

The effect of hot water treatment on the storage ability improvement of fresh-cut Chinese cabbage

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Abstract

Fresh-cut Chinese cabbage (*Brassica rapa* ssp. *pekinensis*) was subjected to hot water treatment (HWT) at different temperatures (38–57°C) and duration (3 s – 20 min.), followed by ambient air cooling. After treatment, the cabbage was stored at different temperatures: 0°C, 5°C and 15°C. Fresh-cut cabbage (untreated) served as the control object. During storage, quality assessments and sensory evaluation were performed. Additionally, nutrient content and microbial contamination were determined. Chinese cabbage responded in a variety of ways to hot water treatment. Positive and stable reactions were obtained for cabbage after short treatment in a water bath at 53°C and 55°C for 3 s. These treatments delayed unfavourable quality alterations of fresh-cut cabbage, such as cut surface browning and rotting of leaf pieces at all storage temperatures. The development of off-odors and off-tastes was significantly inhibited in cabbage after HWT and short storage at 15°C. In general, the treatments did not influence the nutritional value of the cabbage. The concentrations of ascorbic acid, total sugars, soluble phenols and antiradical activity did not differ significantly in treated and non-treated material. Only the content of nitrates in cabbage stored at 15°C decreased significantly in all objects and the lowest amount was found for cabbage dipped in tap water.

The intensive multiplication of yeasts and coliforms was noticed on fresh-cut Chinese cabbage after 3 days of storage at 15°C. A lower storage temperature (0°C) significantly inhibited microbial development in the cabbage, and especially yeasts and coliforms. The dipping of cut cabbage in tap water had no significant effect on the number of yeasts and coliforms, but increased mesophilic bacteria and *Enterobacteriaceae* compared to cut, untreated cabbage. HWT at 53°C and 55°C decreased the number of *Enterobacteriaceae* over 7 days of storage at 5°C.