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Using ultrasound technology for the inactivation and thermal sensitization of peroxidase in green coconut water

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Abstract

Green coconut water has unique nutritional and sensorial qualities. Despite the different technologies already studied, its enzymatic stability is still challenging. This study evaluated the use of ultrasound technology (US) for inactivating/sensitizing coconut water peroxidase (POD). The effect of both US application alone and as a pre-treatment to thermal processing was evaluated. The enzyme activity during US processing was reduced 27% after 30 min (286 W/L, 20 kHz), demonstrating its high resistance. The thermal inactivation was described by the Weibull model under non-isothermal conditions. The enzyme became sensitized to heat after US pre-treatment. Further, the use of US resulted in more uniform heat resistance. The results suggest that US is a good technology for sensitizing enzymes before thermal processing (even for an enzyme with high thermal resistance). Therefore, the use of this technology could decrease the undesirable effects of long times and/or the high temperatures of the conventional thermal processing.

Keywords: food processing; ultrasound technology; thermal processing; coconut water; enzyme inactivation.

1. Introduction

Green coconut water is a tropical beverage obtained from the immature coconut fruit (*Cocos nucifera L.*) [1, 2], with an increasing demand not only due to its sensory properties, but also due to its nutritional characteristics. It contains

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