RETENTION OF VITAMIN A, IRON AND IODINE IN FORTIFIED SOY SAUCE

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Background: The prevalence of micronutrient malnutrition in the Philippines, namely, vitamin A, iron and iodine deficiency diseases prompted the Food and Nutrition Research Institute of the Department of Science and Technology to study food fortification. Soy sauce is one of the favorite sauces for direct consumption and food preparation among rich and poor alike. It is a regularly consumed food by majority of the Filipinos. Fortifying soy sauce with vitamin A, iron and iodine can contribute to efforts to decrease the prevalence of micronutrient malnutrition.

Objective: To determine the retention of vitamin A, iron and iodine in fortified soy sauce prepared in the laboratory and stored using different packaging materials and storage conditions for a period of one (1) year.

Methods: The soy sauce was fortified with vitamin A, iron and iodine and the changes in the physico-chemical, microbiological and sensory properties of the fortified soy sauce stored using transparent glass and plastic bottles exposed under fluorescent light and sunlight were investigated for a period of one (1) year.

Results: After one (1) year of storage, iodine content changed from 456 µg to 438 µg (glass bottle) and to 431 µg (plastic bottle) per 100 g for samples exposed to fluorescent light and from 405 to 426 µg (glass bottle) and to 422.4 µg (plastic bottle) per 100 g for samples exposed to sunlight. Iron content changed from 31.6 mg to 27.0 mg (glass bottle) and to 26.3 mg (plastic bottle) per 100 g for samples under fluorescent light and from 28.8 mg to 25.1 mg (glass bottle) and to 25.2 mg (plastic bottle) per 100 g for samples under sunlight. The vitamin A content changed from 1,319 µg to 726 µg (glass bottle) and to 558 µg (plastic bottle) per 100 g for samples exposed to fluorescent light and from 1,816 µg to 481 µg (glass bottle) and to 441 µg (plastic bottle) per 100 g for samples exposed to sunlight condition. Fortified soy sauce was rated like very much (6) to like extremely (7) using a 7-point hedonic rating scale by trained laboratory panelists in terms of color, flavor, odor and general acceptability even after the one-year storage. The fortified soy sauce was also found microbiologically safe for the same period.

Conclusion and Recommendation: Iron and iodine were substantially retained in fortified soy sauce after one (1) year of storage in glass and plastic bottles exposed under fluorescent light and sunlight. Significant reduction in vitamin A content was noted in soy sauce kept in plastic and glass bottle and stored under fluorescent light and sunlight. The results of the study will serve as basis for large-scale production of fortified soy sauce and eventually for transfer to food industry.