

**Title** Seasonal changes in glutamate dehydrogenase activities and amino acid content in green asparagus during spear growth

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#### **Abstract**

Seasonal changes in glutamate dehydrogenase (GDH) amination and deamination activities in the top and bottom portions of the spear of two asparagus cultivars ‘Welcome’ and ‘E-414’, grown in greenhouses from March to October were investigated. In the two cultivars and portions, the GDH amination activity showed an increasing trend in July, then declined remarkably from August to September and started to increase in October. On the other hand, GDH deamination activity increased gradually with the temperature changes during the growth of the spears. The GDH deamination activity in the top portion showed significantly higher activity than the bottom portion. Of the two cultivars, ‘Welcome’ was relatively higher both in the GDH amination and deamination activities than ‘E-414’ in both portions but no significantly higher activities in the top portion than the bottom portion. Glutamine, glutamic acid, asparagine and aspartic acid contents fluctuated during the growing season with a higher content at higher temperature and lower content at low temperature. These results clearly demonstrate that the temperature had a great influence on the metabolic rate of enzymes and its accumulation of amino acid in asparagus spears.