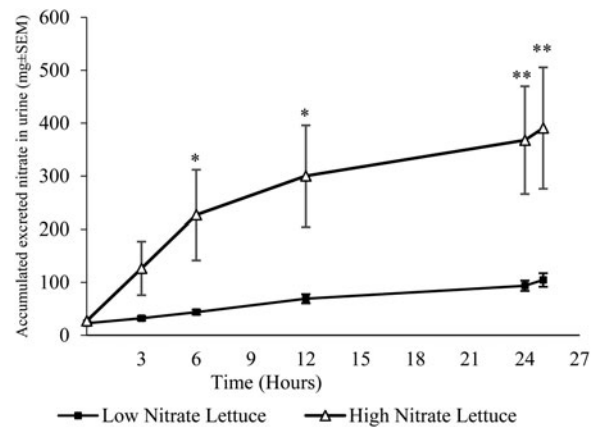


Recovery of urinary nitrate from ingestion of high-nitrate lettuce in healthy young subjects

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Nitrogen fertiliser is important for plant growth and its use affects the accumulation of nitrate in vegetables⁽¹⁾. Lettuce may contain high amounts of nitrate, which may be beneficial based on the emerging evidence on the positive effects of dietary nitrate on vascular health⁽²⁾. Consumption of vegetables raises plasma nitrate concentrations to a similar extent as infusion of inorganic nitrate⁽³⁾, however no studies have assessed to what extent oral ingestion of nitrate increases the amount of nitrate excreted with the urine. For this study, Butterhead lettuce (*Lactuca sativa* var. *capitata*) cv Egery was fertilised with either 154 or 26 ppm N, resulting in high nitrate lettuce (~530 mg nitrate/50 g fresh weight of lettuce) and low nitrate lettuce (~3 mg nitrate/50 g), respectively. The two sets of lettuce were applied in a double-blind cross-over trial with 20 volunteers. Interventions were separated by a wash-out period of three weeks. Subjects consumed 50 g fresh lettuce in the morning and urine samples were collected before the supplementation and full urine collection at set times for 24 hours after the supplementation (between 0–3hr, 3–6hr, 6–12hr and 12–24 hr).



The results show that it took more than 12 hours after the consumption of lettuce until the excretion rate returned to baseline, and that the amount of nitrate excreted through urine during more than 24 hours increased from 104 mg with low-nitrate lettuce to 391 mg ($P = 0.015$) with the high-nitrate lettuce. This 287 mg increase in urinary excretion corresponded to 54 % of the 527 mg additional dietary intake of nitrate. This confirms that dietary nitrate is highly bioavailable. However additional research is required to determine whether dietary nitrate may suppress the endogenous synthesis of nitrate via arginine and NO, or if the remaining 240 mg nitrate from the lettuce was lost e.g. in faeces, sweat etc.

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