

Reduction of microbial load in yellow alkaline noodle using optimized microwave and pulsed-UV treatment to improve storage stability

ABSTRACT

Pulsed-UV is an emerging innovation in non-thermal processing and is scarcely explored. This study introduces a combined treatment of microwave and pulsed-UV to reduce the microbial load in yellow alkaline noodle (YAN), a popular staple food among South East Asians that is easily perishable, without jeopardising its textural qualities. Results indicated that the combination of 5 s microwave (power = 900 W; frequency = 2450 MHz) and 3.5 J/cm² pulsed-UV significantly reduced aerobic plate count and spore forming bacteria, from 637.5 to 50 CFU/g and 1500 to 100 CFU/g, respectively. In terms of textural properties, even though significant changes were detected in hardness and springiness for treated YAN kept at ambient storage as compared to control, the alterations were not prominent. Based on these observations, it is concluded that a combined treatment of microwave and pulsed-UV successfully improved the shelf life of YAN at ambient storage by 50%, from 1.0 day (control) to 1.5 days (treated sample) and by 140%, from 2.0 to 4.8 weeks at chilled storage. Current study proves the potential of microwave + pulsed-UV, a “green” hurdle treatment, to extend the shelf life of preservative-free YAN without causing major undesirable textural alterations on the noodle.

Keyword: Yellow alkaline noodle; Microwave; Pulsed-UV; Microbial reduction; Storage study