

SHORT COMMUNICATION

Contents of Boric Acid in Noodles and Processed Foods

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Received: 04 December 2019

Accepted: 08 April 2020

Published: 30 June 2020

ABSTRACT

Boric acid is commonly used as pesticides, antifungal and antiseptics. It was also used as a food preservative to prolong the shelf life and enhance the food texture. In Malaysia, the addition of boric acid during food processing is prohibited due to its detrimental effect on health. In this study, noodles and fish-based processed food from different manufacturers were analysed for their boric acid concentrations by using the curcumin method. The results showed that there was high concentration of boric acid found in the noodles and fish-based processed food samples. The amount of boric acid detected in yellow noodles varied over the four weeks and amongst manufacturers. A similar pattern was also observed for 'kuey teow' (flat rice noodle) and 'kolok' noodle. The highest amount of boric acid concentrations was found in 'kuey teow' followed by yellow noodles and 'kolok' noodle. There was also inconsistency in the concentration of boric acid in fish cakes, fish balls and crab sticks. For fish-based products, crab stick contained the highest amount of boric acid followed by fish ball and fish cake. Even though the addition of boric acid to food is banned in Malaysia, the results of this study showed that boric acid is still being used as a food preservative in food manufacturing.

Keywords: Boric acid, noodles, preservative, processed foods

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In Malaysia, processed food and noodles become the preferred foods in the country with statistic showing 59.27% and 58.01% locals consuming wheat noodles and rice-based noodles in a week, respectively (Norimah *et al.*, 2008). In order to meet the demand by the population, fresh noodles and processed food are mass-produced by manufacturers throughout the country. However, these foods are easily perishable due to microbial load as they have high moisture content and rich with nutrient suitable for microbial growth (Wang *et al.*, 2018). Hence, to extend the shelf-life of the food, food preservation is vital and one of the most commonly available preservatives used in the food industry is boric acid.

Boric acid possesses antifungal and antibacterial activities, hence a good preservative to prolong the food's shelf life and give food a better texture (Seta *et al.*, 2009). Boric acid can control starch gelatinisation and enhance colour,

texture and food producers use it to hide the staleness and preserve the freshness of fish, prawn and meat. Low levels of boric acid ingestion result in minimal or no toxicity and does not require aggressive treatment in most patients (Litovitz *et al.*, 1988). However, chronic ingestion of boric acid results in vomiting, nausea, diarrhoea, and abdominal pain ensued by headaches, fever, tremors, muscle twitching, a lack of energy and weakness (Boone *et al.*, 2012). In severe cases, coma, seizures, liver and kidney dysfunction, a low red blood cell count and death can occur. For neonates, doses between 3-6 g total are possible to cause death while for adults, the potential lethal dose is 15-20 g total (Litovitz *et al.*, 1988).

The utilization of boric acid as a preservative has been prohibited by the Malaysian government, just as in some different nations like Singapore, Thailand, China and United