

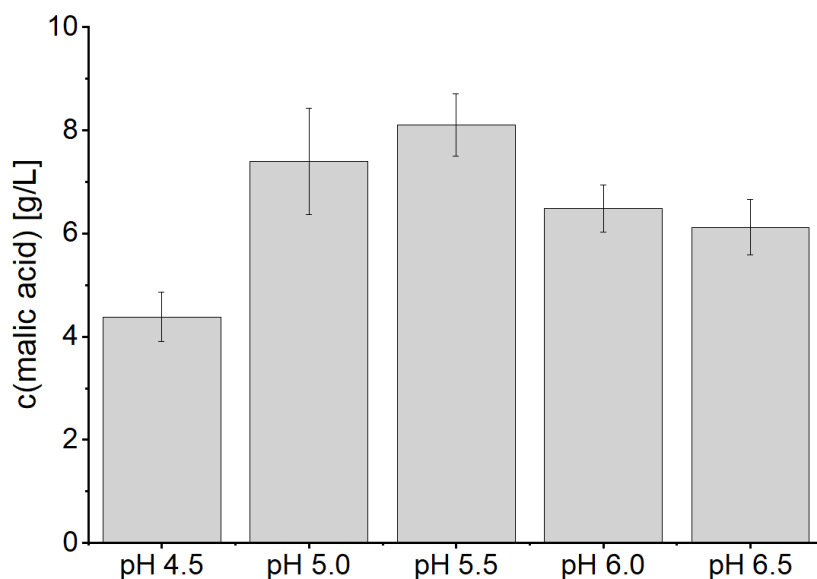


Figure S1: Evaluation of optimum initial pH for malic acid production with acetate. Initial medium pH-values of 4.5, 5.0, 5.5, 6.0 and 6.5 were tested and malic acid concentration after 192 h is displayed. Experiments were performed with 45 g/L acetic acid, 1.2 g/L $(\text{NH}_4)_2\text{SO}_4$ and 90 g/L CaCO_3 . Cultures were incubated at 32 °C and 120 rpm. Data points are the mean of biological triplicates and error bars indicate the standard deviation.

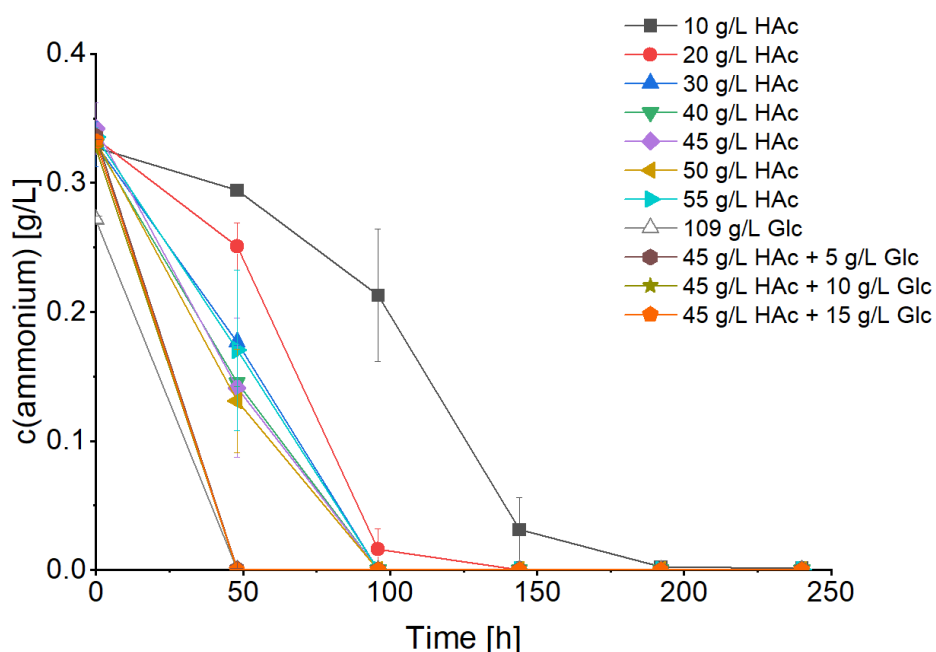


Figure S2: Determination of ammonium consumption with different substrate concentrations. Cultures were incubated at 32 °C and 120 rpm in the presence of 90 g/L CaCO_3 . Data points are the mean of biological triplicates and error bars indicate the standard deviation. HAc = acetic acid, Glc = glucose.

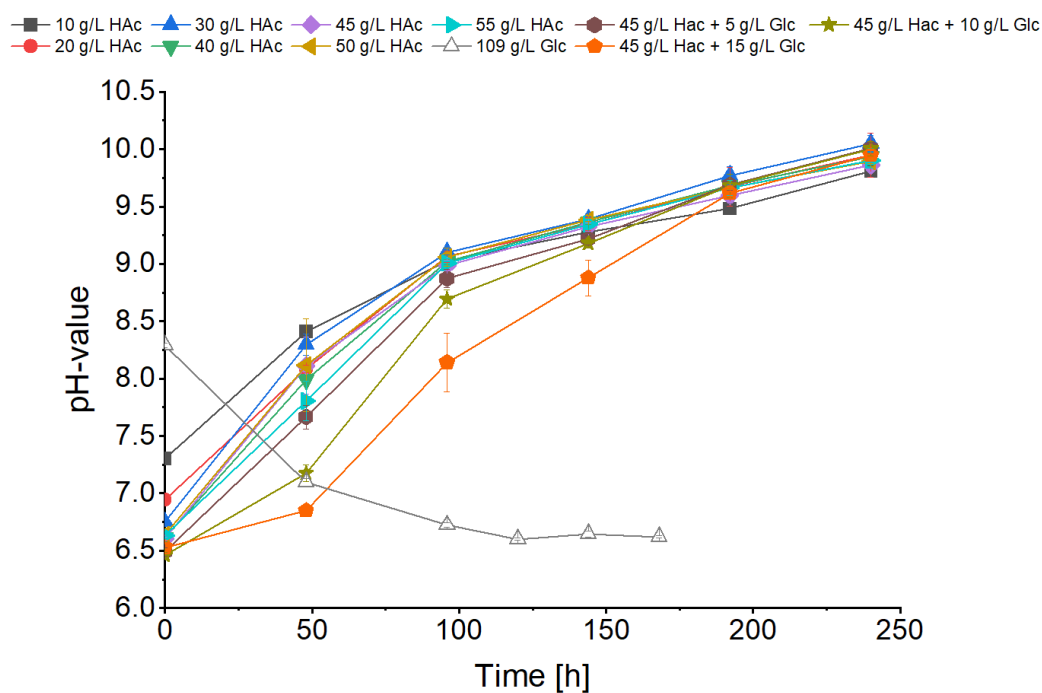


Figure S3: pH-values depending on substrate type and concentration. Cultures were incubated at 32 °C and 120 rpm in the presence of 90 g/L CaCO_3 . Data points are the mean of biological triplicates and error bars indicate the standard deviation. HAc = acetic acid, Glc = glucose.

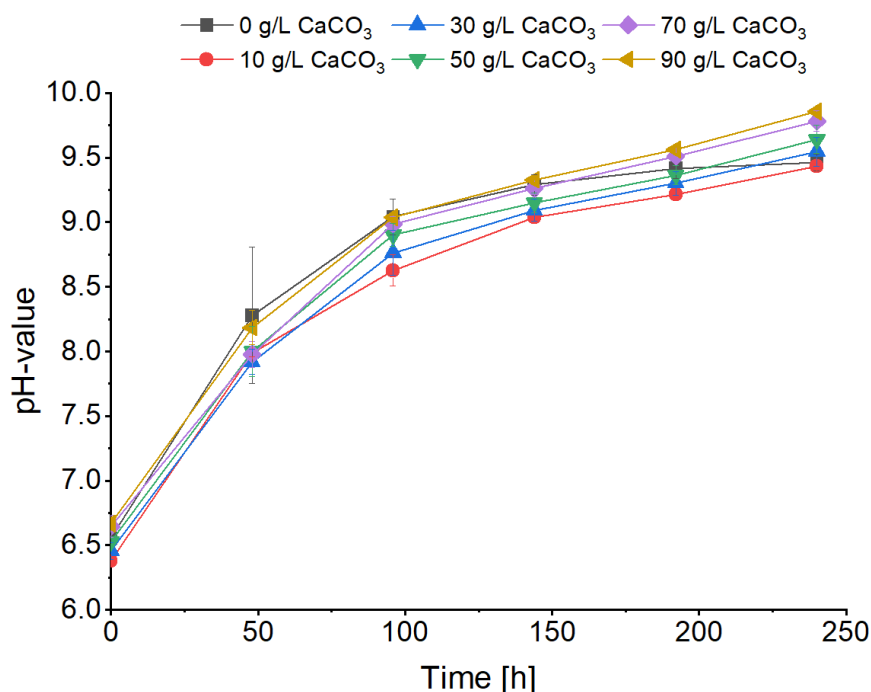


Figure S4: pH-values depending on the CaCO_3 concentration. Cultures were incubated at 32 °C and 120 rpm with 45 g/L acetic acid. Data points are the mean of biological triplicates and error bars indicate the standard deviation.

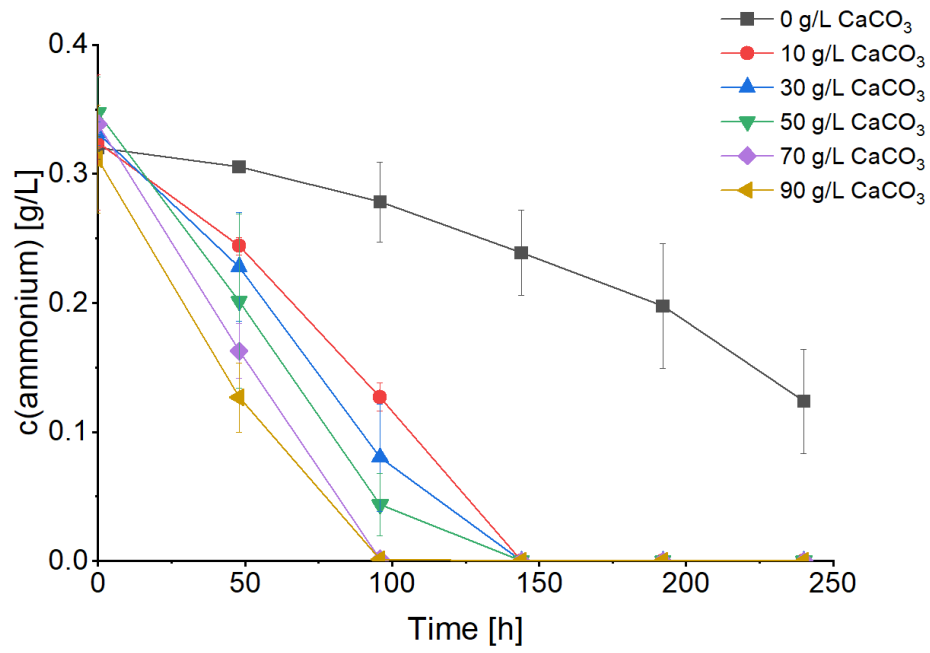


Figure S5: Determination of ammonium consumption depending on the CaCO_3 concentration. Cultures were incubated at 32 °C and 120 rpm with 45 g/L acetic acid. Data points are the mean of biological triplicates and error bars indicate the standard deviation.