

Title Integrated application of nitric oxide and modified atmosphere packaging to improve quality retention of button mushroom (*Agaricus bisporus*)

Author Tianjia Jiang, Xiaolin Zheng, Jianrong Li, Guoxing Jing, Luyun Cai and Tiejin Ying

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Abstract

Button mushrooms (*Agaricus bisporus*) were dipped for 10 min in different concentrations (0.5, 1, and 2 mM) of 2,2'-(hydroxynitrosohydrazino)-bisethanamine (DETANO), a nitric oxide donor, then packed in biorientated polypropylene (BOPP) bags, heat sealed and stored at 4 °C for 16 days (d). Mushroom weight loss, firmness, colour, percent open caps, total phenolics, ascorbic acid and H₂O₂ contents, superoxide anion (O_2^-) production rate and activities of polyphenol oxidase (PPO), superoxide dismutase (SOD), catalase (CAT), and ascorbate peroxidase (APX) were measured. The results indicate that treatment with 1 mM DETANO maintained a high level of firmness, delayed browning and cap opening, promoted the accumulation of phenolics, ascorbic acid and reduced the increases in both O_2^- production rate and H₂O₂ content. Furthermore, NO inhibited the activity of PPO, and increased the antioxidant enzymes activities of CAT, SOD and APX throughout storage period. Thus it was observed that application of NO in combination with modified atmosphere packaging (MAP) can extend the storage life of button mushroom up to 12 d.