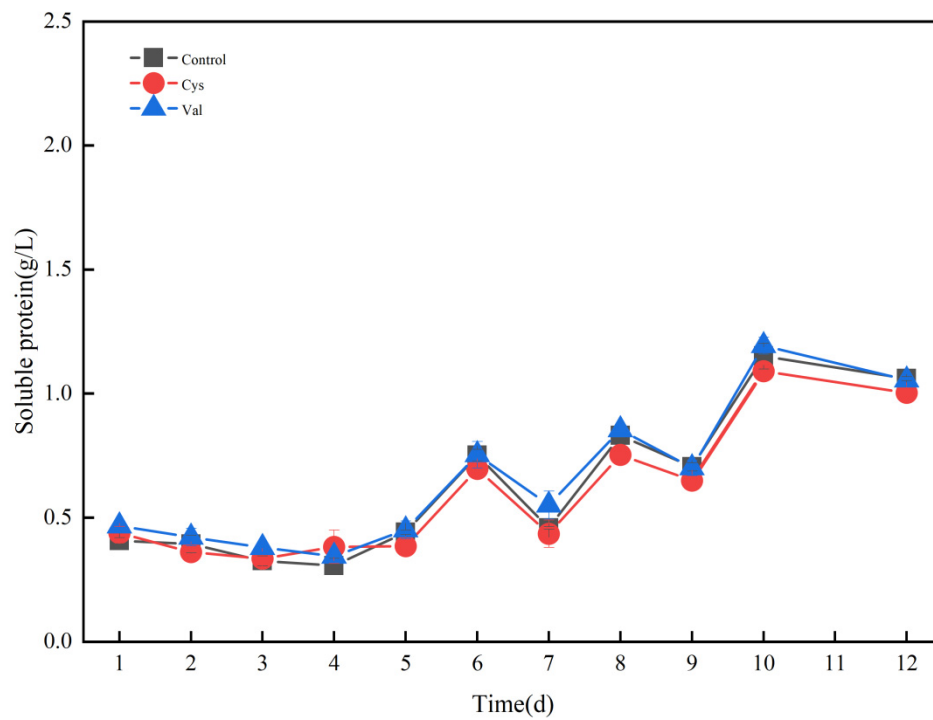


Figure S2. Soluble protein for three groups (Control, Cys, and Val).