***Cite this as*:** Yongcong ZHU, Wei CHENG, Yuemin NI, Wuzhong NI. Changes of folate constituents and contents in pakchoi as affected by nitrate to ammonium ratio in nutrient solution under hydroponic conditions. *Journal of Zhejiang University-SCIENCE B*, 26(12):1245-1259. https://doi.org/10.1631/jzus.B2500011

JZUS-B

Changes of folate constituents and contents in pakchoi as affected by nitrate to ammonium ratio in nutrient solution under hydroponic conditions

Key words: Pakchoi (*Brassica rapa* subsp. *chinensis*); Nitrate; Ammonium; Folate; Biosynthesis

Research Summary

This experiment mainly focused on the effects of the NO_3^-/ NH_4^+ ratio on the folate constituents and contents of pakchoi, and was to find the best ratio for stimulating folate synthesis and reveal the mechanism by which NO_3^-/ NH_4^+ ratio regulates folate accumulation in pakchoi.

JZUS-B

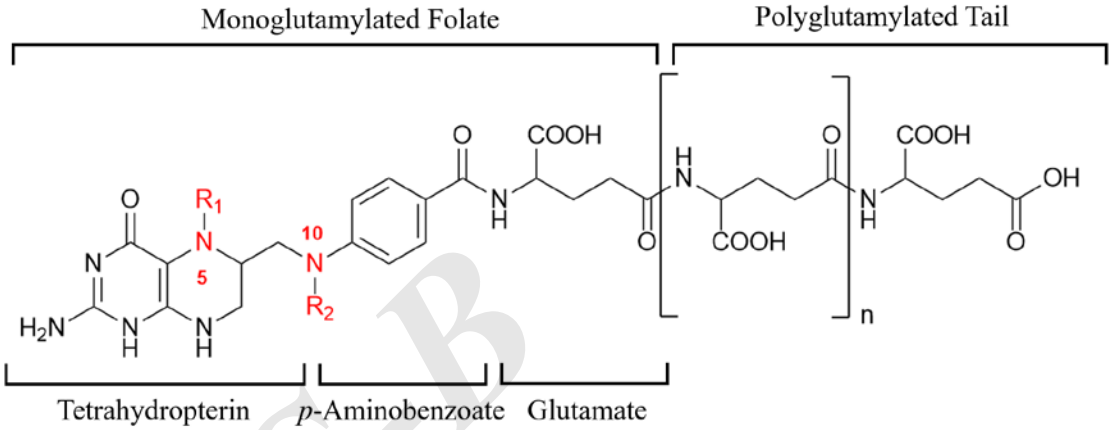
NO_3^-/ NH_4^+ ratio



Research Summary

70/30

NO_3^-/ NH_4^+ ratio



Metabolic flux of folate biosynthesis metabolism ↑

GGH activity ↑

151 μg per 100g FW

100/0 NO_3^-/ NH_4^+ ratio

1.5 fold

(1) Polyglutamylated 5-CHO-THF ↑

(2) Polyglutamylated 5-CH_3-THF ↑

231 μg per 100 g FW

JZUS-B

Innovation points

- **Investigating the effects of the integrated application of NO_3^-/ NH_4^+ on the folate constituents and contents of pakchoi**

- **Finding the best NO_3^-/ NH_4^+ ratio for stimulating pakchoi folate synthesis**

- **Rvealing the mechanism by which NO_3^-/ NH_4^+ ratio regulates folate accumulation in pakchoi**

JZUS-B

Conclusions

1 | The appropriate 70/30 NO_3^-/NH_4^+ ratio increased folate contents in pakchoi shoots

2 | 70/30 NO_3^-/NH_4^+ ratio promote pakchoi folate accumulation by increasing polyglutamylated 5-CHO-THF and polyglutamylated 5-CH_3-THF

3 | 70/30 NO_3^-/NH_4^+ ratio promote pakchoi folate accumulation by increasing the consumption of the folate precursors and intermediate metabolites

4 | 70/30 NO_3^-/NH_4^+ ratio improve pakchoi folate stability folate by reducing γ-glutamyl hydrolase (GGH) activity to weaken folate deglutamylation

5 | Strategic selection of the NO_3^-/NH_4^+ ratio should be considered for the hydroponic cultivation of foliar vegetable crops

JZUS-B