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Reverse-enteric iron microencapsulation with blend of chitosan and maltodextrin using spray drying: Tea fortification

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Statement of the Problem: Dairy products are good targets for fortification with vitamin D. The stability of added micronutrients is one of the most important factors. Vitamin D3 is likely to decline during processing and storage of fortified products, and oxidation is suspected as the likely cause. Fatty acid lipoxidation could be one of the ways which causes vitamin D3 degradation. The influence of heat treatment and storage conditions on lipid oxidation and vitamin D3 degradation in simulated milk powder were investigated.

Methodology & Theoretical Orientation: In milk powder processing, heat treatment and storage conditions are two factors which could have an effect on lipid oxidation. In this study, simulated whole milk powder (SWMP) were produced and fortified with vitamin D3 premix. Pasteurized and non-pasteurized samples were stored at room temperature (RT) and 40°C for 12 months. Primary and secondary lipid oxidation products were monitored by analyzing PV and TBARS values, respectively. Vitamin D3 content was also analyzed in model samples during the storage period.

Findings: Based on the observation of 12 month storage, heat treatment resulted in lower levels of PV and TBARS in SWMPs compared to those without heat treatment. Storage temperature was important in lipid oxidation of model milk powders. The higher storage temperature leads to increased PV levels and TBARS values. In terms of vitamin D3 content, heat treatment resulted in lower vitamin D3 degradation for both samples stored at RT (B1) and 40°C (B2) (Figure1). However, upon storage vitamin D3 content decreased in B2 and showed the lowest after 7 months of storage.

Conclusion & Significance: During 12 months storage, an inverse relationship was observed between secondary lipid oxidation products and vitamin D3 degradation for SWMPs. This indicated that the generation of lipid oxidation products is associated with the degradation of vitamin D3.

Biography

Fatemeh Mahmoodani is a PhD student of Food Science at the School of Chemical Sciences, University of Auckland, New Zealand. Her current research focuses on vitamin D3 degradation in whole milk powder and identification of vitamin D3 isomerization and oxidation products. Her PhD project is in collaboration with Fonterra Cooperative Group Ltd. and funded by the Primary Growth Partnership Programme of New Zeeland. She received her MSc degree in Food Science, and is working on the antioxidant and antihypertensive activities of bioactive peptide from 2012 at the National University of Malaysia

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